Oregon
Theodore R. Kulongoski, Governor

Department of Land Conservation and Development
635 Capitol Street, Suite 150
Salem, OR 97301-2540
(503) 373-0050
Fax (503) 378-5518
www.lcd.state.or.us

NOTICE OF ADOPTED AMENDMENT

11/19/2012

TO: Subscribers to Notice of Adopted Plan or Land Use Regulation Amendments

FROM: Plan Amendment Program Specialist

SUBJECT: City of Madras Plan Amendment
DLCD File Number 001-12

The Department of Land Conservation and Development (DLCD) received the attached notice of adoption. Due to the size of amended material submitted, a complete copy has not been attached. A Copy of the adopted plan amendment is available for review at the DLCD office in Salem and the local government office.

Appeal Procedures*

DLCD ACKNOWLEDGMENT or DEADLINE TO APPEAL: Wednesday, December 05, 2012

This amendment was submitted to DLCD for review prior to adoption pursuant to ORS 197.830(2)(b) only persons who participated in the local government proceedings leading to adoption of the amendment are eligible to appeal this decision to the Land Use Board of Appeals (LUBA).

If you wish to appeal, you must file a notice of intent to appeal with the Land Use Board of Appeals (LUBA) no later than 21 days from the date the decision was mailed to you by the local government. If you have questions, check with the local government to determine the appeal deadline. Copies of the notice of intent to appeal must be served upon the local government and others who received written notice of the final decision from the local government. The notice of intent to appeal must be served and filed in the form and manner prescribed by LUBA, (OAR Chapter 661, Division 10). Please call LUBA at 503-373-1265, if you have questions about appeal procedures.

*NOTE: The Acknowledgment or Appeal Deadline is based upon the date the decision was mailed by local government. A decision may have been mailed to you on a different date than it was mailed to DLCD. As a result, your appeal deadline may be earlier than the above date specified. NO LUBA Notification to the jurisdiction of an appeal by the deadline, this Plan Amendment is acknowledged.

Cc: Nick Snead, City of Madras
Gordon Howard, DLCD Urban Planning Specialist
Karen Swirsky, DLCD Regional Representative
Gary Fish, DLCD Transportation Planner

<paa> YA

FORM 2

DLCD Notice of Adoption

This Form 2 must be mailed to DLCD within **5-Working Days after the Final Ordinance is signed** by the public Official Designated by the jurisdiction and all other requirements of ORS 197.615 and OAR 660-018-000

☐ In person ☐ electronic ☐ mailed

DATE STAMP

DEPT OF
NOV 15 2012
LAND CONSERVATION AND DEVELOPMENT

For Office Use Only

Jurisdiction: **City of Madras**

Local file number: **PA-11-1**

Date of Adoption: **11/13/2012**

Date Mailed: **11/14/2012**

Was a Notice of Proposed Amendment (Form 1) mailed to DLCD? ☒ Yes ☐ No Date:

☒ Comprehensive Plan Text Amendment

☐ Comprehensive Plan Map Amendment

☐ Land Use Regulation Amendment

☐ Zoning Map Amendment

☐ New Land Use Regulation

☐ Other:

Summarize the adopted amendment. Do not use technical terms. Do not write "See Attached".

Adopt amendments to City of Madras Transportation System Plan (Bicycle & Pedestrian elements).

Does the Adoption differ from proposal? Please select one

No

Plan Map Changed from: to:

Zone Map Changed from: to:

Location: Acres Involved:

Specify Density: Previous: New:

Applicable statewide planning goals:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☒	☐	☐	☐	☐	☐	☐	☐

Was an Exception Adopted? ☐ YES ☒ NO

Did DLCD receive a Notice of Proposed Amendment...

35-days prior to first evidentiary hearing? ☒ **Yes** ☐ **No**

If no, do the statewide planning goals apply? ☐ **Yes** ☐ **No**

If no, did Emergency Circumstances require immediate adoption? ☐ **Yes** ☐ **No**

DLCD file No. 001-12 (19234) [17237]

Please list all affected State or Federal Agencies, Local Governments or Special Districts:

City of Madras, Jefferson County and DLCD

Local Contact: **Nicholas Snead** Phone: **(541) 323-2916** Extension:

Address: **71 SE "D" Street** Fax Number: **541-475-7061**

City: **Madras** Zip: **97741-** E-mail Address: **nsnead@ci.madras.or.us**

ADOPTION SUBMITTAL REQUIREMENTS

This Form 2 must be received by DLCD no later than 5 working days after the ordinance has been signed by the public official designated by the jurisdiction to sign the approved ordinance(s)
per ORS 197.615 and OAR Chapter 660, Division 18

1. This Form 2 must be submitted by local jurisdictions only (not by applicant).
2. When submitting the adopted amendment, please print a completed copy of Form 2 on light **green paper if available**.
3. Send this Form 2 and **one complete paper copy** (documents and maps) of the adopted amendment to the address below.
4. Submittal of this Notice of Adoption must include the final signed ordinance(s), all supporting finding(s), exhibit(s) and any other supplementary information (ORS 197.615).
5. Deadline to appeals to LUBA is calculated **twenty-one (21) days** from the receipt (postmark date) by DLCD of the adoption (ORS 197.830 to 197.845).
6. In addition to sending the Form 2 - Notice of Adoption to DLCD, please also remember to notify persons who participated in the local hearing and requested notice of the final decision. (ORS 197.615).
7. Submit **one complete paper copy** via United States Postal Service, Common Carrier or Hand Carried to the DLCD Salem Office and stamped with the incoming date stamp.
8. Please mail the adopted amendment packet to:

ATTENTION: PLAN AMENDMENT SPECIALIST
DEPARTMENT OF LAND CONSERVATION AND DEVELOPMENT
635 CAPITOL STREET NE, SUITE 150
SALEM, OREGON 97301-2540

9. **Need More Copies?** Please print forms on **8½ -1/2x11 green paper only if available**. If you have any questions or would like assistance, please contact your DLCD regional representative or contact the DLCD Salem Office at (503) 373-0050 x238 or e-mail **plan.amendments@state.or.us**.

ORDINANCE NO. 847

AN ORDINANCE AMENDING AND RESTATING THE CITY'S TRANSPORTATION SYSTEM PLAN IN ITS ENTIRETY PURSUANT TO GOAL 12 OF THE CITY'S COMPREHENSIVE PLAN.

WHEREAS, the City of Madras adopted its Transportation System Plan by passage of Ordinance No. 668 on August 25, 1998; and

WHEREAS, the Transportation System Plan was amended by Ordinance No. 707 on May 27, 2003, and Ordinance No. 785 on December 12, 2006; and

WHEREAS, because bicycling and walking are increasingly recognized as a viable means of alternative transportation that provides many benefits, including travel choice and mobility, affordability, reduced road congestion, infrastructure savings, improved community health, and recreation, the Community Development Department determined the need to review the City's Transportation System Plan to insure that it was up-to-date and contained all of the components necessary to provide transportation options to the Madras community; and

WHEREAS, the Community Development Department determined that the Transportation System Plan was not up-to-date and lacked certain critical components; and

WHEREAS, the Community Development Department applied for and was awarded a Transportation and Growth Management Grant by the Oregon Department of Transportation to amend the Transportation System Plan to (1) include the development of a bicycle, pedestrian, and Safe Routes to Schools system map, (2) include a Key Pedestrian infrastructure map, (3) update the Funding Options and Financial Plan in the Transportation System Plan, (4) identify individual bicycle and pedestrian improvement projects, (5) update the bicycle and pedestrian system inventory maps, and (6) implement Goal 12 (Transportation) of the City's Comprehensive Plan by adoption of the Transportation System Plan; and

WHEREAS, the City hired Kittelson and Associates, Inc., a transportation engineering firm specializing in transportation system updates, to assist the City with identifying necessary amendments to the Transportation System Plan pursuant to Goal 12 of the Comprehensive Plan; and

WHEREAS, the City followed the City's Citizen Involvement Plan as applicable for this plan amendment process; and

WHEREAS, the City established a Technical Advisory Committee consisting of representatives from the City, Jefferson County, Oregon Department of Transportation, utility providers, and the Housing Works (a regional housing authority) to assist Kittelson and Associates in (1) identifying necessary bicycle and pedestrian facility improvement projects, (2) developing a Safe Routes to Schools system map, (3) identifying necessary updates to the bicycle and pedestrian system inventory maps, (4) identifying possible funding options, and (5) identifying necessary amendments to the Transportation System Plan pursuant to Goal 12 of the Comprehensive Plan; and

WHEREAS, the Technical Advisory Committee held public meetings on August 11, 2011, August 12, 2011, and October 10, 2011 to gather information from the public and work with Kittelson and Associates to develop amendments necessary to bring the bicycle and pedestrian components of the Transportation System Plan pursuant to Goal 12 of the Comprehensive Plan up-to-date; and

WHEREAS, the City provided the public with an additional opportunity to participate in the amendment process via a website made available by the City for this purpose, whereby the public could provide comment or suggest improvements; and

WHEREAS, the City received comments from the public via the website and considered those comments in preparing the proposed amendments; and

WHEREAS, a joint City Council / Planning Commission meeting was held on March 7, 2012 to allow the Planning Commission and City Council to familiarize themselves with the proposed amendments and provide the public with an additional opportunity to participate in the amendment process; and

WHEREAS, a public hearing was held before the City Planning Commission on April 18, 2012 to accept written and oral comments from the public and staff on the proposed amendments; and

WHEREAS, after reviewing all relevant materials and considering written comments and oral testimony from the public and staff, the Planning Commission approved the proposed amendments to the Transportation System Plan pursuant to Goal 12 of the Comprehensive Plan; and

WHEREAS, the Planning Commission forwarded the approved comments to the City Council for review and consideration; and

WHEREAS, a public hearing was held before the City Council on April 24, 2012 to accept public testimony on the proposed amendments; and

WHEREAS, the Region IV Planner for the Oregon Department of Transportation indicated at the public hearing on April 24, 2012 that the Oregon Department of Transportation and the Department of Land Conservation and Development support the proposed amendments; and

WHEREAS, the City Council, after reviewing all relevant materials, and considering oral and written comments from the public and staff, approved the proposed amendments, closed the public hearing, and instructed staff to prepare the appropriate ordinance for approval at a future date; and

WHEREAS, because the Transportation System Plan, adopted on August 25, 1998 and amended in 2003 and 2006, is again being amended rather than replaced, it is the City's desire that the 2003, 2006 and current amendments be set forth in a single useable document and that the Transportation System Plan be restated in its entirety and adopted as part of the City's Comprehensive Plan.

NOW, THEREFORE, the City of Madras ordains as follows:

SECTION 1: AMENDMENTS

The Transportation System Plan adopted by Council on August 25, 1998, as amended by Ordinance No. 707 on May 27, 2003 and Ordinance No. 785 on December 12, 2006, is hereby amended to include the amendments to the Transportation System Plan that were approved by Council on April 24, 2012. The City's Transportation System Plan is hereby restated in its entirety as shown on Exhibit 1, attached hereto, and is adopted as part of the Comprehensive Plan.

SECTION 2: FINDINGS

The Findings on the Proposed Amendments to the Comprehensive Plan and Transportation System Plan, attached hereto as Exhibit 2, and the statements listed above, are hereby adopted.

SECTION 3: MISCELLANEOUS

3.1 Severability. If any section, subsection, sentence, clause, and/or portion of this Ordinance is for any reason held invalid, unenforceable, and/or unconstitutional, such invalid, unenforceable, and/or unconstitutional section, subsection, sentence, clause, and/or portion will:

(a) yield to a construction permitting enforcement to the maximum extent permitted by applicable law, and

(b) not affect the validity, enforceability, and/or constitutionality of the remaining portion of this Ordinance.

3.2 Corrections. This Ordinance may be corrected by order of the City Council to cure editorial and/or clerical errors.

3.3 Effective Date. This Ordinance will be in full force and effect thirty (30) days after its adoption by the City Council and signing by the Mayor.

ADOPTED by the City Council and signed by the Mayor this 13th day of November, 20 12.

Ayes: 4
Nays: 0
Abstentions: 0
Absent: 1
Vacancies: 1

Melanie Widmer
Melanie Widmer, Mayor

ATTEST:

Karen J. Coleman
Karen J. Coleman, City Recorder

EXHIBIT "1"

City of Madras Transportation System Plan

Updated: May 2012

CITY OF MADRS

TRANSPORTATION SYSTEM PLAN

Adopted August 25, 1998
(Ordinance #668)

Amended May 27, 2003
(Ordinance #707)

Amended December 12, 2006
(Ordinance #785)

Amended _____
(Ordinance No. _____)

Revised By:
Oregon Department of Transportation
Planning and programming Unit
63034 OB Riley Road
Bend, OR 97701

Revised By:
Kittelson and Associates, Inc.
610 S.W. Alder, Suite 700
Portland, Oregon 97205

Prepared By:
David Evans and Associates, Inc.
709 N.W. Wall Street, Suite 102
Bend, Oregon 97701-2744

Prepared for:
City of Madras
71 South D Street
Madras, Oregon 97741

ACKNOWLEDGMENT

The Madras Department of Public Works made an important contribution to this plan by preparing a draft Transportation Development Plan in 1993. The draft plan provided useful information for the system inventory and insight into the community and its future needs. David Evans and Associates (DEA) has incorporated most of the elements from the draft plan into this document. We would like to acknowledge the writer, Gerald Breazeale, for his valuable help in both preparing the draft plan and development of this TSP.

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CHAPTER 1: INTRODUCTION

The Madras Transportation System Plan (TSP) guides the management of existing transportation facilities and the design and implementation of future facilities for the next 20 years. **This Transportation System Plan constitutes the background study for the transportation element of the City's Comprehensive Plan and satisfies the requirements of the Oregon Transportation Planning Rule.**

Green colored text depicts the amendments that were outlined in the Kittelson and Associates Report dated October 10, 2006 (Project #7976), and approved by the City Council on December 12, 2006 by passage of Ordinance No. 785.

The information that was provided in the report had been divided into three areas: Refinement Plans, Updated Project List, and Additional Amendments.

Background

Per Oregon Administrative Rule (OAR) Division 12, "Transportation Planning" #660-012-000, the City of Madras initiated the process to prepare its long-range transportation plan in 1994 with the help of a grant from the Oregon Department of Transportation (ODOT). A consultant team prepared the Transportation System Plan (TSP), which was published in 1995. After the City and ODOT staff's extensive review, the document was modified and republished in 1998. The City adopted the modified TSP in August 1998.

The impact of the, then newly proposed, Department of Correction's facility located to the east of the City was not included in the original TSP. In order to incorporate the impact of the proposed facility, the City decided to update its Comprehensive Plan and TSP through the Transportation Growth Management (TGM) grant from ODOT and Department of Land Conservation and Development (DLCD) in 2000. The plan was completed and adopted by the City in 2001.

In 2005, Jefferson County began preparing their TSP with the help of a grant from ODOT. The County TSP project included the preparation of refinement plans for the Madras Truck Route and "J" Street improvements. This report summarizes the results of those refinement plans. In addition, this report updates the list of City projects to reflect the impact of the County TSP project list in an effort to coordinate the City's TSP project list with the new County's TSP project list. Furthermore, during the County TSP process, City staff recognized the need to include additional amendments to address the growing development trends in the City. These amendments are also included in the Kittelson Report dated October 10, 2006.

In 2011, Kittelson prepared an update to the pedestrian and bicycle elements of the TSP. The amendments to the TSP were adopted by the City in 2012. These amendments are also outlined in the memo prepared by Kittelson on April 11, 2012.

PLANNING AREA

The Madras TSP planning area included the City of Madras, as well as the area within the City's UGB and adjacent areas that are currently developing or that have a strong potential to develop within the 20-year planning period. The Madras TSP planning area is shown on Figure 1-1. Roadways included in the TSP fall under several jurisdictions: the City of Madras, Jefferson County, and the State of Oregon.

Madras and the surrounding area constitute a small but rapidly growing community. Madras' location along the US Highway 97/26 corridor through Central Oregon, and its desirable climate, outstanding scenery, and proximity to recreation assure that growth will continue at a strong pace. The area is economically strong, supported by a combination of resource-based industries, agriculture, and increasing important tourist trade. In addition, Madras is attractive to retired people because of its relatively inexpensive housing and attractive amenities.

Because Madras has developed along the US 97/26-highway corridor, the area has grown in a north-south pattern. City blocks are longer along the north-south axis than they are east and west. The majority of the retail businesses are located along the US 97/26-highway corridor, forming a two-mile long commercial strip through the city. Highway accesses to businesses have been largely unregulated. This land use pattern, typical of cities located along highway corridors, encourages automobile traffic to the exclusion of other forms of transportation. As the area grows, the conflicts of unlimited access and highway traffic will increase.

Local traffic relies heavily on the US 97/26-highway corridor through Madras. There are few good east / west routes across Madras. The only two existing streets that extend east and west the full width of the city are "B" and "C" Streets.

Willow Creek, which runs from southeast to northwest through the City, has also created pressure on existing streets because it interrupts the grid pattern. Many platted streets have not been connected across the creek because of the expense of building bridges and steep terrain in some locations. Traffic is therefore diverted onto a few main streets, especially onto US Highway 97. However, Willow Creek has also provided the City with an opportunity to develop a multi-use path for pedestrians and bicyclists.

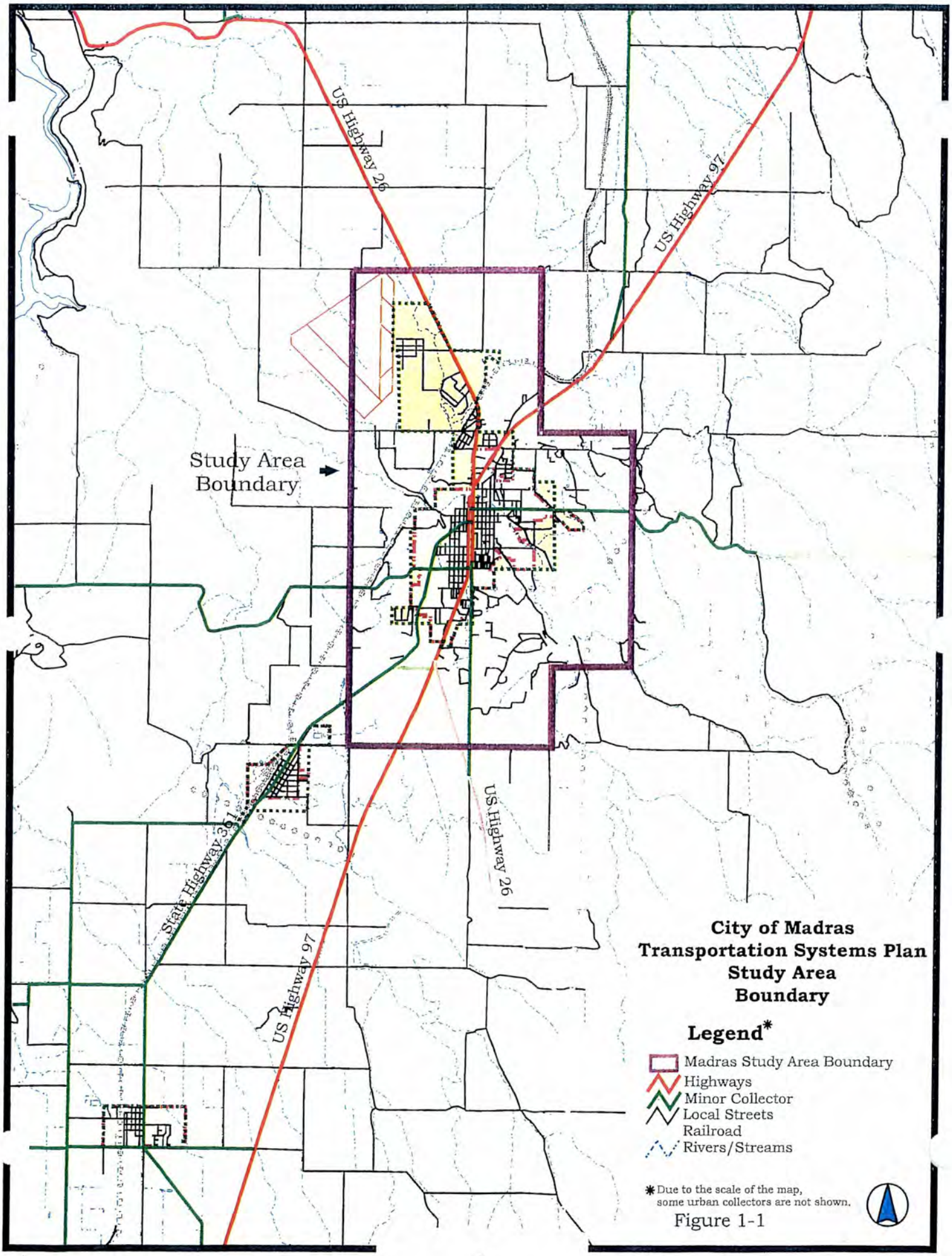

US Highway 26
US Highway 97
Study Area
Boundary
US Highway 26
State Highway 361
US Highway 97
City of Madras
Transportation Systems Plan
Study Area
Boundary
Legend*
Madras Study Area Boundary
Highways
Minor Collector
Local Streets
Railroad
Rivers/Streams
*Due to the scale of the map,
some urban collectors are not shown.

Figure 1-1

The Madras Industrial Park is located north of the city on US Highway 26. Present vehicular access to the Industrial Park is limited to US Highway 26 because of the steep terrain to the south and the lack of any highway frontage roads. Employees commuting to the Industrial Park cause noticeable increases in traffic in the morning and late afternoon. The existing highway at the Industrial Park is only two lanes wide (with a portion having a center turn lane). The existing mix of truck traffic, commuters, and through traffic creates congestion during heavy use times and shift changes at the Industrial Park.

Local streets in Madras are generally very wide. The streets are largely paved with an oil mat surface over native materials. On average, streets are in fairly good condition; however, a lack of adequate base coupled with insufficient funding for surfacing and maintenance is contributing to a decline in condition. Rarely have sidewalks been constructed along streets. Consequently, pedestrians must share the streets with cars and trucks. The low traffic volumes on local City streets have minimized conflicts between pedestrians and motorists; however, conflicts will grow as volumes increase. The lack of walkways may discourage some from walking as a form of transportation.

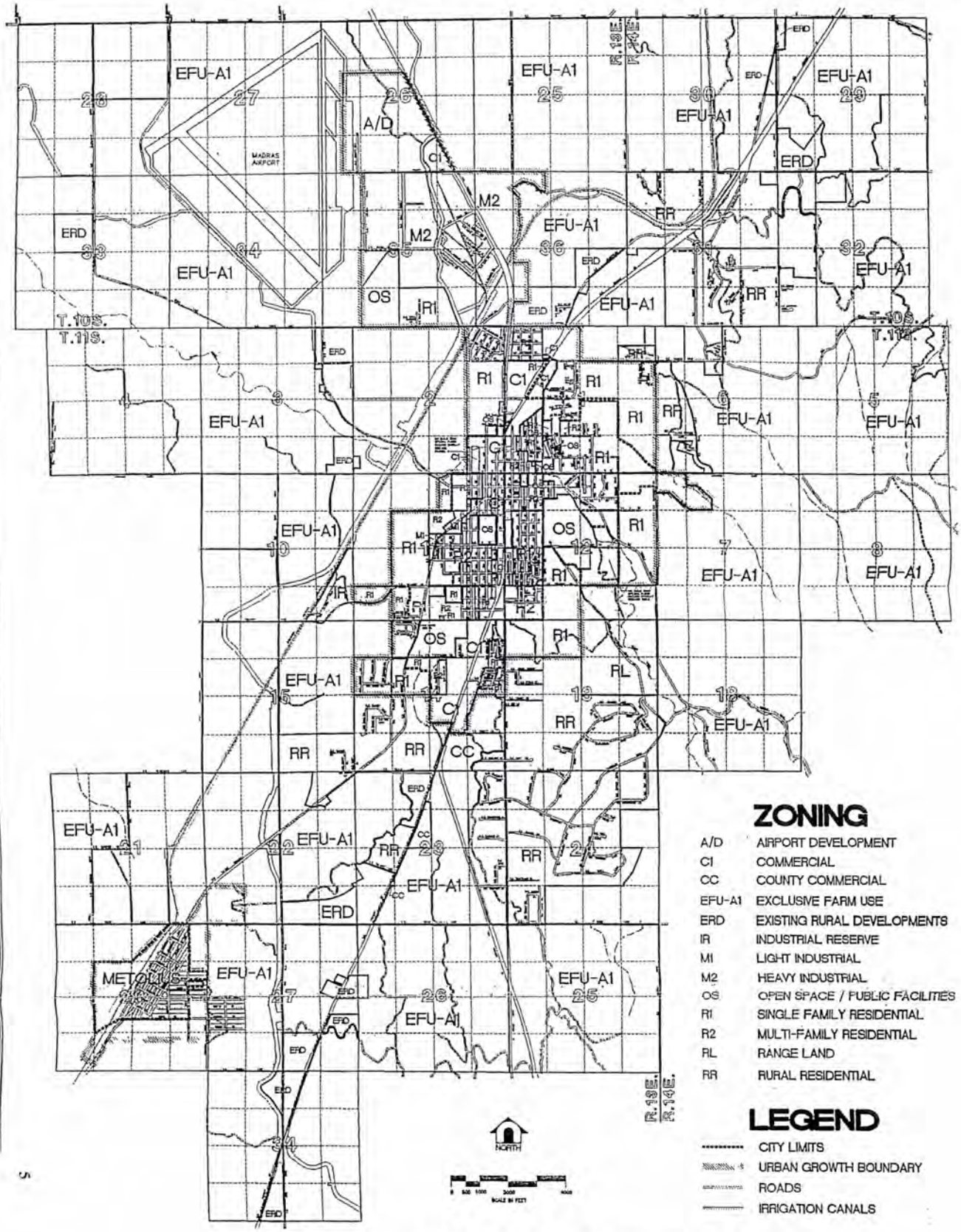
A zoning map of the Madras TSP planning area is show on Figure 1-4. The commercial zones are focused along the two highways. Residential zoning surrounds the commercial core. The manufacturing and industrial uses are primarily in the northwest quadrant of the city with some smaller pockets in other areas.

The challenge for the future of Madras is to provide a transportation system that will accommodate growth without the associated traffic problems. Appropriate planning while Madras is still relatively small will provide the opportunity to avoid the transportation problems that plague many cities.

PLAN ORGANIZATION

The Madras TSP was developed through a series of technical analyses combined with systematic input and review by City staff, a technical advisory committee (TAC), and the public. Key elements of the process include:

- Involving the Madras community (Chapter 1)
- Defining goals and objectives (Chapter 2)
- Reviewing existing plans and transportation conditions (Chapter 3 and 4; Appendix C)
- Developing population, employment and travel forecasts (Chapter 5)
- Developing and evaluating potential transportation system improvements (Chapter 6)
- Developing the transportation system plan (Chapter 7)
- Developing a capital improvement program (Chapter 8)
- Developing Recommended Policies and Ordinances (Chapter 9)



ZONING

A/D	AIRPORT DEVELOPMENT
CI	COMMERCIAL
CC	COUNTY COMMERCIAL
EFU-A1	EXCLUSIVE FARM USE
ERD	EXISTING RURAL DEVELOPMENTS
IR	INDUSTRIAL RESERVE
MI	LIGHT INDUSTRIAL
M2	HEAVY INDUSTRIAL
OS	OPEN SPACE / PUBLIC FACILITIES
R1	SINGLE FAMILY RESIDENTIAL
R2	MULTI-FAMILY RESIDENTIAL
RL	RANGE LAND
RR	RURAL RESIDENTIAL

LEGEND

- CITY LIMITS
- URBAN GROWTH BOUNDARY
- ROADS
- IRRIGATION CANALS

MADRAS URBAN AREA ZONING MAP

CITY OF MADRAS AND JEFFERSON COUNTY, OREGON

Community Involvement: Community involvement was an important part of developing the Madras Transportation System Plan. Interaction with the community was achieved through holding open meetings and by forming a Transportation Advisory Committee (TAC). The TAC functioned as a combination technical and citizen advisory committee. The TAC provided local knowledge and guidance to the consultant team, and review of work products. The TAC consisted of representatives from Madras, Jefferson County and the Oregon Department of Transportation (ODOT). Six TAC meetings were held throughout the planning process.

Three open community meetings were held in Madras on September 28, 1994, February 22, 1995 and June 29, 1995. The first meeting was held at the beginning of the process in a workshop format to solicit public input on issues and problems to be addressed. The results of this meeting formed the basis for the transportation goals and objectives. The second meeting was held in the middle of the process to review the potential improvement options for Madras. The third was held at the end of the process for community review and comments upon completion of the draft TSP. Two newsletters were published in the *Madras Pioneer*, one in advance of each of the last two public meetings. These are included in Appendix B.

In addition, a Bicycle Advisory Committee was formed to provide review and recommendations for the bikeway-planning portion of the TSP. This committee included members from all segments of the community, including the Police Department. They met numerous times throughout the project.

Goals and Objectives: Based on input from the City, the TAC, and the community, a set of goals and objectives were defined for the TSP. These goals and objectives were used to make decisions about various potential improvement projects. They are described in Chapter 2.

Review and Inventory of Existing Plans, Policies, and Public Facilities: To begin the planning process, all applicable Madras and Jefferson County transportation and land use plans and policies were reviewed and an inventory of public facilities was conducted. The purpose of these efforts was to understand the history of transportation planning in the Madras area, including the street system improvements planned and implemented in the past, and how the City is currently managing its ongoing development. Existing plans and policies are described in Appendix C of this report.

The inventory of existing facilities catalogs the current transportation system. The results of the inventory are described in Chapter 3. Chapter 4 describes how the system now operates. Appendix D summarizes the inventory of the existing arterial and collector street system.

Future Transportation System Demands: The Transportation Planning Rule requires the TSP to address a 20-year forecasting period. Therefore, 20-year travel forecasts were developed based on projections of population and employment by different land use categories within the Urban Growth Boundary (UGB). The forecasting process is described in Chapter 5.

Transportation System Potential Improvements: Once the travel forecasts were developed, it was possible to evaluate a series of potential transportation system improvements. The initial evaluation was the "No Build" option, which is the existing street system plus any currently committed street system improvements. This evaluation revealed that a "No Build" option did not meet the goals and objectives of the TSP.

Based on projected capacity deficiencies and safety concerns identified in the "No Build" evaluation, potential improvements to the street system were developed and tested. After comparing the benefits of each improvement in meeting the project's goals and objectives, a series of transportation system improvements were selected. The recommended improvements are described in Chapter 6.

Modal Plans and Implementation Plan: The TSP was developed to address each mode of transportation. The street system plan was developed from the forecasting and potential improvement evaluation described above. The bicycle and pedestrian plans were developed based on current usage, land use patterns, and the requirements set forth by the Transportation Planning Rule. The public transportation, air, water, rail, and pipeline plans were developed based on discussions with the owners and operators of those facilities. Chapter 7 details the plan elements for each mode.

Capital Improvement Program and Funding Options: The capital improvement program was developed from the short-term improvements and the recommended street system plan. The funding analysis examines options for financing these improvements. These elements are described in Chapter 8.

Recommended Policies and Ordinances: Suggested Comprehensive Plan policies and implementing zoning and subdivision ordinances are included in Chapter 9 and the appendices.

CHAPTER 2: GOALS AND OBJECTIVES

The purpose of the Transportation System Plan is to provide a guide for Madras to meet its transportation system needs. The following goals and objectives were developed from information supplied by the Transportation Advisory Committee, City staff, and public. Throughout the planning process, each element of the plan was evaluated against these parameters.

An overall goal was first developed. Then more specific goals and objectives were formulated. The goals and objectives are listed below. All of the goals and objectives guided the development of the TSP.

OVERALL TRANSPORTATION GOAL:

Develop a transportation system that enhances the livability of Madras and accommodates growth and development through careful planning and management of existing and future transportation facilities.

GOAL 1: Improve and enhance safety and traffic circulation on the local street system.

Objectives:

A. Develop an efficient grid system for the community by improving the local street system.

B. Improve and maintain existing roadways.

C. Identify truck routes to reduce truck traffic in urban areas.

D. Examine the need for speed reduction and improved signalization in specific areas.

E. Identify local problem spots and recommend solutions; e.g., the junction of Highways 26 and 97.

This goal and its objectives are discussed in Chapters 6 and 7.

GOAL 2: Identify transportation system needs to accommodate developing or undeveloped areas.

Objectives:

A. Provide policies and standards that address street connectivity, spacing, and access management.

B. Integrate new streets into the city grid system with an emphasis on taking the pressure off of traditionally heavy traffic collectors.

C. Improve accesses into and out of Madras for goods and services.

This goal and its objectives are addressed in Chapters 6, 7, 8, and 9.

GOAL 3: Increase walking and bicycling through improved access, circulation, safety, and convenience.

Objectives:

A. Provide sidewalks and safe crossings on arterial, collector, and most local streets.

B. Provide shoulders and rural collectors and arterials.

C. Provide bikeways along arterials and major collectors and in other locations where high use occurs or may occur.

D. Provide bicycle parking facilities as part of new multi-family residential developments of four or more units, new retail, office, and institutional developments, and transit transfer stations and park and ride lots.

This goal and Objectives A-D are discussed in Chapter 7.

GOAL 4: Increase the use of transit and transportation demand management measures.

Objectives:

A. Promote alternate modes and carpool programs through community awareness and education.

B. Plan for expanded transit service by sustaining funding to local transit efforts and seeking consistent state support.

A plan for Objective A was beyond the scope of the TSP. Objective B is partially met in Chapter 9, in that land use planning that accommodates future transit expansion is included.

GOAL 5: Enhance the role of the Madras Airport as an important part of the health, safety, and welfare of the area.

Objectives:

A. Improve emergency medical air access by providing instrument approach.

B. Continue runway improvements.

C. Improve access to the airport.

D. Continue to seek matching funds for state and federal funds.

This goal will be partially met by the City of Madras and Jefferson County adopting the recommended policies and ordinances included in Chapter 9 of the TSP. The ordinances help protect the function of the airport by restricting certain land uses in its vicinity. Objective C is met by the proposed improvements to Canyon Road/Glass Drive to Adler Street in the Industrial Park, and by adding shoulders to Cherry Lane (see Chapter 6). Objectives A, B, and D are outside the scope of the TSP, and should be considered in a Madras Airport Master Plan update.

CHAPTER 3: TRANSPORTATION SYSTEM INVENTORY

As part of the planning process, an inventory of the existing transportation system in Madras was conducted. This inventory covered the street system as well as the pedestrian, bikeway, public transportation, rail, air, water, and pipeline systems.

STREET SYSTEM

The most common understanding of transportation is of roadways carrying cars and trucks. Most transportation dollars are devoted to building and maintaining these facilities. The mobility provided by the personal automobile has resulted in a great reliance on this form of transportation. Likewise, these facilities allow trucks to carry freight to nearly any destination.

Accommodating the use of cars and trucks must be balanced against costs, livability factors, the ability to accommodate other modes of transportation, and negative impacts on adjacent land uses. However, the basis of transportation in all American cities is the roadway system. This trend is clearly seen in the existing Madras transportation system. It consists almost entirely of roadway facilities for cars and trucks. The street system will most likely continue to be the basis of the transportation system through the 20-year planning period. Therefore, the emphasis of this plan is on improving the existing street system for all users.

An inventory of the existing street system was conducted for the Transportation System Plan planning area. Inventory elements include:

- Street classification and jurisdiction
- Street width and right-of-way
- Number of travel lanes
- Presence of on-street parking, sidewalks, or bikeways
- Speed limits
- General pavement conditions

Figure 3-1 shows the roadway functional classification and jurisdiction, and the location of traffic signals. Appendix D lists the complete inventory.

City of Madras/Jefferson County
1995 Street Classification and Signals

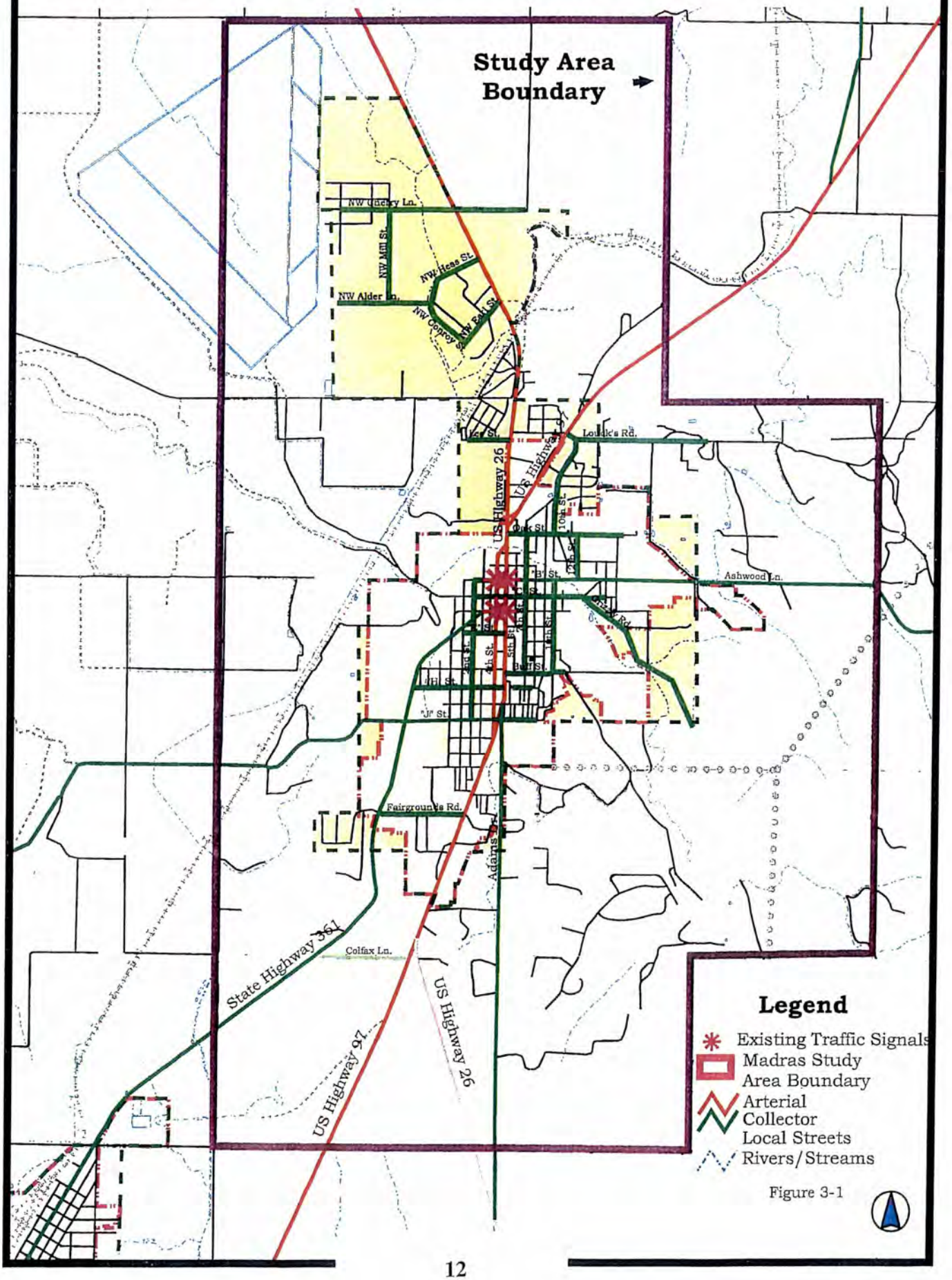


Figure 3-1

State Highways

Any discussion of the Madras street system must include the State highways that traverse the planning area. Although Madras has no direct control over the State highways, adjacent development as well as traffic patterns are heavily influenced by the highways. Madras is served by three highways: US Highway 97, US Highway 26, and State Highway 361 (Culver Highway). These highways serve as the major route through town with commercial and industrial development focused along the corridors.

The 1991 Oregon Highway Plan (OHP) classifies the state highway system into four levels of importance (LOI): Interstate, Statewide, Regional, and District. Oregon Department of Transportation (ODOT) has established primary and secondary functions for each type of highway and objectives for managing the operations for each, as shown in Appendix E.

Both Highways 26 and 97 through the Madras area are classified as highways of Statewide Level of Importance, Access Oregon Highways (AOH), and are part of the National Highway System. The management emphasis on these highways is to preserve safe and efficient higher speed through travel in rural areas, and moderate to low-speed operations in urban or urbanizing areas. This means that design factors such as controlling access and providing passing lanes are of primary importance.

State Highway 361 is classified as a district highway, mainly serving local traffic.

US Highway 97

US Highway 97 bisects Madras into east and west sections. The highway widens from a two-lane roadway into a couplet of one-way streets from Pine Street at the north end of Madras to "J" Street at the south end. There it joins again into a two-way road south through the remainder of the City. The couplet consists of 5th Street for northbound traffic and 4th Street for southbound traffic.

Both 4th and 5th Streets were originally developed as city streets. 4th Street is still owned by the City, with the State using the street under permit from the City. The numerous intersections and accesses to the highway through town create conflicts with the relatively high volumes of highway traffic within the City. Current ODOT recommendations for a highway with the volume of US Highway 97 would limit intersection distances to one per 1/4 mile (1,320 feet). Existing intersections are spaced at an average of 450 feet between Pine and "J" Streets.

Accesses to businesses along Highway 97 have developed over time in an uncontrolled manner with little definition of ingress and egress. In many cases, the entire frontage of a business is the access. Only fairly recently have efforts been made to define and separate access points to businesses. Today, the Highway Plan guidelines of a

minimum 1/4 mile spacing for public road intersections and 500 ft. for private drives are used to guide development and access review decisions. In some cases this may not be possible due to lot/block size or other constraints. Access control deficiencies are most severe at the south end of Madras.

Access control is critical in portions of the Madras study area where traffic speeds are over 30 MPH and the main purpose of the highway is to move through traffic. However, in the downtown core of Madras, where the posted speed limit is 25 MPH, it is both practical and appropriate for blocks to be 200 to 400 feet long. Driveway accesses should be limited, with businesses relying upon on-street parking or sharing off-street parking where possible. Numerous accesses reduce pedestrian and bicycle safety in the downtown core, where the potential for their use is the highest.

US Highway 26

US Highway 26 is the major route for traffic between Central Oregon and the Portland area. This highway carries essentially all the traffic in and out of the Industrial Park. There is no other practical vehicle access to the Park, which is a major employer in Jefferson County.

Traffic on US Highway 26 joins traffic from US Highway 97 just north of Oak Street in Madras. The alignment of the two highways where they intersect has caused numerous problems. ODOT has worked with the City to identify two preferred alternatives for this intersection. Comments made earlier regarding US Highway 97 and access issues apply equally to US Highway 26.

State Highway 361

State Highway 361, the Culver Highway, carries traffic between Madras and the cities of Metolius and Culver. Lake Billy Chinook and Cove State Park also add traffic to the Culver Highway. State Highway 361 joins US Highway 97 at "D" Street in Madras. Commercial development has not been intensive along State Highway 361. There is a pocket of commercial development near its intersection with Madison Street in Madras. As with Highways 26 and 97, access has been nearly unlimited along the Culver Highway.

Street Classification

Madras has classified their street system at three levels: arterial streets, collector streets, and local streets. The classification system includes city, county, and state roadways.

Arterial Streets

Arterial streets form the primary roadway network within and through a region. They provide a continuous road system that distributes traffic between neighborhoods and districts. Generally, arterial streets are high capacity roadways that carry high traffic volumes with minimal localized activity.

In Madras, the arterial network consists of two highways, US Highways 26 and 97. US Highway 97 runs concurrently with US Highway 26 beginning just north of Colfax Lane through the center of town. Between "J" Street on the south and Pine Street on the north, the roadway splits into a one-way couplet along 4th Street and 5th Streets. After Pine Street, the highways split with US Highway 26 heading northwest and 97 heading northeast.

Collector Streets

Collector streets connect local neighborhoods or districts to the arterial network. Madras has 26 designated collector streets. Within the study area limits, collector streets include the following:

B Street
C Street
E Street
H Street
J Street
2nd Street
7th Street
Adams Drive
Adler Lane
Bard Lane
Belmont Lane
Buff Street
Canal Street
Canyon Road
Cherry Lane
Conroy Street
Earl Street
Fairgrounds Road
Grizzly Road
Hess Street
Lee Street
Marie Street
Mill Street
Oak Street
10th Street
12th Street

Local Streets

Local streets form the majority of the street system in Madras. They are designed to carry low traffic volumes associated with local uses that abut them. In Madras, the local streets help form part of the grid system; however, they are not intended to function as alternate routes to the arterial and collector street system.

General Street System Characteristics

There are currently 18 miles of roads under City ownership and control, excluding 4th Street. Of these streets, 14 miles are paved, two miles are graded and drained, and less than a mile is unimproved but open for travel. Of the paved streets, 2.7 miles are asphalt concrete and 11.5 miles are surfaced with an oil mat. Nearly all of the streets

were built on native material without sufficient base to support heavy truck loading. The streets vary in width from 34 feet to 54 feet.

The majority of the streets in the core area of the city are from 44 feet wide to 54 feet wide. Most streets are curbed; however, most are lacking sidewalks. Rights-of-way in nearly every instance are 16 feet wider than the street. This allows only 8 feet outside the curb for sidewalks and utilities. Consequently, most utilities are buried within the street.

The unusually wide streets within the city may be a blessing or a liability depending on how they are viewed. Wide streets promote or provide for high traffic volumes, and encourage increased speeds. A 54-foot wide street could easily accommodate four lanes of traffic without curbside parking. Such streets may be appropriate for major traffic routes, but are less desirable in a local neighborhood. Wide may contribute to excessive heat during the Summer and increased storm water run off during rainstorms. The greater width of Madras streets does allow the storage of snow in the center of the street rather than along the sides where it can block driveways and storm sewers.

A number of roads within the Madras TSP planning area are under the jurisdiction of Jefferson County. These are summarized in Appendix A. Of these, many are without shoulders and have an insufficient base.

While there is a good grid of connecting streets in the core of Madras, no local streets run the entire length of the city from north to south. This feature encourages local north/south traffic to use the state highway.

Two streets, "B" and "C", traverse Madras in the east-west direction. Willow Creek, along with the Madras Elementary and the High School, prevents streets between "C" and Buff Streets from traversing the city. This interruption of the grid system places a greater burden of traffic on "B" and "C" Streets. Although current traffic levels are not excessive on these streets, future development is likely to occur on the east side of Madras, which will place much greater demands on "B" and "C" Streets. "B" Street serves as the primary access to the hospital, which is currently being expanded. A middle school is currently being constructed on "B" Street just east of the Madras city limits. Some of the most desirable home sites lie east of Madras along "B" Street.

Buff Street, which connects the Madras High School, Buff Elementary, and Madras Elementary to 5th Street, is unusually narrow by Madras standards, with a width of 34 feet at the crest of the hill at 7th Street. This street is quite steep and has an abrupt vertical curve near the intersection with 8th Street. School buses use the route to access the schools in the area, as well as parents driving children to school, children walking or bicycling to and from school, and residents of Madras Ranchos Subdivision. A great deal of attention has recently been given to the potential for motorist, pedestrian, and bicyclist conflicts on this street.

Traffic lights were installed by ODOT in 1991 at the intersections of the State highway and "B" and "D" Streets. These traffic signals were installed at the request of the City of Madras to facilitate safe crossing of the highway by vehicles and pedestrians at these two important locations.

PEDESTRIAN SYSTEM

Walking is the most basic form of transportation. Nearly every trip begins and/or ends with walking, even if it is as short as the walk from the parking space to the end destination. Walking trips generally fall into one of the four following categories:

- Relatively short trips (under one mile) to local destinations, including schools, parks, stores, and civic facilities (e.g. libraries and recreation and community centers;
- Recreational trips;
- Commute trips, where residents live within walking distance to where they work; and
- Trips made by individuals without access to other transportation options.

The relatively small size of Madras results in many origins and destinations within a short distance of each other. Therefore, walking could be employed regularly to reach a variety of destinations. Encouraging pedestrian activities may decrease the use of the personal automobile, increase daily physical activity of individuals, improve community relationships, and may also provide benefits for retail businesses. Where people find it safe, convenient, and pleasant to walk, they may linger and take notice of shops that they previously overlooked. They may also feel inclined to return to renew the pleasant experience time and again.

An important component of the pedestrian system is a complete street network. A complete street network generally resembles a grid pattern and has a high level of connectivity and a limited number of cul-de-sacs and dead-end roads. This type of network minimizes out-of-direction travel, which is important for pedestrians, since they travel slower than motor vehicles. Additionally, it provides alternate routes so they may avoid traveling on higher-volume, higher-speed roadways. Many of the roads in Madras are already constructed in such a fashion, especially in the vicinity of the older areas of the city (i.e. 1ST Street to 10TH Street and "M" Street to Oak Street).

The pedestrian system was inventoried to identify where there are opportunities to improve the network of sidewalks, crossings, and shared-use paths.

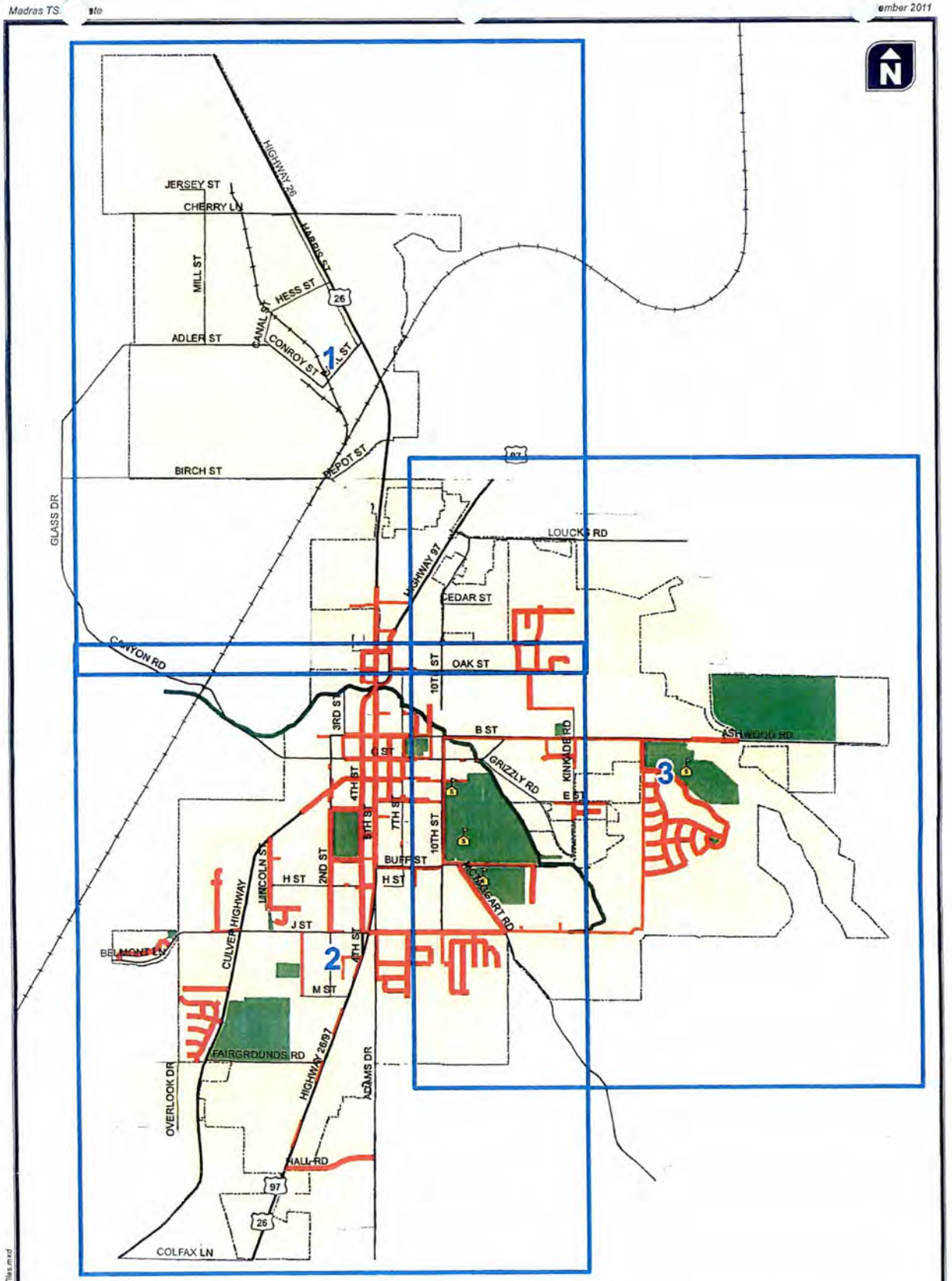
Sidewalk

The most obvious components of the pedestrian system are sidewalks. City of Madras street design standards include six-foot sidewalks on both sides of all public streets, excluding Expressways. A 12-foot wide multi-use path is standard for Expressways. Many streets were constructed prior to the establishment of these standards and do not have consistent sidewalks. Figure 3-2a shows the location of existing sidewalks in the Madras UGB. This inventory uses the inventory prepared for the 1998 TSP as a starting point.

Updates have been made through the use of recent aerial photography. The inventory was also verified by input from local residents and field visits to select locations by the project team. As Figure 3-2a shows, sidewalks currently cover at least one side of approximately 35% of all roads in Madras. Most sidewalks are found in the downtown business section and surrounding area. Along the 4TH Street - 5TH Street couplet, the sidewalks are concrete and eight feet wide. Sidewalks run the length of 4TH Street from Pine Street on the north to "J" Street on the south on both sides of the street and along the west side of 5TH Street. Lighting in the area consists of streetlights where cross streets intersect 4TH Street. There are not continuous sidewalks on either side of US Highway 97 from "J" Street to the southern UGB, except along certain blocks where recent development has occurred.

Sidewalks extend along the west side of 5TH Street from "J" Street north to Pine Street. There are two gaps in the sidewalk on this side where steep banks along the road would require fill to construct a sidewalk. These gaps occur between "G" Street and "F" Street. On the east side of 5TH Street, sidewalks extend from Trade Street to Oak Street. From Oak Street, the sidewalk extends north along US Highway 97 to Cedar Street. Most of the cross streets between 5TH and 4TH Streets have sidewalks.

Sidewalks also extend for a considerable distance along "B" Street / Ashwood Road, 10TH Street, "D" Street, and 2ND Street. Other than the downtown business district, and along these streets, sidewalks are provided sporadically where their construction has been required with new development. There are few places where one can travel by foot without having to walk in the street. Where sidewalks have been provided, many of the intersections do not have wheelchair ramps. Lighting in most areas consists of streetlights at strategic corners. The remainder of the walkway remains fairly dark at night. Many of the older sections of sidewalk are in a state of disrepair due to excessive weathering.



Sidewalks
- Both Sides
- One Side
- Willow Creek Trail
- School
- Sub-AreaBoundary
- Park
- City Limits
- Urban Growth Boundary

Existing Sidewalks

CITY OF MADRAS

KITTELSON & ASSOCIATES, INC.

Figure 3-2a

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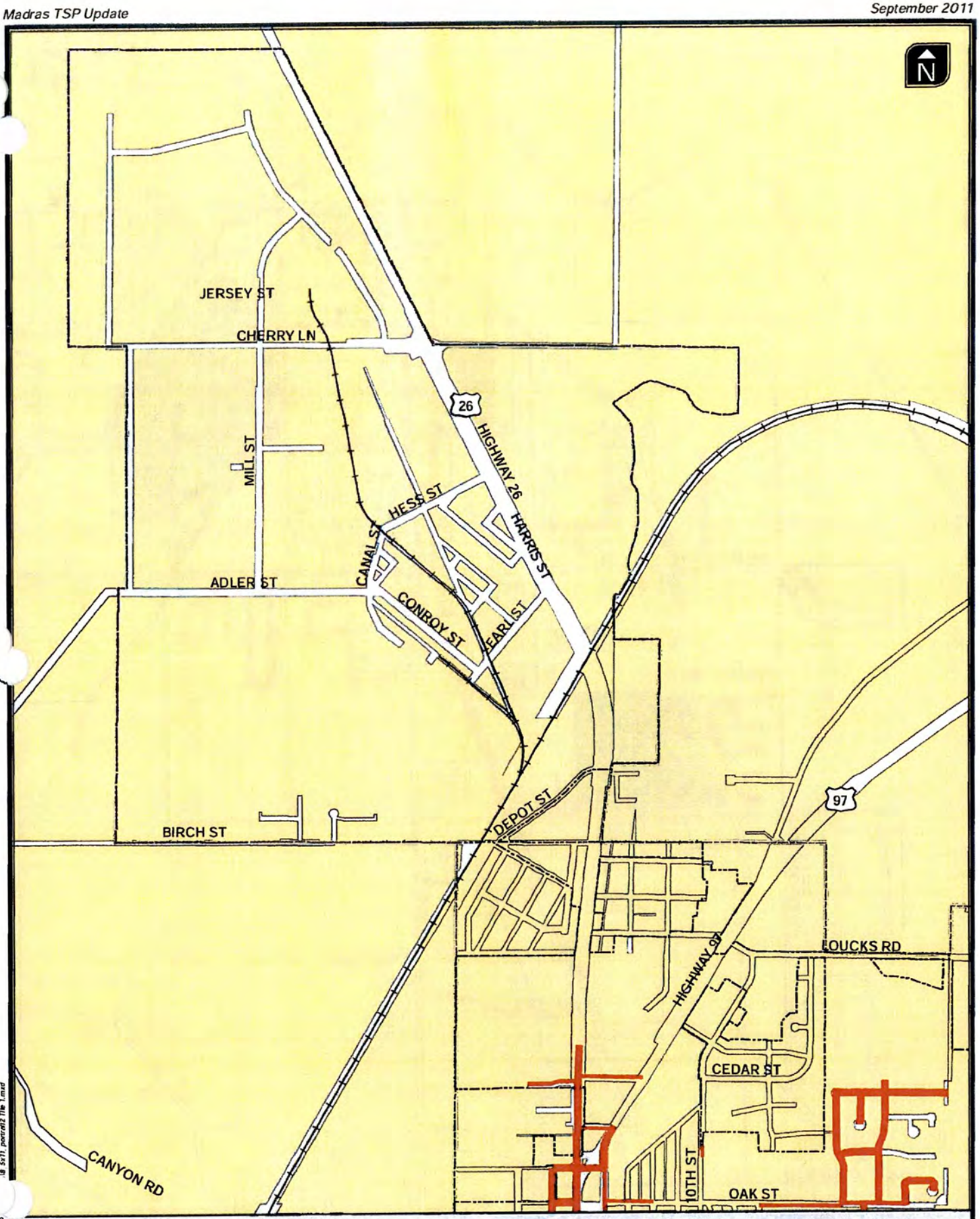
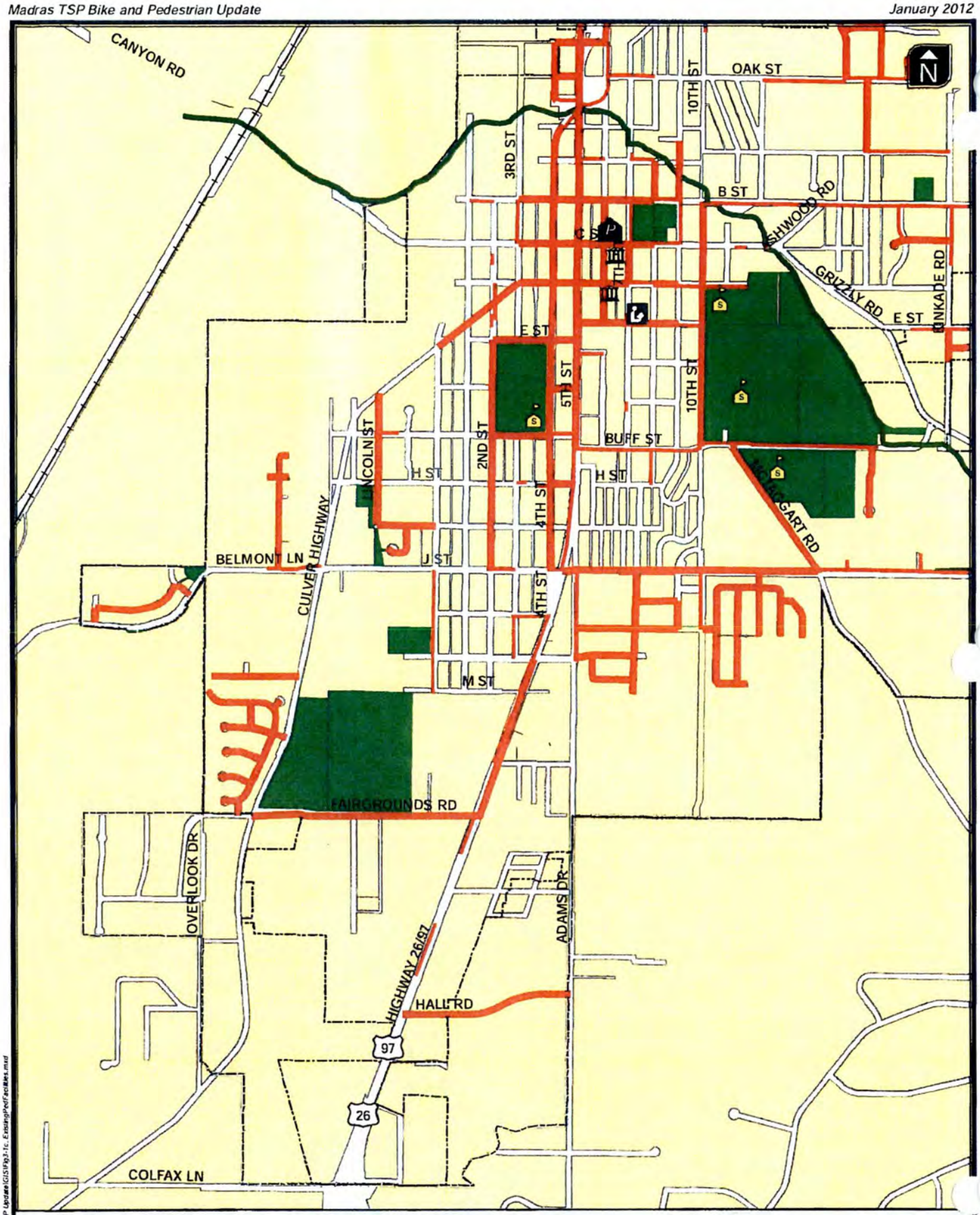


Sidewalks
Both Sides
One Side
Willow Creek Trail
Park
City Limits
Urban Growth Boundary

Existing Sidewalks
Sub-Area 1

Figure
3-2b

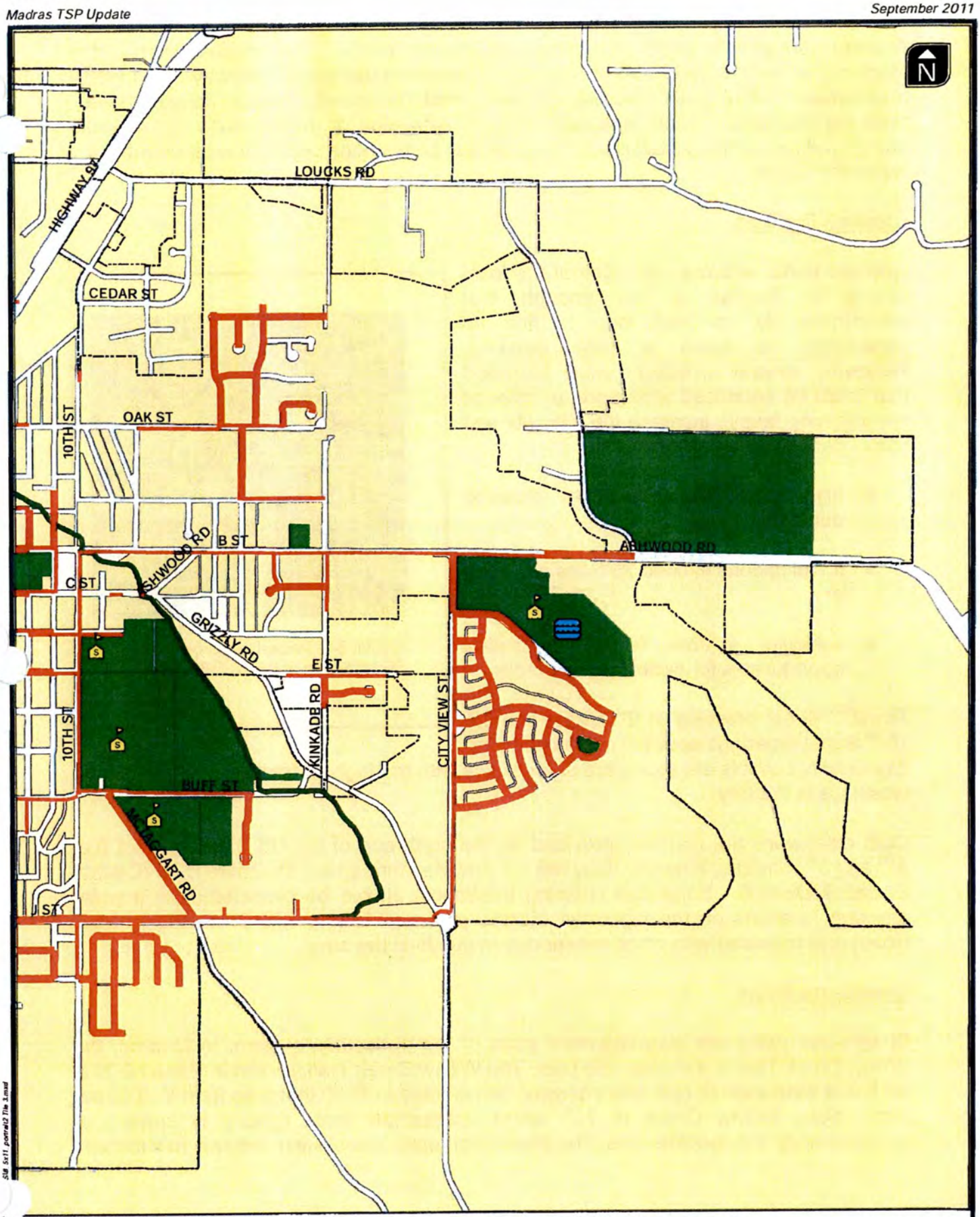


Sidewalks
- Both Sides
- One Side
- Willow Creek Trail

City Hall/Courthouse
Library
School
USPS
Park
City Limits
Urban Growth Boundary

Existing Sidewalks
Sub-Area 2

Figure
3-2c



Sidewalks
- Both Sides
- One Side
- Willow Creek Trail
- School
- Aquatic Center
- Park
- City Limits
- Urban Growth Boundary

Existing Sidewalks
Sub-Area 3

Figure
3-2d

A unique opportunity exists along many of Madras' roads. The unusual width of the road may allow the placement of new sidewalks within the paved roadway. This would accomplish several goals: slowing excessive motorist speeds through neighborhoods, reducing the amount of asphalt needed for construction or maintenance of the street and providing needed sidewalks in areas where pedestrians currently walk unprotected within the street.

Crossing Facilities

Average traffic volume on many of the local streets in Madras is low enough that pedestrians do not wait long to find an opportunity to make a safe crossing. However, several crossings were identified that could be enhanced where one or more of the following factors increase the difficulty and risk of pedestrian crossings:

- high volume of pedestrian crossing demand;
- travel speeds exceed 35 miles per hour; or
- vehicular volume results in limited opportunities for pedestrians to cross.

Exhibit 3-1: Pedestrian Crossing on SE "J" Street at SE 10TH Street

The 2ND Street crossing at "F" Street and the 10TH Street crossings near the high school and Elementary schools are examples of crossings with the highest frequency of pedestrian crossings in the City.

Curb extensions are currently provided on the north end of the US 97/26 couplet (i.e. 4TH and 5TH Streets); however, they are not provided throughout the entire CBD (Central Business District). Enhanced crossing treatments should be considered for popular crossing locations on the highways outside of the CBD (e.g. US 97 at Fairgrounds Road) and balanced with other transportation needs in the area.

Shared-use Paths

Shared-use paths are also important parts of the pedestrian system. In Madras, the Willow Creek Trail is a shared-use path. The Willow Creek Trail (shown in Exhibit 3-2) is an 8-feet wide asphalt concrete pathway; constructed in 1990 that runs from Buff Street north along Willow Creek to 7TH Street. Pedestrian scale lighting is spaced at approximately 100-foot intervals. The planting of many trees lining the way has further

enhanced the Willow Creek Trail. The path is well used by walkers, joggers, and cyclists. The proximity of the path to the schools on 10TH Street makes it a good route for children walking and bicycling to and from school. The lack of connecting sidewalks, especially at the highway couplet, limits the trail's utility for providing a route to some of Madras' destinations.

The Willow Creek Trail begins again at the end of "D" Street near the Madras Public Works Complex and extends west along Willow Creek to Canyon Road. This section was constructed in 1991 and is approximately 1/2-mile long. Construction is similar to the older section of the trail. This portion of the trail provides access to other unpaved trails.

Exhibit 3-2: Willow Creek Trail near S.E. "J" Street.

BIKEWAY SYSTEM

Cycling is an efficient mode of travel. Bicycles take up little space on the road or when parked, do not contribute to air or noise pollution, and offer relatively higher speeds than walking. Because of the small size of Madras, a cyclist can generally travel to any destination in town within less than 20 minutes.

Bicycling should be encouraged to reduce the use of automobiles for short trips. This in turn can reduce some of the negative aspects of urban growth, such as noise, air pollution, and traffic congestion. Bicycling and walking also provide health benefits.

A complete street network is important for cyclists, as for pedestrians, in order to minimize out-of-direction travel and provide alternate route options.

The bikeway system in Madras is made up of the following facilities.

Exhibit 3-3: Existing Bike Lane on "B" Street.

Bike Lanes - These are separate lanes adjacent to vehicular travel lanes for the exclusive use of bicyclists. Current City design standards require bicycle lanes to be included on roads functionally classified as Major Collector and above, except Expressways, which are to have a 12-feet wide multi-use path. ODOT's Highway Design Manual acknowledges that bikes are typically

accommodated along the roadway rather than a separated path. The Oregon Bike and Pedestrian Plan provides criteria for providing a separated path, which include travel speed and average daily traffic volume.

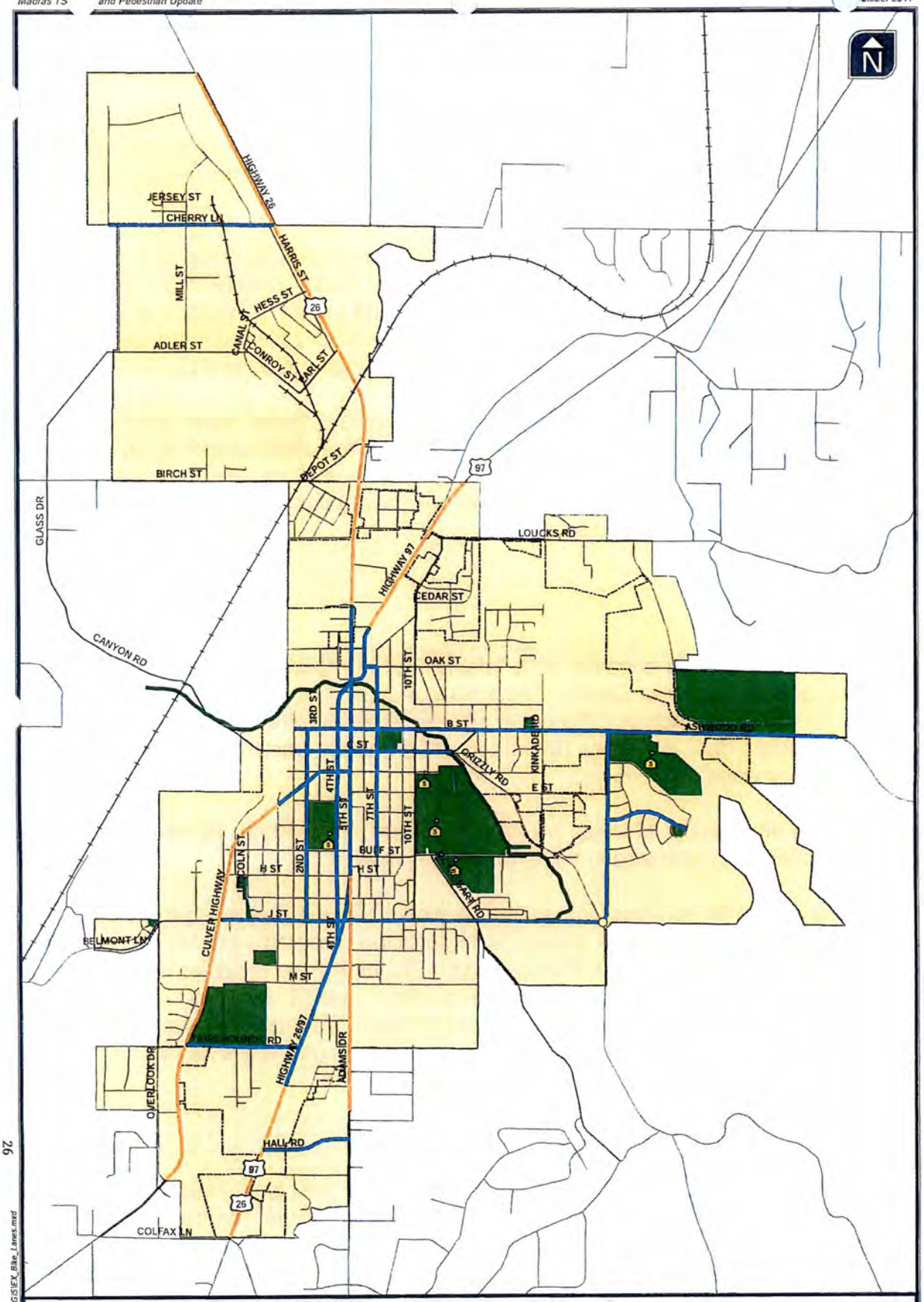
Shoulder Bikeways - Paved shoulders alongside roads may also be used to accommodate cyclists in rural areas.

Shared-use Paths - These provide multiple modes of non-motorized transportation and are a dedicated facility separated from motor vehicle traffic.

Shared Roadways - Bicyclists and motor vehicles share a travel lane on shared roadways. According to the Oregon Bicycle and Pedestrian Plan (Oregon Department of Transportation, 1995), shared roadways are acceptable on streets with low speeds (25 mph or less) and/or low traffic volumes (3,000 ADT or less), which includes most local streets and minor collectors in Madras. Shared roadways may include special pavement markings or signs - such as sharrows - to alert drivers to the presence of cyclists and to inform cyclists of preferable routes.

Figure 3-3 displays the current inventory of bike lanes and shoulders within the Madras UGB. This inventory is based on the inventory prepared for the 1998 TSP, with updates being made through the use of current aerial photography and a field visit at select locations.

As the figure shows, bike lanes and shoulders currently cover approximately 60% of major collector and arterial roadways in Madras. Many of the bike lanes shown in Figure 3-3 have been added since the 1998 TSP as part of roadway improvement projects.



Existing Bike Lane
Existing Shoulder
Willow Creek Trail
School
Park
City Limits
Urban Growth Boundary

Existing Bicycle Facilities

alta PLANNING + DESIGN
KITTELSON & ASSOCIATES, INC. TRANSPORTATION ENGINEERING/PLANNING

Figure 3-3

The Willow Creek Trail is a shared-use path shared by cyclists and other non-motorized users. It is shown on Figure 3-3 and described in greater detail in the Pedestrian System section above

Many of the Local and Minor Collector streets in Madras are relatively wide and can easily accommodate bicycle traffic in addition to the current motor vehicle traffic on a shared roadway. The local and minor collector roadways that have the highest bicycle usage could benefit from additional treatments, such as signage or pavement markings, which would identify them as designated bikeways and alert drivers to expect cyclists.

Promoting bicycling as a viable alternative to motor vehicle travel also requires supporting facilities, such as secure parking (particularly at key destinations such as downtown, schools, and other attractions). The number, type, and location of existing supporting bike facilities were not inventoried, but as new bicycle infrastructure is planned, these facilities should be considered.

PUBLIC TRANSPORTATION

Public Transportation in Madras consists of a "dial-a-ride" demand response service. This service is funded through the Central Oregon Council on Aging (COCOA). This service will pick up and carry senior citizens to any destination within Madras and to Metolius and Culver three days per week (Mondays, Wednesdays and Fridays), as well as to Bend one day per week (Thursdays).

Greyhound bus lines also serves Madras, providing connections to Bend, Portland and Yakima, where transfers can be made to travel to any destination.

The small size and low traffic volumes on city streets would indicate that mass transit is not currently necessary. A citywide public transportation program would not be economically feasible at this time. The Transportation Planning Rule exempts cities of less than a population of 25,000 from including mass transit facilities in their development regulations. However, Madras is eager to plan for future transit services so that growth patterns will support rather than discourage transit use in the future.

RAIL SERVICE

The use of railroad facilities for the Madras area is confined mainly to freight trains serving the industrial park north of the city. The only railroad track near Madras is west of town and outside the Madras TSP planning area. There is no passenger rail service currently available locally. Although the current railroad facility does not directly serve the City of Madras, it is vital to the Industrial Park, which is critical to the economic

health of the community. Future development must be considered in relationship to the railroad and should not inhibit its use. It is also conceivable that passenger service may someday be desired and restored.

AIR SERVICE

The City of Madras owns and operates a general aviation airport about 5 miles north of town, adjacent to US Highway 26. The airport property is on land developed in the 1940's as an Army air base. Since the city has acquired the property, a number of improvements have been made that add greatly to its serviceability. Leading the improvements is the development and reconstruction of a 5,000-foot runway, a 3,000-foot cross wind runway, and resurfacing of the taxiways. The improvements constructed permit larger and faster aircraft to use the airport. The land available and alignment of the runways permit the main runway to be lengthened to 8,000 feet. This would allow large jets to land at the airport.

Because the airport is governed by its own Master Plan, recommendations for its improvement do not fall into the scope of this TSP. However, the airport is an essential part of the economy of the area. It is necessary to include the airport when considering future development proposals for the surrounding land. In many localities, uses have been allowed around airports that are not compatible with air traffic. This issue is addressed in Chapter 9 (Recommended Policies and Ordinances).

PIPELINE SERVICE

Although not often considered as transportation facilities, pipelines carry liquids and gases very efficiently. The use of pipelines can greatly reduce the number of trucks and rail cars carrying fluids such as natural gas, oil, and gasoline. Recently, a large natural gas pipeline was constructed east of Madras to carry natural gas from Canada to California. Although this pipeline does not serve Madras directly, it has provided economic benefits locally through dollars expended during construction and continuing tax income to the City. Also constructed in 1992 was a 4-inch natural gas pipeline that serves Madras and serves the City of Metolius.

WATER SERVICE

Madras has no waterborne transportation services.

CHAPTER 4: EXISTING CONDITIONS

[Entire Chapter Replaced Per Ordinance No. 707, Passed May 27, 2003]

The existing conditions section provides an operational analysis of key signalized and unsignalized intersections within the City of Madras under 2001 weekday p.m. peak hour conditions.

TRAFFIC CAPACITY / OPERATIONS ANALYSIS

The study intersections and overall study area for this project were selected based on a review of the local transportation system and direction provided by the City of Madras and the Oregon Department of Transportation (ODOT) staff. Operational analyses were performed at the following intersections:

- Cherry Lane / US 26
- Hess Road / US 26
- Earl Street / US 26
- Loucks Road / US 97
- US 97 / US 26
- 4th Street / "B" Street
- 5h Street / "B" Street
- 4th Street / "D" Street
- 5th Street / "D" Street
- 4th Street / "J" Street
- 5th Street / "J" Street
- Fairgrounds Road / US 97

Figure A1 shows the existing lane configurations and traffic control devices at the study intersections.

Manual turning movement counts were obtained for the study intersections on a mid-week day in January 2001. These counts were conducted during the weekday evening (4:00 p.m. - 6:00 p.m.) hours. The weekday p.m. peak hour on the street system occurs between 4:30 and 5:30 p.m. To ensure that the existing conditions analysis represents a reasonable worst-case scenario, the January counts were increased by a 48-percent seasonal adjustment factor to reflect peak summertime conditions (reflecting increased recreational traffic as well as the Summer harvest season). The seasonal adjustment is based on data provided by ODOT's Transportation and Planning Analysis Unit (TPAU). The summertime weekday p.m. peak hours were summarized and rounded to the nearest five vehicles per hour as shown in Figure A2. Attachment "A1" contains the traffic count sheets used in this study.

Highway Mobility Analysis

Using the summertime weekday p.m. peak hour turning movement volumes shown in Figure A2, an operational analysis was conducted at the study area intersection to determine the existing volume-to-capacity ratios. As defined in the 1999 Oregon Highway Plan, a volume-to-capacity (v/c) ratio is the peak-hour traffic volume (vehicles/hour) on a highway section divided by the highway capacity. For example, when v/c equals 0.85, peak-hour traffic uses 85 percent of a highway's capacity; 15 percent of the capacity is not used.

All volume-to-capacity ratio and level-of-service analyses described in this study were conducted in accordance with the 2000 Highway Capacity Manual, published by the Transportation Research Board. A description of level-of-service and the criteria by which they are determined are presented in Attachment "A2".

To ensure that this analysis was based on a reasonable worst-case scenario, the peak 15-minute flow rate during the weekday p.m. peak hour was used in the evaluation. For this reason, the volume-to-capacity ratio analyses reflect conditions that are only likely to occur for 15 minutes out of each average weekday p.m. peak hour. Traffic conditions during all other weekday periods will likely operate under better conditions than those described in this report.

In addition, the following assumptions regarding saturation flow rate and lost time wee incorporated into the analysis:

- Saturation Flow Rate = 1,800 vehicles per hour per lane (vphpl)
- Lost Time = 4.0 seconds per phase

Signalized Intersections

Under the 1999 Oregon Highway Plan (OHP), ODOT requires that a peak-hour volume-to-capacity ratio of 0.70 be maintained at signalized intersections along US 26 and US 97 (within the study area) where the posted speed limit is greater than 45 miles per hour (mph). At signalized intersections along US 26 and US 97 where the posted speed limit is less than or equal to 45 mph, the OHP mandates a peak hour volume-to-capacity ratio of 0.75. For the purposes of this study, it was assumed that if a given intersection operated at a peak 15-minute volume-to-capacity ratio of less than ODOT's peak-hour standard, ODOT's peak-hour standard would automatically be met and no additional analysis would be required. City of Madras operating standards require that a level of service of "D" or better be maintained for all signalized intersections.

Using the summertime weekday p.m. peak-hour traffic volumes, volume-to-capacity ratios and levels of service were calculated for the four signalized study intersections shown in Figure A2. As indicated in Figure A2, the signalized study intersections currently operate at acceptable levels of service and volume-to-capacity ratios during the weekday p.m. peak hour.

Unsignalized Intersections

For unsignalized, two-way stop-controlled (TWSC) intersections, the highway mobility standards are applied to both the mainline and the intersecting roadway. The left-turn from the stop-controlled approach is typically the most difficult movement for drivers to complete at a TWSC intersection because this movement is exposed to the greatest number of potentially conflicting, higher-priority movements at the intersection. Vehicles making all other conflicting movements use the available gaps in the through traffic flow of the uncontrolled approach(es) before the side street can be negotiated. Therefore, the number of gaps available for side-street drivers to negotiate the left-turn movement safely is likely to be substantially lower than any other movement. As a result, the side street left-turn typically experiences the highest delays and worst level of service.

Under the 1999 Oregon Highway Plan, ODOT requires that a peak-hour volume-to-capacity ratio of 0.70 be maintained on all US 26 and US 97 approaches (within the study area) where the posted speed limit is greater than 45 mph, and a volume-to-capacity ratio of 0.75 on all US 26 and US 97 approaches where the posted speed limit is less than or equal to 45 mph. On all stopped approaches at unsignalized intersections along US 26 and US 97, ODOT requires that a peak-hour volume-to-capacity ratio of 0.80 be maintained where the posted speed limit is greater than 45 mph, and a volume-to-capacity ratio of 0.85 be maintained where the posted speed limit is less than or equal to 45 mph. City of Madras operating standards require that a level of service of "E" or better be maintained for all unsignalized intersections.

Using the summertime weekday p.m. peak-hour traffic volumes, volume-to-capacity ratios and levels of service were calculated for the 10 unsignalized study intersections shown in Figure A2. As shown in Figure A2, all unsignalized study intersections currently operate at acceptable levels of service and volume-to-capacity ratios during the weekday p.m. peak hours, with the exception of the 4th Street / "J" Street and Fairgrounds Road / US 97 intersections. Attachment "A3" includes the 2001 existing conditions level-of-service worksheets.

At the 4th Street / "J" Street intersections, the critical westbound approach experiences a delay of more than 50 seconds; however, the volume-to-capacity ratio of the approach is well within ODOT's mobility threshold. At the Fairgrounds Road / US 97 intersection, the critical eastbound left-turn movement experiences a delay of more than 50 seconds and the movement's volume-to-capacity ratio exceeds ODOT's mobility thresholds.

Signal Warrant Analysis

A signal warrant analysis was conducted for the Fairgrounds Road / US 97 intersection under 2001 existing conditions. The signal warrant analysis was performed based on the procedures described in the Manual on Uniform Traffic Control Devices (MUTCD, Reference 7). The MUTCD warrants that were evaluated include the Minimum Vehicular Volume, Interruption of Continuous Traffic, and Peak Hour Volume (Warrants #1, #2, and #11, respectively). Warrants #1 and #2 are both based on the eighth-highest hour traffic operations. The eighth-highest hour as a percent of the weekday p.m. peak hour typically ranges from 60-percent in predominately residential areas to 80-percent in areas with intense retail development. For the purposes of this study, the eighth-highest hour was estimated to be 70-percent of the peak hour traffic. Table A1 summarizes the results of the analysis.

Table A1: Signal Warrant Evaluation - Fairgrounds Road/US 97 - Existing Conditions

MUTCD Warrant	Required Volumes	Actual Volumes	Met?
Warrant #1			
Major Street Approach (US 97)	350	1285	No
Minor Street Approach (Fairgrounds Road)	105	74	
Warrant #2			
Major Street Approach (US 97)	525	1285	Yes
Minor Street Approach (Fairgrounds Road)	55	74	
Warrant #11			
Major Street Approach (US 97)	1835	1835	Yes
Minor Street Approach (Fairgrounds Road)	75	105	

Note: Warrants #1 and #2 are based on the eighth-highest hour and reflect 70-percent of the weekday p.m. peak hour volume. Warrant #11 is based on the weekday p.m. peak hour volumes.

As shown in Table A1, MUTCD Warrants #2 and #11 are met at the Fairgrounds Road / US 97 intersection under 2001 existing traffic conditions. Attachment "A4" contains the signal warrant analysis worksheet.

Queuing Analysis

Using the 2001 summertime weekday p.m. peak-hour traffic volumes shown in Figure A2, a queuing analysis was performed at all of the study intersections to ensure that adequate stacking distance will be available. In the queuing analysis, a Poisson

distribution was applied at a 95th percentile confidence level to determine queue length probabilities. (Given assumed random arrivals, the queue lengths shown will not be exceeded during 95 percent of the signal cycles occurring in the weekday p.m. peak hour). For unsignalized intersections, the queue length is determined based on the capacity of the movement and the volume traffic served during the analysis period. The assumed length-of-red interval was obtained from the signal timing parameters used in the existing traffic level-of-service analysis, and one vehicle was assumed to occupy 25 feet. Tables A2 and A3 summarize the results of the queuing analysis signalized and unsignalized intersections, respectively, within the study area. Attachment "A5" contains the 2001 existing vehicular queue analysis worksheets.

Table A2: Signalized Queuing/Stacking Distance Analysis

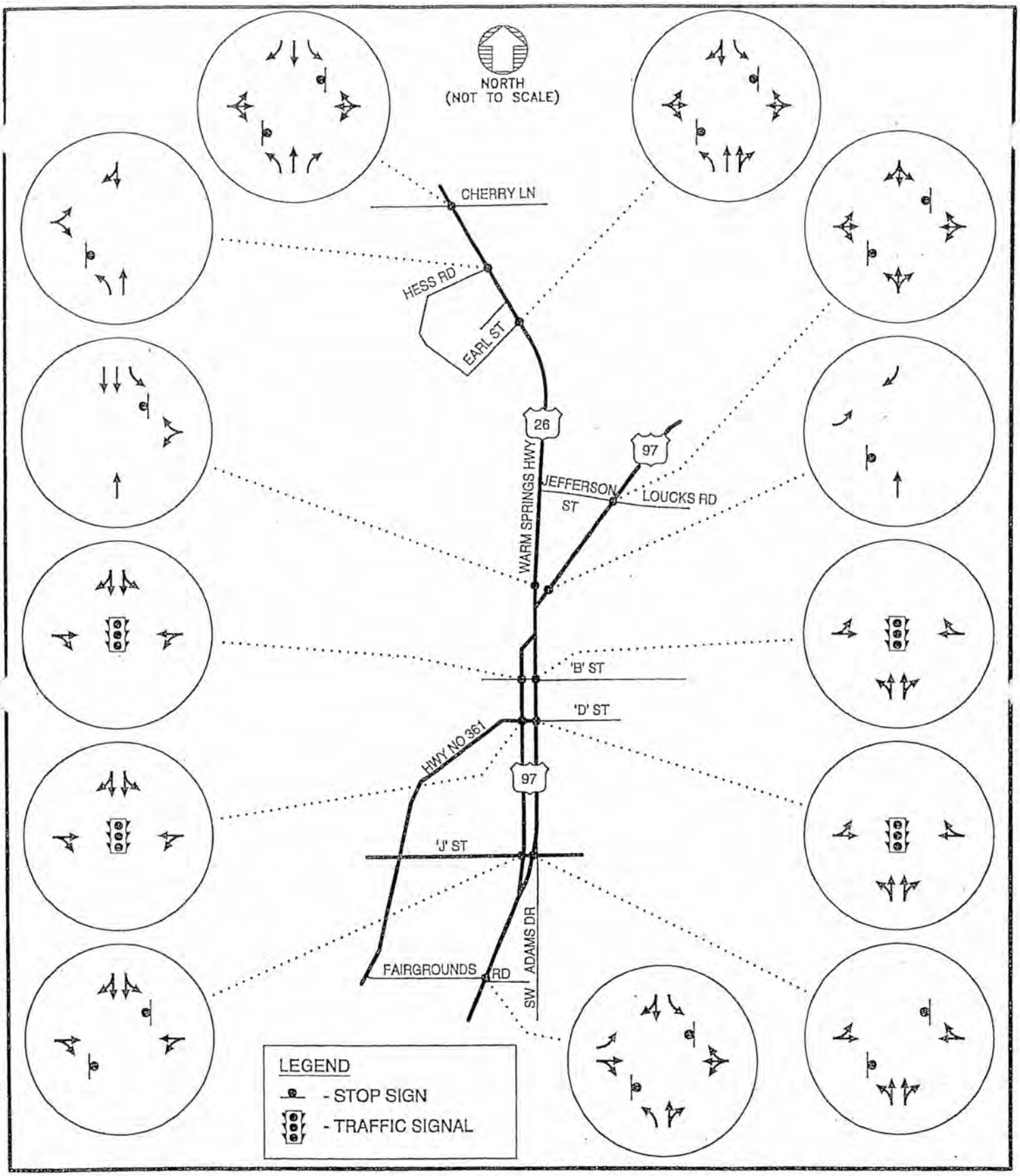
Signalized Intersection	Approach	Lane Designation	2001 Existing Conditions (feet)	Available Storage (feet)
4th Street / "B" Street	SB	TL	200	300+
		TR	200	300+
	EB	TR	75	275
	WB	TL	175	200
5th Street / "B" Street	NB	TL	175	300+
		TR	200	300+
	EB	TL	75	200
	WB	TR	175	175
4th Street / "D" Street	SB	TL	175	300+
		TR	175	300+
	EB	TR	125	300+
	WB	TL	150	175
5th Street / "D" Street	NB	TL	150	300+
		TR	150	300+
	EB	TL	125	175
	WB	TR	100	175

NB: Northbound
SB: Southbound
EB: Eastbound
WB: Westbound
TL: Through-Left
TR: Through-Right

Table A3: Unsignalized Queuing / Stacking Distance Analysis

Unsignalized Intersection	Approach	Lane Designation	2001 Existing Conditions (feet)	Available Storage (feet)
Cherry Lane / US 26	NB	LT	25	300+
	SB	LT	25	300+
	EB	LTR	25	300+
	WB	LTR	25	300+
Hess Road / US 26	NB	LT	25	300+
	EB	LTR	25	300+
Earl Street / US 26	NB	LT	25	300+
	EB	LTR	25	300+
	WB	LTR	25	300+
Loucks Road / US 97	EB	LTR	25	300+
	WB	LTR	25	250
US 97 / US 26 (WB stopped)	SB	LT	25	250
	WB	LTR	125	300+
US 97 / US 26 (EB stopped)	EB	LT	25	125
4th Street / "J" Street	EB	TR	75	300
	WB	TL	75	75
5th Street / "J" Street	EB	TL	50	75
	WB	TR	25	75
Fairgrounds Road / US 97	NB	LT	25	300+
	SB	LT	25	300+
	EB	LT	O/S	300+
		TR	25	75
	WB	LTR	25	225

NB: Northbound
SB: Southbound
EB: Eastbound
WB: Westbound
LT: Left-turn
TL: Through-Left
TR: Through-Right
LTR: Left-Through-Right



EXISTING LANE CONFIGURATIONS AND TRAFFIC CONTROL DEVICES

KT TENNESON	CITY OF MADRAS COMPREHENSIVE PLAN AND TRANSPORTATION SYSTEM PLAN UPDATE	FIGURE A1

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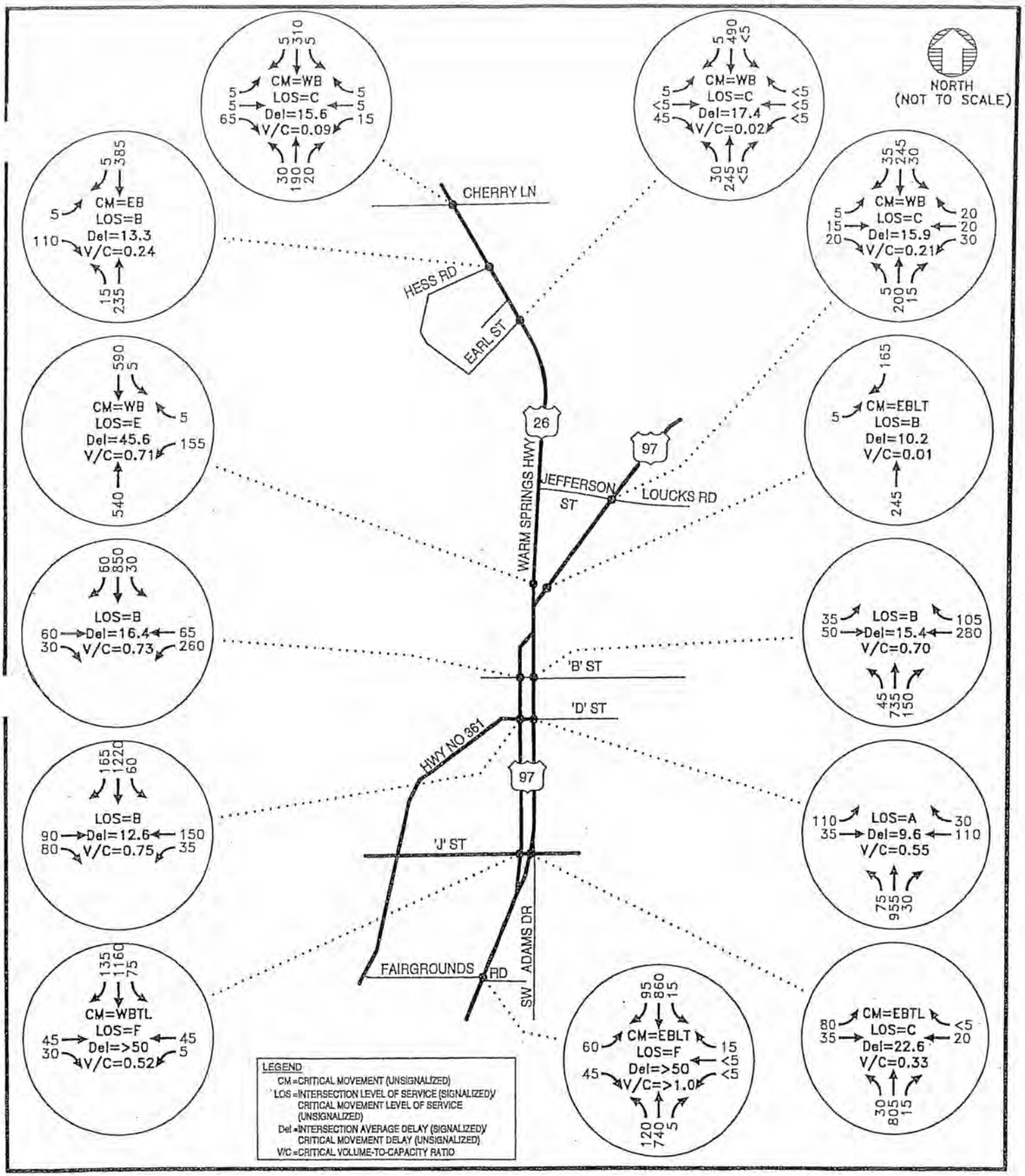


2001 EXISTING TRAFFIC CONDITIONS WEEKDAY PM PEAK HOUR

CITY OF MADRAS COMPREHENSIVE PLAN AND TRANSPORTATION SYSTEM PLAN UPDATE

APRIL 2001

FIGURE A2

4139\DWGS\TECH MEMO #2B\4139F0AC

CHAPTER 5: STREET SYSTEM EVALUATION & IMPROVEMENT ANALYSIS

This section provides an evaluation of the current transportation system improvements identified in the 1998 City of Madras Transportation System Plan and identifies several new transportation system improvements to facilitate the new development and potential expansions to the existing Urban Growth Boundary.

EXISTING TRANSPORTATION SYSTEM IMPROVEMENT EVALUATION

Figure B1 illustrates and Tables 1 through 19 describe each of the currently planned transportation system improvements identified in the 1998 City of Madras Transportation System Plan. The tables provide the purpose of the project, a project description, an estimated timeframe for construction, an illustration of the improvement, and a roadway cross-section detail.

Based on a review of the 1998 TSP and update information provided through the course of this project, it was determined that the majority of the planned transportation improvements are still needed to address the long-term transportation needs in the City of Madras. However, the initial review determined that the proposed Truck By-Pass alignment scenarios identified in the 1998 TSP may need to be further refined or potentially eliminated given the cost and long-term capacity needs within Madras. Thus, Improvement Tables 18A through 18D propose an alternative Truck By-Pass route utilizing the OR 361 corridor with new north and south US 26/97 junction concepts.

CONCEPT AREA PLANNING PROCESS

For the purposes of this evaluation and analysis, three concept planning areas have been identified to focus the land use and transportation planning efforts in the areas that are expected to accommodate a large portion of the development over the 20-year planning period. The three concept areas are shown in Figure B2. As illustrated in Figure B2, the three areas have been identified as the North Industrial Concept Area, the East Madras Concept Area, and the South Madras Concept Area. It should be noted that the East Madras Concept Area contains the potential UGB Expansion Areas "A" through "D" (See Technical Memorandum #2A) and the South Madras Concept Area contains Expansion Areas "E" and "F".

[Text on this page added by Ordinance No. 707, passed May 27, 2003]

In October, 2006, several projects were identified in and around the City of Madras city limits during the course of preparing the Jefferson County Transportation System Plan (TSP). These projects addressed the long-term transportation needs of the County and

City. The projects were reviewed by the Technical Advisory Committee for the Jefferson County TSP, which included staff from the City of Madras planning division, engineering division, and school district, as well as the police department. Some of these projects impacted the list of projects approved in the 2001 City of Madras TSP Update. In addition, the updated project list takes into consideration the recent residential developments in the east side of town.

In an effort to coordinate the two project lists (County and City), the City of Madras TSP project list was updated to match the ones recommended in the County TSP. The following section identifies the projects that are impacted. (Figure 9) provides the updated Figure B6 of the 2001 City of Madras TSP Update.

The remainder of this section describes the proposed transportation improvements identified for each concept planning area and incorporates the changes that were approved by the City Council on December 12, 2006.

[The text on this page added by Ordinance No. 785, Passed by Council December 12, 2006]

Infrastructure Inventory Methodology Overview

Pedestrian and bicycle systems were inventoried as a part of this project. The inventory included updates to the 1998 TSP inventory and did not include a complete on-ground survey of all city streets. Updates have been made through the use of recent aerial photography and GIS data provided by the City. Areas where development has occurred since 1998 and where City projects have been completed were of primary interest. The inventory was also verified by input from local residents obtained through public meetings and an online interactive map. The project team also conducted field visits to key areas of the city to verify inventory.

Exhibit A-1: Project team conducting bicycle tour of Madras to verify inventory.

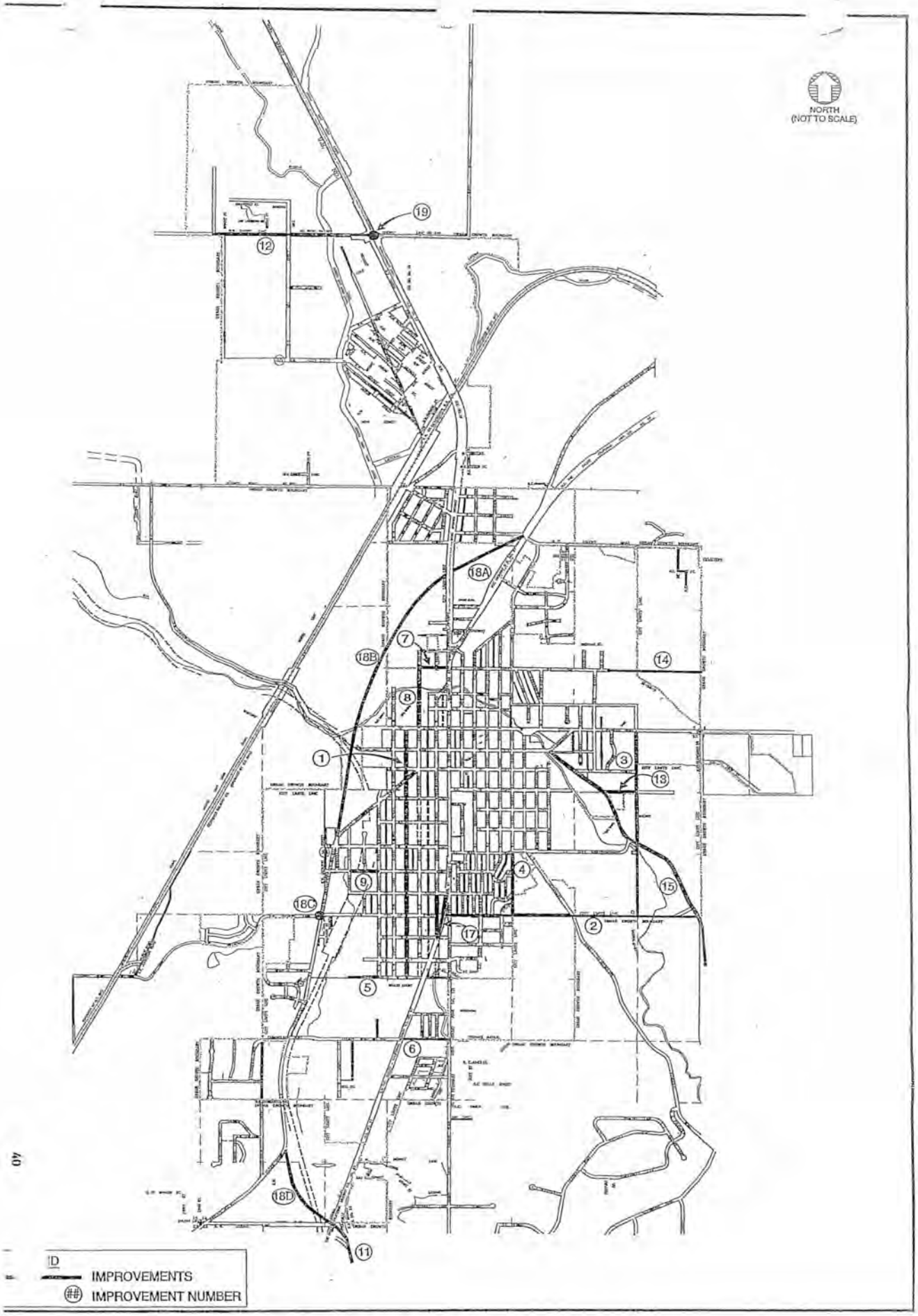
Purpose

The inventory identifies where bike and pedestrian facilities are provided today, which includes many additional facilities that have been constructed since 1998. The inventory was used to evaluate where pedestrian and bike connections are provided

and where new facilities are needed in Madras to provide consistency in the bicycle and pedestrian network. Facilities identified by the inventory included bike lanes, sidewalk, intersection crossing treatments, and shared-use paths (e.g. Willow Creek Trail).

Challenges and Limitations

The major challenge in creating the inventory maps, provided in Chapter 3, related to use of aerial photography to update the 1998 TSP inventory. Aerial photography provides a good overview of an area from a high level. In most cases, however, it does not provide a quality street level view due to image resolution quality and/or overhanging objects obstructing the photo (i.e. trees). Also, the data obtained from aerial photography is only as current as when the photo was taken. Consequently, inventory based on aerial photos alone may not identify locations where sidewalk is missing. To minimize these oversights the project team conducted a bike tour of Madras (See Exhibit A-1), sought input from members of the community and City staff, and utilized multiple sources of aerial photography (i.e. Bing, Google, and aerials provided by the City). The recent economic downturn and corresponding slowdown in construction also reduce the likelihood that the aerial photographs do not show current levels of development.

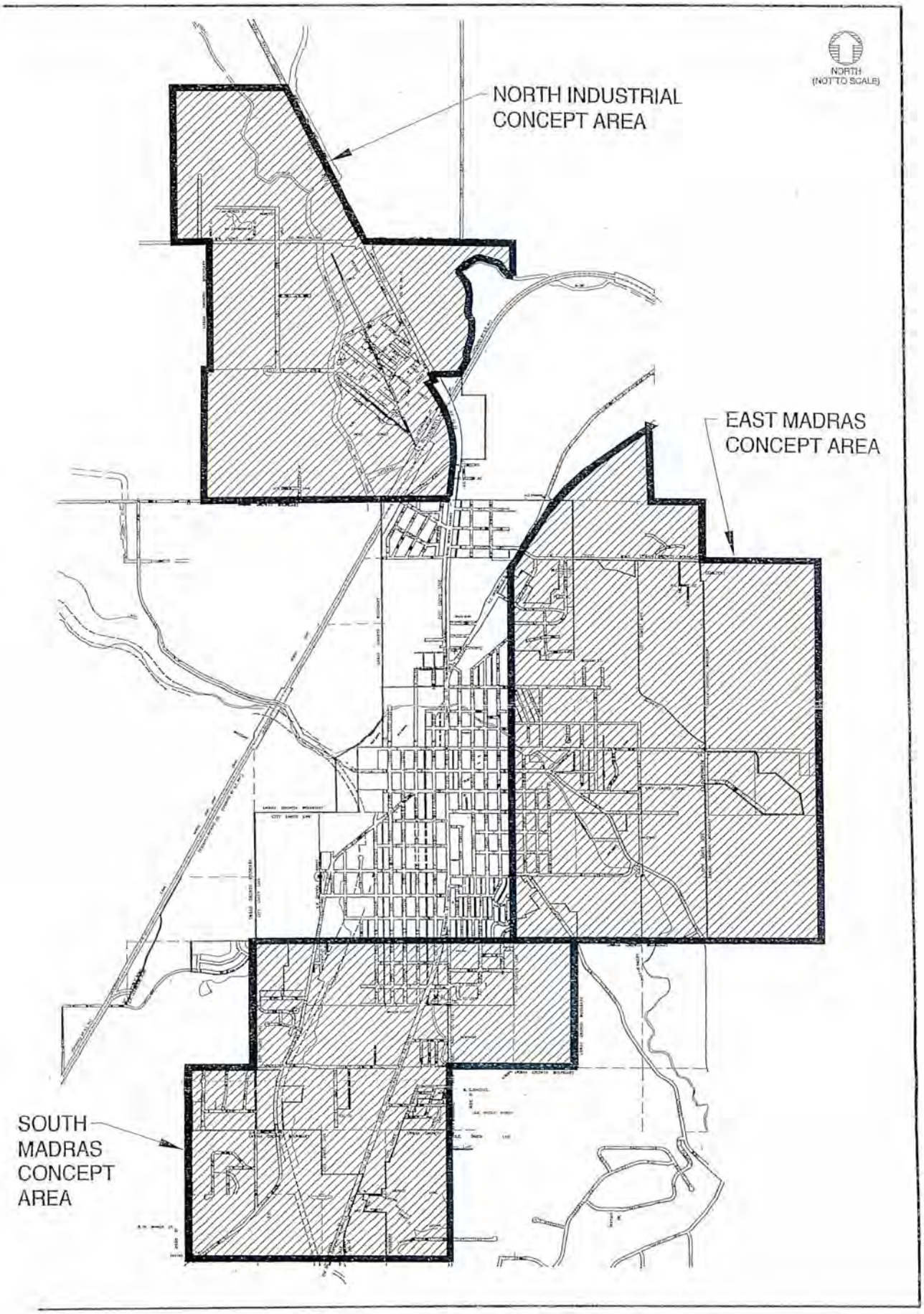


SUMMARY OF CURRENTLY PLANNED TRANSPORTATION SYSTEM IMPROVEMENTS

CITY OF MADRAS COMPREHENSIVE PLAN AND TRANSPORTATION SYSTEM PLAN UPDATE

APRIL 2001

FIGURE B1



CONCEPT PLANNING AREAS

CITY OF MADRAS COMPREHENSIVE PLAN AND
TRANSPORTATION SYSTEM PLAN UPDATE

APRIL 2001

FIGURE
B2

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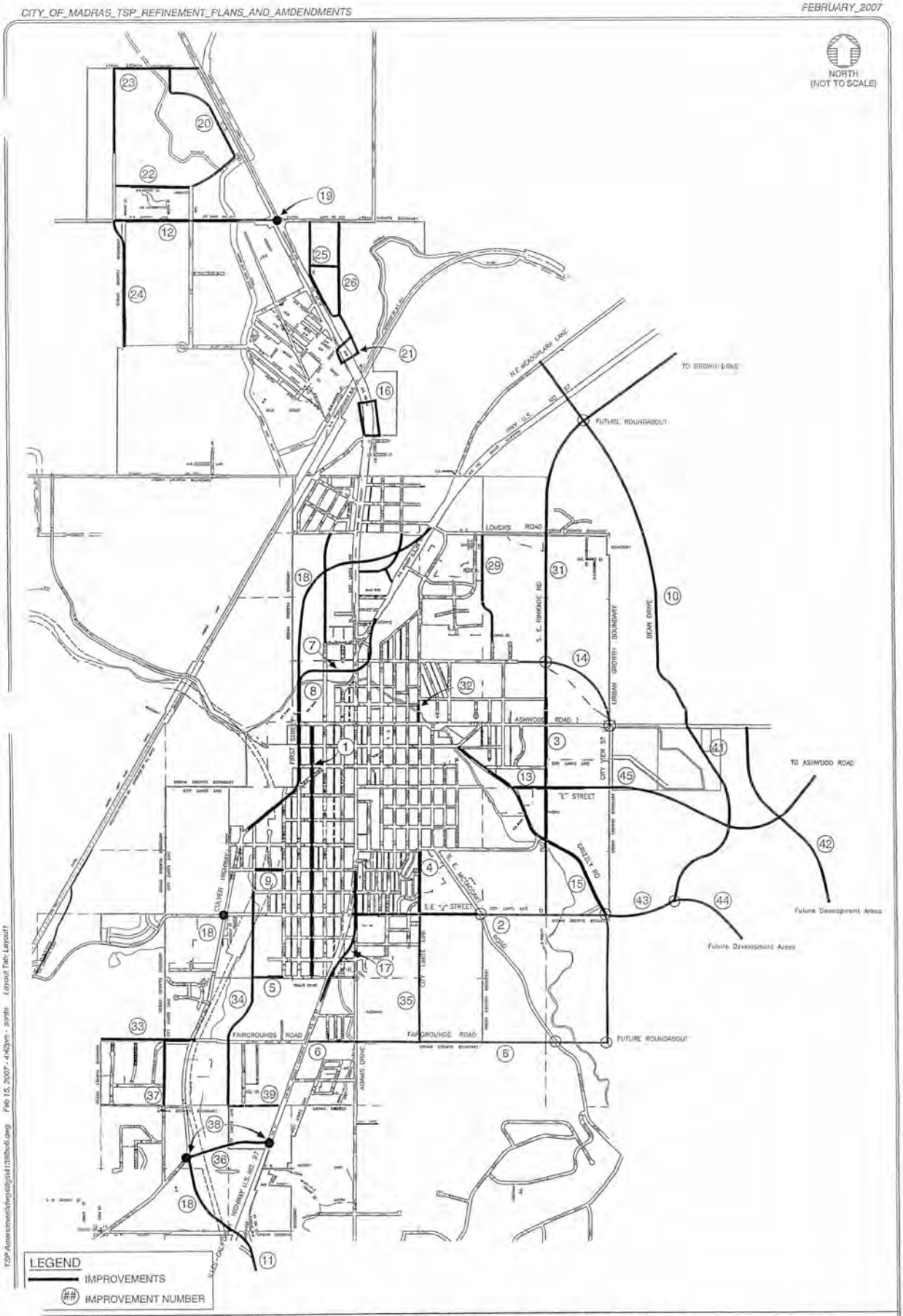


UPDATED SUMMARY OF PROPOSED TRANSPORTATION SYSTEM IMPROVEMENTS

CITY OF MADRAS COMPREHENSIVE PLAN AND TRANSPORTATION SYSTEM PLAN UPDATE

OCTOBER 2006

FIGURE B6

4139\DWGS\TECHMEMO#2B\4139FOB6

FIGURE 9

#1 2nd Street Improvements ("B" Street to "M" Street)

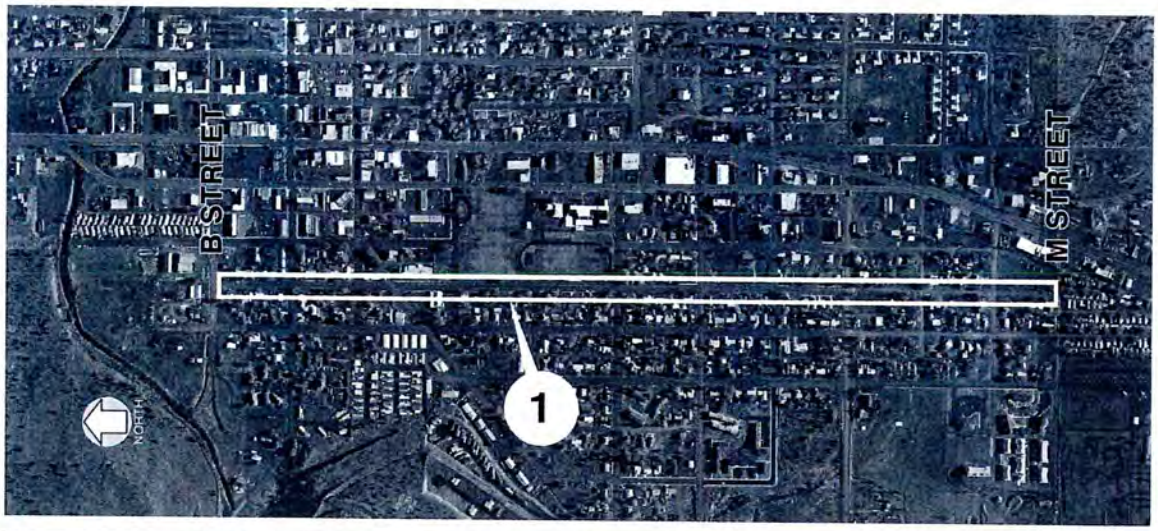
PURPOSE:

Provides a parallel north-south collector facility for vehicular, pedestrian and bicycle traffic, thereby minimizing reliance on US 26/US 97 (4th/5th Street Couplet). In addition, it further develops the grid street network and improves overall local circulation of traffic within the city.

PROJECT DESCRIPTION:

This project involves widening 2nd Street and upgrading the roadbed and surface between "B" Street and "M" Street. This one-mile segment of roadway would be designed to Major Collector street standards between "B" Street and "J" Street, and to Minor Collector street standards between "J" Street and "M" Street.

TIME FRAME: 0-5 years



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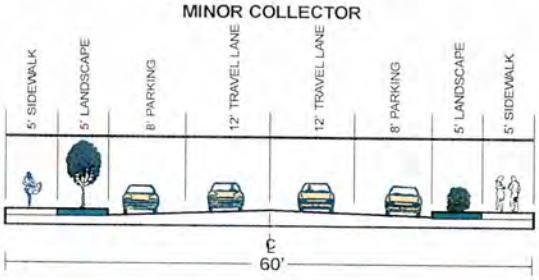
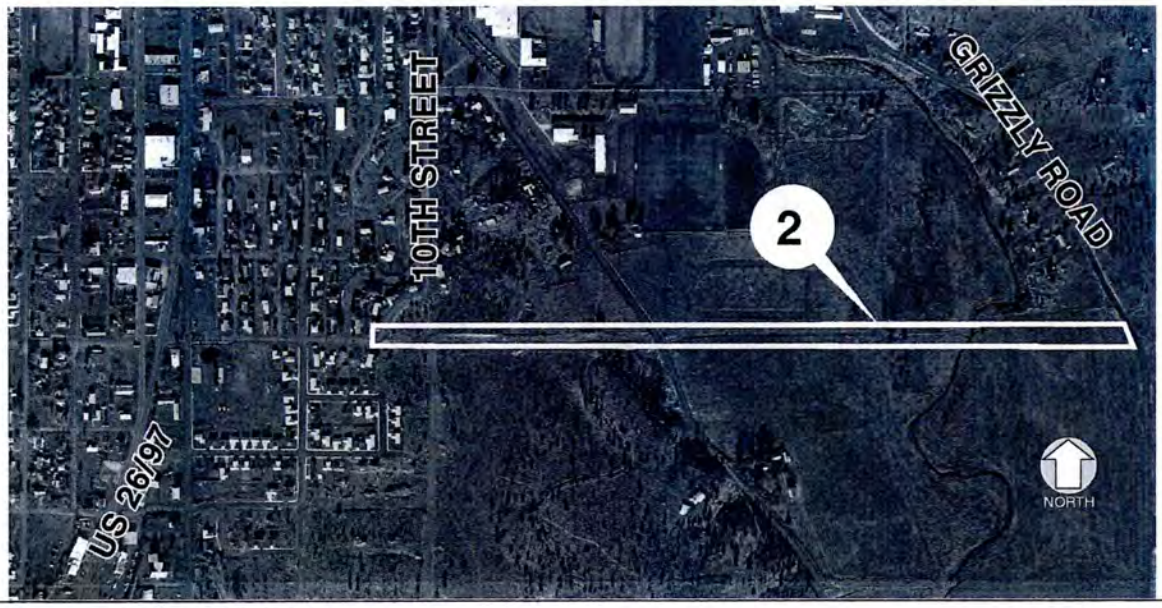


#2 "J" Street Extension (10th Street to Grizzly Road)

PURPOSE:
Provides additional accessibility to and from Grizzly Road. Provides an alternative access to the central business district from the south. Reduces reliance on "C" Street and Buff Street and further develops the grid street network within the city limits.

PROJECT DESCRIPTION:
This project extends "J" Street from 10th Street to Grizzly Road. The 0.8-mile road improvement will require additional right-of-way from the "J" Street/South Adams Drive intersection to Grizzly Road. In addition, the central section of the project will involve property located within Jefferson County; consequently, interagency coordination will be required for improving the roadway from 5th Street east. This project involves widening and upgrading the existing roadbed and surface to accommodate increased traffic demand along this facility. Sidewalks and bicycle lanes will be included in this project.

TIME FRAME: 0-5 years



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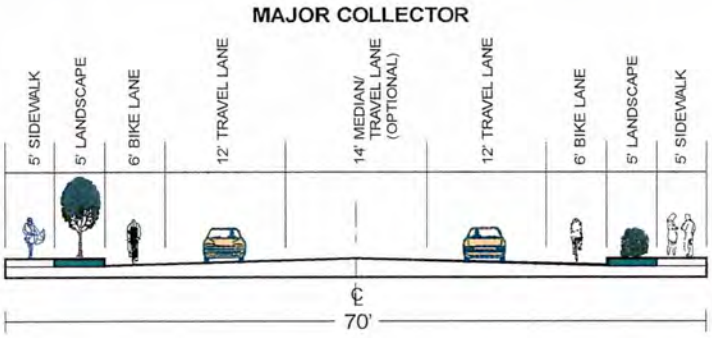
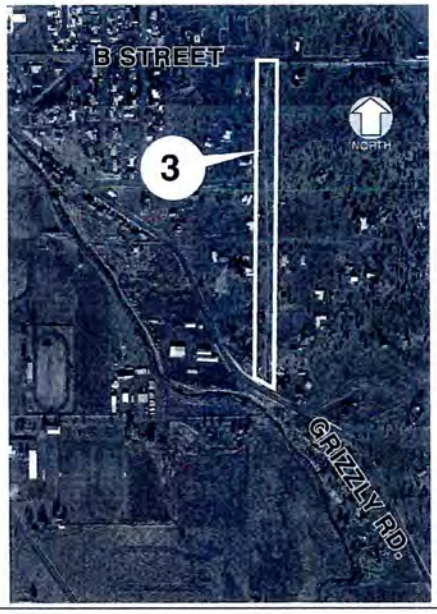


#3 Kinkade Road Improvements ("B" Street to Grizzly Road)

PURPOSE:
Provides an additional north-south travel route for traffic generated by the new middle school and new residential areas on the east side of city, while reducing reliance on "B" and "C" Streets. The project further develops the grid street network within the city limits, thereby providing better local traffic circulation.

PROJECT DESCRIPTION:
This project improves approximately 2,300 feet of roadway to Minor Collector street standards to accommodate future vehicular, bicycle, and pedestrian traffic. The existing right-of-way should be widened to incorporate sidewalks, bicycle lanes, and utilities. Substantial cuts and fills will be needed to address the hilly terrain. This roadway will be stop-controlled at "B" Street and Grizzly Road.

TIME FRAME: 5-10 years (Ordinance No. 707, May 27, 2003)



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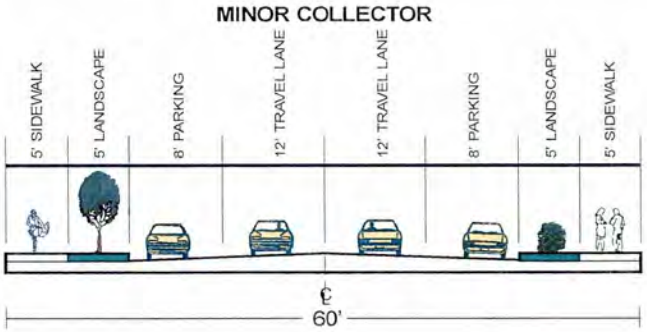
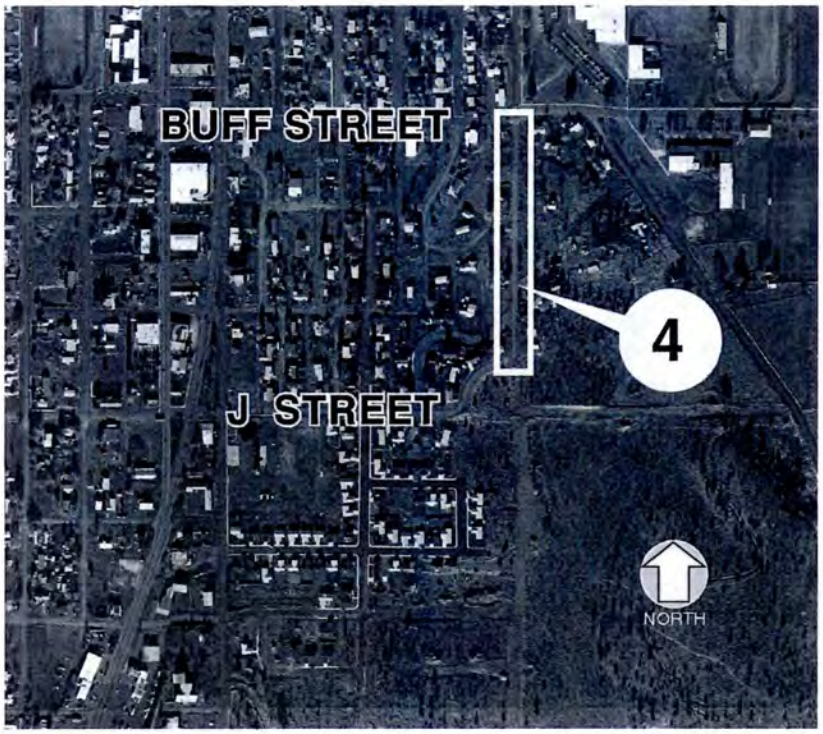


#4 10th Street Improvements (Buff Street to "J" Street)

PURPOSE:
Improves the north-south 10th Street corridor and reduces reliance on the US 26/US 97 corridor. In addition, the project will provide better access to the Wistful Vista subdivision and local schools for vehicular, bicycle and pedestrian traffic.

PROJECT DESCRIPTION:
This 0.25-mile widening project provides sidewalks, bicycle lanes, and utilities along 10th Street between Buff Street and "J" Street.

TIME FRAME: 0-5 years



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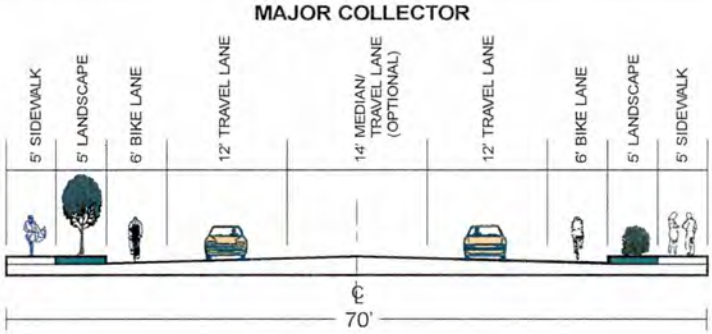


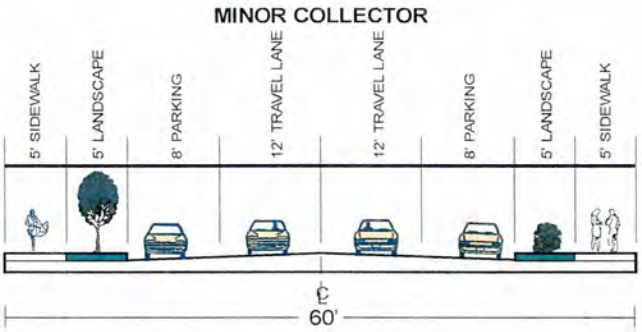
#5 "M" Street Extension (Marshall Extension to Madison Street)

PURPOSE:
Continues grid development for properties between OR-361 (Culver Highway) and Madison Street, allowing for more residential development.

PROJECT DESCRIPTION:
This project extends "M" Street to the west where it will connect with the proposed Marshall Street Extension. The Minor Collector facility would include roadway construction across relatively level ground. "M" Street would be stop-controlled at Marshall Street.

TIME FRAME: 5-10 years

TYPICAL CROSS-SECTION:



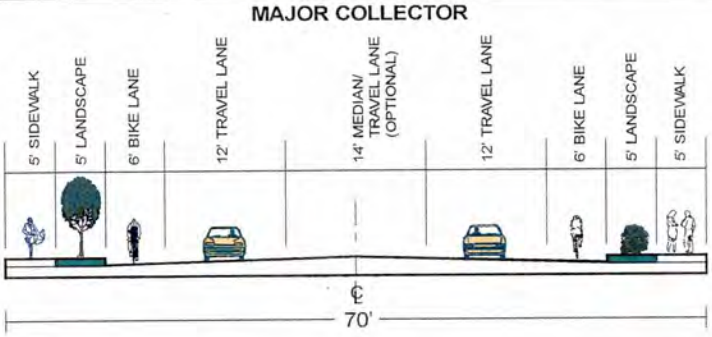
#6 Fairgrounds Road Extension (US 26/US 97 to Grizzly Road)

PURPOSE:
Provides additional access onto Adams Drive, thereby relieving congestion on "J" Street, US 26/US 97, and Bard Lane. The project further develops the grid street network within the city limits and provides a primary east-west collector facility within the southern area of the city. This extension represents anticipated future growth in the area. (Ordinance No. 785, December 12, 2006)

PROJECT DESCRIPTION:
This project provides an east-west connection between US 26/US 97 and Grizzly Road. This Major Collector facility will require right-of-way acquisition and construction of the entire roadway facility (travel lanes, bicycle lanes, and sidewalks).

TIME FRAME: 5-10 years

TYPICAL CROSS-SECTION:



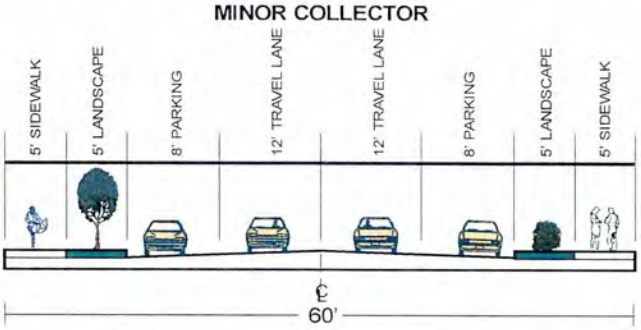
#7 Maple Street Extension (1st Street to US 26/US 97)

PURPOSE:
Improves an existing roadway and incorporates this roadway into the City maintenance inventory. Further coordinates with the newly constructed US 26/US 97 North intersection, and preserves the option of extending the fourth leg of the intersection as the Madras Truck Route, change Oak Street Extension to Maple Street extension. (Ordinance No. 785, December 12, 2006)

PROJECT DESCRIPTION:
This project requires the acquisition of additional right-of-way and construction of the street to meet Minor Collector street standards. Sidewalks would be developed in conjunction with local development

TIME FRAME: 0-5 years

TYPICAL CROSS-SECTION:



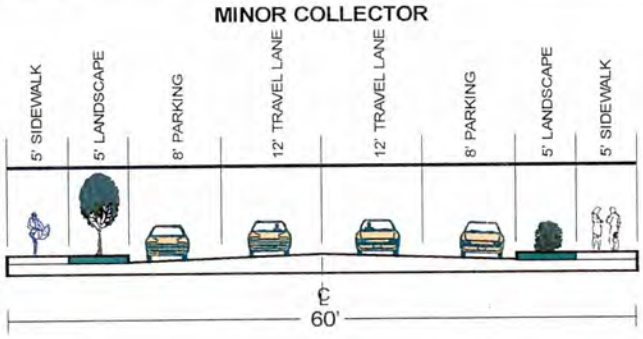
#8 1st Street Extension (Maple Street to "B" Street)

PURPOSE:
Provides a connection to properties located between Maple Street and "B" Street. Provides an additional north-south throughway for traffic, thereby reducing local reliance on the US 26/US 97 corridor (4th Street/5th Street). In order to coordinate with the Madras Truck Route option, project changed to 1st Street Extension from Maple Street to "B" Street. (Ordinance No. 785, December 12, 2006)

PROJECT DESCRIPTION:
This project involves construction of a bridge across Willow Creek and approximately 1,300 feet of roadway improvements. Sidewalks and bicycle lanes will be added to meet Minor Collector street standards. A potential realignment alternative is to transition 3rd Street to 2nd Street between Pine Street and "B" Street. This would create a continuous collector facility extending between Oak Street and "M" Street.

TIME FRAME: 0-5 years

TYPICAL CROSS-SECTION:



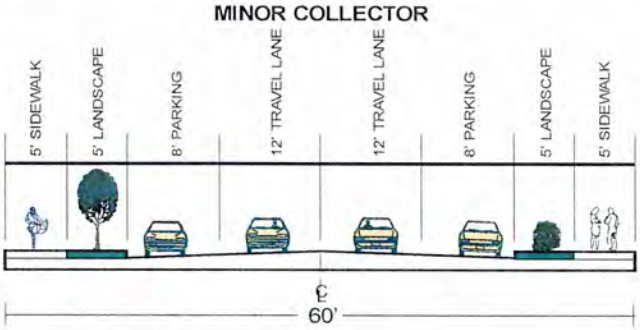
#9 "H" Street Improvements (Marshall Extension to Madison Street)

PURPOSE:
Provides an east/west route for traffic, reducing the burden on "J" Street. Further develops the grid street network within the city limits. Improves local circulation within the west area of the city.

PROJECT DESCRIPTION:
This project involves upgrading and paving the current gravel roadway to Minor Collector street standards. "H" Street would be stop-controlled at the OR-361 (Culver Highway) and Madison Street intersections. Sidewalks would be developed in conjunction with local development.

TIME FRAME: 0-5 years

TYPICAL CROSS-SECTION:



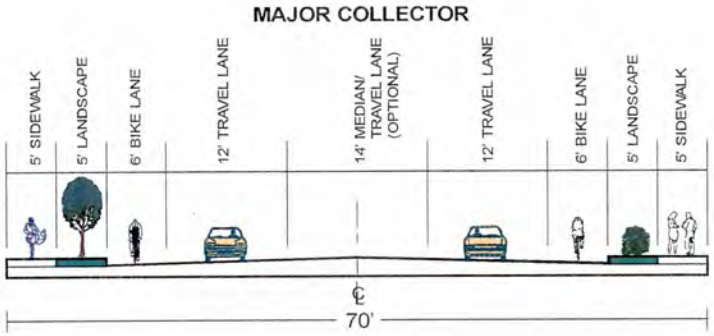
#10 Bean Drive Extension (Meadow Lark to "B" Street)

PURPOSE:
Provides additional access into the new school from the south. Further develops the grid street network within the city limits. Improves local circulation within the eastern part of the city. Coordinates with Jefferson County TSP. The future intersection of Bean Drive/Kinkade Road is planned to be a modern roundabout. (Ordinance No. 785, December 12, 2006)

PROJECT DESCRIPTION:
This project involves the construction of a new roadway to accommodate new development in the eastern part of the City. This project will be designed to Major Collector street standards. Sidewalks will be developed in conjunction with local development.

TIME FRAME: 0-5 years (Ordinance No. 707, May 27, 2003)

TYPICAL CROSS-SECTION:

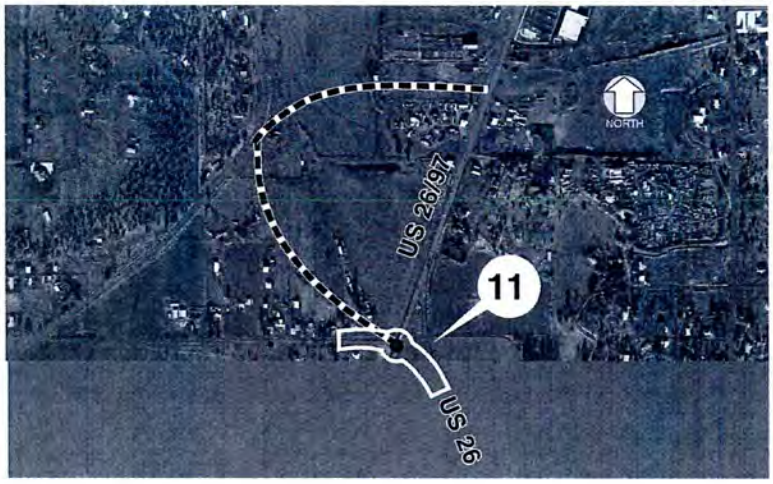


#11 US 26/US 97–Colfax Lane Realignment

PURPOSE:
Realigns US 26 to be perpendicular to US 97. Improves safety for motorists making left-turns from US 26 onto US 97 by reducing the overall intersection area. This project also provides a direct route from Prineville to Culver.

PROJECT DESCRIPTION:
This project involves realigning US 26 to the south to create a single intersection with Colfax Lane. The new Colfax Lane–US26/US97 intersection will be signalized with exclusive right- and left-turn lanes. Significant right-of-way and construction will be required for the new facility. Sidewalks and bicycle lanes will be added to meet City and ODOT standards. This improvement will serve as the first phase of the planned US 26/US 97 South Junction Realignment.

TIME FRAME: 5-10 years



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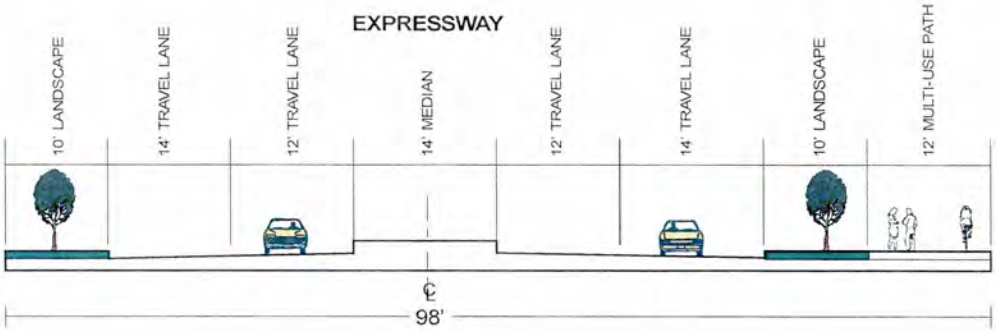
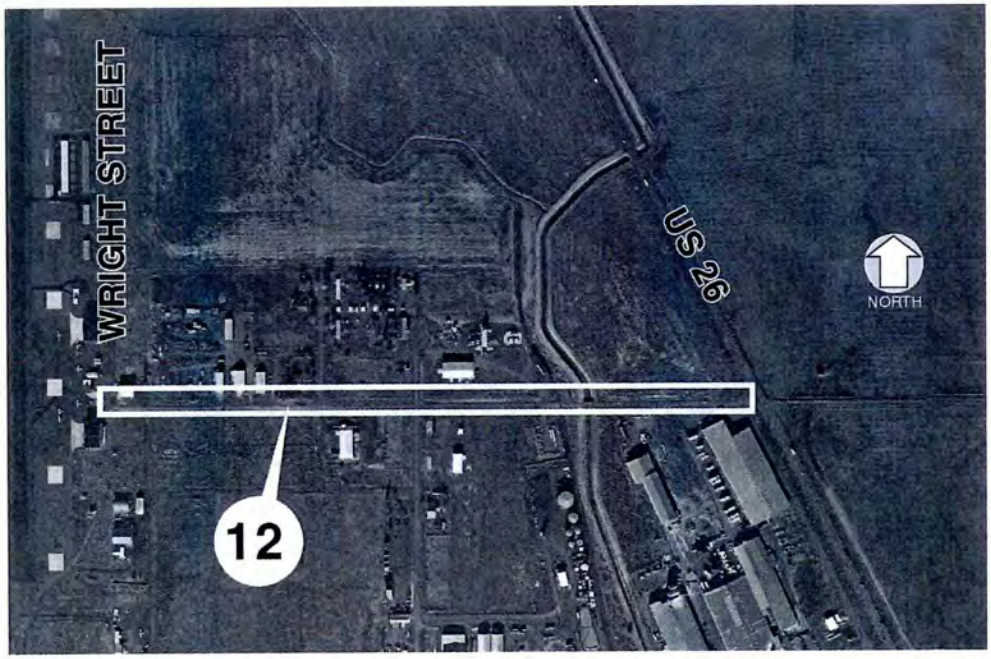


#12 Cherry Lane Improvements (Wright Street to US 26)

PURPOSE:
Improves existing roadway to accommodate traffic going to and from Madras Airport and the northern industrial areas. Cherry Lane will support much of the future growth as this roadway provides the primary access route to the airport.

PROJECT DESCRIPTION:
This project involves widening Cherry Lane and upgrading the roadbed and surface to accommodate increased volume along this facility. This roadway would be designed to Major Collector street standards. Sidewalks and bicycle lanes will be added or upgraded to accommodate increased use.

TIME FRAME: 0-5 years (Ordinance No. 707, May 27, 2003)



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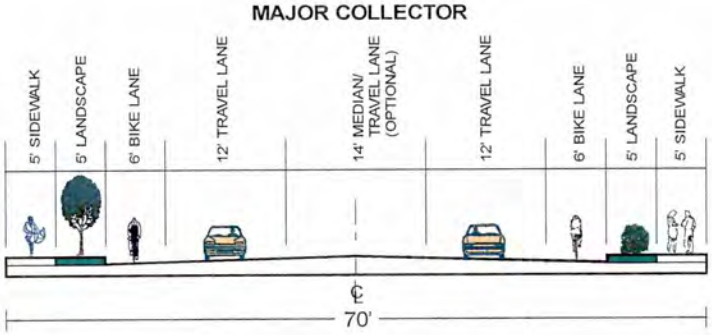
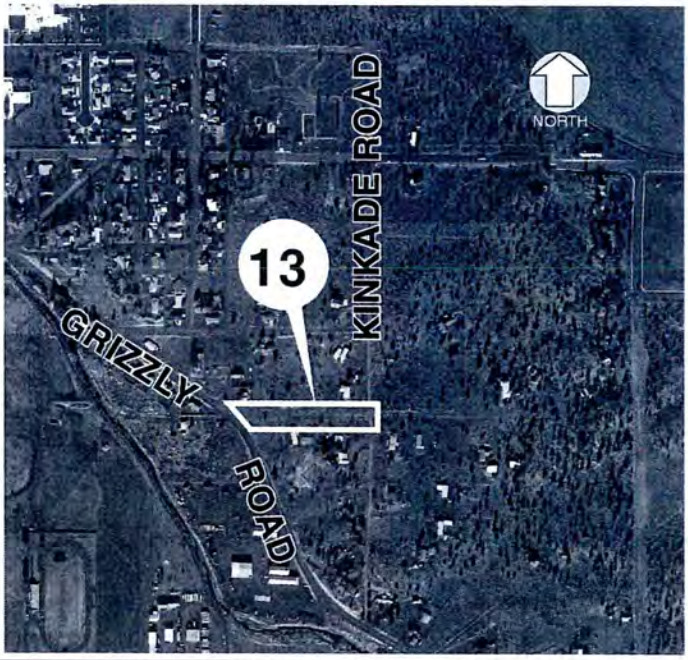


#13 "E" Street Improvements (Grizzly Road to Kinkade Road)

PURPOSE:
Provides additional access onto Grizzly Road and reduces burden on "C" Street. Further develops the grid street network within the city limits. Provides better traffic circulation along local streets.

PROJECT DESCRIPTION:
This 600-foot roadway project involves upgrading the roadbed and surface to accommodate increased volume along this facility. This roadway will be designed to Minor Collector street standards. "E" Street will be stop-controlled at Grizzly and Kinkade Roads. Sidewalks will be developed in conjunction with local development.

TIME FRAME: 5-10 years



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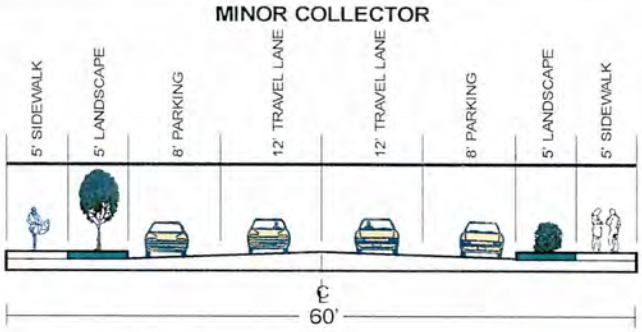


#14 Oak Street Extension (16th Street to City View Street)

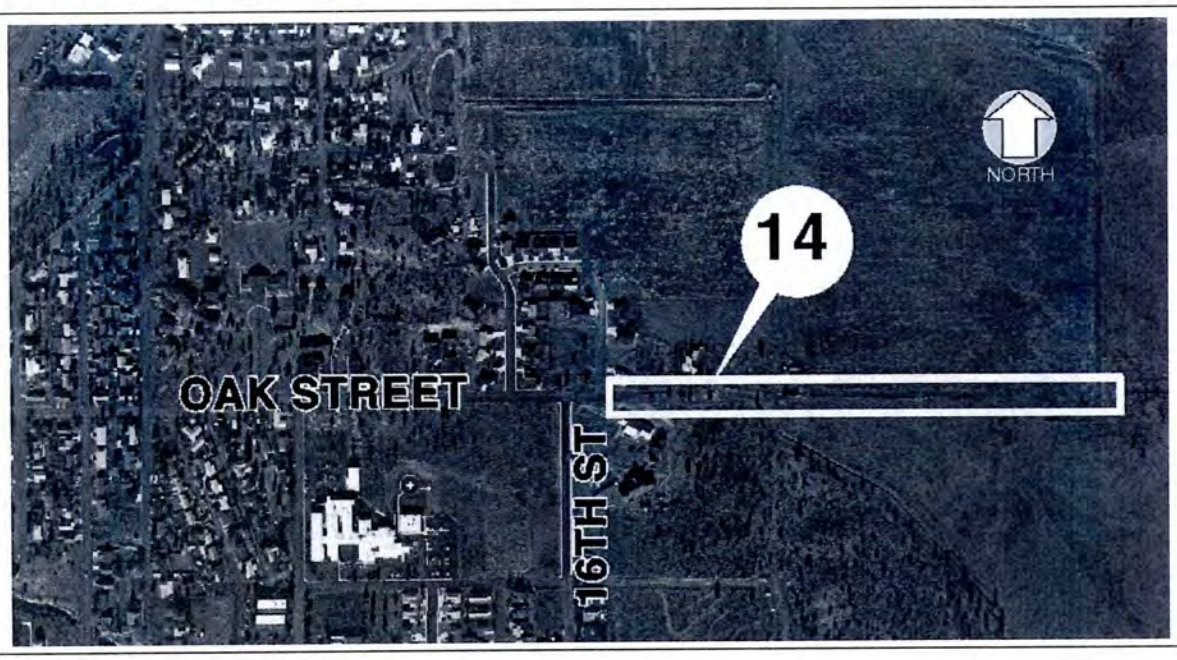
PURPOSE:

The alignment of the Oak Street Extension is altered to form a curvilinear roadway and intersection opposite the City View Street / B Street intersection. A modern roundabout is planned at the intersection of Kinkade Avenue and Oak Street. (Ordinance No. 785, December 12, 2006)

PROJECT DESCRIPTION:

This roadway project involves upgrading the roadbed and surface to accommodate increase volume along this facility. This project will be designed to Minor Collector street standards. Sidewalks will be developed in conjunction with local development. Oak Street will be stop-controlled at Kinkade Road.

TIME FRAME: 5-10 years



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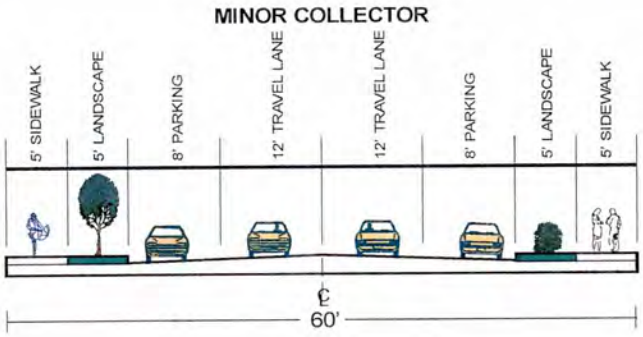
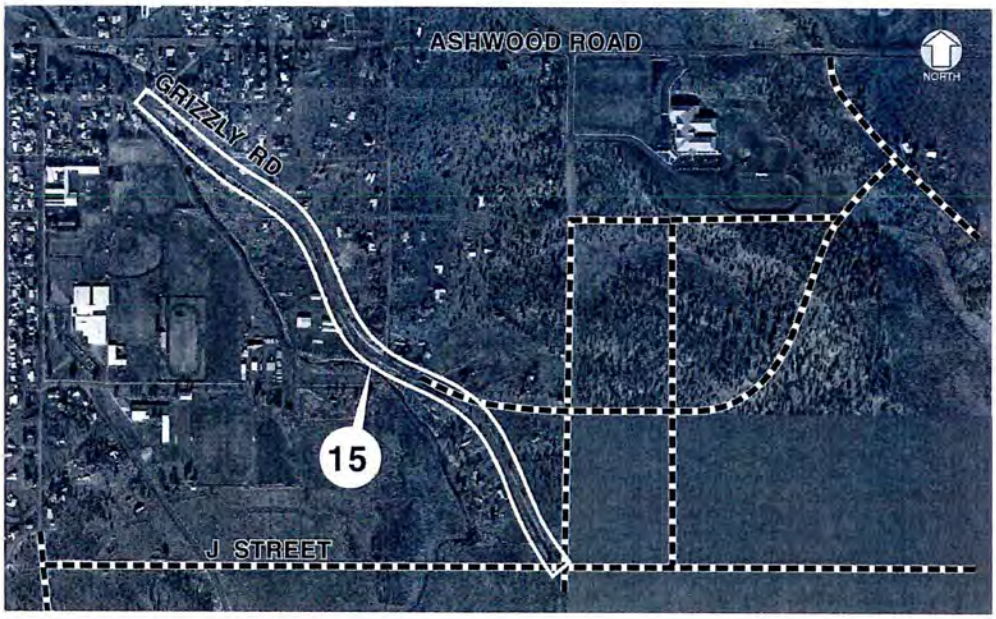


#15 Grizzly Road Improvements - ("C" Street to UGB)

PURPOSE:
Provides a better roadway to accommodate the potential increase in traffic going to and from the developable lands located southeast of downtown.

PROJECT DESCRIPTION:
This project involves widening Grizzly Road and upgrading the roadbed and surface to Minor Collector street standards between "C" Street and Kinkade Road, and to Major Collector Street standards between "J" Street and the southeast UGB. To accommodate future expansion of the City's grid system, the segment of Grizzly Road between Kinkade Road and Claremont Street may need to be realigned to eliminate fifth approaches to the Buff Street/Kinkade Road and "J" Street/Claremont Street intersections.

TIME FRAME: 10-20 years



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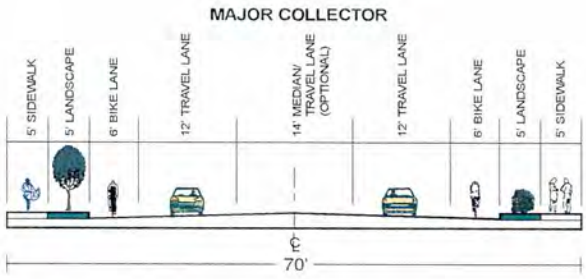
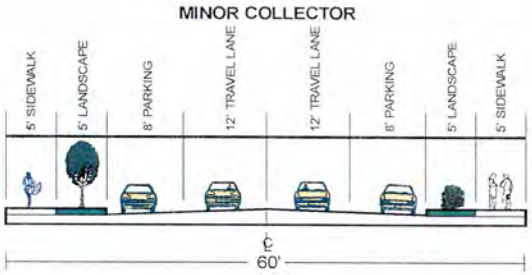


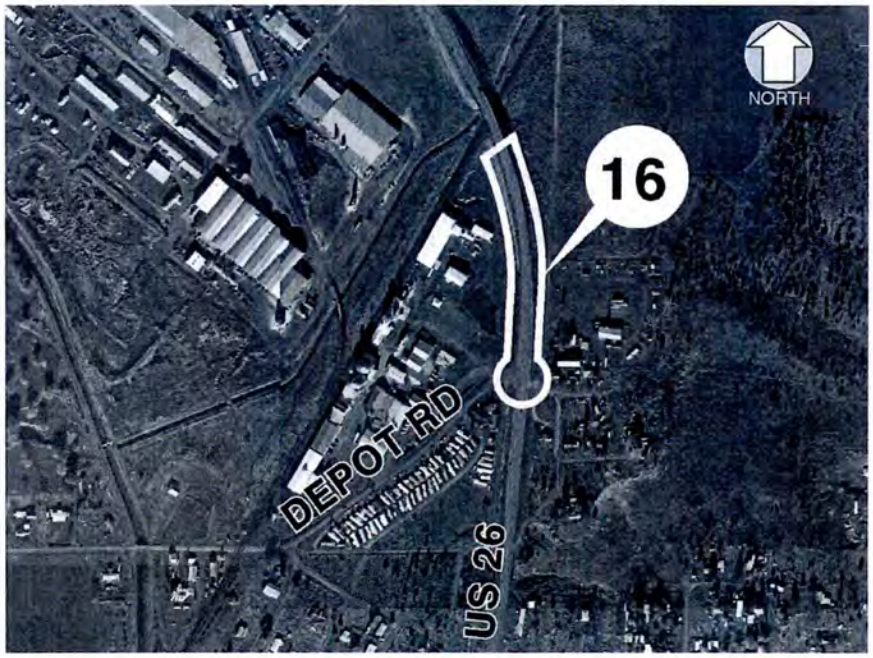


#16 Depot Road/US 26 Intersection Improvements

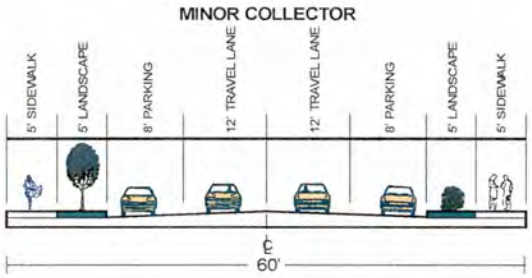
PURPOSE:
Enhances motorist safety by eliminating eastbound and northbound left-turn conflicts with traffic on US 26. Sight distance for the eastbound left-turn movement is currently limited by the grade and horizontal curve of US 26 north of the intersection.

PROJECT DESCRIPTION:
This intersection project will create two parallel frontage roads between the railroad tracks and Depot Road. The frontage roads will be joined via a culvert installation under US 26 near the railroad overpass. The current eastbound left-turn and northbound left-turn movements would be removed from the intersection, allowing the intersection to operate with right-in/right-out turning movements only. A non-traversable median will be constructed on US 26 to prevent left-turn movements between US 26 and Depot Road.

TIME FRAME: 5-10 years (Ordinance No. 707, May 27, 2003)



TYPICAL CROSS-SECTION:

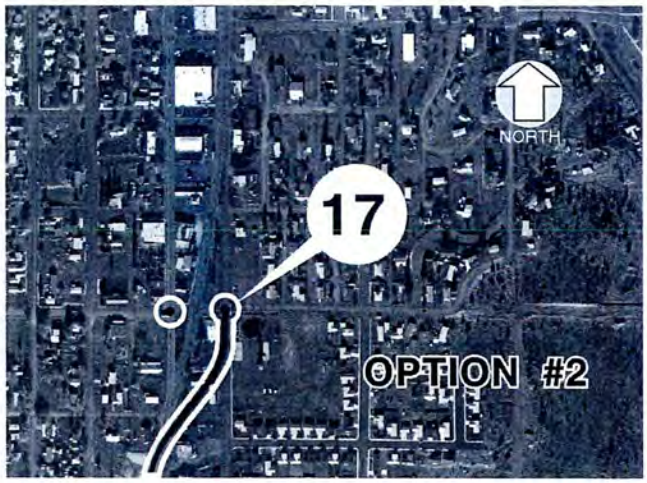


#17 "J" Street/US 97 Intersection Realignment

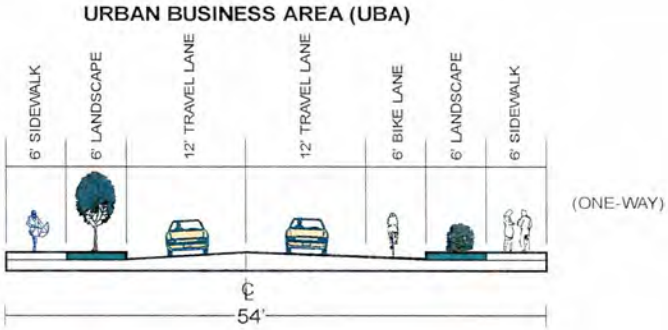
PURPOSE:
Provides a safe "J" Street crossing of the US 26/US 97 couplet and improves the east-west connectivity within Madras.

PROJECT DESCRIPTION:
This project has two design options that both require significant right-of-way and will likely impact existing businesses. "J" Street/US 97 intersection realignment design to be updated to the double-line design shown in Figure 8. The project is estimated to cost approximately $9 million dollars including right-of-way acquisition, engineering, and construction cost, according to the ODOT cost estimate. (Ordinance No. 785, December 12, 2006)

TIME FRAME: 10-20 years



TYPICAL CROSS-SECTION:

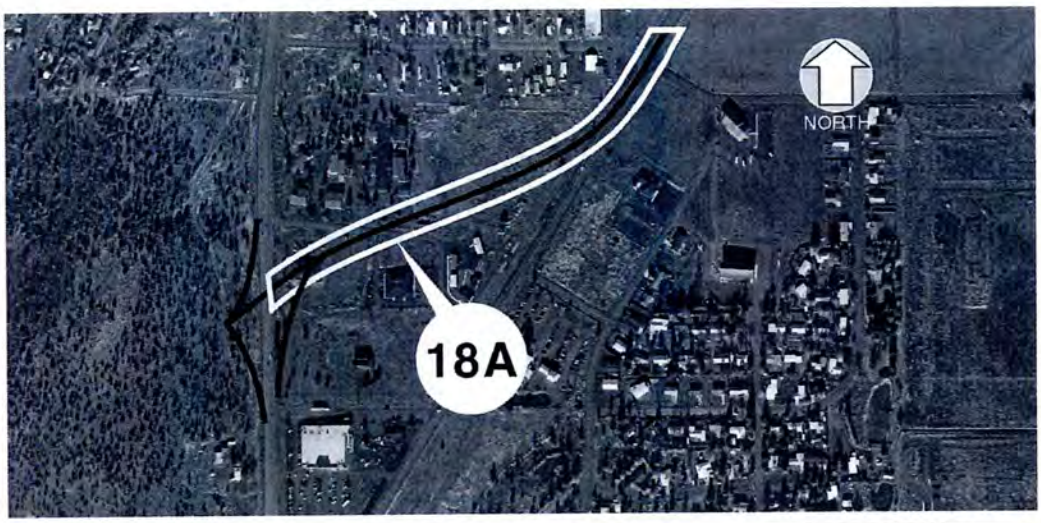


#18A US 26/US 97 North Junction Realignment

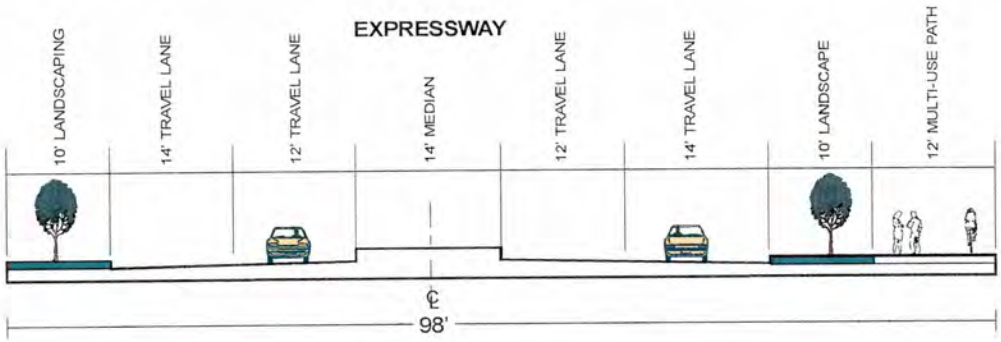
PURPOSE:
Provides a long-term capacity improvement to reduce congestion within downtown Madras. This project would preserve the ability to construct a future truck by-pass, while reducing the number of signalized intersections within downtown Madras.

PROJECT DESCRIPTION: (Amended by Ordinance No. 785, December 12, 2006)
This project would realign US 97 to the north and create a grade-separated junction with US 26. This project would represent the first phase of the US 26/US 97 truck by-pass and relieve the congestion at the existing US 26/US 97 junction. (Refer to #18D for additional comments)

TIME FRAME: 10-20 years



TYPICAL CROSS-SECTION:

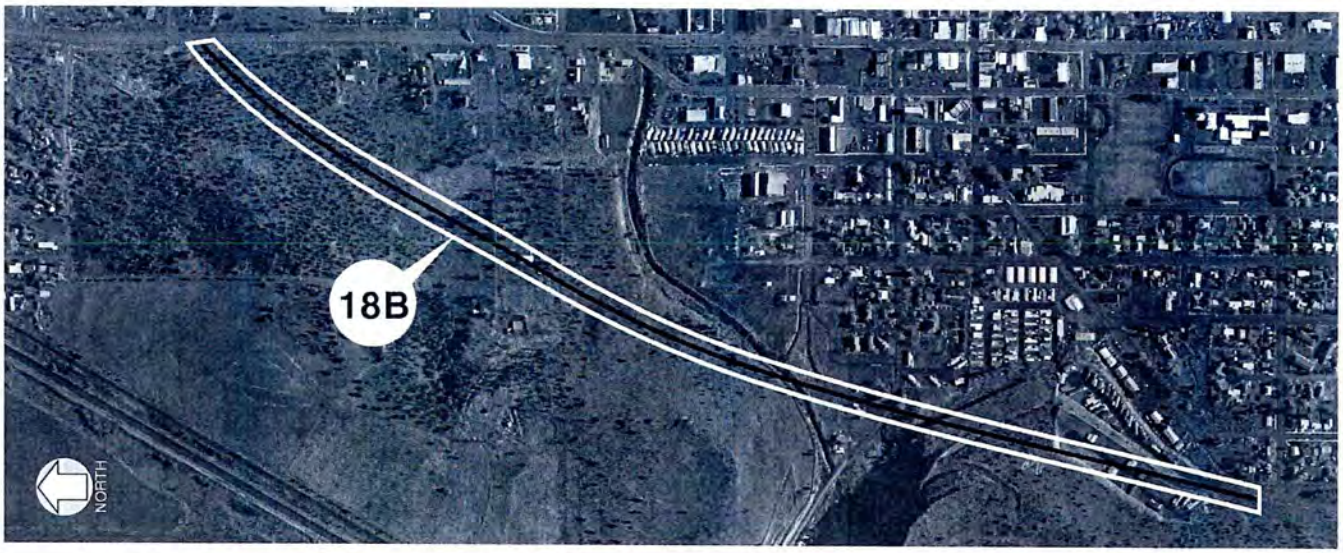


#18B Limited Access Truck By-Pass

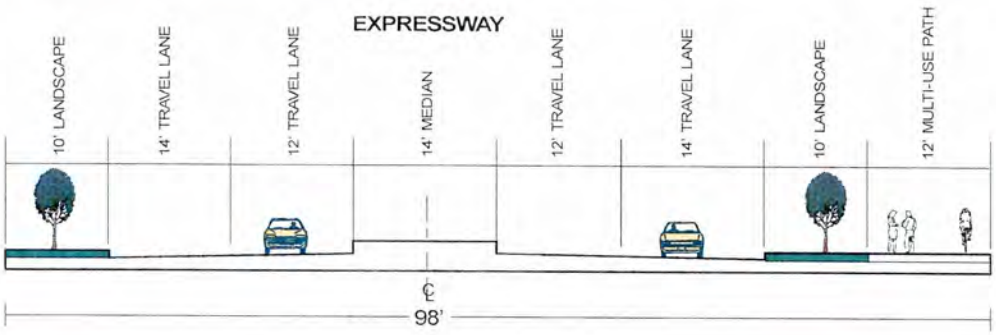
PURPOSE:
Provides a long-term capacity improvement to reduce congestion within downtown Madras. This project would preserve the ability to construct a future truck by-pass, while reducing the number of signalized intersections within downtown Madras.

PROJECT DESCRIPTION: (Amended by Ordinance No. 785, December 12, 2006)
This 1.25-mile limited access facility would be constructed following the US 26/US 97 North Junction Realignment project (Project #18A). The project would link the grade-separated US 26/US 97 North Junction with OR-361 near the existing "G" Street/OR-361 intersection. This new roadway segment would be fully access- controlled over the 1.25-mile link. (Refer to #18D for additional comments)

TIME FRAME: 10-20 years



TYPICAL CROSS-SECTION:

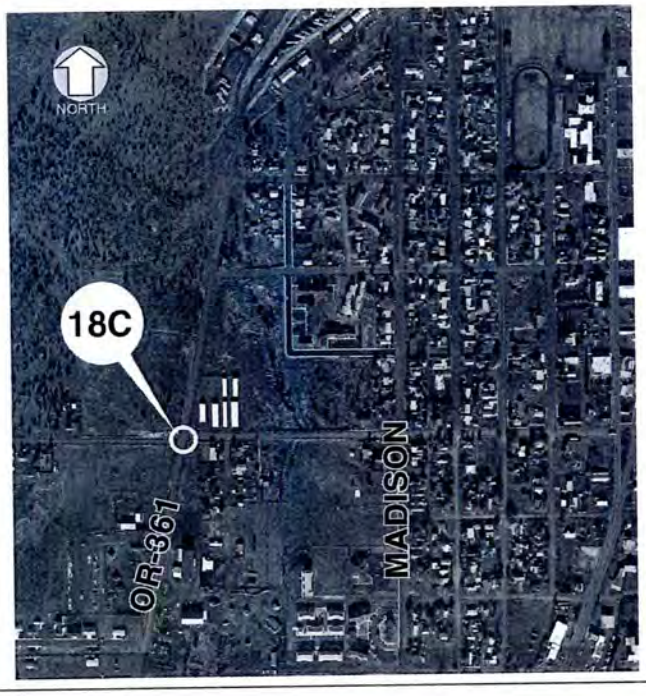


#18C "J" Street/Truck By-Pass Intersection Improvements

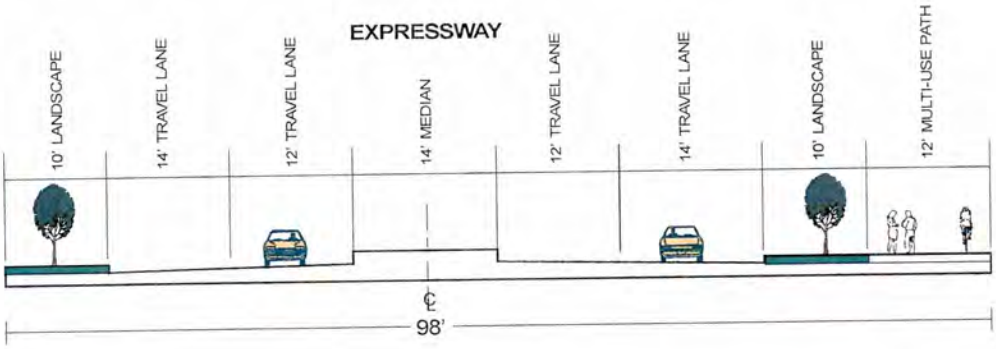
PURPOSE:
Provides safe and efficient access to/from the truck by-pass.

PROJECT DESCRIPTION: (Amended by Ordinance No. 785, December 12, 2006)
This project would signalize the "J" Street/OR-361 intersection and provide northbound and southbound left-turn lanes. (Refer to #18D for additional comments)

TIME FRAME: 10-20 years



TYPICAL CROSS-SECTION:

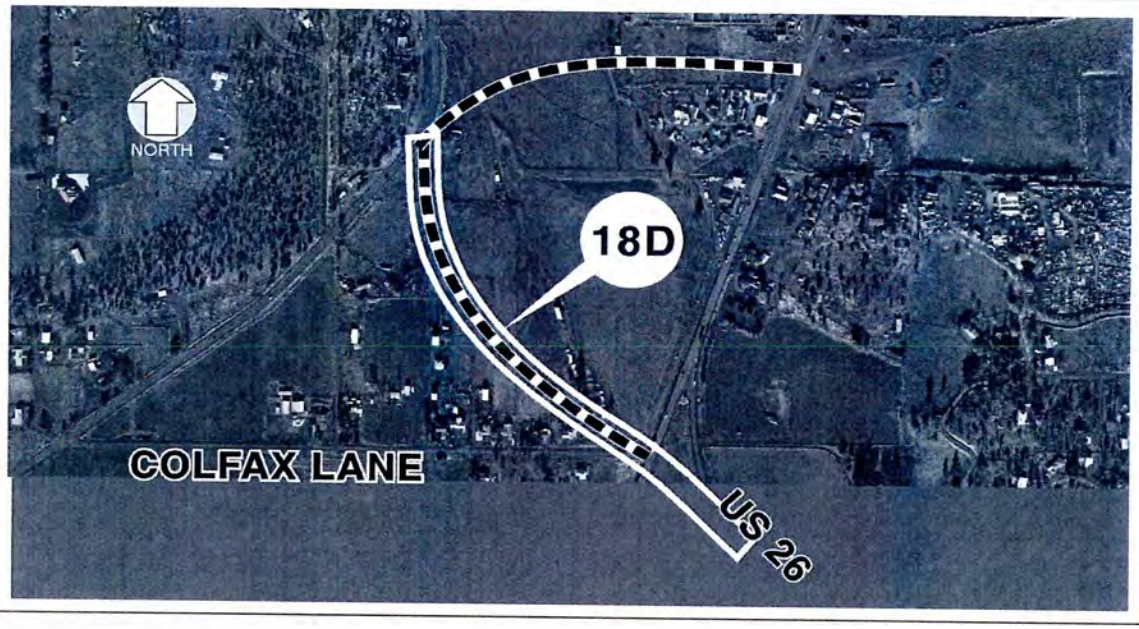


#18D Truck By-Pass (US 26/US 97 and OR-361 Connection)

PURPOSE:
To provide an access-controlled southern connection to US 26 and US 97 for the proposed truck bypass.

PROJECT DESCRIPTION: (Amended by Ordinance No. 785, December 12, 2006)
The expressway facility would connect OR-361 to the US 26/97 South Junction. The by-pass facility would be fully access-controlled with the exception of signalized intersections at OR-361/Hall Road Extension and Colfax Lane/US 26/US 97.

TIME FRAME: 10-20 years



TYPICAL CROSS-SECTION:

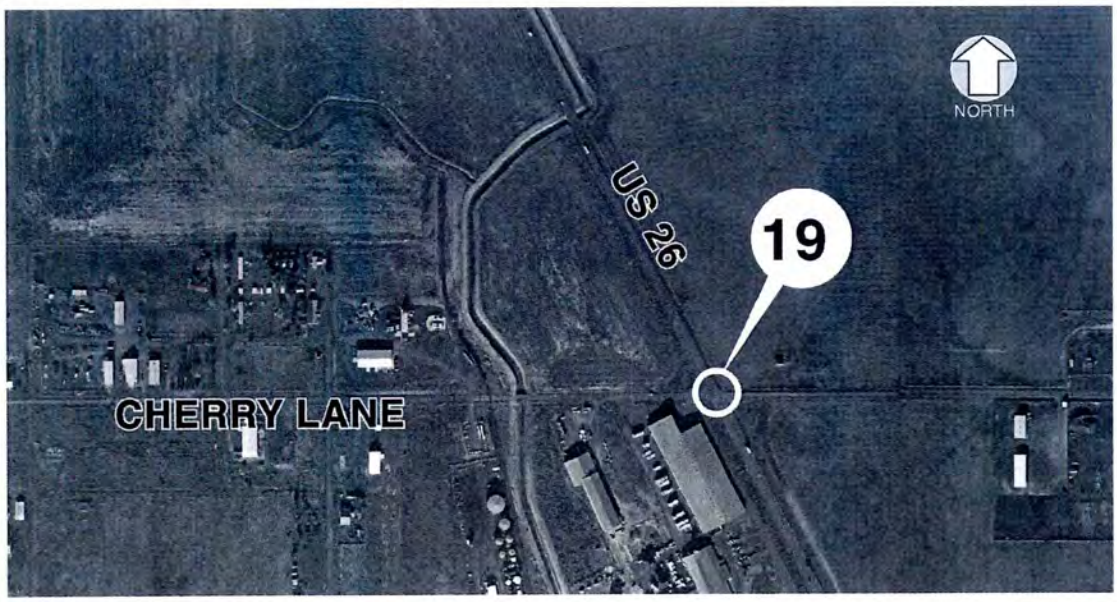
The Madras Truck Route refinement plan analyzed various alternative alignments. Based on the discussion on those alignments, the alignment that extends the truck route as the fourth leg of the US 97/US 26 North intersection and follows 1st Street to the current alignment of Culver Highway was identified as the most feasible alignment. The alignment is named Alternative 1C and Alternative 2 in Figure 2. Even though the alignment addresses some of the concerns such as the impact on the hotel development and cost of construction, it is anticipated to continue to have major right-of-way and access impacts on the properties adjacent to Culver Highway. As such, it is recommended that a detained quantitative impact analysis be conducted in accordance with NEPA process before a final preferred alternative is selected.

#19 Cherry Lane/US 26 Intersection Improvements

PURPOSE:
Provides enhanced access to US 26. Installation of a traffic signal at the Cherry Lane/US 26 intersection will improve the safety and operation of turning movements to and from Cherry Lane. This signal location has an added benefit of serving as the City's northern "gateway" whereby it marks the beginning of the city limits and begins the transition of US 26 from a high-speed expressway to a lower-speed urban arterial.

PROJECT DESCRIPTION:
This improvement project entails the installation of a traffic signal at the Cherry Lane/US 26 intersection. In conjunction with signalization of the intersection, turn lanes will be constructed to better facilitate higher-volume turn movements.

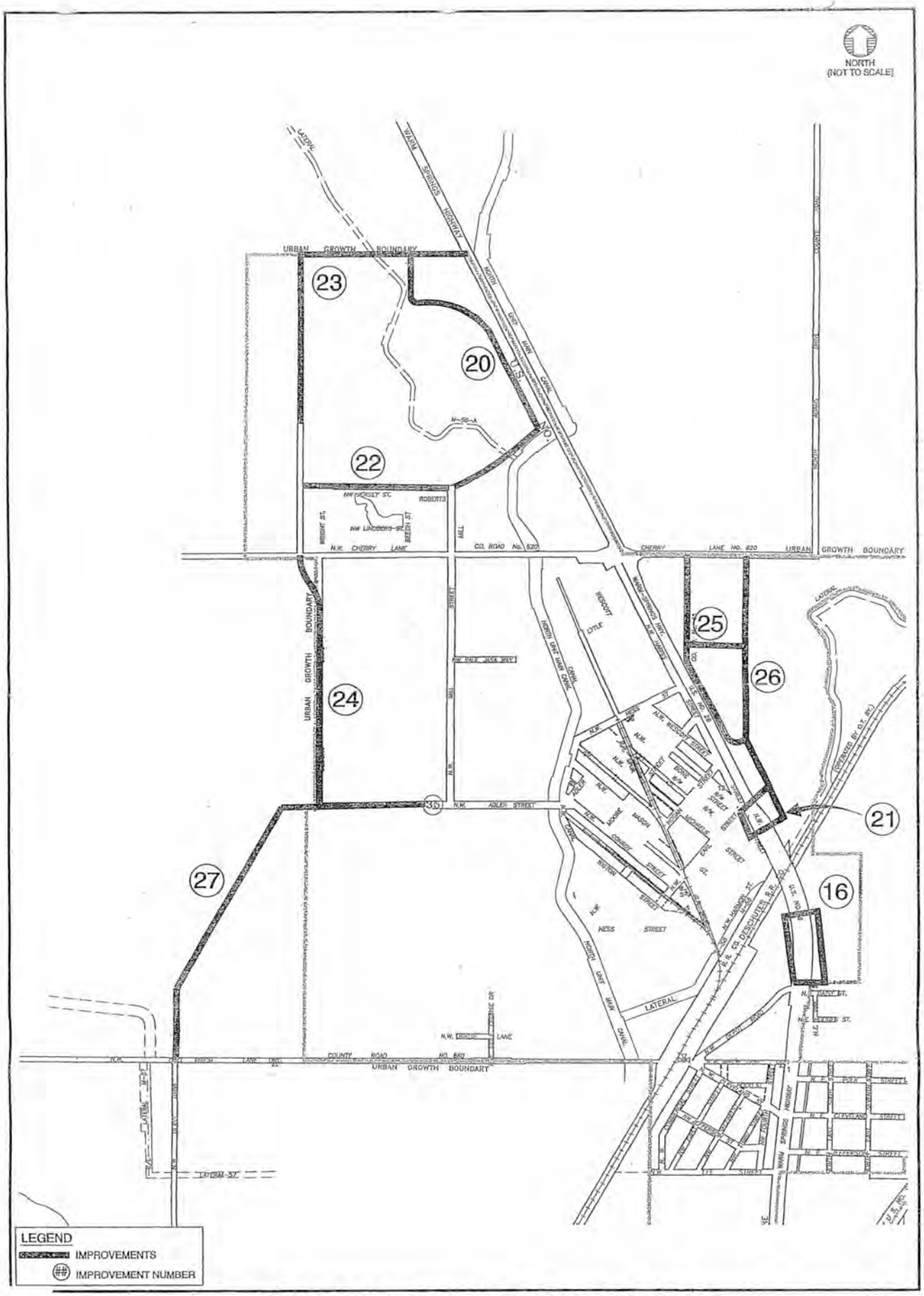
TIME FRAME: 10-20 years



NOTES:

North Industrial Concept Area Transportation System Evaluation

To provide local circulation and reduce the reliance on US 26, eight transportation system improvements have been proposed in the North Industrial Concept Area. These improvements have been developed to encourage future industrial development, while allowing safe ingress and egress from US 26. Figure B3 illustrates the project locations and Improvement Tables 20 through 27 provide the purpose of the project, a project description, an estimated timeframe for construction, an illustration of the improvement, and a roadway cross-section detail.



NORTH INDUSTRIAL CONCEPT AREA
TRANSPORTATION SYSTEM IMPROVEMENTS

CITY OF MADRAS COMPREHENSIVE PLAN AND
TRANSPORTATION SYSTEM PLAN UPDATE
2001

FIGURE
B3

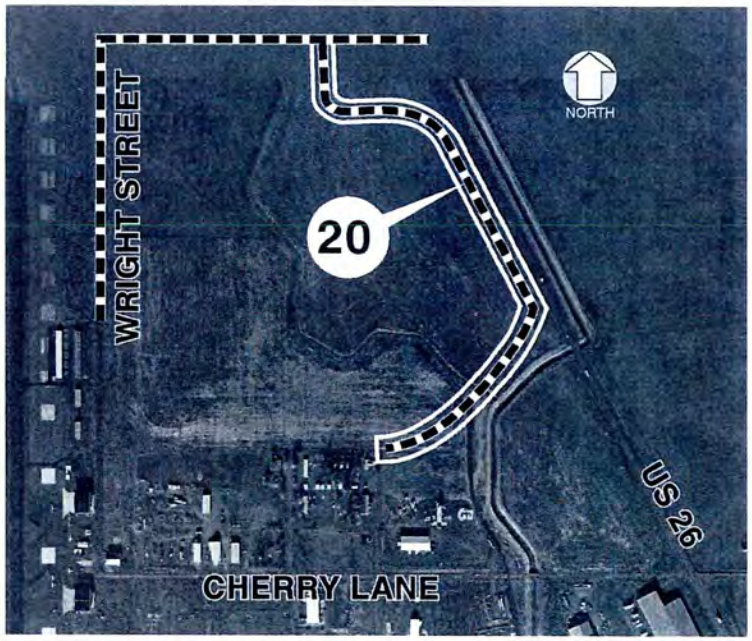
4139\DWGS\TECHMEMO#2\4139F083

#20 Jersey Street Extension (Mill Street to the Wright Street Extension)

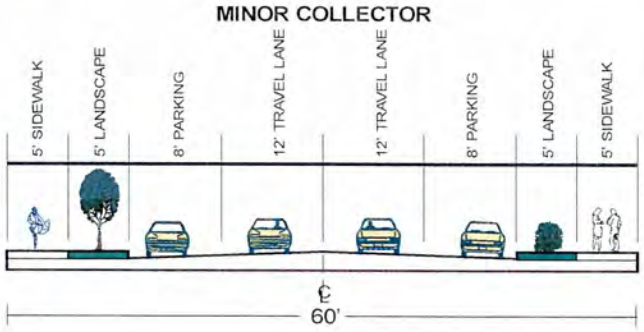
PURPOSE:
Provides local street access for properties located north of Cherry Lane and west of US 26. Local street access will help eliminate the need for access driveways on US 26, thereby enhancing safety and operations on the highway.

PROJECT DESCRIPTION:
This improvement project entails the construction of a US 26 frontage roadway between the Jersey Street/Mill Street intersection and the proposed Wright Street Extension (Improvement #23). A bridge crossing will need to be constructed to traverse the North Unit Main Canal. The proposed roadway will be constructed to Minor Collector street standards.

TIME FRAME: 5-10 years (Ordinance No. 707, May 27, 2003)



TYPICAL CROSS-SECTION:

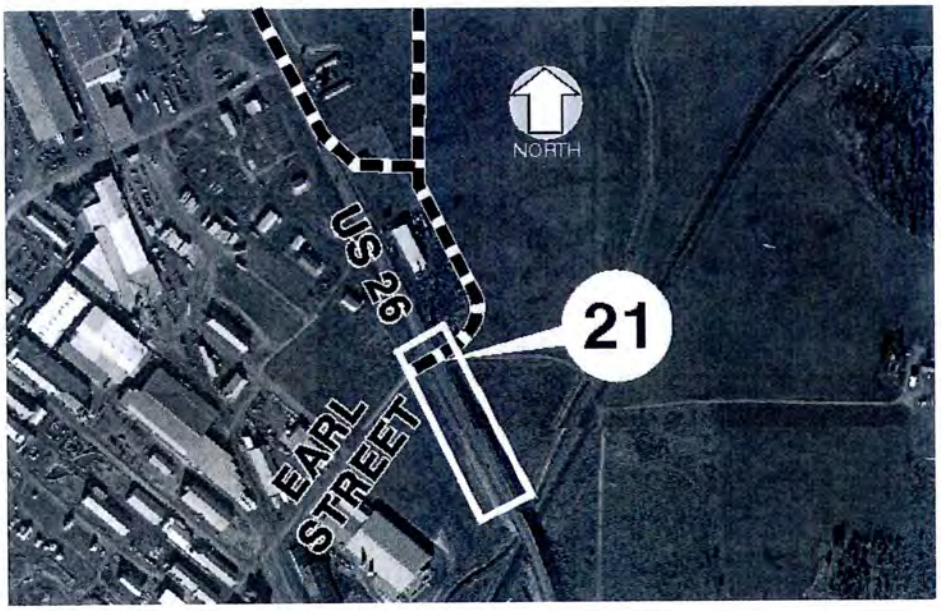


#21 Earl Street/US 26 Intersection Improvements

PURPOSE:
Enhances motorist safety by eliminating eastbound and northbound left-turn conflicts with traffic on US 26. Due to the heavy traffic volumes and relatively high speeds on US 26, motorists (particularly heavy vehicle operators) have difficulty finding gaps large enough to access the highway. Eliminating left-turns (and future through movements) on Earl Street will reduce potential conflict points and reduce overall intersection delay.

PROJECT DESCRIPTION:
This project involves construction of two parallel frontage roads between the railroad tracks and Earl Street. The frontage roads will be joined via a culvert installation under US 26 near the railroad overpass. The current eastbound left-turn and northbound left-turn movements would be removed from the intersection, allowing the intersection to operate with right-in/right-out turning movements only. A non-traversable median will be constructed on US 26 to prevent left-turn movements between US 26 and Earl Street.

TIME FRAME: 10-20 years



NOTES:

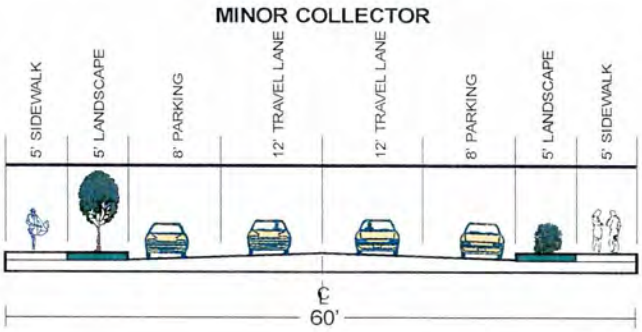
#22 Mill Street & Jersey Street Improvements

PURPOSE:
Provides improved connectivity between Wright Street and Mill Street and further develops the grid street network within the northern UGB area.

PROJECT DESCRIPTION:
This project involves upgrading the existing roadbed and surfaces of Mill Street and Jersey Street, and extending Jersey Street west to Wright Street. Both Mill Street and Jersey Street will be constructed to Minor Collector street standards.

TIME FRAME: 0-5 years (Ordinance No. 707, May 27, 2003)

TYPICAL CROSS-SECTION:

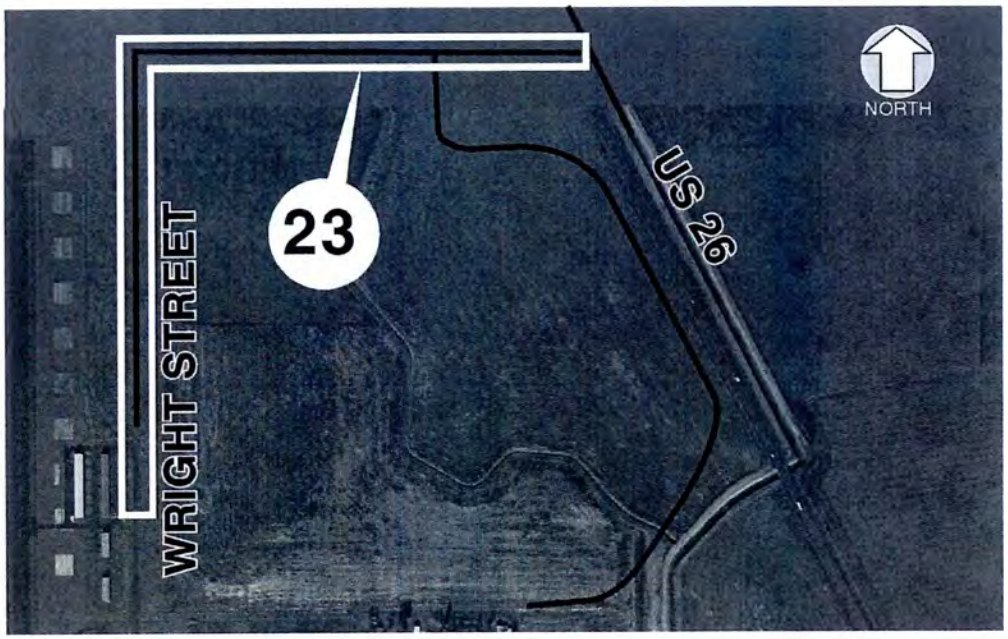


#23 Wright Street Extension (Wright Street to US 26)

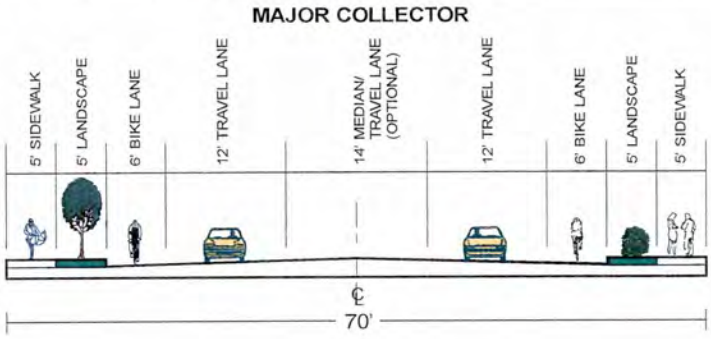
PURPOSE:
Provides a parallel north-south collector facility in the north UGB area. As the north industrial area develops, this road will help to relieve demand at the Cherry Lane/US 26 intersection. In addition, the Wright Street Extension will enable the development of the Jersey Street Extension (Improvement #20) helping to reduce the reliance on US 26 for local travel in this area.

PROJECT DESCRIPTION:
This project involves extending Wright Street from its current northern terminus north to the UGB and then east to US 26. The proposed roadway should be constructed to Major Collector Street standards.

TIME FRAME: 10-20 years



TYPICAL CROSS-SECTION:

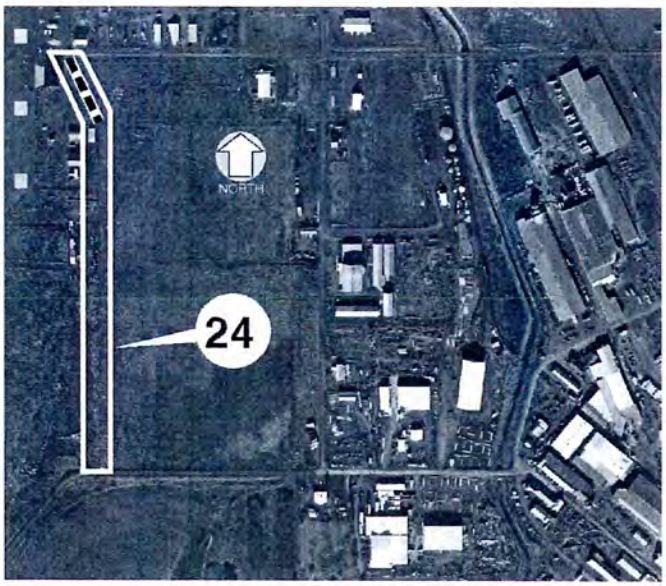


#24 Demers Road Extension (Cherry Lane to Glass Drive)

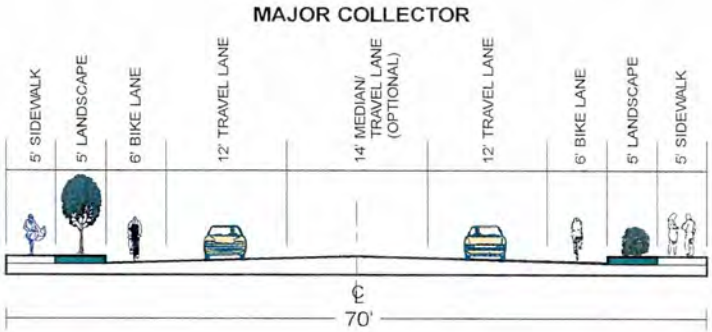
PURPOSE:
Provides improved connectivity between Cherry Lane and Glass Drive and further develops the grid street network within the northern UGB area.

PROJECT DESCRIPTION:
This improvement project entails construction of a new roadway facility between the current southern terminus of Diemers Road and Glass Drive. The proposed roadway will be constructed to Major Collector street standards.

TIME FRAME: 5-10 years



TYPICAL CROSS-SECTION:

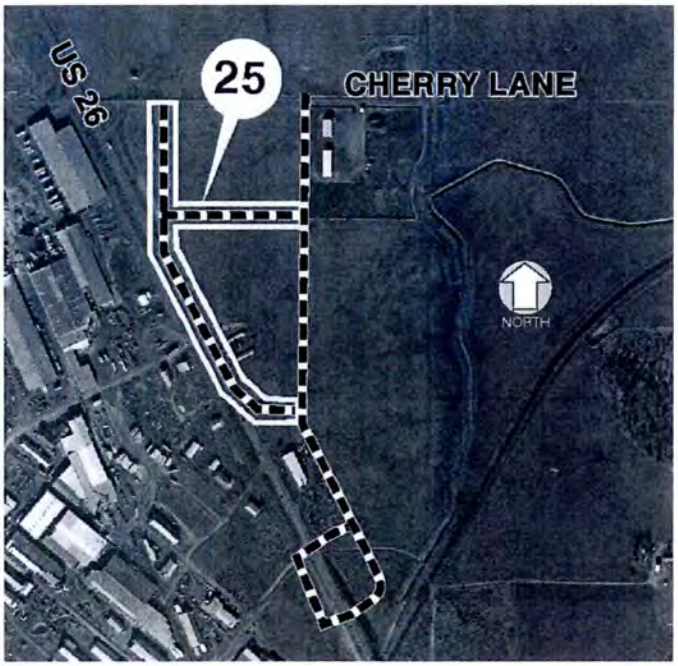


#25 Easterly US 26 Frontage Road (Cherry Lane to Earl Street)

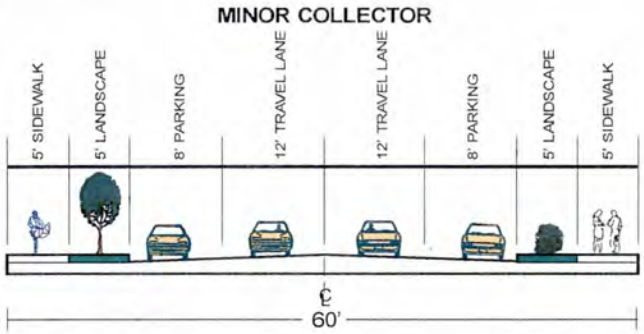
PURPOSE:
Provides local street access for properties located south of Cherry Lane and east of US 26. Local street access will help eliminate the need for access driveways on US 26, enhancing safety and operations on the highway.

PROJECT DESCRIPTION:
This improvement project entails construction of a US 26 frontage roadway between Cherry Lane and the proposed Easterly Earl Street Extension (Improvement #26). The proposed roadway will be constructed to Minor Collector street standards.

TIME FRAME: 10-20 years



TYPICAL CROSS-SECTION:



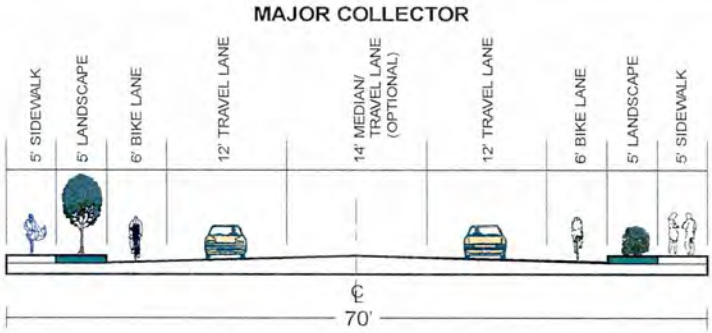
#26 Easterly Earl Street Extension (Cherry Lane to US 26)

PURPOSE:
Provides a parallel north-south collector facility in the north UGB area, east of US 26. As this area develops, this proposed road will help to enable development of the US 26 Frontage Road (Improvement #25) helping to reduce reliance on US 26 for local travel in this area.

PROJECT DESCRIPTION:
This project involves construction of a new roadway between Cherry Lane and the Earl Street/US 26 intersection. The proposed roadway will be constructed to Major Collector street standards.

TIME FRAME: 10-20 years

TYPICAL CROSS-SECTION:



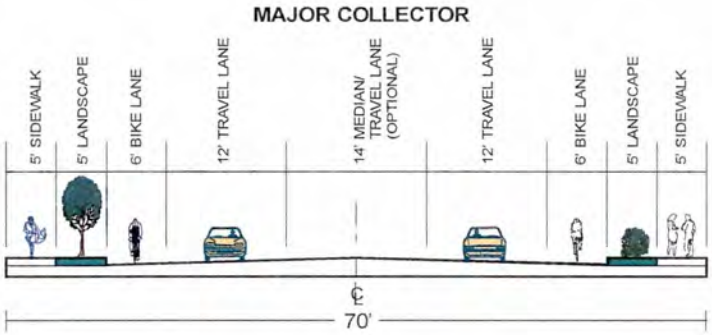
#27 Adler Street Improvements (Glass Drive to Mill Street)

PURPOSE: **(PROJECT REMOVED - ORDINANCE NO. 785, DECEMBER 12, 2006)**
To improve the roadway travel surface to accommodate future traffic demand.

PROJECT DESCRIPTION:
Upgrade roadbed and pave Adler Street from Glass Drive to Mill Street. Improve roadway to meet Major Collector street standards.

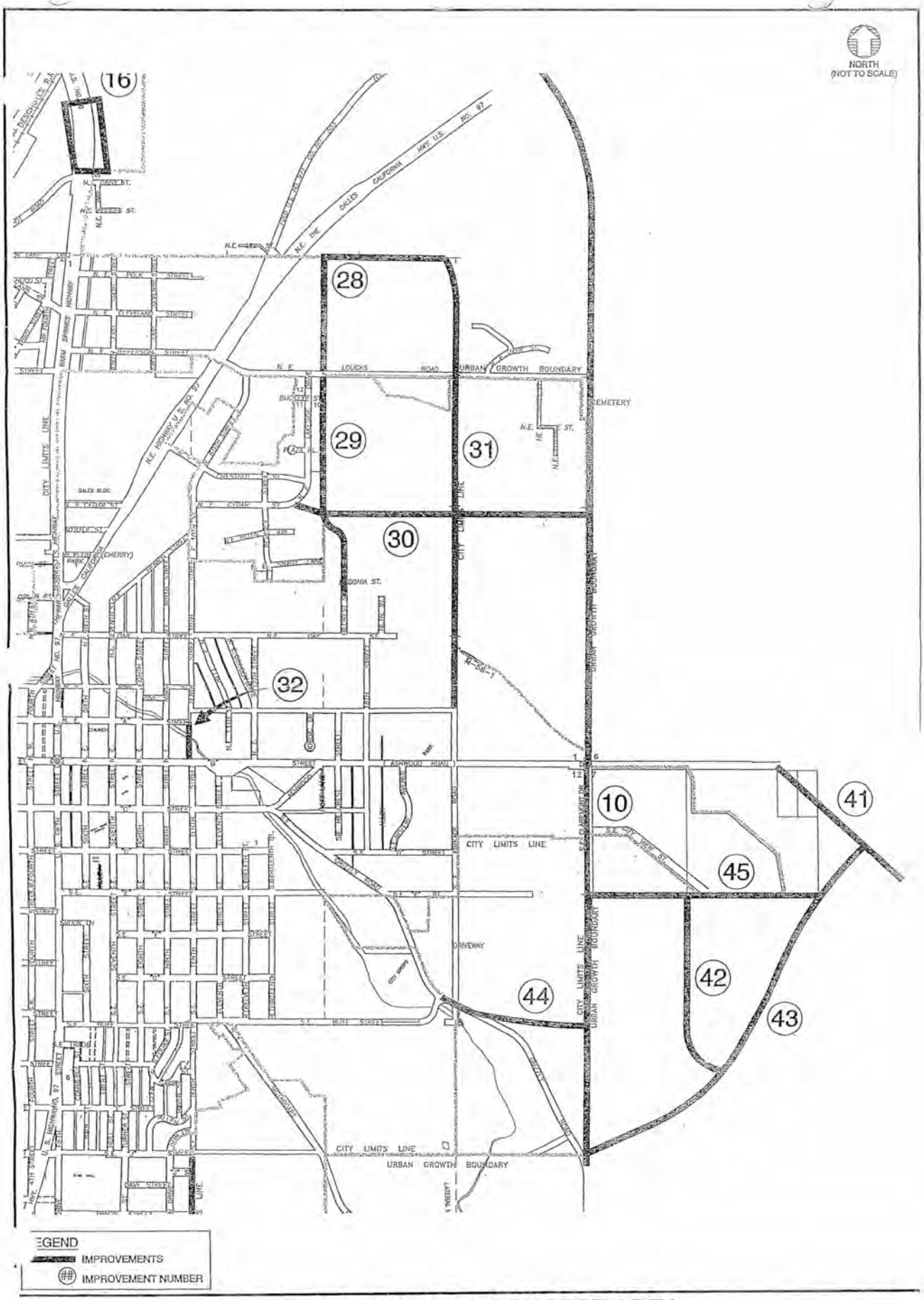
TIME FRAME: 0-5 years (Ordinance No. 707, May 27, 2003)

TYPICAL CROSS-SECTION:



East Madras Concept Area Transportation System Evaluation

To provide transportation support for new development in east Madras and potential Urban Growth Boundary expansions, eleven transportation system improvements have been proposed in the East Madras Concept Area. These improvements have been developed to encourage future residential development and provide a long-term local circulation system that does not rely solely on the "B" Street and Ashwood Street corridor. Figure B4 illustrates the project locations and Improvement Tables 28 through 32 and 41 through 45 provide the purpose of the project, a project description, an estimated timeframe for construction, an illustration of the improvement, and a roadway cross-section detail.



EAST MADRAS CONCEPT AREA
TRANSPORTATION SYSTEM IMPROVEMENTS

CITY OF MADRAS COMPREHENSIVE PLAN AND
TRANSPORTATION SYSTEM PLAN UPDATE

APRIL 2001

FIGURE B4

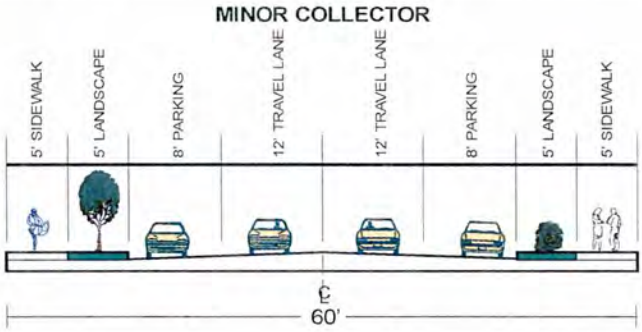
#28 Lakeside Drive Extension (Loucks Road to Kinkade Avenue)

PURPOSE: **(PROJECT REMOVED - ORDINANCE NO. 785, DECEMBER 12, 2006)**
Provides connectivity between Loucks Road and the Kinkade Avenue Extension and further develops the grid street network within the City of Madras. Reduces reliance on US 97 to provide private access for properties located between Loucks Road and the proposed Kinkade Avenue Extension (Improvement #27).

PROJECT DESCRIPTION:
This project involves construction of a new roadway alignment between the Loucks Road intersection and the proposed Kinkade Avenue Extension. The proposed roadway should be constructed to Minor Collector street standards.

TIME FRAME: 10-20 years

TYPICAL CROSS-SECTION:

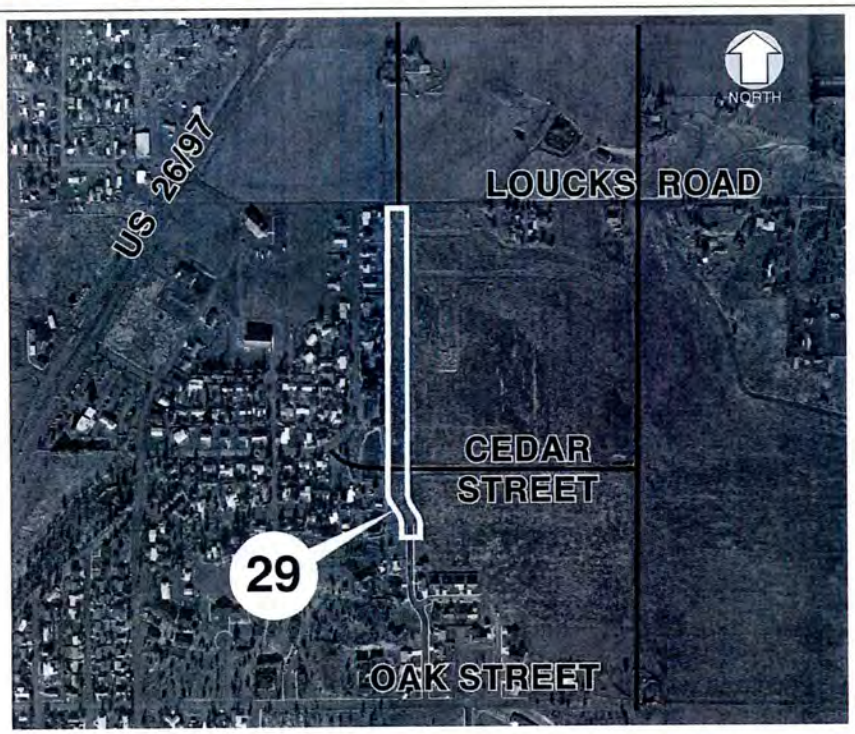


#29 Hillcrest Street Extension (Loucks Road to Oak Street)

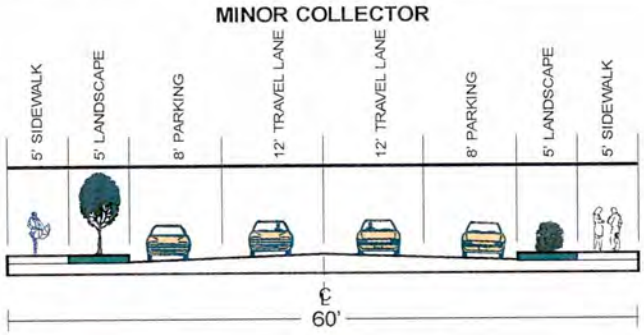
PURPOSE:
Provides connectivity between Loucks Road and Oak Street and further develops the grid street network within the city. Enhances local street circulation by providing Hillcrest Street connections to Cedar Street and Loucks Road.

PROJECT DESCRIPTION:
This project involves construction of a new roadway between the northern terminus of Hillcrest Street and Loucks Road. The proposed roadway will be constructed to Minor Collector street standards.

TIME FRAME: 10-20 years



TYPICAL CROSS-SECTION:

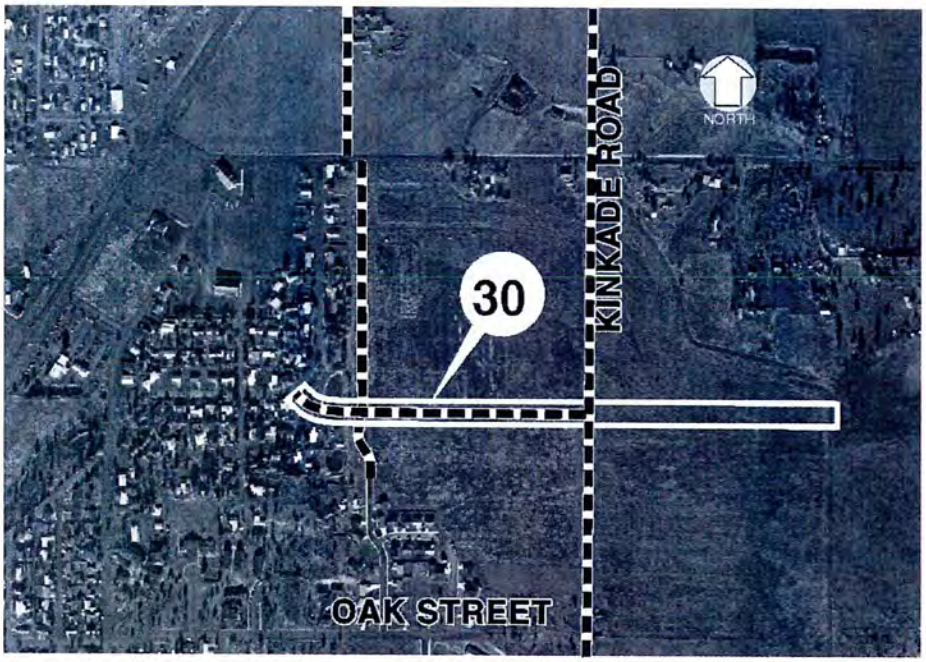


#30 Cedar Street Extension (Lakeside Drive to Claremont Extension)

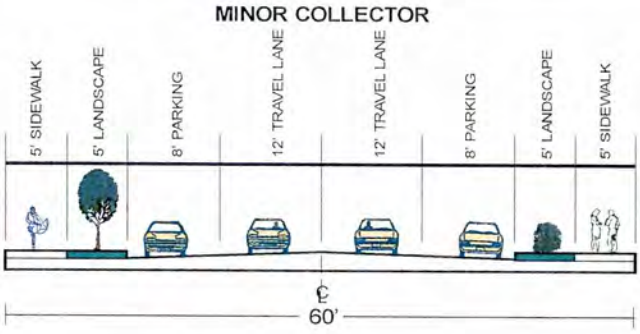
PURPOSE: **(PROJECT REMOVED - ORDINANCE NO. 785, DECEMBER 12, 2006)**
Provides connectivity between the proposed Hillcrest Street Extension (Improvement #29) and the proposed Claremont Street Extension (Improvement #10) and further develops the grid street network within the city.

PROJECT DESCRIPTION:
This project involves construction of a new roadway between the eastern terminus of Cedar Street and the proposed Claremont Street Extension. The proposed roadway will be constructed to Minor Collector street standards.

TIME FRAME: 5-10 years



TYPICAL CROSS-SECTION:



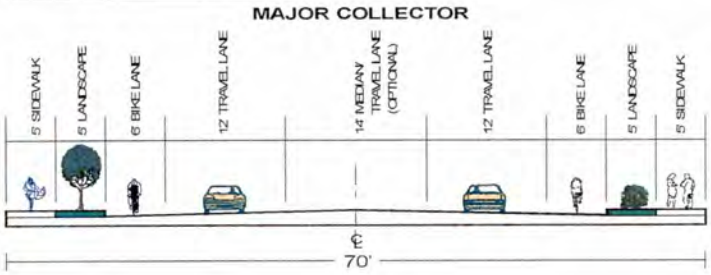
#31 Kinkade Avenue Extension (Brown Drive to "B" Street)

PURPOSE:
Provides an additional north-south collector facility east of US 26 and US 97. Further develops the City's grid street network, relieving demand on US 26/97 and providing better traffic circulation along local streets.

PROJECT DESCRIPTION: (Amended by Ordinance No. 785, December 12, 2006). The proposed roadway will be constructed to Major Collector street standards. The alignment of this project is modified to be extended north from "B" Street to the future extension of Bean Drive and continue to the northeast to Brown Drive. This project is anticipated to provide residential developments around Brown Drive with alternative access to downtown Madras without relying on US 97. The intersections of Kinkade Avenue/Bean Drive and Kinkade Avenue/Oak Street are planned to be modern roundabouts.

TIME FRAME: 10-20 years

TYPICAL CROSS-SECTION:



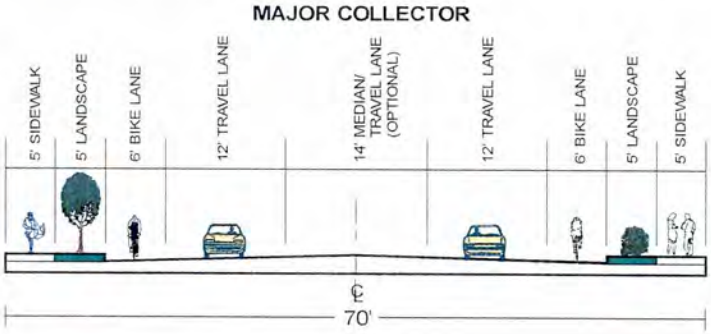
#32 10th Street Improvements ("A" Street to "B" Street)

PURPOSE:
Provides a continuous route along 10th Street between "A" and "B" Streets. This connection creates an easterly north-south parallel route to US 26/97.

PROJECT DESCRIPTION:
This improvement entails the construction of a Willow Creek bridge crossing and the extension of 10th Street between "A" and "B" Streets. The significant grade difference between "A" and "B" Streets would hinder the development of the bridge crossing. Potential environmental impacts of the bridge crossing include closing a segment of the Willow Creek Trail and water quality impacts resulting from road surface runoff. The project will be designed to Major Collector street standards.

TIME FRAME: 5-10 years

TYPICAL CROSS-SECTION:

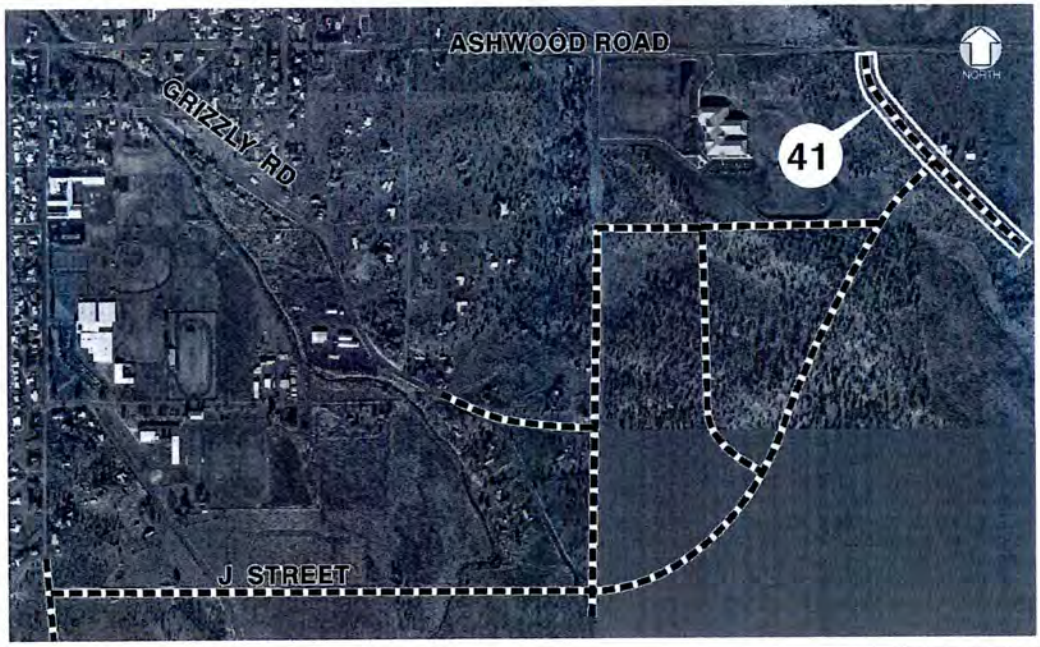


#41 Bean Drive Extension (Ashwood Road to "J" Street Extension)

PURPOSE:
To accommodate current development pattern in the area as well as serve future development.

PROJECT DESCRIPTION: (Amended by Ordinance No. 785, December 12, 2006)
Construction of a Major Collector facility from Ashwood to the future "J" Street extension. To be completed in conjunction with local development activities. The alignment of the Bean Drive extension has been modified to accommodate current development pattern in the area. The final alignment of this project will need to accommodate topographical constraints and final development activity in the area.

TIME FRAME: 10-20 years



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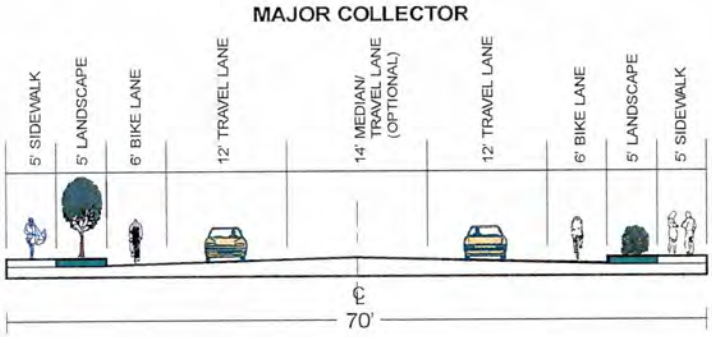
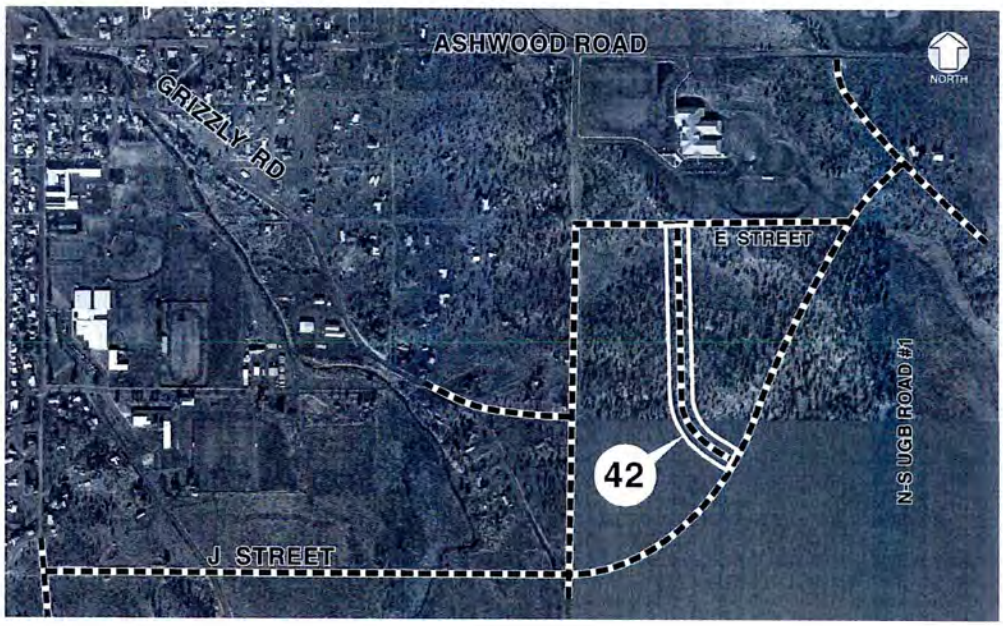


#42 North-South UGB Road #1 ("B" Street to "J" Street Extension)

PURPOSE:
To serve future development.

PROJECT DESCRIPTION: (Amended by Ordinance No. 785, December 12,2006)
Construction of a Minor Collector facility from "B" Street to the future "J" Street extension. To be completed in conjunction with local development activities. The final alignment of this project will need to accommodate topographical constraints and development activity in the area.

TIME FRAME: 10-20 years



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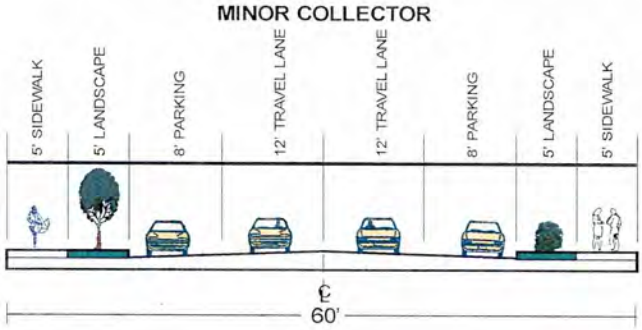
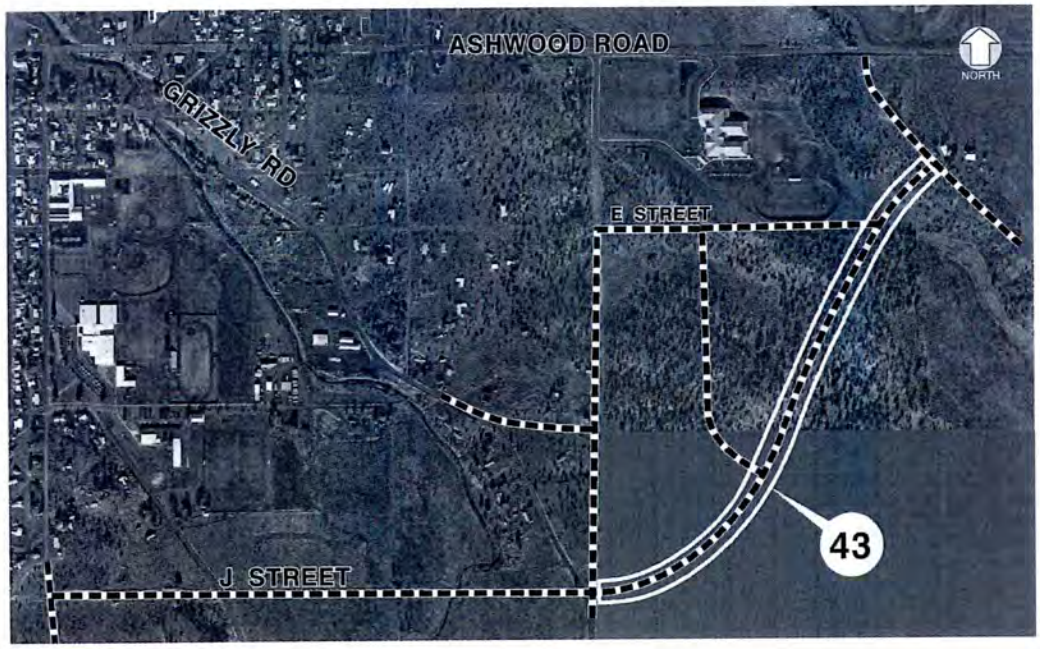


#43 "J" Street Extension (Grizzly Road to Bean Drive Extension)

PURPOSE:
To serve future development.

PROJECT DESCRIPTION: (Amended by Ordinance No. 785, December 12, 2006)
Construction of a Major Collector facility from Grizzly Road to the Bean Drive extension. To be completed in conjunction with local development activities. The alignment of the extension has been modified to accommodate current development pattern in the area. The final alignment will need to accommodate topographical constraints and developmental activity in the area.

TIME FRAME: 10-20 years



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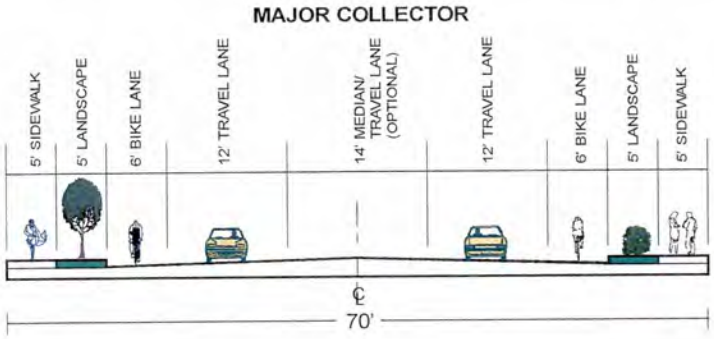
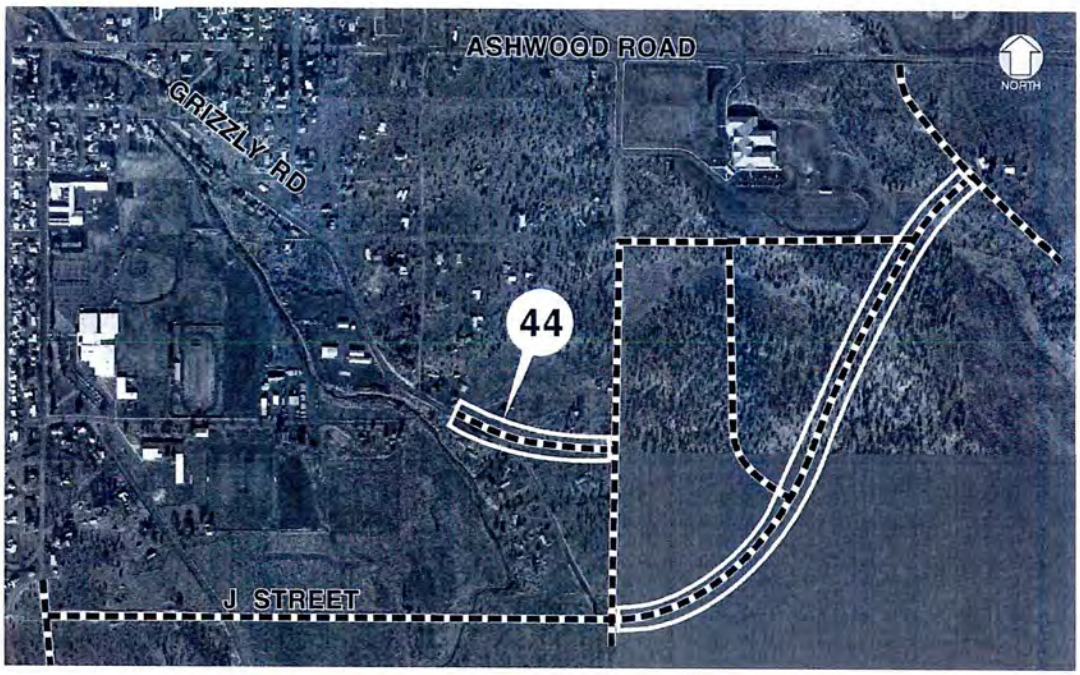


#44 East-West UGB Road #1 - (City View Street to Future Growth Area)

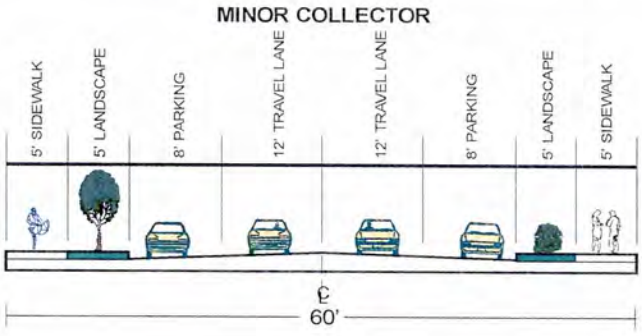
PURPOSE:
To serve future development.

PROJECT DESCRIPTION: (Amended by Ordinance No. 785, December 12, 2006)
Construct a Minor Collector facility. To be completed in conjunction with local development activities. The final alignment of this project will need to accommodate topographical constraints and development activity in the area.

TIME FRAME: 10-20 years



TYPICAL CROSS-SECTION:



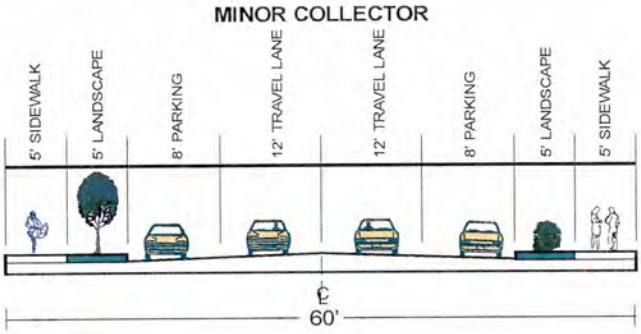
#45 "E" Street Extension (Kinkade Avenue to Ashwood Road) Renamed Yarrow Ave.

PURPOSE:
To extend "E" Street East to Ashwood Road to accommodate future development in the area.

PROJECT DESCRIPTION: (Amended by Ordinance No. 785, December 12, 2006)
Construct a Minor Collector facility from Kinkade Avenue to the "J" Street Extension. To be completed with local development activities. The final alignment of this project will need to accommodate topographical constraints and development plan.

TIME FRAME: 10-20 years

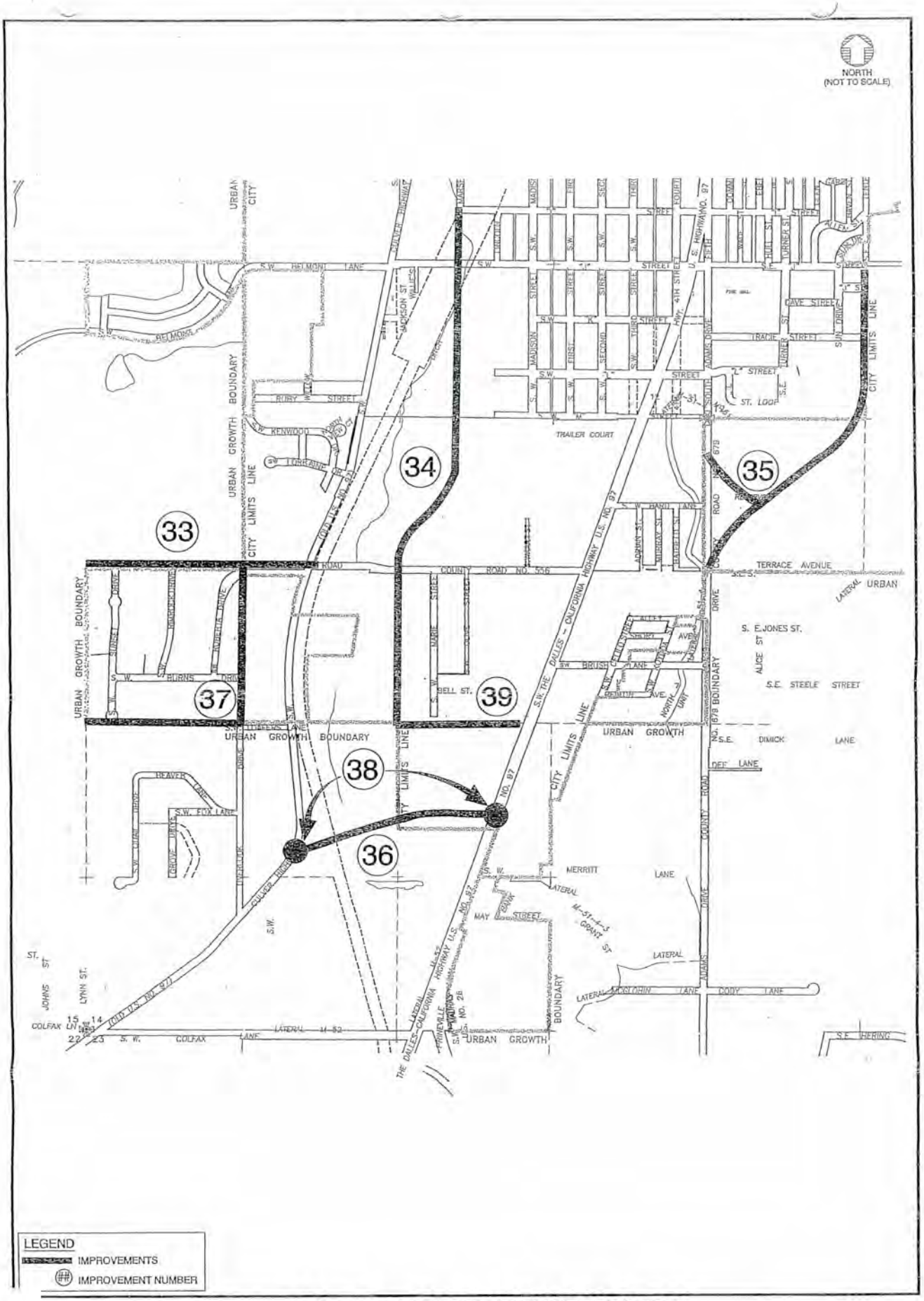
TYPICAL CROSS-SECTION:



South Madras Concept Area Transportation System Evaluation

To provide transportation support for new development in south Madras and potential Urban Growth Boundary expansions and facilitate the US 26 / US 97 / OR 361 junctions, seven transportation system improvements have been proposed in the South Madras Concept Area. These improvements have been developed to encourage future commercial and residential development and provide a long-term local circulation system that maintains the integrity of US 26, US 97, OR 361, and the proposed Truck By-Pass. Figure B5 illustrates the project locations and Improvement Tables 33 through 39 provide the purpose of the project, a project description, an estimated timeframe for construction, an illustration of the improvement, and a roadway cross-section detail.

Figure B6 provides a summary of all the proposed transportation system improvements.



SOUTH MADRAS CONCEPT AREA TRANSPORTATION SYSTEM IMPROVEMENTS

CITY OF MADRAS COMPREHENSIVE PLAN AND TRANSPORTATION SYSTEM PLAN UPDATE

APRIL 2001

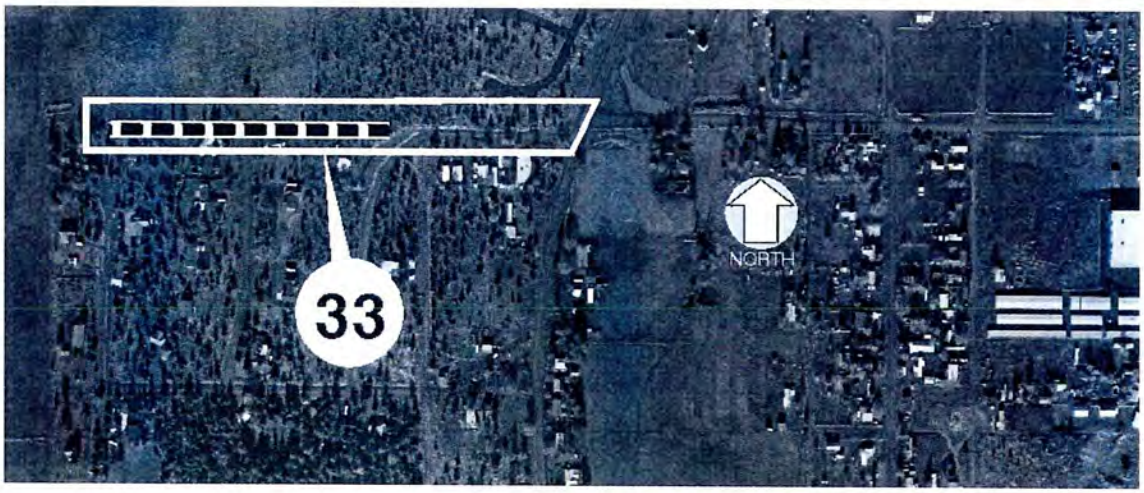
FIGURE B5

#33 Fairgrounds Road Extension (East UGB to OR-361)

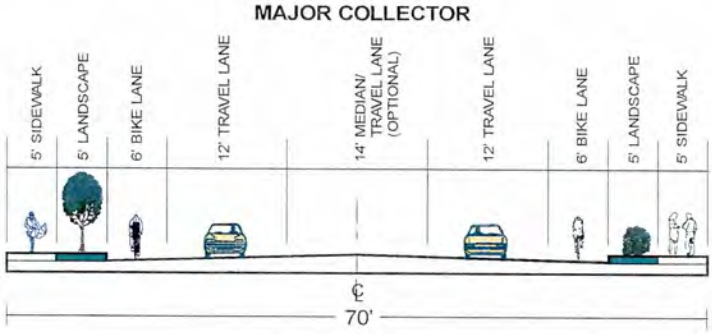
PURPOSE:
Enhance street connectivity west of OR-361 (Culver Highway). Further defines Fairgrounds Road as an alternate east-west collector facility to "J" Street.

PROJECT DESCRIPTION:
This project involves construction of a new roadway between the east UGB and the current western Fairgrounds Road terminus at OR-361. The proposed roadway will be constructed to Major Collector street standards.

TIME FRAME: 10-20 years



TYPICAL CROSS-SECTION:

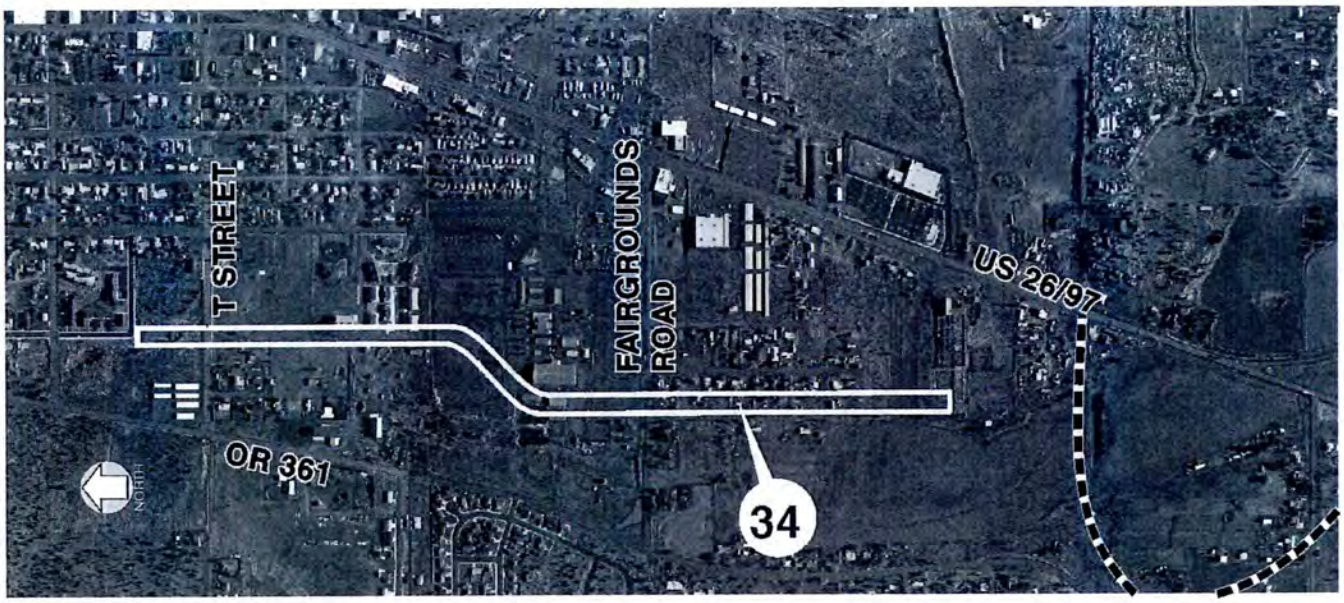


#34 Marshall Street Extension ("I" Street to Loafers Lane)

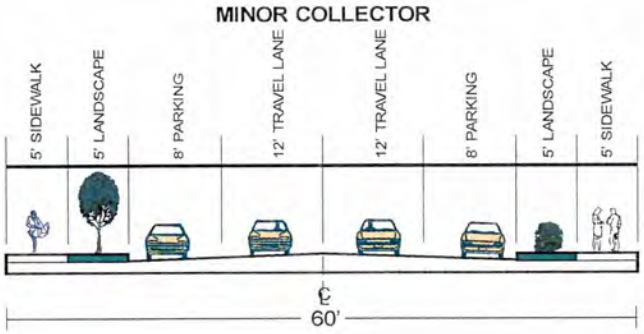
PURPOSE:
Provides a parallel north-south collector facility to US 26 /US 97 in the southwest UGB area. The Marshall Street Extension will help to reduce the reliance on OR-361 (Culver Highway) and US 26/US 97 for local travel in this area and will provide a continuous north-south route from OR-361 (near "G" Street) to Loafers Lane.

PROJECT DESCRIPTION:
This project involves construction of a new roadway between the south terminus of Marshall Street and Loafers Lane. The proposed roadway will be constructed to Minor Collector street standards.

TIME FRAME: 5-10 years



TYPICAL CROSS-SECTION:



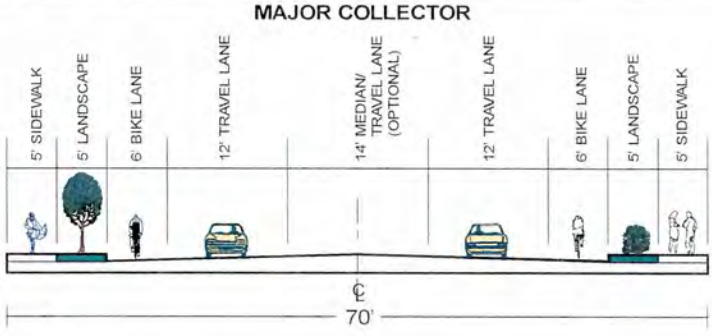
#35 Adams Drive/10th Street Connection

PURPOSE:
Provides a parallel north-south collector facility to US 26 /US 97 in the southeast UGB area. The Adams Drive/10th Street Connection will improve street connectivity and enhance local travel in this area by providing a continuous north-south route between Adams Drive and 10th Street. This project also eliminates the number of street connections within the "J" Street/US 26/97 junction.

PROJECT DESCRIPTION: (Amended by Ordinance No. 785, December 12, 2006)
This project involves construction of a new roadway between the south terminus of 10th Street and Adams Drive. The alignment of this project is modified to illustrate a road connection on 10th Street from "J" Street to Fairgrounds Road and on Fairgrounds Road from 10th Street to Adams Drive (rearranges alignment to an "L" Shape). The proposed roadway should be constructed to Major Collector street standards.

TIME FRAME: 0-5 years

TYPICAL CROSS-SECTION:

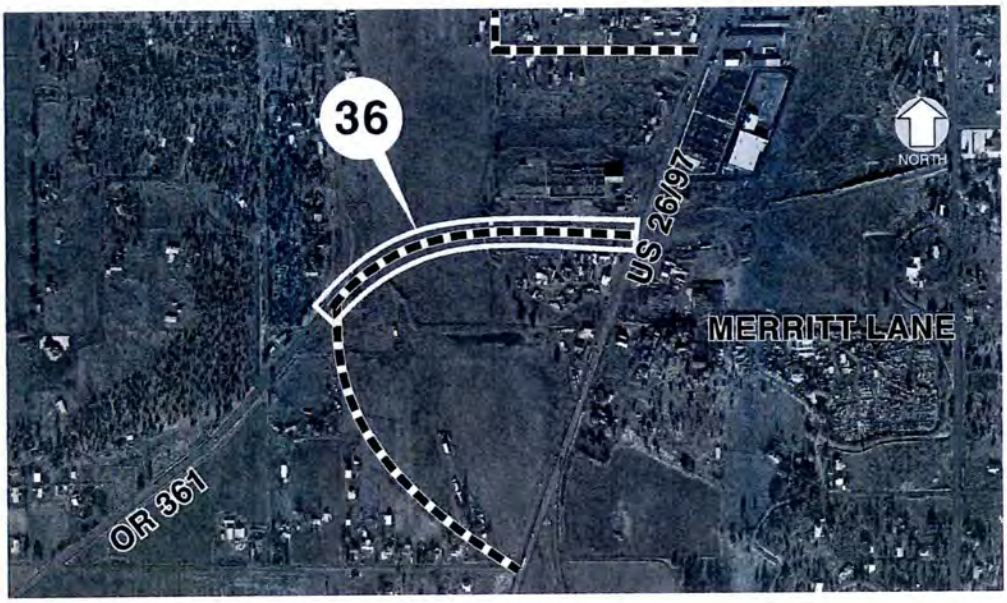


#36 Hall Road Extension (OR-361 to US 97)

PURPOSE:
Provides connectivity between OR-361 (Culver Highway) and US 26/US 97. This facility will facilitate the transition of high volumes of traffic between US 26/US 97 and OR-361.

PROJECT DESCRIPTION:
This project involves construction of a new roadway between OR-361 and the Hall Road–US 26/US 97 intersection. In addition, traffic signals will be installed at the proposed Truck By-Pass (Improvement #37)/Hall Road Extension and US 26/97/Hall Road Extension intersections. Hall Road will have full access control between US 26/97 and the proposed Truck By-Pass, with the exception of the Marshall Street intersection. The proposed roadway will be constructed to Major Collector street standards.

TIME FRAME: 10-20 years



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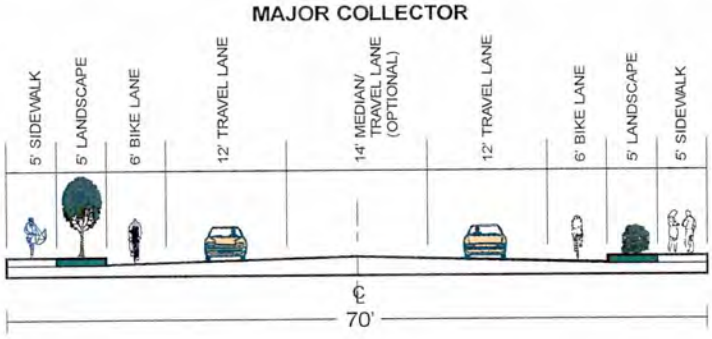
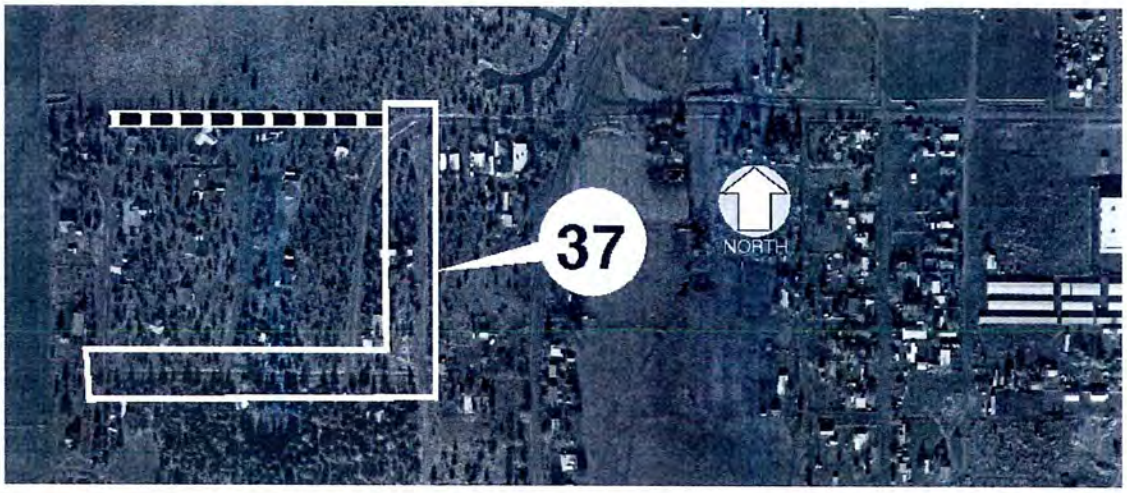


#37 Overlook Drive and Burns Lane Road Improvements

PURPOSE:
Provides improved connectivity between Fairgrounds Road, Overlook Drive, and Burns Lane, and further develops the grid street network within the southwestern UGB area.

PROJECT DESCRIPTION:
This project involves upgrading the existing roadbed and surfaces of Overlook Drive and Burns Lane. Both Overlook Drive and Burns Lane will be constructed to Minor Collector street standards

TIME FRAME: 10-20 years



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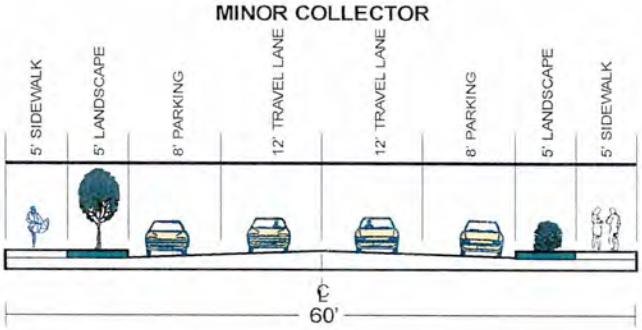


#38 South Junction Traffic Signals

PURPOSE:
This project would increase circulation and provide safe turning movements at the US26/97/Hall Road Extension and OR-361-Hall Road Extension/Truck By-pass intersections. It includes control strategies for the extensions and realignments of all three roadways, which would improve the safety and operational characteristics of each of these intersections.

PROJECT DESCRIPTION:
The project consists of signalization of the US26/97–Hall Road Extension and OR-361–Hall Road Extension/Truck By-Pass intersections.

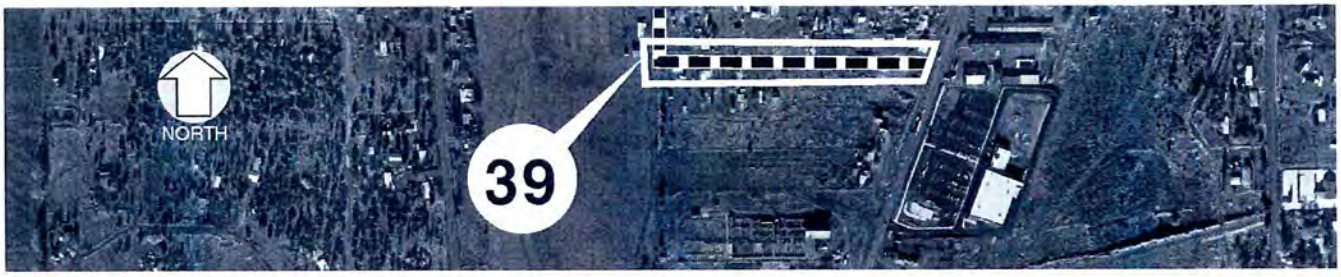
TIME FRAME: 10-20 years

#39 Loafers Lane Extension (Marshall Street Extension to US 26/US 97)

PURPOSE:
To provide additional east-west connectivity in the south part of the city.

PROJECT DESCRIPTION:
This project will include the construction of a Minor Collector street between the southern Marshall Street terminus and US26/US 97.

TIME FRAME: 10-20 years



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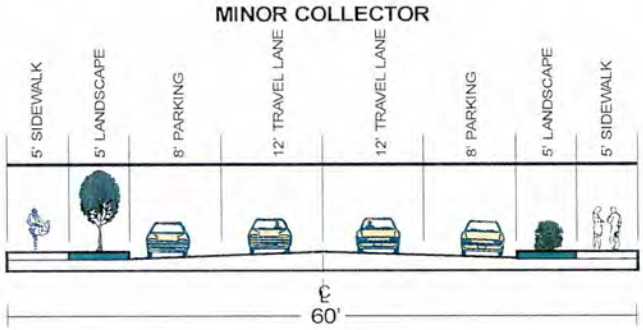


ALTERNATIVE 5A - AT-GRADE SIGNALIZATION

Overview: Reroute US Highway 97 traffic onto 6th Street to connect with US Highway 26 at a signalized intersection North of Pine Street where the 4th / 5th Street couplet begins. This improvement would divert US Highway 97 traffic down the present 6th Street right-of-way and go through the existing ODOT maintenance facility to make a connection at the North junction of 4th and 5th Streets. The section of highway located between 6th Street and US Highway 26 would be abandoned after this improvement was in place. This option would require the acquisition of the ODOT maintenance facility that is used to store equipment and rock. A traffic signal would be constructed at the couplet intersection of the rerouted US Highway 97 and the junction of 4th and 5th.

Operations Analysis: Traffic remodeling and analysis of Option 5A shows a substantial improvement in operations. The major shift in traffic would be the southbound left turns from US Highway 97. Because the traffic from US Highway 97, which currently experiences long delays, would be able to merge easily at the signalized intersection, delays would be significantly reduced. Movements that are currently near failure, and would certainly fail over the next 20 years, would improve from LOS F to LOS C.

A second smaller shift of traffic making westbound left turns from Oak Street would also shift onto the new highway alignment to use the signalized intersection. An added benefit of this option would be the improvement in operations from LOS F to LOS B at the Oak Street intersection. Depending on projected traffic volumes at the time of construction, Oak Street will be cul-de-saced either initially or at a later date.

This intersection configuration would also be safer than the current intersection configuration for two reasons. First, it would eliminate the risks associated with turning from either US Highway 97 or Oak Street into the oncoming US Highway 26-traffic stream. Second, pedestrians and bicyclists would have the protection of crossing US Highway 97/26 at a signalized intersection.

The analysis assumes that the City of Madras would allow US Highway 97 to be rerouted along 6th Street, between US Highway 97 and a point North of Pine Street; and that ODOT would abandon the existing state highway maintenance facility, located at the intersection of 4th and Oak Streets.

The advantages of Alternative 5A area as follows:

- Signal location at the intersection of Highway 97/26 is on a level grade.
- Need for change of access to most businesses along US Highway 26 is minimized.
- Eliminating left turns at the existing intersection of the two highways minimizes accident potential.

- The proposed local street improvement plan is accommodated by allowing the connection of Oak Street to 3rd Street.
- The need to take right-of-way is minimized by using the existing ODOT maintenance facility property.
- Large trucks and emergency vehicles are accommodated.
- Projected LOS meets State standards

The disadvantages of Alternative 5A are as follows:

- The intersection has unconventional geometry and circulation pattern, potentially creating driver confusion.
- The cul-de-sac on Oak Street creates out-of-direction East-West travel.
- A raised median necessary North of the signalized intersection eliminates access for service stations for northbound travel on 5th Street/US Highway 26.
- Emergency vehicle circulation will be out-of-direction from southbound US Highway 26 to Oak Street because of cul-de-sac.
- Service station access requires a separate signal phase.
- There are potential noise impacts to residences on 6th Street.

Cost: The estimated cost of the Signalized alternative is $1,500,000.

Added back in by City Council on January 8, 2002.

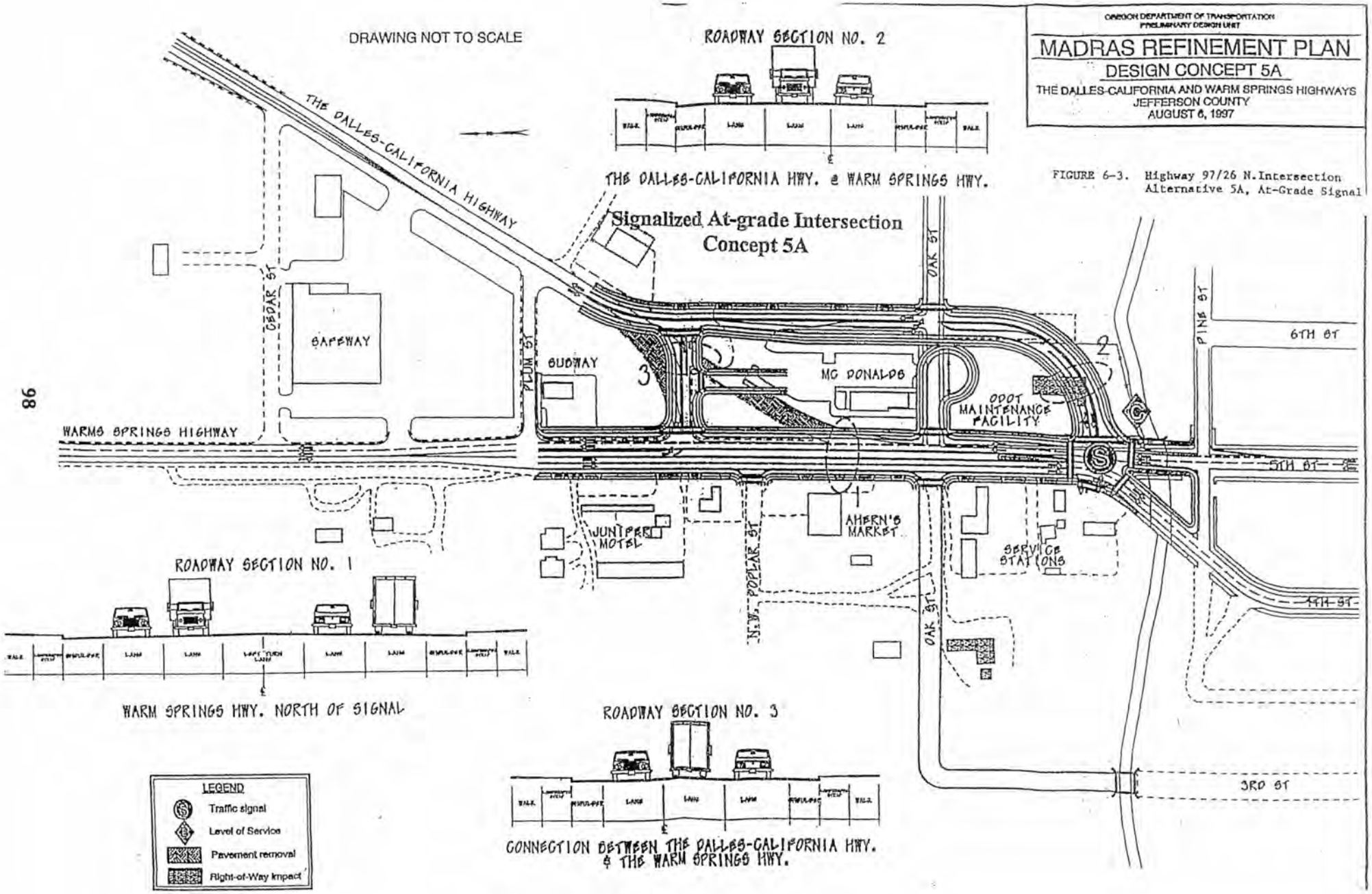


FIGURE 6-3. Highway 97/26 N. Intersection Alternative 5A, At-Grade Signal

Determination of Need

Technical Memoranda "A" and "B" of the Jefferson County TSP project provide detailed information needed to determine the needs of the proposed Madras Truck Route. The information provided in this section is a summary of the memoranda.

US 97 and US 26, in Central Oregon, are critical elements of Oregon's Statewide Highway Freight System. The 1999 Oregon Highway Plan classifies these roadways as Statewide Highways and designated Freight Routes. According to the 2004 Automatic Traffic Recorder (ATR) data obtained from ODOT, US 97 carries around 6,300 average daily traffic (ADT) and US 26 carries around 11,900 ADT, just north of City of Madras downtown. Through downtown Madras US 97/US 26 carries around 19,700 ADT, while south of downtown Madras, US 97/US 26 carries around 13,100 ADT. The ATR data also show that 14%-18% of the traffic on the highway is truck traffic. These high traffic volumes and truck percentages indicate the importance of the truck mobility through downtown Madras.

Technical Memoranda "A" provided the near-term operational and safety analysis of US 97/US 26 through downtown Madras. The US 97/US 26 North intersection was recently realigned and upgraded as part of ODOT's 2004-2007 Statewide Transportation Improvement Program (STIP) project. With the upgrade, the intersection is anticipated to operate at level-of-service (LOS) "C" and at a volume-to-capacity (v/c) ratio of 0.73 during the 30th highest hour. This level of operation meets the ODOT mobility standard of 0.75 for the intersection.

While the operation of the US 97/US 26 North intersection will meet the operational standards in the near term, the proposed intersection modification will not eliminate operational concerns related to truck traffic traveling through downtown Madras. Downtown Madras will continue to have numerous traffic signals and low travel speeds that do not facilitate the mobility of freight traffic on US 97/US 26. As such, in spite of the recent upgrade to the US 97/US 26 North intersection, a truck route bypassing downtown Madras is anticipated to reduce the volume of downtown truck traffic, improve the operation of the intersections in downtown, and facilitate truck mobility around Madras.

A safety analysis was also conducted on US 97/US 26 around Madras as part of the needs analysis. The crash data (for a three year period) obtained from the ODOT Crash Unit revealed that US 97/US 26 through the Madras City Limit experienced annual crash rates of 1.34, 1.86, and 1.46 crashes per million vehicle miles traveled, respectively. These crash rates are higher than the statewide average for similar facilities, which were reported at 1.16, 1.28 and 0.99 for the same three year period, respectively.

Long-Term Transportation Need

Technical Memorandum "B" analyzed various traffic volume forecast scenarios to determine the most realistic estimate of future traffic volume in the area. The analysis reviewed three traffic volume forecasting methodologies, namely, historic traffic growth, ODOT future volume forecast and updated population forecast. Based on extensive discussions with City, ODOT, and County staff, the updated population forecast methodology that included the impact of the Department of Corrections facilities that is currently under construction on the east side of the city, was determined to most closely approximate the future traffic volume forecast in and around the city. As such, the traffic volume on US 97/US 26 through downtown Madras and south of downtown were forecasted to grow annually at 3.37% and 2.37%, respectively.

Based on the forecasted traffic volume, US 97/US 26 North and South intersection are anticipated to operate at LOS "F" in year 2025 if no improvements are made to the facilities through downtown Madras.

The existing and future operational and safety analysis indicates that, at the current pace of traffic growth, US 97/US 26 is anticipated to carry a high volume of traffic through downtown Madras by 2025. The increase in traffic volume in downtown Madras will deteriorate the operation and safety of the roadway. As US 97 and US 26 are classified as highways of statewide significance, the mobility of vehicles on the highway is important to the economic viability of the state.

Alternative Analysis

Concerns with Approved Alternative

Figure 1 shows the approved alignment of the Madras Truck Route as recommended in the 2001 City of Madras TSP Update. Several new developments have occurred in Madras since the adoption of the TSP. Some of the new commercial developments that were approved have impacted the feasibility of the approved truck route alignment. One of the major developments is a new hotel and mixed-use retail development planned and approved for construction to the west of the existing US 97/US 26 North intersection in downtown. The location of this development eliminates the ability to create the northern connection of the truck route as previously planned in the TSP update.

A second concern relates to access management along Culver Highway 361. The route is anticipated to have a high volume of truck traffic and relatively high travel speed. Access from adjacent properties will likely be limited to facilitate the mobility of truck traffic and enhance safety. However, the section of existing Culver Highway 361 that the planned truck route is to follow is lined with single-family and multi-family homes that

have direct access to the highway. Access management to facilitate the truck route along this section of highway would be challenging.

Given these concerns and the high cost of the planned alignment, this refinement plan evaluates the feasibility of an alternative alignment taking right-of-way impact, in-process developments, and current and future transportation operation and safety concerns into account.

Refinement Plan Alternatives

The Madras Truck Route will provide alternate access for regional traffic passing through Madras, thus reducing traffic volume and the percentage of truck traffic traveling through downtown Madras. The alternate access can be provided on existing roadways or on a new roadway that bypasses the downtown area. After considering the existing roadway network, impact on existing businesses, and physical constraints, past studies recommended that a feasible alternative is to provide a truck bypass that generally follows the existing Culver Highway 361 alignment. Taking those recommendations into account, this refinement plan developed additional alternatives based on the information received from two sources: 1) comments received from the public and input from County, ODOT, and City staff; and 2) the technical analysis of traffic operations and safety on the roadway. Three new alignment options were proposed for the northern connection of the bypass and four new alignment options were proposed for the southern connection. Figure 2 shows the alternative alignments and provides the advantages and disadvantages of each.

The Madras Truck Route is anticipated to be a limited-access expressway with a median barrier to improve the mobility of vehicles. It is planned to have four 12-foot travel lanes and a 12-foot raised median, with four-foot shy distance, two eight-foot bike lanes, and eight-foot planter strip and a six-foot sidewalk on both sides for a total of 114-foot right-of-way (see Figure 2 for detail cross-section). Access to the expressway will be provided via right-in/right-out driveways and full-access traffic signals at the intersections with Fairgrounds Road, Belmont Lane, and "C" Street.

The Madras Truck Route has various advantages and disadvantages, highlighted below:

Advantages

- Reduces regular and truck traffic through downtown Madras, thus improving safety and mobility for local traffic and pedestrians in downtown Madras.
- Increases the mobility of regional truck traffic by providing an access-controlled facility.

- Utilizes existing right-of-way of Culver Highway 361 for majority of the alignment.
- Minimal impact on land outside the urban growth boundary, which will require a goal exception from Department of Land Conservation and Development (DLCD)

Disadvantages

- Impacts access to and from existing properties along Culver Highway. Alternate access, such as a frontage road, should be provided to the affected properties.
- Changes the characteristic of portions of Culver Highway from a rural/semi-urban highway to a higher speed, limited-access expressway.
- Requires acquisition of significant right-of-way along Culver Highway.

According to the City staff, the Alternative 1C and Alternative 2 concepts appear to have the most advantages. Alternative 1C begins at the US 97/US 26 North intersection as a west approach of the intersection. It then follows 1st Street and the existing Culver Highway alignment. The alignment does not impact the proposed hotel development and preserves the area for further development. In addition, the alignment stays to the east of the railroad track and the bluff on the west side of the city, which will reduce the cost of the project considerably. However, the alignment will have a right-of-way and access impact on the properties on 1st Street and portions of the Culver Highway alignment.

Alternative 2 follows the existing alignment of Culver Highway to SW Loafers Lane, where it diverts to intersect with US 97 near the existing US 97/US 26 South intersection. This new intersection with US 97 will most likely be a grade-separated interchange in the long run. As shown in Figure 2, various other alignments were analyzed for advantages and disadvantages. However, based on discussion with City staff, it was determined that Alternative 2, which follows the approved alignment of the Madras Truck Route, is the most feasible.

The planning-level cost estimate for Alternative 1C, improvement to the existing alignment of Culver Highway 361, and Alternative 2, is approximately $7.5 million, $8.75 million, and $3 million, respectively. The total estimated cost is $19.25 million, without consideration for right-of-way acquisition, impacts to adjacent properties, or the cost of interchanges.

Evaluation of the Madras Truck Route-US 97/US26 North Intersection

Alternative 1C connects to the existing US 97/US 26 North intersection as the fourth leg of the intersection, which currently serves a small retail development. The impact of the truck route on the turning movements at the intersection was determined after reviewing the existing turning movement patterns. In order to estimate traffic volume on the Madras Truck Route, approximately 55 percent of the existing westbound left-turning traffic and 30 percent of the southbound through traffic was assigned to the new truck route. Similarly, 55 percent of the northbound right-turning traffic and 30 percent of the northbound through traffic is estimated to use the new truck route. With these turning movement estimates, the intersection is anticipated to operate at volume to capacity ratio of 0.70 in 2025 traffic condition with the lane configuration listed below.

- Northbound: left-turn, through, and through-right lanes
- Southbound: left-turn, dual through, and right-turn lanes
- Eastbound: dual left-turn, through, and through right-turn lanes
- Westbound: duel left-turn, through, and through right-turn lanes

Even with the lanes recommended above, the total delay incurred at a traffic signal will increase as traffic volume increases. Therefore, it is recommended to preserve the option to provide an interchange at the Madras Truck Route-US 97/US 26 North intersection in the future. An interchange will provide the highest degree of mobility and route continuity for US 97 and US 26. By reducing delay in transporting goods and services, the interchange is anticipated to enhance the economic benefit to the region.

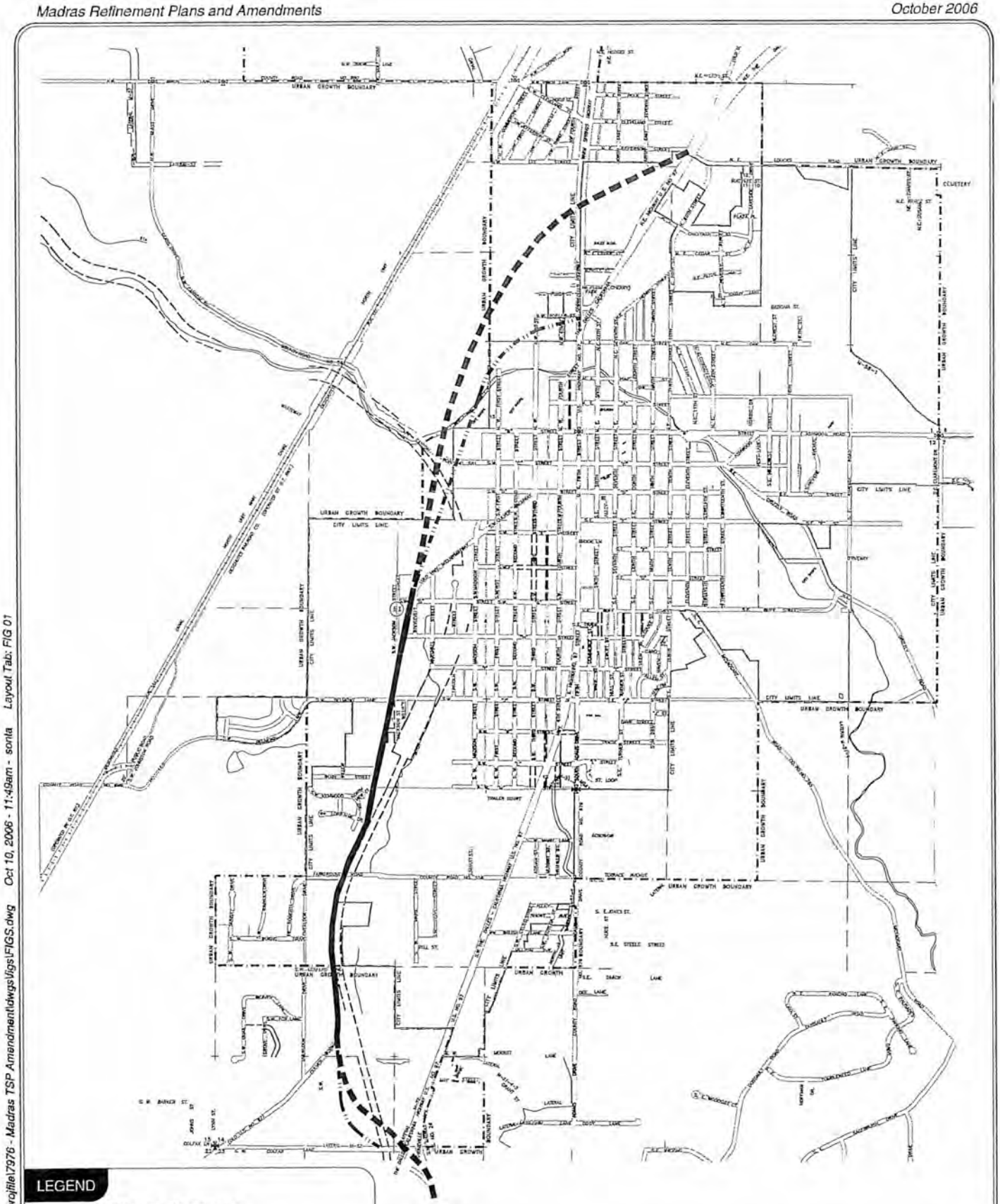
Evaluation of the Madras Truck Route - US97/US 26 South Intersection

The growth in traffic on US 97 and US 26 south of Madras is anticipated to deteriorate the operation of the existing US 97/US 26 South intersection. Without the Madras Truck Route, the intersection will require a traffic signal to meet the ODOT mobility standard in 2025. The intersection is anticipated to operate at a volume-to-capacity ratio of 0.67 under 2025 traffic conditions with a traffic signal installed. With the Madras Truck Route, which is anticipated to connect to US 97 in the vicinity of the intersection, the intersection area would need to be redesigned to an interchange to provide adequate mobility for truck traffic.

Recommendation

The next steps required to formalize the Madras Truck Route include conducting a further detail analysis and a feasibility study to determine the full impact of the proposed truck by-pass on adjacent properties and finalizing the preferred alternative. The analysis should consider other potential solutions to mitigate the operation and safety of US 97/US 26 through downtown. Options include optimizing the operation of US 97/US 26 through downtown Madras and/or adding capacity to the existing roadway. The study would likely need to include a National Environmental Policy Act (NEPA) analysis and appropriate environmental assessments of the alternative alignment of the future US 97 Truck Bypass before a final preferred alternative alignment is chosen.

[Madras Truck Route Refinement Plan added by passage of Ordinance No. 785, on December 12, 2006.]



LEGEND

- Existing Infrastructure
- 2001 Madras TSP Udpate Alignment
- 1998 Madras TSP Alignment
- Madras UGB

APPROVED MADRAS TRUCK ROUTE
2001 CITY OF MADRAS TSP UPDATE
MADRAS, OREGON

FIGURE 1

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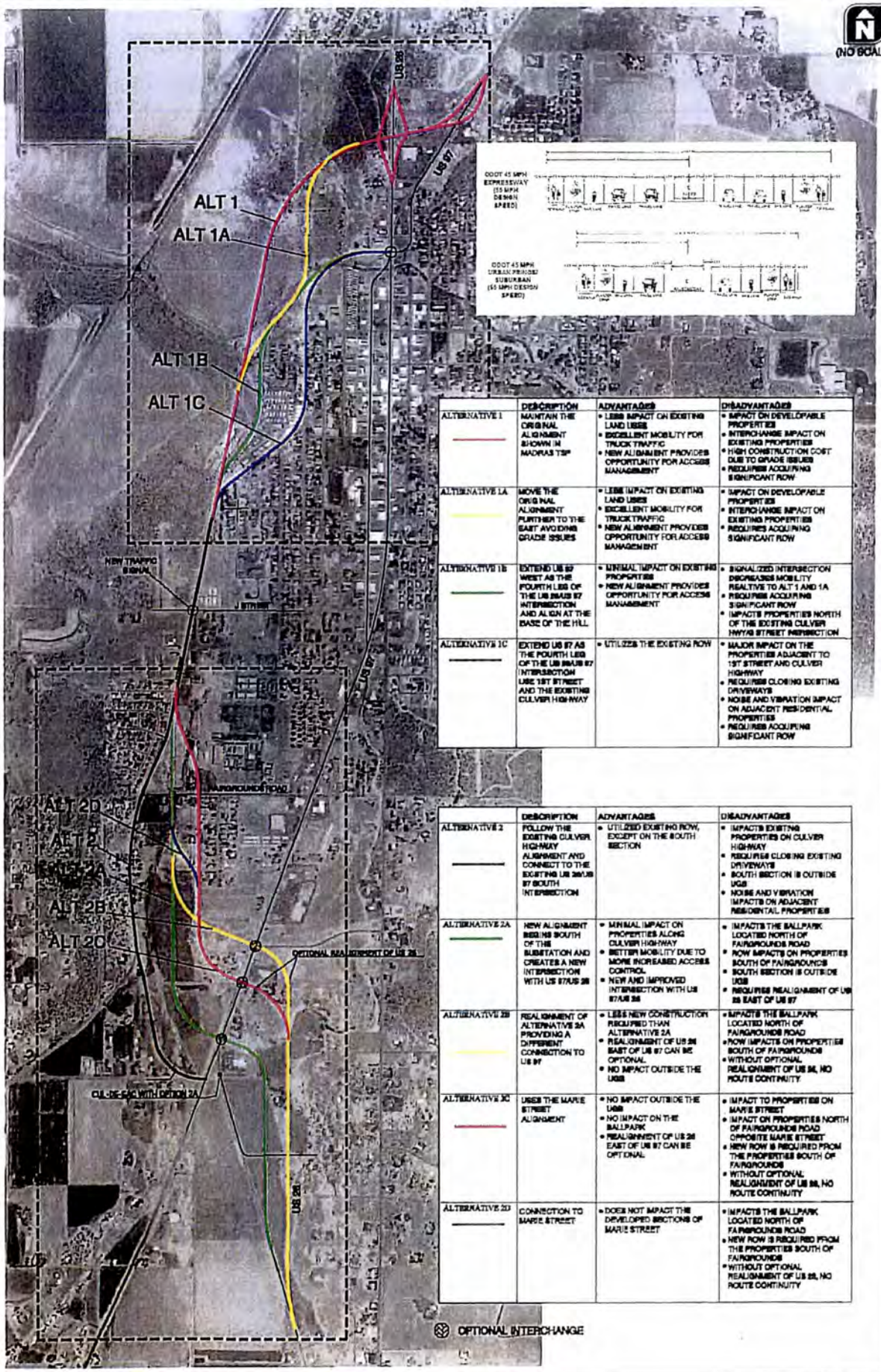
KITTELSON & ASSOCIATES, INC.
TRANSPORTATION PLANNING / TRAFFIC ENGINEERING



	DESCRIPTION	ADVANTAGES	DISADVANTAGES
ALTERNATIVE 1	MAINTAIN THE ORIGINAL ALIGNMENT SHOWN IN MADRAS TSP	• LESS IMPACT ON EXISTING LAND USES • EXCELLENT MOBILITY FOR TRUCK TRAFFIC • NEW ALIGNMENT PROVIDES OPPORTUNITY FOR ACCESS MANAGEMENT	• 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	• LESS IMPACT ON EXISTING LAND USES • EXCELLENT MOBILITY FOR TRUCK TRAFFIC • NEW ALIGNMENT PROVIDES OPPORTUNITY FOR ACCESS MANAGEMENT	• 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	• MINIMAL IMPACT ON EXISTING PROPERTIES • NEW ALIGNMENT PROVIDES OPPORTUNITY FOR ACCESS MANAGEMENT	• SIGNALIZED INTERSECTION DECREASES MOBILITY REALTIVE TO ALT 1 AND 1A • REQUIRES ACQUIRING SIGNIFICANT ROW • IMPACTS PROPERTIES NORTH OF THE EXISTING CULVER HWY/9 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	• UTILIZES THE EXISTING ROW	• 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	• UTILIZED EXISTING ROW, EXCEPT ON THE SOUTH SECTION	• 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	• MINIMAL IMPACT ON PROPERTIES ALONG CULVER HIGHWAY • BETTER MOBILITY DUE TO MORE INCREASED ACCESS CONTROL • NEW AND IMPROVED INTERSECTION WITH US 97/US 26	• 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	• LESS NEW CONSTRUCTION REQUIRED THAN ALTERNATIVE 2A • REALIGNMENT OF US 26 EAST OF US 97 CAN BE OPTIONAL • NO IMPACT OUTSIDE THE UGB	• 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	• NO IMPACT OUTSIDE THE UGB • NO IMPACT ON THE BALLPARK • REALIGNMENT OF US 26 EAST OF US 97 CAN BE OPTIONAL	• 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	• DOES NOT IMPACT THE DEVELOPED SECTIONS OF MARIE STREET	• 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

MADRAS TRUCK ROUTE REFINEMENT PLAN ALTERNATIVES
PROJECT 18
MADRAS, OREGON

FIGURE 2

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION PLANNING / TRAFFIC ENGINEERING

"J" STREET IMPROVEMENT REFINEMENT PLAN

Background and Determination of Need

"J" Street is the main east-west connection in the south end of downtown Madras and provides access to the Palisades State Park to the west and new residential developments to the east. On the Westside of Madras, "J" Street is known as Belmont Lane and is mostly a two-lane rural roadway with minimal shoulder widths and shallow drainage ditches on both sides of the roadway. To the east of US 97, "J" Street is a two-lane roadway with urban features, (e.g., bike lanes and sidewalks), and provides access to new residential developments on the east end of the roadway, near McTaggart Road.

Past studies have identified the need to improve the operation of the intersections of "J" Street and US 97/US 26 Northbound and Southbound. In order to determine that the "J" Street improvements are still needed, analyses were conducted at three study intersections, namely "J" Street- US 97/US 26 Northbound, "J" Street- US 97/US 26 Southbound, and "J" Street/South Adams Drive, to evaluate the existing operation of the intersections. The following section is a summary to technical analysis provided in Technical Memoranda "A", "B", and "C" of the Jefferson County TSP.

The operation analysis was based on the 30th highest traffic volume and latest analysis guidelines provided by ODOT. Figure 3 shows the results of the operational analysis at the intersections. As shown in the figure, all the intersections meet OHP standard, except the "J" Street- US 97/US 26 Southbound intersection. The westbound left-turn movement at the "J" Street- US 97/US 26 Southbound intersection operates at a volume-to-capacity ratio greater than 1.0 during the 30th highest hour.

As mentioned in the Madras Truck Route Refinement Plan section, the traffic volume in downtown Madras is anticipated to grow at the rate of 3.37% annually. Using this growth rate, a 20-year analysis was conducted to the study intersection. Based on the analysis, the "J" Street- US 97/US 26 Northbound and Southbound intersections are anticipated to operate over capacity in year 2025 if no improvements are made at the intersections.

Similarly a review of the five year crash history (from 2000-2004) revealed that there were six and seven crashes reported at the "J" Street- US 97/US 26 Southbound and "J" Street- US 97/US 26 Northbound intersections, respectively. The majority of the crashes were angle-type collisions. One of the potential causes of the high number of crashes is the close proximity of the two intersections which makes it an unsafe environment for motorists in the area. With the anticipated 70-percent increase in traffic volume over the next 20 years, the number and severity of crashes at the intersections are likely to increase in the future if no improvements are made at this intersection.

In addition, field observation revealed several other factors impacting the capacity and safety of the intersection:

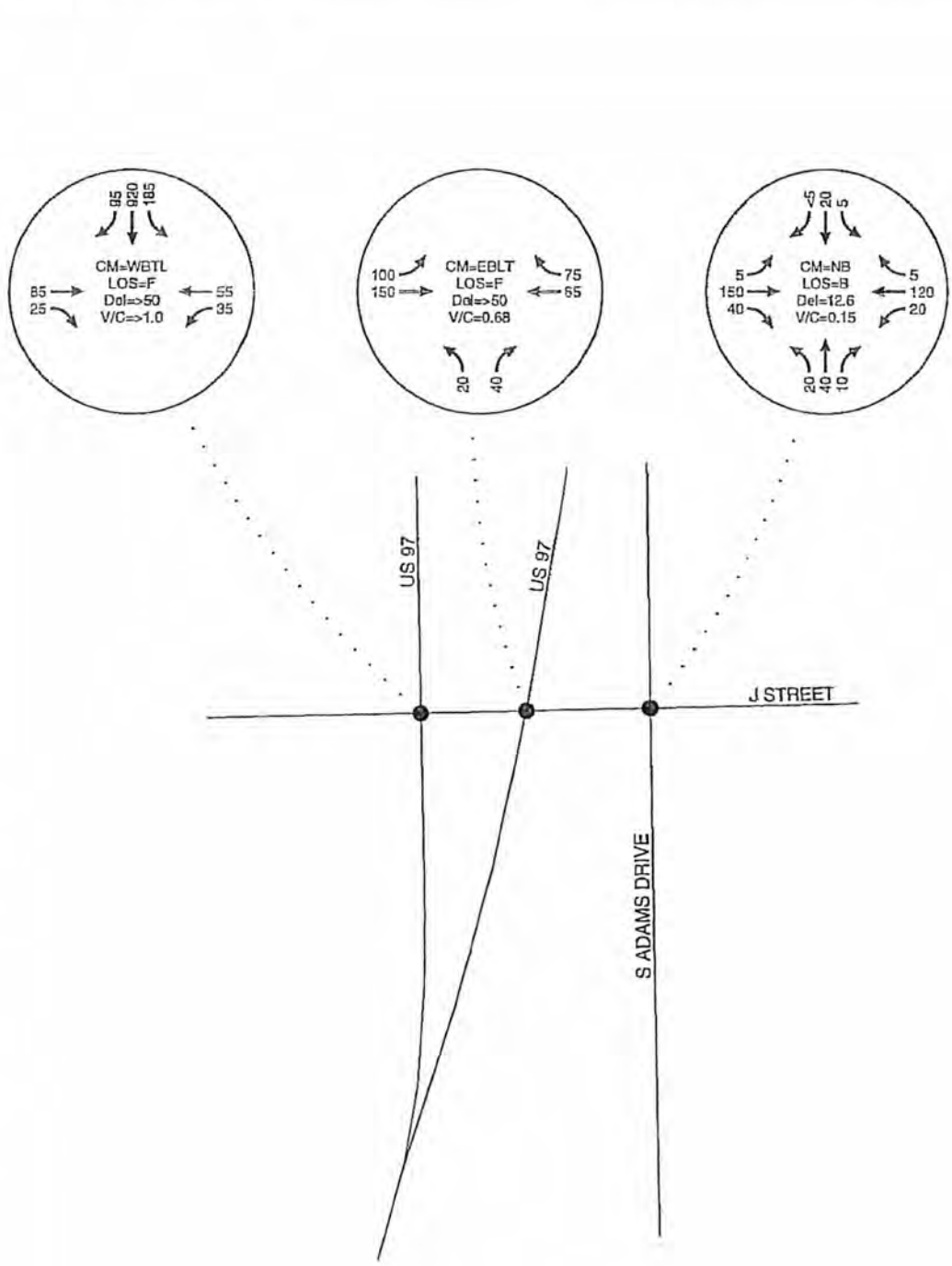
- When looking north, the sight distance for the westbound movement at the "J" Street-US 97/US 26 Southbound intersection is not adequate for safe turning movements. The existing on-street parking on US 97/US 26 southbound blocks the view of oncoming southbound traffic.

- The westbound through movement at the "J" Street-US 97/US 26 Southbound intersection is not aligned with the corresponding receiving lane.

- US 97/US 26 Southbound traffic merges from two lanes to one lane through the "J" Street intersection.

- US 97/US 26 Northbound traffic diverges from one lane to two lanes through the "J" Street intersection.

In summary, "J" Street forms two closely spaced (60 feet apart) intersections with the US 97/US 26 couplet. The close proximity of these intersections presents traffic operation problems on "J" Street including high vehicle delay for east-west traffic, queuing problems, and safety concerns. In addition, the US 97/US 26 couplet is two lanes in each direction to the north of "J" Street and one lane in each direction to the south. The lane transition occurs through "J" Street exacerbating the operation and safety concerns at the intersection. As a result, it was determined that the intersections of "J" Street and US 97/US 26 Northbound and Southbound continue to need improvements to provide a safe operational environment in both the short and long term.



2005 EXISTING TRAFFIC CONDITIONS
30th HIGHEST HOUR
MADRAS, OREGON

FIGURE 3

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Alternative Analysis

In 1998 City of Madras TSP proposed two design alternatives at the "J" Street-US 97/US 26 intersections. The design alternatives provided more distance between the US 97/US 26 southbound and northbound intersections with "J" Street. The first alternative realigned US 97/US 26 northbound (or 5th Street) to 7th Street, while the second alternative realigned it to 10th Street. The TSP recommends realigning US 97/US 26 northbound to 10th Street as 7th Street is found to have "inadequate geometry to function as a good north-south route."

Subsequently, the 2001 City of Madras TSP Update reviewed the alternatives presented in the 1998 TSP and recommended two additional design alternatives. These alternatives are shown in Figure 4 and discussed below.

Design Option 1

Design Option 1 shortens the existing one-way couplet by shifting the couplet transition north of "J" Street and signalizing the "J" Street- US 97/US 26 intersection. With this option, there will be only one intersection between "J" Street and US 97/US 26, which eliminates the operational hazards of having two closely spaced intersections. However, this design option will impact existing businesses located between the US 97/US 26 couplet, north of "J" Street.

Design Option 2

Design Option 2 extends the existing one-way US 97/US 26 couplet through downtown by shifting the couplet transition south of "J" Street and signalizing both the southbound and northbound "J" Street intersections. With this option, the current alignment of Adams Drive will be used for the realigned section of US 97/US 26. While this option will increase the distance between the existing closely spaced intersections, the new signalized intersections will still be within 200 feet of one another and will require signal coordination to reduce queues.

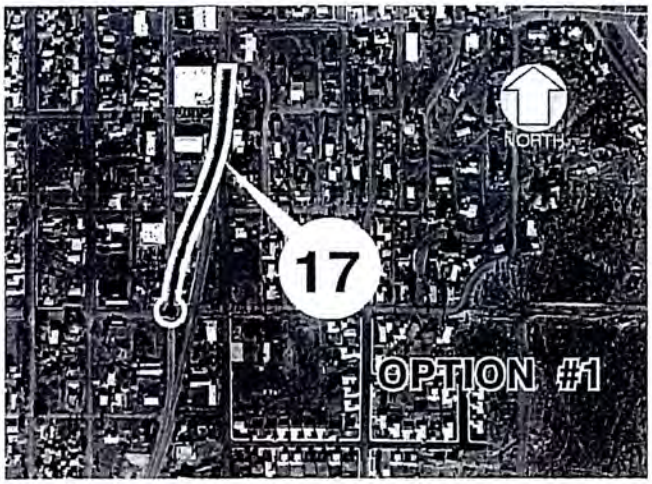
Based on qualitative review of the design options, the 2001 TSP update recommended Design Option 2 as a preferred alternative. The main advantage of Design Option 2 over Design Option 1 is that it "allows for future 5-lane section" of the highway.

#17 "J" Street/US 97 Intersection Realignment

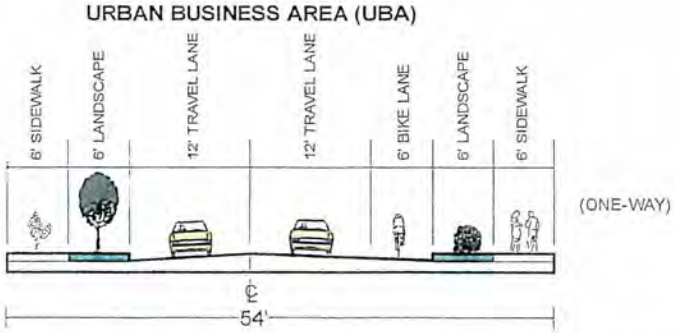
PURPOSE:
Provides a safe "J" Street crossing of the US 26/US 97 couplet and improves the east-west connectivity within Madras.

PROJECT DESCRIPTION:
This project has two design options that both require significant right-of-way and will likely impact existing businesses. Design Option #1 shortens the existing one-way couplet by shifting the couplet transition north of "J" Street and signalizing the "J" Street/US 26/US 97 intersection. Design Option #2 lengthens the existing one-way couplet by shifting the couplet transition south of "J" street and signalizing both the 4th Street and 5th Street intersections. Both of these design options will require Adams Drive to be reconfigured. (Ordinance No. 785, December 12, 2006)

TIME FRAME: 10-20 years



TYPICAL CROSS-SECTION:



2001 MADRAS TSP UPDATE DESIGN OPTIONS
MADRAS, OREGON
FIGURE 4

Refinement Plan Alternatives

Alternative Solution A: Install Traffic Signal at the Current Intersection Location

One of the options to improve the operation of the "J" Street- US 97/US 26 intersections is to install traffic signals at the current location of the northbound and southbound intersections. Due to the proximity of these intersections (there is approximately 60 feet of storage between the intersections), a Synchro analysis was conducted at the intersections to take the progression of traffic between the intersections into consideration. The northbound and southbound intersections are anticipated to operate at volume-to-capacity ratio of 0.48 and 0.41, respectively, during the weekday p.m. peak hour periods with the traffic signals in place under 2005 traffic conditions.

A review of the 95th percentile queues between the intersections showed that the eastbound and westbound queues at the intersections will exceed the 60 feet of available storage between the intersections. Subsequently, the queues are anticipated to spill back through the upstream signals. Even with east-west coordination between the intersections, the queues between the intersections are anticipated to exceed available storage. Furthermore, with anticipated growth in traffic on US 97/US 26, the coordination of the signals in the east-west direction will adversely impact the operation and queue for the north-south traffic at both the intersections. Consequently, it was determined that installing traffic signals at the current intersection location is not a viable solution. Figure 5 shows the general layout of this solution.

Alternative Solution B: Single Point Urban Intersection

One option to eliminate the issue of queues between the intersections is to redesign the two intersections into a one signal-point urban intersection. The intersection is anticipated to operate at a volume-to-capacity ratio of 0.59 as a single intersection under 2005 traffic conditions. The intersection needs to be improved to the lane configuration listed below to meet the ODOT mobility standard of volume-to-capacity ratio 0.70 under 2025 traffic conditions.

- Northbound: left-turn, dual through, and right-turn lanes
- Southbound: dual left-turn, dual through, and right-turn lanes
- Eastbound and Westbound: dual left-turn, through, and through-right turn lanes

This lane configuration will widen the intersection considerably and have adverse impact on the properties adjacent to the intersection. In addition, pedestrian and bicycle mobility through the intersection will be challenging, especially for children and the elderly. Hence, this solution was not determined to address all the operational and safety needs of the area. Figure 6 shows the single-lane drawing of alternative solution B.

Alternative Solution C: US 97/US 26 Realignment

As discussed previously, the 2001 Madras TSP Update evaluated realigning the highway north and south of "J" Street. The report recommended realigning the highway to the South of "J" Street based on the impact to current businesses and other concerns.

The current refinement plan evaluated two options for realigning the US 97/US 26 northbound approach south of "J" Street. The southern of the two alignments was determined to have lesser impact on the properties, based on discussions with City and County staff. A Synchro analysis was conducted to ensure that the traffic signal at the new realigned intersection would operate acceptably. The analysis showed that the "J" Street - US 97/US 26 Southbound intersection would operate at a volume-to-capacity ratio of 0.73 and the "J" Street - US 97/US 26 Northbound intersection would operate at a volume-to-capacity ratio of 0.67 during the 2025 30th highest hour conditions. Figure 7 shows the single-line drawing of alternative alignment C. Figure 8 shows the double-line drawing of the southern alignment option.

The US 97/US 26 realignment project has several advantages and disadvantages, which are highlighted below.

Advantages

- Provides enough queuing distance between the northbound and southbound approaches of the highway, to store the vehicles on "J" Street.
- Reduces the speed for the northbound approach by using a low-speed design for the realignment.
- Extends the couplet south and provides access to additional properties for development.

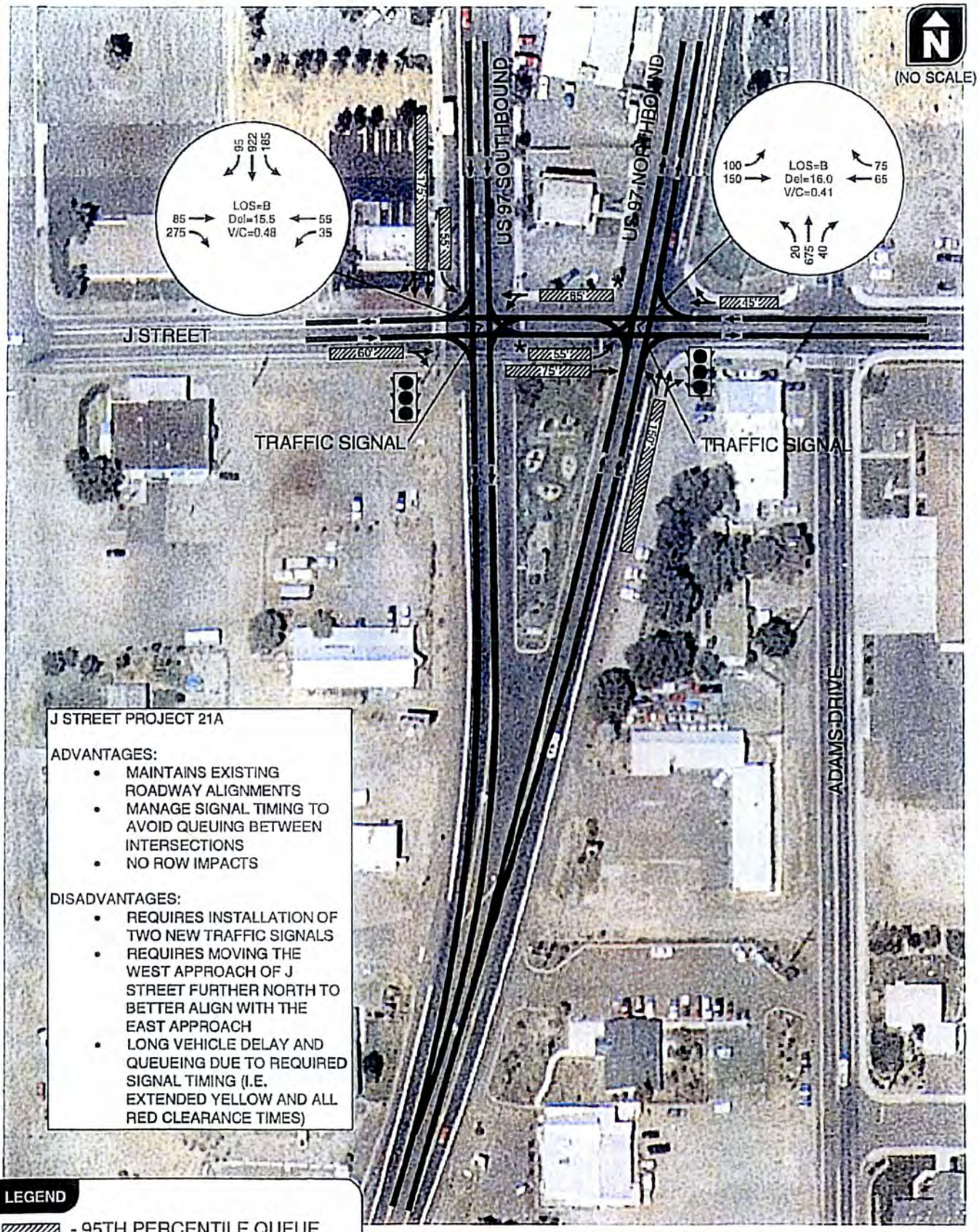
Disadvantages

- Adversely impacts properties south of "J" Street between Adams Street and US 97/US 26.
- Substantial construction and right-of-way cost. ODOT cost estimate for the project is approximately $9 million.

Recommendation

The transportation alternatives presented above were discussed in detail in the technical advisory committee meetings and presented to the public in an open house. Based on the discussion and review comments received, Alternative C, the realignment of the US 97/US 26 northbound approach to Adams Drive, was found to be most feasible and provides a long-term solution.

[The "J" Street Improvement Refinement Plan added by passage of Ordinance No. 785, on December 12, 2006.]



POTENTIAL J STREET ALTERNATIVE SOLUTION A
INSTALL TRAFFIC SIGNAL AT CURRENT LOCATION
2005 30TH HIGHEST HOUR TRAFFIC CONDITIONS

FIGURE 5

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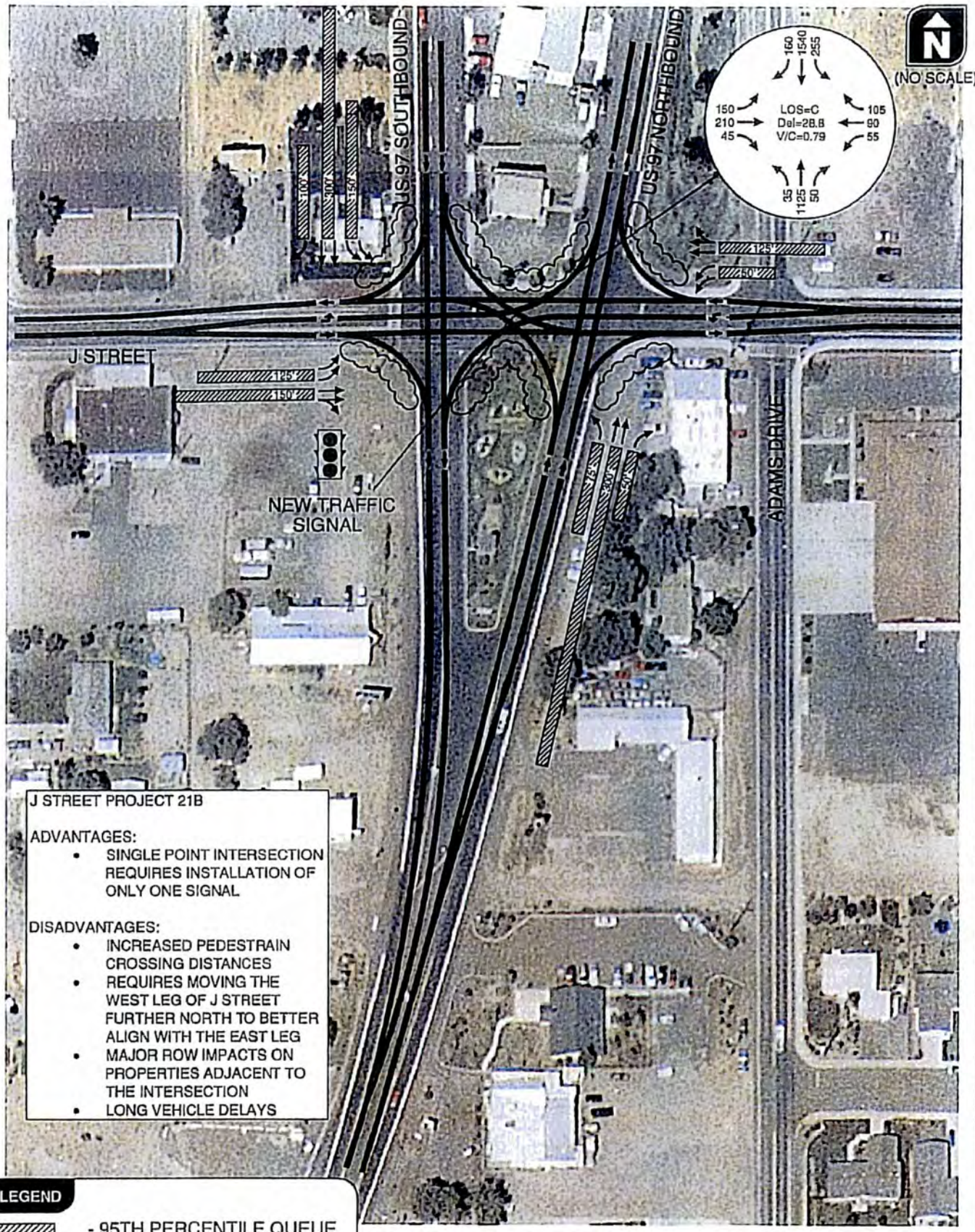

POTENTIAL J STREET ALTERNATIVE SOLUTION B
SINGLE POINT URBAN INTERSECTION
2025 30TH HIGHEST HOUR TRAFFIC CONDITIONS

FIGURE 6

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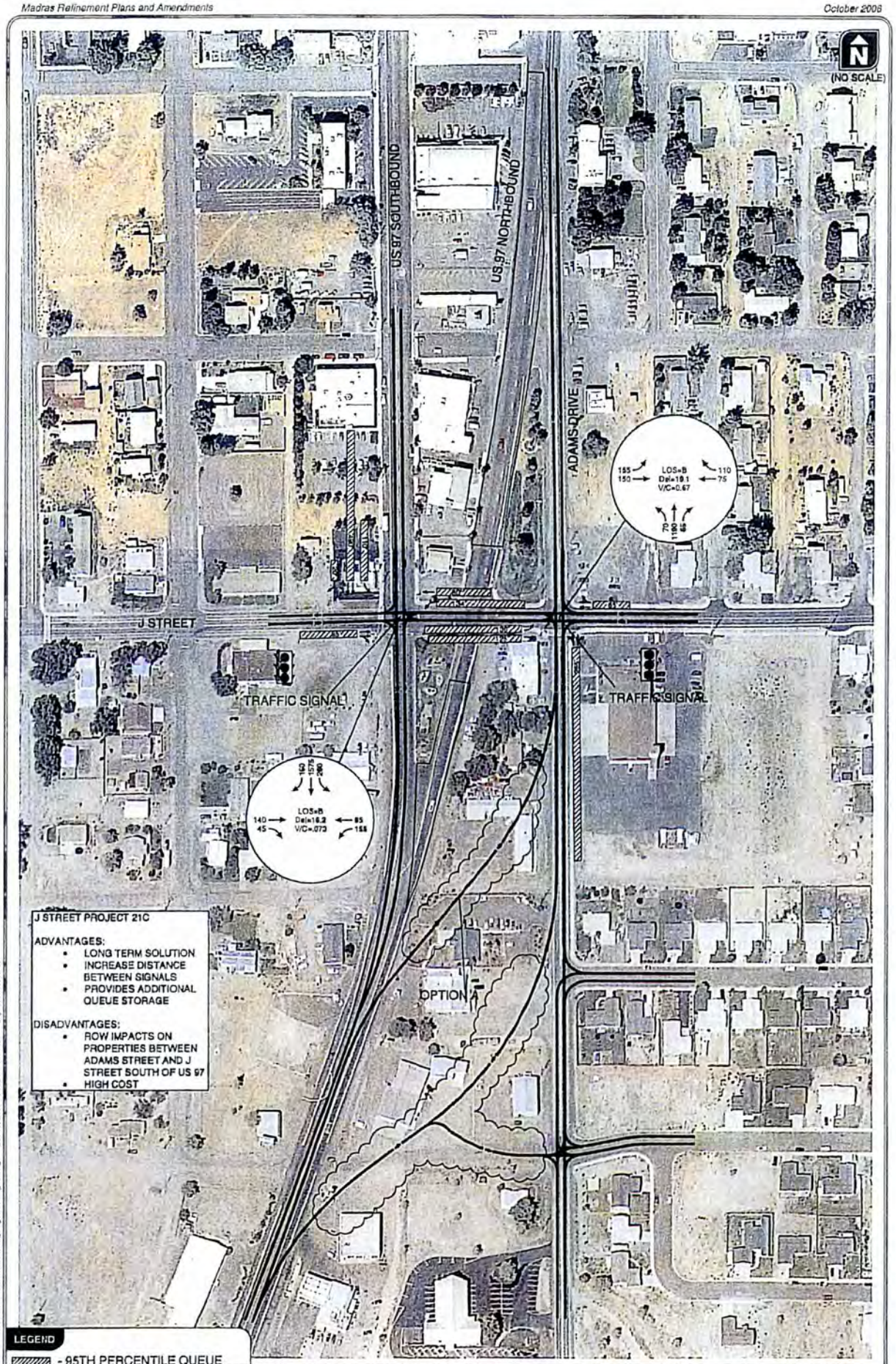

POTENTIAL J STREET ALTERNATIVE C
US 97/US 26 NORTHBOUND APPROACH REALIGNMENT
MADRAS, OREGON

FIGURE 7

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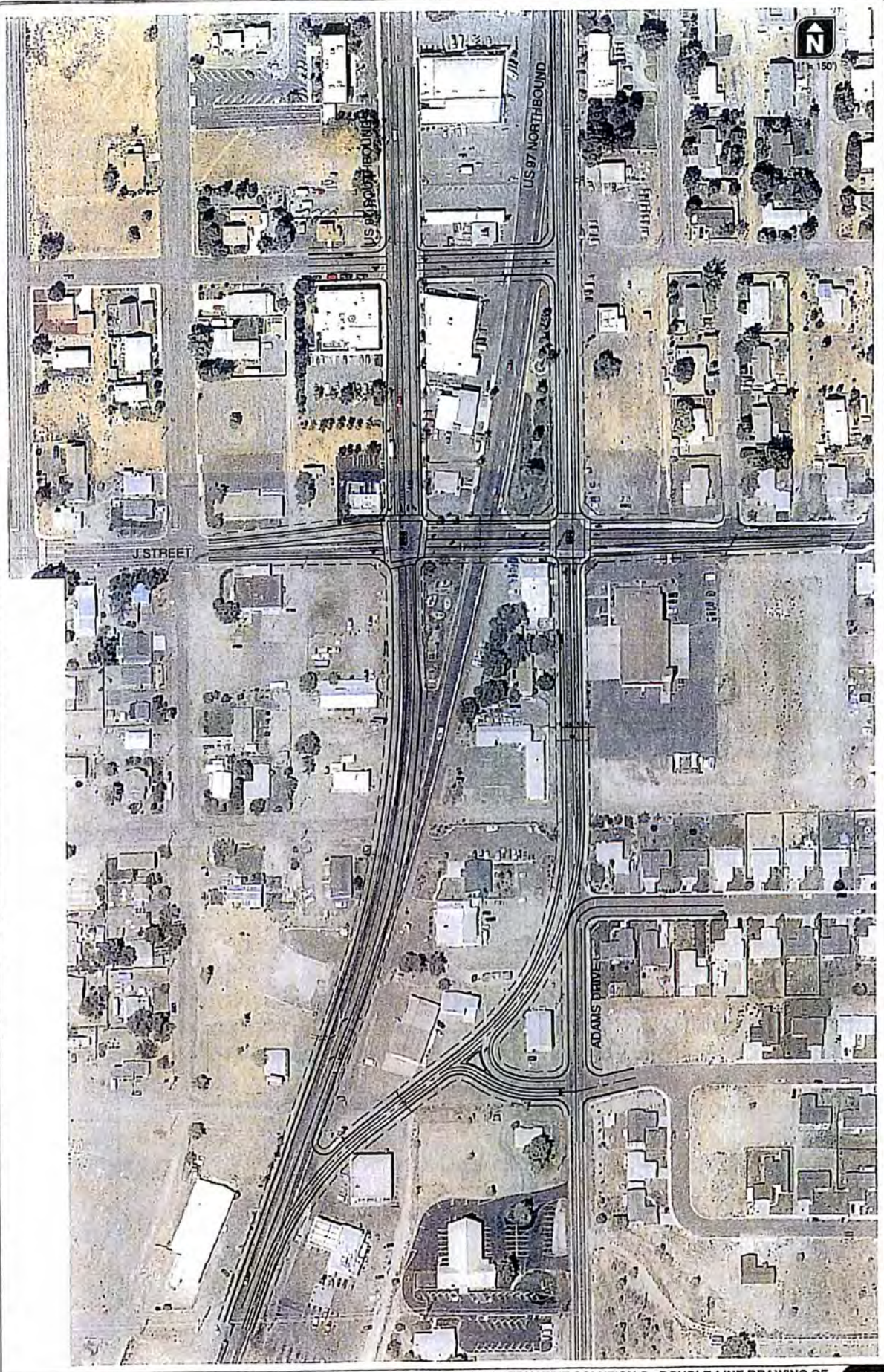
Transportation Engineering / Planning



J STREET ALTERNATIVE SOLUTION C - DOUBLE-LINE DRAWING OF
US 97/US 26 NORTHBOUND APPROACH REALIGNMENT
MADRAS, OREGON

FIGURE 8

Kittelson & Associates, Inc.
Transportation Engineering / Planning

US 97 / US 26 HIGHWAY UPGRADE: "K" STREET TO COLFAX ROAD

The City of Madras and ODOT are planning to upgrade US 97/ US 26 south of downtown Madras, from "K" Street to Colfax Road. The highway upgrade is anticipated to improve the operation and safety of motorists on the highway by reducing speed and adding urban features on the highway. Within a 100-foot right-of-way, the cross-section of the highway will include:

- Two 12-foot travel lanes
- One 16-foot center two-way left-turn lane
- Two 8-foot bike lanes
- 15-foot planter strip/drainage ditch on each side
- 6-foot sidewalk on each side

Figure 11 shows the cross-section of the US 97/US 26 highway upgrade. It should be noted that the above cross-section was included at the request of City staff. No specific reviews of the cross-section were conducted as part of the TSP amendment process.

[US 97/US 26 Highway Upgrade: "K" Street to Colfax Road Added by passage of Ordinance No. 785, December 12, 2006]

CULVER HIGHWAY UPGRADE: 1ST STREET TO COLFAX ROAD

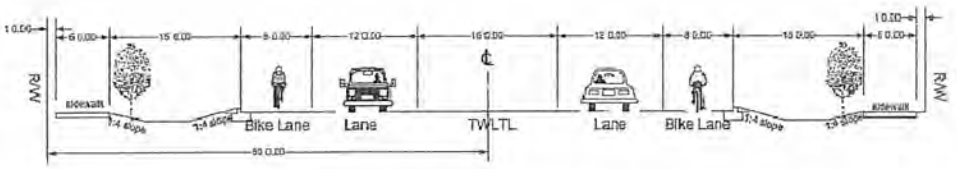
Culver Highway is planned to be upgraded from 1st Street to Colfax Road as part of the Madras Truck Route. The design will include urban features and a posted speed of 45 mph.

- Two 12-foot travel lanes
- One 13-foot raised median with 3-foot shy distance on each side
- Two 8-foot bike lanes
- 4-8-foot planter strip on each side
- 6-foot sidewalk on each side

Figure 11 also shows the planned cross-section of Culver Highway/Madras Truck Route upgrade. Similar to US 97/US 26 cross-section, it should be noted that the cross-section for Culver Highway was included at the request of City staff. No specific reviews or impact analysis of the cross-section were conducted as part of the TSP amendment process.

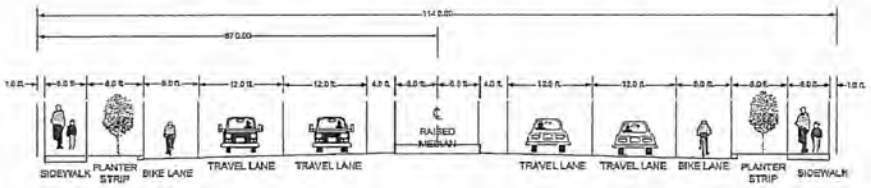
[Culver Highway Upgrade: 1st Street to Colfax Road Added by passage of Ordinance No. 785, December 12, 2006]

TYPICAL SECTION US 97 – "K" STREET TO COLFAX RD.

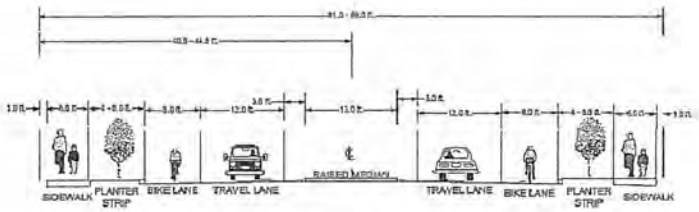


TYPICAL SECTION CULVER HIGHWAY - 1ST STREET TO COLFAX RD.

ODOT 45 MPH EXPRESSWAY (55 MPH DESIGN SPEED)



ODOT 45 MPH URBAN FRINGE/ SUBURBAN (55 MPH DESIGN SPEED)



US 97/US 26 AND CULVER HIGHWAY PLANNED CROSS-SECTION
MADRAS, OREGON

FIGURE 11

Kittelson & Associates, Inc.
Transportation Engineering / Planning

C:\Documents and Settings\mcladden\Desktop\ram_temp\Fig 11.dwg Dec 31, 2007 - 3:26pm - mcladden Layout Tab: Fig 11

Development of Planned Bicycle and Pedestrian Infrastructure Projects

A variety of bicycle and pedestrian facility needs were identified through review of the updated existing facilities maps provided in Chapter 3. The facility needs formed the basis for development of planned infrastructure projects. The location of each planned project is shown on Figures 5-1 through 5-4. Project details used to prioritize the projects are shown in tables that follow the figures. Projects were identified and refined through the following:

- Public feedback obtained during the project Charette;
- TAC (Technical Advisory Committee) Meetings #1 and #2; and
- Comments received through the interactive website.

Projects are identified to provide a network that connects Madras residents to major attractors of bicycle travel, such as commercial areas, schools, parks, and civic uses, with complete routes. Four types of projects were identified and the location of each project is shown on project maps. The details of each project (identified with a unique identification number) are provided in a series of tables that follow the maps.

Prioritization of Planned Pedestrian and Bicycle Infrastructure Projects

The planned pedestrian and bicycle infrastructure projects have been prioritized as high, medium, or low priority according to a set of criteria. These criteria have been developed based on the project team's experience with similar types of projects and refined using feedback from attendees of the project workshop and TAC meetings. The prioritization criteria and how they are applied are summarized here:

- *Proximity to schools* - does the project improve a major route to a school or a facility adjacent to a school property? This would include any project that is also identified by one of the existing local Safe Routes to School (SRTS) plans.
    - 2 points - project is adjacent to a school
    - 1 point - project is on a route to school
    - 0 points - all others
- *Proximity to activity centers* - does the project improve facilities in downtown, or near other activity and community centers, including the Madras Aquatic Center,

the library, Central Oregon Community College, City Hall, and Madras Theater where pedestrian and bicycle travel occurs?

- 2 points - project is adjacent to an identified activity center
- 1 point - project provides a moderate connection to an identified activity center
- 0 points - all others

- *Fills a gap in the current bike or pedestrian network* - will the project connect two existing facilities to provide greater connectivity?
  - 2 points - project fills a gap in a frequently used route
  - 1 point - project fills a gap in a moderately used route
  - 0 points - project does not fill a gap

- *The functional classification of the adjacent roadway* - is the roadway a major collector or higher-order facility?
  - 2 points - project is located adjacent to a highway (i.e. US 97, US 26, or the Culver Highway)
  - 1 point - project is located adjacent to an arterial or collector road
  - 0 points - project is located along a local road

The average number of points per criteria for each project was used to establish a prioritization 'score' that was compared to project cost to determine an overall project priority.

In order to account for the difference in cost between each type of project, unique cost classifications were established within each project type, as shown in Table 5-1. The project cost estimates were used to determine the project cost category in Table 5-1, which were compared to the project prioritization score to determine overall project priority.

Table 5-1 - Pedestrian and Bicycle Project Cost Categories by Project Type

Project Type	High	Medium	Low
Sidewalk	> $ 150,000	$ 50,000 <X< $ 150,001	< $ 50,001
Crossing Improvement	> $ 30,000	$ 10,000 <X< $ 30,001	< $ 10,001
Bicycle	> $ 150,000	$ 50,000 <X< $ 150,001	< $ 50,001
Shared-use Path	> $ 400,000	$ 200,000 <X< $ 400,001	< $ 200,001

Based on the project criteria score and project cost category established for each project, a combined low, medium, or high project ranking was determined based on the red, yellow, or green classifications in Table 5-2. For example, those projects that could be constructed for the lowest cost and received the highest average priority score were identified as "high" priority projects.

Table 5-2 - Pedestrian and Bicycle Project Cost / Priority Matrix

Average Priority Score	Cost		
	High	Medium	Low
< .05	🔴	🟡	🟡
0.5 < and < 1.0	🟡	🟡	🟢
> 1.0	🟡	🟢	🟢

The project team prepared a draft prioritization of the projects using the project / cost matrix and has since refined it based on input from the TAC and other stakeholders. The final results of this prioritization effort are summarized in the project tables.

The projects shown in the Planned Project Prioritization table are grouped into categories (green being the highest priority and red being the lowest), as opposed to individual rankings. This is done to allow for flexibility in selecting projects for implementation. Public opinion, travel patterns, development, and availability will all play a role in determining when projects are implemented in the future. Also, because the cost thresholds for prioritizing projects differ by project type, an absolute ranking of all projects is not prepared; though bicycle and sidewalk projects do use similar categories.

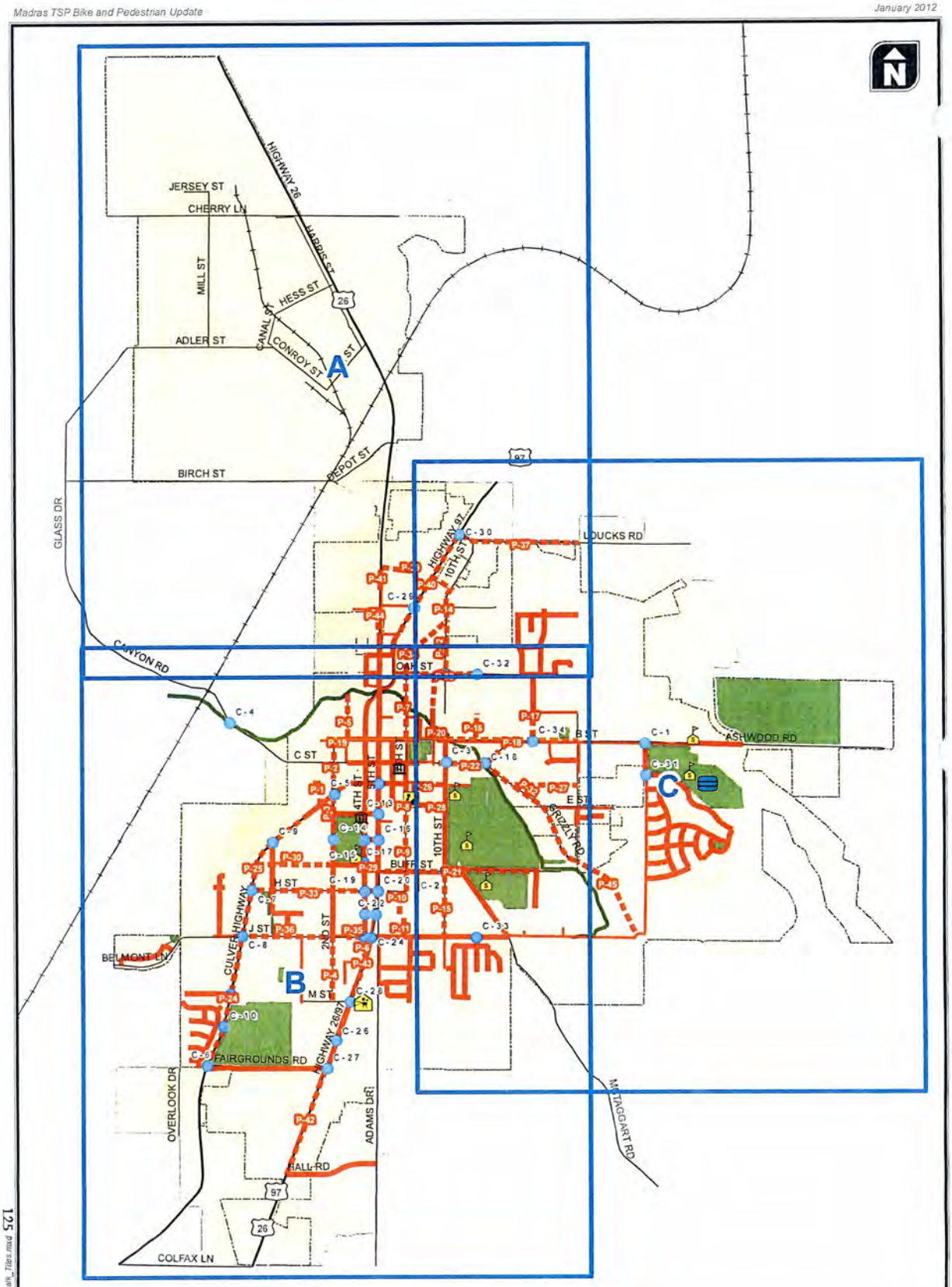
Planned Pedestrian System

Planned pedestrian system projects include sidewalks and improved intersection crossings. Sidewalk projects range in size from filling relatively short gaps on one side of a road to constructing new sidewalks on both sides of a longer section of road. A range of pedestrian crossing improvement options were considered that could include restriping a crosswalk, installing advanced "crossing ahead" signage, or installing "active when present" traffic control devices such as a Rectangular Rapid Flashing Beacon (RRFB). Each range in construction cost, and applicability is based on speeds of vehicles and the volume of pedestrians crossing and crossing distance.

Crossing Improvements

Crossing improvement project types are described below. Figure 5-1 includes a map showing each project location and tables that follow provide project details that reference the maps.

Crosswalk Striping / Signage - Installation of 10-foot wide staggered continental crosswalk striping and/or advanced crossing warning sign (W11-2) may be considered at unsignalized pedestrian crossings. The estimated cost to implement these treatments at each intersection where these types of improvements are expected to be valuable is $1,500, assuming average signs cost $500 each and striping costs average $500 per intersection.



Crossing Improvement
Proposed Sidewalk
Existing Sidewalk
Willow Creek Trail
Aquatic Center
Movie Theater
School
Library
City Hall/Courthouse
Sub-AreaBoundary
Park
City Limits
Urban Growth Boundary

Planned Sidewalk And Crossing Projects

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Figure 5-1

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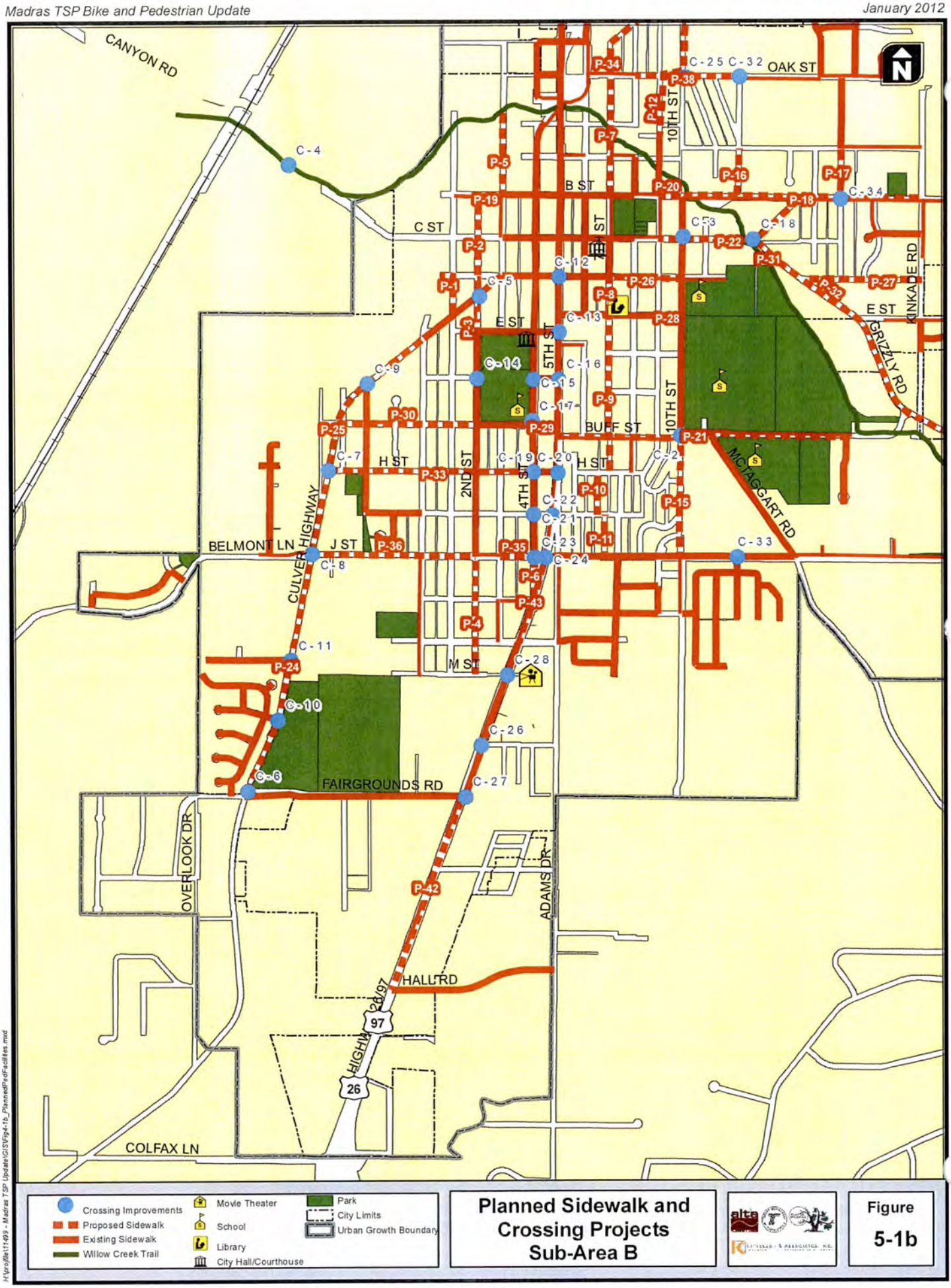

Planned Sidewalk and Crossing Projects Sub-Area B

Figure 5-1b

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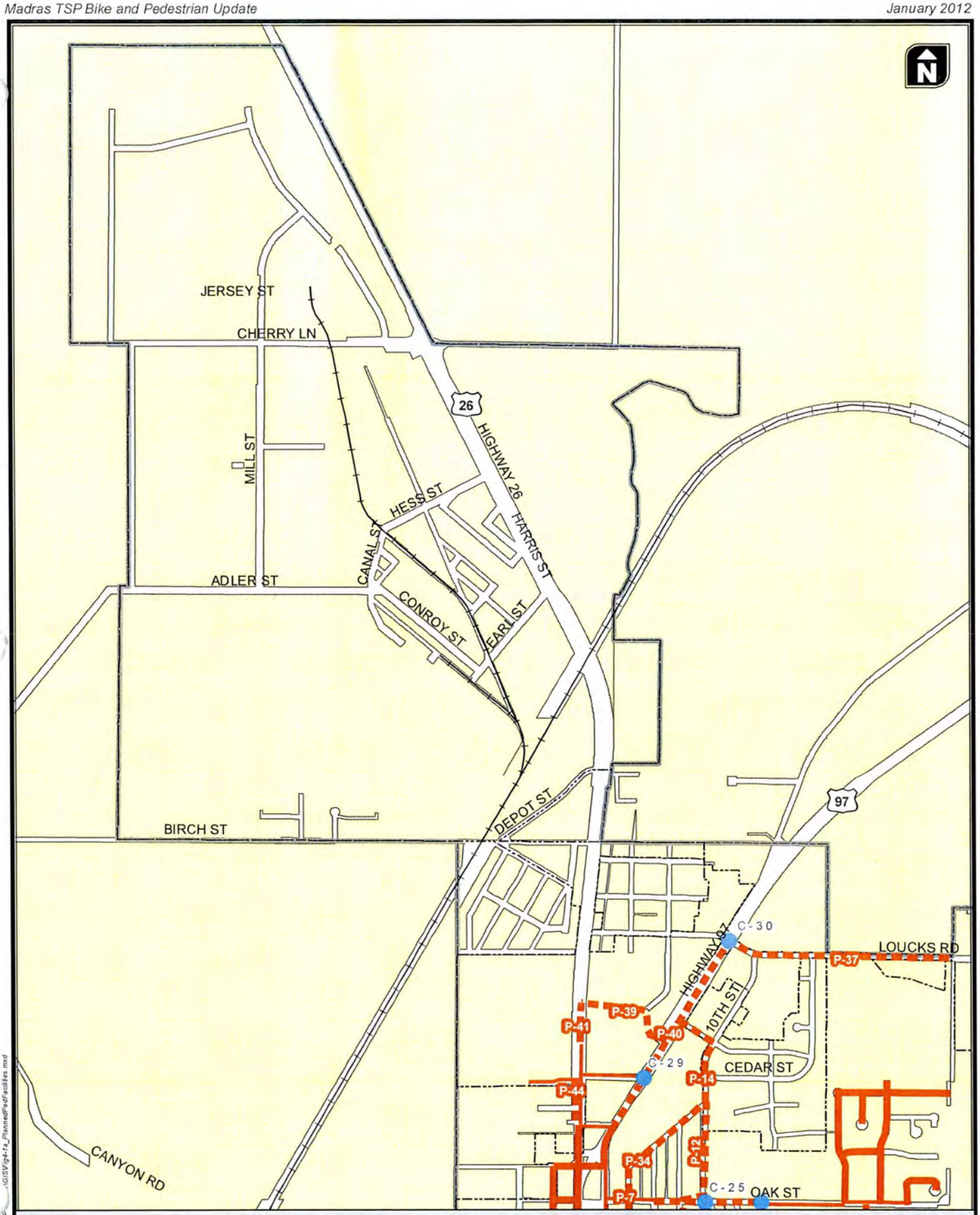

Proposed Crossing Improvements
Proposed Sidewalk
Existing Sidewalk
Willow Creek Trail
Urban Growth Boundary

Planned Sidewalk and Crossing Projects Sub-Area A

Figure 5-1a

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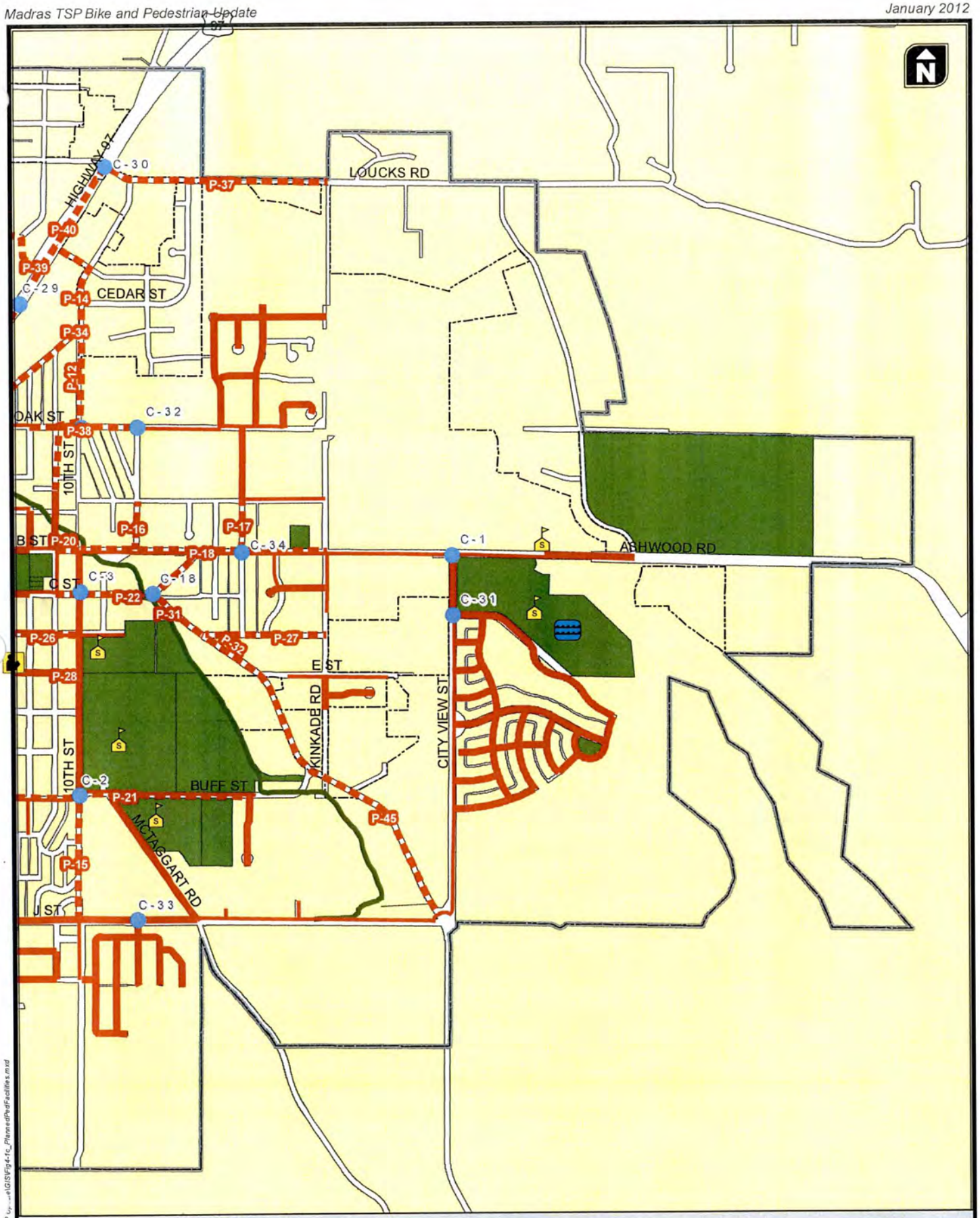


Planned Sidewalk and Crossing Projects Sub-Area C

Figure 5-1c

Table F-1 - Planned Intersection Crossing Projects

Project ID	Street Name/ Intersection	Description	SRTS Project	Project Cost*	Priority Score	Cost/ Priority Category
C-2	Buff Street/10th Street	Crosswalk Striping/Signage	Yes	$ 1,500	1	
C-6	Culver Highway/Fairgrounds Road	Crosswalk Striping/Signage	No	$ 1,500	0.75	
C-7	Culver Highway/H Street	Crosswalk Striping/Signage	No	$ 1,500	0.75	
C-8	Culver Highway/J Street	Crosswalk Striping/Signage	No	$ 1,500	0.75	
C-9	Culver Highway/Lincoln Street	Crosswalk Striping/Signage	No	$ 1,500	0.75	
C-10	Culver Highway/Lorraine Drive	Crosswalk Striping/Signage	No	$ 1,500	0.75	
C-11	Culver Highway/Ruby Street	Crosswalk Striping/Signage	No	$ 1,500	0.75	
C-12	D Street/5th Street	Enhanced intersection crossing treatments	No	$ 10,000	1.25	
C-13	E Street/5th Street	Enhanced intersection crossing treatments	No	$ 10,000	1.5	
C-14	F Street/2nd Street	Crosswalk Striping/Signage	No	$ 1,500	1	
C-15	F Street/4th Street	Enhanced intersection crossing treatments	No	$ 10,000	1.25	
C-16	F Street/5th Street	Enhanced intersection crossing treatments	No	$ 10,000	1.25	
C-17	G Street/4th Street	Enhanced intersection crossing treatments	No	$ 10,000	1.25	
C-18	Grizzly Road/Ashwood Road/C Street	Crosswalk Striping/Signage	No	$ 1,500	1	
C-19	H Street/4th Street	Enhanced intersection crossing treatments	No	$ 10,000	1	
C-20	H Street/5th Street	Enhanced intersection crossing treatments	No	$ 10,000	1	
C-21	I Street/4th Street	Enhanced intersection crossing treatments	No	$ 10,000	1	
C-22	I Street/5th Street	Enhanced intersection crossing treatments	No	$ 10,000	1	
C-23	J Street/4th Street	Enhanced intersection crossing treatments	No	$ 10,000	1	
C-24	J Street/5th Street	Enhanced intersection crossing treatments	No	$ 10,000	1	
C-33	Strawberry Lane/J Street	Enhanced intersection crossing treatments	No	$ 10,000	0.75	
C-26	US 97/26/Bard Lane	Rapid Rectangular Flashing Beacon, Crosswalk Striping, Signage	No	$ 30,000	1.25	
C-27	US 97/26/Fairgrounds Road	Rapid Rectangular Flashing Beacon, Crosswalk Striping, Signage	No	$ 30,000	1.25	
C-32	12th Street/Oak Street	Enhanced intersection crossing treatments	No	$ 10,000	0.25	
C-34	16th Street/B Street	Enhanced intersection crossing treatments	No	$ 10,000	0.5	
C-1	B Street/City View	Crosswalk Striping/Signage	No	$ 1,500	0.5	
C-3	C Street/10th Street	Rapid Rectangular Flashing Beacon, Crosswalk Striping, Signage	Yes	$ 50,000	0.75	
C-4	Canyon Road/Willow Creek trail	Crosswalk Striping/Signage	No	$ 1,500	0.5	
C-31	City View Road/Kemper Way	Enhanced intersection crossing treatments	No	$ 10,000	0.5	
C-5	Culver Highway/2nd Street	Crosswalk Striping/Signage	No	$ 1,500	0.5	
C-25	Oak Street/10th Street	Crosswalk Striping/Signage	No	$ 1,500	0.25	
C-28	US 97/26/M Street	Rapid Rectangular Flashing Beacon, Crosswalk Striping, Signage	No	$ 30,000	0.75	
C-29	US 97/Cedar Street	Rapid Rectangular Flashing Beacon, Crosswalk Striping, Signage	No	$ 30,000	0.75	
C-30	US 97/Loucks Road	Rapid Rectangular Flashing Beacon, Crosswalk Striping, Signage	No	$ 30,000	0.75	

* Project costs provide for a range of treatment options; actual project costs depend on the treatments applied at each intersection.

Table F-2 - Planned Sidewalk Projects

Project ID	Street Name/ Intersection	Description	Includes Curb and Gutter?	SRTS Project	One-way or Two-way	Length (feet)	Project Cost*	Priority Score	Cost/ Priority Category
P-3	2nd Street	Culver Highway to E Street	Yes	Yes	2	133	$ 17,300	0.75	
P-26	D Street	7th Street to 10th Street	Yes	No	1	761	$ 49,500	0.75	
P-28	E Street	9th Street to 10th Street	Yes	No	1	305	$ 19,800	0.75	
P-29	G Street	4th Street to 5th Street	Yes	No	1	277	$ 21,600	1.25	
P-35	J Street	3rd Street to 4th Street	Yes	Yes	2	376	$ 48,900	0.75	
P-44	US 26	Plum Street to Cedar Street	Yes	No	1	496	$ 32,200	0.75	
P-13	10th Street	D Street to Buff Street	Yes	Yes	1	1,730	$ 112,500	1	
P-14	10th Street	Henry Street to Chestnut Street	Yes	No	2	665	$ 86,500	0.25	
P-15	10th Street	J Street to Buff Street	Yes	Yes	2	1,325	$ 465,100	1	
P-16	12th Street	Kinkade Road to B Street	Yes	No	2	517	$ 67,200	0.25	
P-17	16th Street	A Street to B Street	Yes	No	2	545	$ 70,900	0	
P-1	1st Street	D Street to Culver Highway	Yes	No	2	577	$ 75,000	0	
P-2	2nd Street	B Street to Culver Highway	Yes	No	2	1,111	$ 144,400	0.5	
P-5	3rd Street	B Street to Willow Creek Trail	Yes	No	2	949	$ 123,400	0	
P-6	4th Street	J Street to 5th Street	Yes	No	1	452	$ 35,300	0.5	
P-8	7th Street	D Street to E Street	Yes	No	2	311	$ 40,400	0.5	
P-10	7th Street	H Street to I Street	Yes	No	2	459	$ 59,700	0.25	
P-11	7th Street	I Street to J Street	Yes	No	2	455	$ 59,200	0.25	
P-20	B Street	9th Street to 10th Street	Yes	Yes	2	261	$ 33,900	0.5	
P-19	B Street	2nd Street to 3rd Street	Yes	No	2	270	$ 35,100	0.25	
P-18	B Street	10th Street to Kinkade Road	Yes	No	1	2,645	$ 171,900	0.75	
P-21	Buff Street	5th Street to Willow Creek Trail	Yes	No	1	3,194	$ 207,600	1	
P-22	C Street/Ashwood Street	9th Street to B Street	Yes	No	2	1,731	$ 225,000	0.75	
P-23	Chestnut Street	10th Street to US 97	Yes	No	2	455	$ 59,200	0.25	
P-27	D Street	Grizzly Road to Kinkade Road	No	Yes	1	1,285	$ 50,000	0.25	
P-31	Grizzly Road	C Street to D Street	No	No	2	704	$ 55,000	0.75	
P-33	H Street	Culver Highway to 4th Street	Yes	No	2	2,273	$ 295,500	0.75	
P-38	Oak Street	8th Street to 12th Street	Yes	No	2	1,149	$ 149,400	0	
P-39	Private Road	US 97 to US 26	Yes	No	2	1,141	$ 148,300	0.5	
P-41	US 26	Cedar Street to Private Road	Yes	No	2	446	$ 58,000	0.75	
P-40	US 97	Plum Street to Cedar Street	Yes	No	2	2,319	$ 301,500	1	
P-43	US 97/26	J Street to L Street	Yes	No	2	985	$ 128,100	0.75	
P-42	US 97/26	Hall Road to Fairgrounds Road	Yes	No	2	2,279	$ 296,300	0.75	
P-4	2nd Street	J Street to M Street	Yes	Yes	2	1,292	$ 168,000	0.25	
P-7	7th Street	B Street to Oak Street	Yes	No	2	1,336	$ 173,700	0.25	
P-9	7th Street	E Street to H Street	Yes	No	2	1,748	$ 227,200	0.5	
P-12	9th Street/10th Street	A Street to Henry Street	Yes	Yes	2	1,916	$ 249,100	0.25	
P-24	Culver Hwy	Fairgrounds Road to J Street	No	No	2	2,772	$ 216,000	0.5	
P-25	Culver Hwy	J Street to Madison Street	No	No	2	2,807	$ 219,000	0.5	
P-30	G Street	Culver Highway to 2nd Street	Yes	Yes	2	1,535	$ 199,600	0	
P-32	Grizzly Road	D Street to Kinkade Road	No	Yes	2	2,100	$ 164,000	0.5	
P-45	Grizzly Road	Kinkade Road to J Street	No	No	2	1,999	$ 156,000	0.25	
P-34	Henry Street	Oak Street to 10th Street	Yes	No	2	1,386	$ 180,200	0	
P-36	J Street	Culver Highway to 2nd Street	Yes	Yes	2	1,805	$ 234,700	0.25	
P-37	Loucks Road	US 97 to Claremont Drive	No	No	2	2,426	$ 189,000	0	

* Includes a 30-percent contingency factor and does not include right-of-way costs.

Enhanced Crossing Treatments - A variety of treatment options for unsignalized and signalized intersections in downtown Madras are described in Chapter 6. The treatments range from geometric improvements aimed to "narrow" the roadway and reduce speeds, installing markings, and Intelligent Transportation Solutions.

Rapid Rectangular Flashing Beacon - At specific unsignalized or mid-block pedestrian crossings on US 97, where pedestrian crossings are frequent, an "active when present" traffic control device, such as a Rapid Rectangular Flashing Beacon (RRFB), is expected to provide the greatest motorist compliance. NCHRP Report 562 provides compliance rates from national studies. More recently, these devices have been used in Central Oregon on US 20 and US 97 in Bend and research locally has documented their effectiveness. The cost of each implementation is anticipated to average $30,000, including supporting signage, striping, and design.

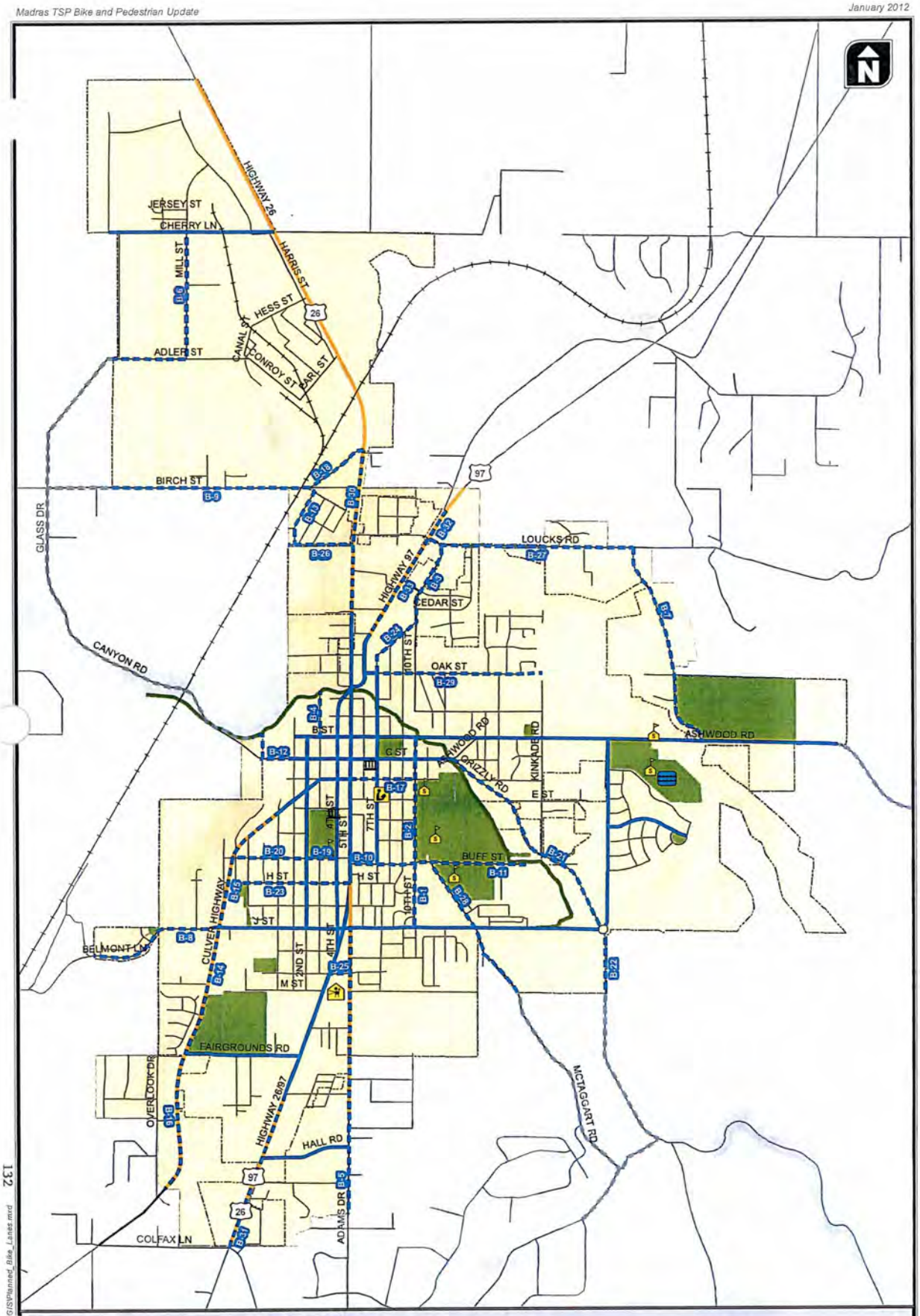
Sidewalk Projects

Sidewalk projects are described in Table F-2 and are also shown in Figure 5-1, Sidewalk projects assume 6-foot wide concrete sidewalk (8-foot downtown) at an estimated cost of $30 per lineal foot ($40 / foot downtown). Where curb and gutter is not currently provided an additional cost of $20 per linear foot is included. A 30-percent contingency factor is assumed and no right-of-way costs are included in the cost estimates.

Planned Bicycle System

The planned bicycle system map (Figure 5-2) illustrates the location of planned bicycle projects. Bicycle project types include: new bike lanes; signed and/or marked bike routes; and, shared-use paths. Bicycle project details are summarized in Table F-3. Components and construction costs of each type of bicycle project are described below.

Bike Lane - Is a striped portion on the outside of the roadway that denotes an area specifically for bicycles. Bike lane projects are suggested where the existing roadway cross-section is sufficient for two 5-foot bike lanes and two 12-foot travel lanes. Costs assume $.40 per linear foot for continuous stripe, and bike symbols every 1000 feet. A 30-percent contingency factor is assumed and no right-of-way costs are included in the cost estimates.



Proposed Bike Lane
Bike Lane Outside UGB
Existing Bike Lane
Existing Shoulder
Willow Creek Trail
Aquatic Center
Movie Theater
School
Library
City Hall/Courthouse
Park
City Limits
Urban Growth Boundary

Planned Bicycle Projects

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Oregon Department of Transportation
City of Madras
KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Figure 5-2

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Table F-3 - Planned Bicycle System Infrastructure

Project ID	Project Type	Street Name/ Intersection	Description	Project Detail	SRTS Project	One-way or Two-way	Length (feet)	Project Cost*	Priority Score	Cost/ Priority Category
B-1	Bike Lane	10th Street	B Street to Buff Street	Bike Lane	No	2	1,334	$ 1,400	1	
B-2	Bike Lane	10th Street	Buff Street to J Street	Bike Lane	No	2	2,608	$ 2,700	1	
B-10	Bike Lane	Buff Street	10th Street to Willow Creek Trail	Bike Lane	No	2	1,349	$ 1,400	0.75	
B-11	Bike Lane	Buff Street	5th Street to 10th Street	Bike Lane w/Pavement Widening	No	2	2,320	$ 25,200	0.75	
B-28	Bike Lane	McTaggart Road	Buff Street to UGB	Bike Lane	No	2	3,279	$ 3,400	0.75	
B-30	Bike Lane	US 26	Lee Street to Depot Road	Bike Lane	No	2	3,354	$ 3,500	0.75	
B-31	Bike Lane	US 26/97	Colfax Lane to Brush Lane	Bike Lane	No	2	3,387	$ 3,500	0.75	
B-32	Bike Lane	US 97	Loucks Road to Meadowlark Lane	Bike Lane	No	2	681	$ 700	0.75	
B-33	Bike Lane	US 97	Loucks Road to Plum Street	Bike Lane	No	2	2,324	$ 2,400	1	
B-3	Bike Lane	10th Street	Henry Street to Loucks Road	Bike Lane w/Pavement Widening	No	2	1,744	$ 69,800	0.25	
B-4	Bike Lane	3rd Street	B Street to Willow Creek Trail	Marking/Signs	No	2	949	$ 1,000	0.25	
B-5	Bike Lane	Adams Drive	H Street to UGB	Bike Lane	No	2	6,860	$ 7,100	0	
B-6	Bike Lane	Adler Street/Mill Street	UGB to Cherry Lane	Lane/Markings/Signs	No	2	4,152	$ 4,300	0.25	
B-7	Bike Lane	Bean Drive	Loucks Road to Ashwood Road	Marking/Signs	No	2	4,443	$ 4,600	0.25	
B-9	Bike Lane	Birch Lane	UGB to Depot Road	Marking/Signs	No	2	4,123	$ 4,300	0.25	
B-12	Bike Lane	C Street	1st Street to UGB	Bike Lane w/Pavement Widening	No	2	1,392	$ 24,200	0.25	
B-13	Bike Lane	Commercial Street	Birch Lane to Lee Street	Marking/Signs	No	2	1,321	$ 1,400	0	
B-15	Bike Lane	Culver Highway	J Street to Madison Street	Bike Lane	No	2	2,842	$ 3,000	0.5	
B-16	Bike Lane	Culver Highway	UGB to Fairgrounds Road	Bike Lane w/Pavement Widening	No	2	2,909	$ 40,800	0.5	
B-14	Bike Lane	Culver Highway	Fairgrounds Road to J Street	Bike Lane w/Pavement Widening	No	2	2,704	$ 108,300	0.5	
B-17	Bike Lane	D Street	5th Street to 10th Street	Marking/Signs	Yes	2	1,350	$ 1,400	0.5	
B-18	Bike Lane	Depot Road	Birch Lane to US 26	Marking/Signs	No	2	1,356	$ 1,400	0.25	
B-19	Bike Lane	G Street	2nd Street to 4th Street	Marking/Signs	Yes	2	621	$ 600	0.5	
B-20	Bike Lane	G Street	Culver Highway to 2nd Street	Marking/Signs	Yes	2	1,535	$ 1,600	0	
B-22	Bike Lane	Grizzly Road	J Street to UGB	Marking/Signs	No	2	1,251	$ 1,300	0.25	
B-21	Bike Lane	Grizzly Road	C Street to J Street	Marking/Signs	No	2	4,803	$ 5,000	0.5	
B-23	Bike Lane	H Street	5th Street to Culver Highway	Lane/Markings/Signs	No	2	2,527	$ 2,600	0.5	
B-24	Bike Lane	Henry Street	Oak Street to 10th Street	Marking/Signs	No	2	1,409	$ 1,500	0	
B-25	Bike Lane	L Street	US 97/26 to Adams Drive	Marking/Signs	No	2	422	$ 400	0.25	
B-26	Bike Lane	Lee Street	Commercial Street to US26	Marking/Signs	No	2	1,332	$ 1,400	0	
B-29	Bike Lane	Oak Street	7th Street to Claremont Drive	Lane/Markings/Signs	No	2	3,698	$ 3,800	0.25	
B-8	Bike Lane	Belmont Lane	Culver Highway to UGB	Bike Lane w/Pavement Widening	No	2	2,822	$ 259,700	0.25	
B-27	Bike Lane	Loucks Road	US 97 to Bean Drive	Bike Lane w/Pavement Widening	No	2	4,298	$ 395,600	0.25	

* Includes a 30-percent contingency factor and does not include right-of-way costs.

Bike Lane with Pavement Widening

Pavement widening is included in bike lane projects where the existing roadway cross-section is not expected to be wide enough to support the addition of two 5-foot bike lanes. Costs assume $0.40 per linear foot for striping and $5 per square foot to provide a 34-foot wide asphalt roadway. A 30-percent contingency factor is assumed and no right-of-way costs are included in the cost estimates.

Signs and Markings - On those roadways where bicyclists and motorists use the same travel lanes (shared roadways) or bicyclists travel on a narrow shoulder (shoulder bikeways), signage and markings may remind motorists to share the road with bicyclists. Signage on rural roads could include a bike warning sign (W11-1) with the supplemental plaque "ON ROADWAY" (OBW1-5) for short segments and the additional rider "NEXT XX MILES" if it is a continuous condition. On residential or other low-volume roads markings could include "sharrows" that indicate that bikes may be on the road with motor vehicles (see Exhibit 5-1).

Exhibit 5-1: Example of a "sharrow" pavement marking on a residential street.

The cost of these improvements will vary based on the number of pavement markings applied and/or the number of signs installed. Cost estimates assume $0.40 per linear foot, which can be allocated to signage and/or markings. A 30-percent contingency factor is assumed and no right-of-way costs are included in the cost estimates.

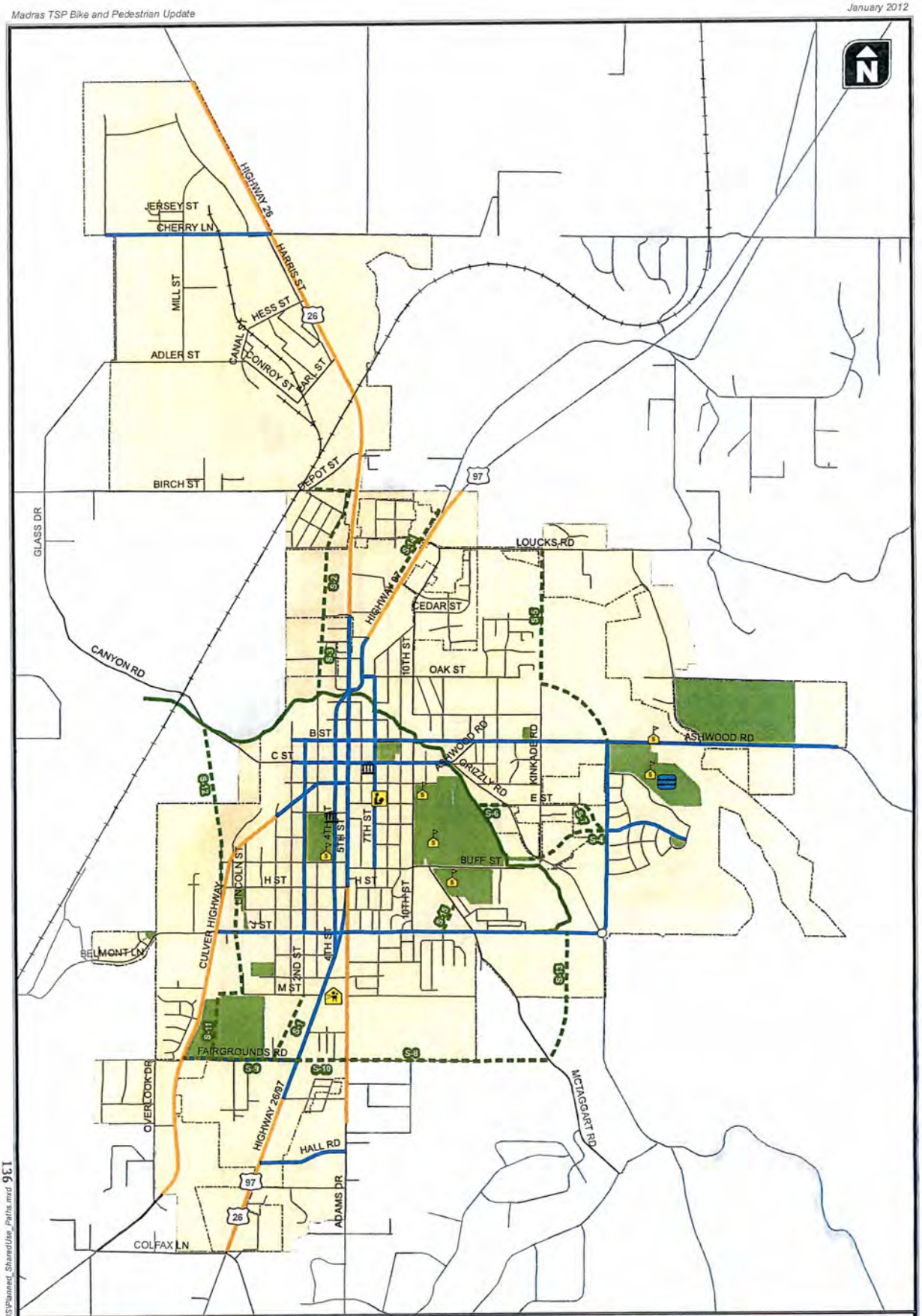
Planned Shared-use Paths

Shared-use paths will help facilitate travel by bicycle and other non-motorized forms of transportation. Locations of planned shared-use paths are shown in Figure 5-3. Shared-use path project details provided in Table F-4 include cost estimates that assume $65 per lineal foot of path for lighting, design, and construction. An additional cost of $150,000 is assumed for each bridge required. The cost estimates are based on previous construction costs for shared-use paths recently constructed in Madras. Right-of-way costs are not included in the estimated project costs.

Planned Safe Routes to School Infrastructure

Existing Safe Routes to School (SRTS) plans have been prepared for Madras' schools by many local volunteers. The Jefferson County 509-J School District SRTS Action Plan and the individual SRTS Action Plans developed for Buff Intermediate (formerly Buff Elementary) and Madras Primary School (formerly Madras Elementary) identify several bike and pedestrian projects.

SRTS projects include constructing bike lanes and sidewalks and improving crossings and access to trails. The projects identified on the SRTS map are also included in the planned bicycle and pedestrian systems maps. The projects in these documents are combined onto the Planned SRTS Infrastructure Map (Figure 5-4) and are also shown with other projects in Figures 5-1 through 5-3. The projects are included in Tables F-1 through F-4.



Planned Shared-use Path
Existing Bike Lane
Existing Shoulder
Willow Creek Trail
Aquatic Center
Movie Theater
School
Library
City Hall/Courthouse
Park
City Limits
Urban Growth Boundary

Planned Shared-Use Path Projects

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Figure 5-3

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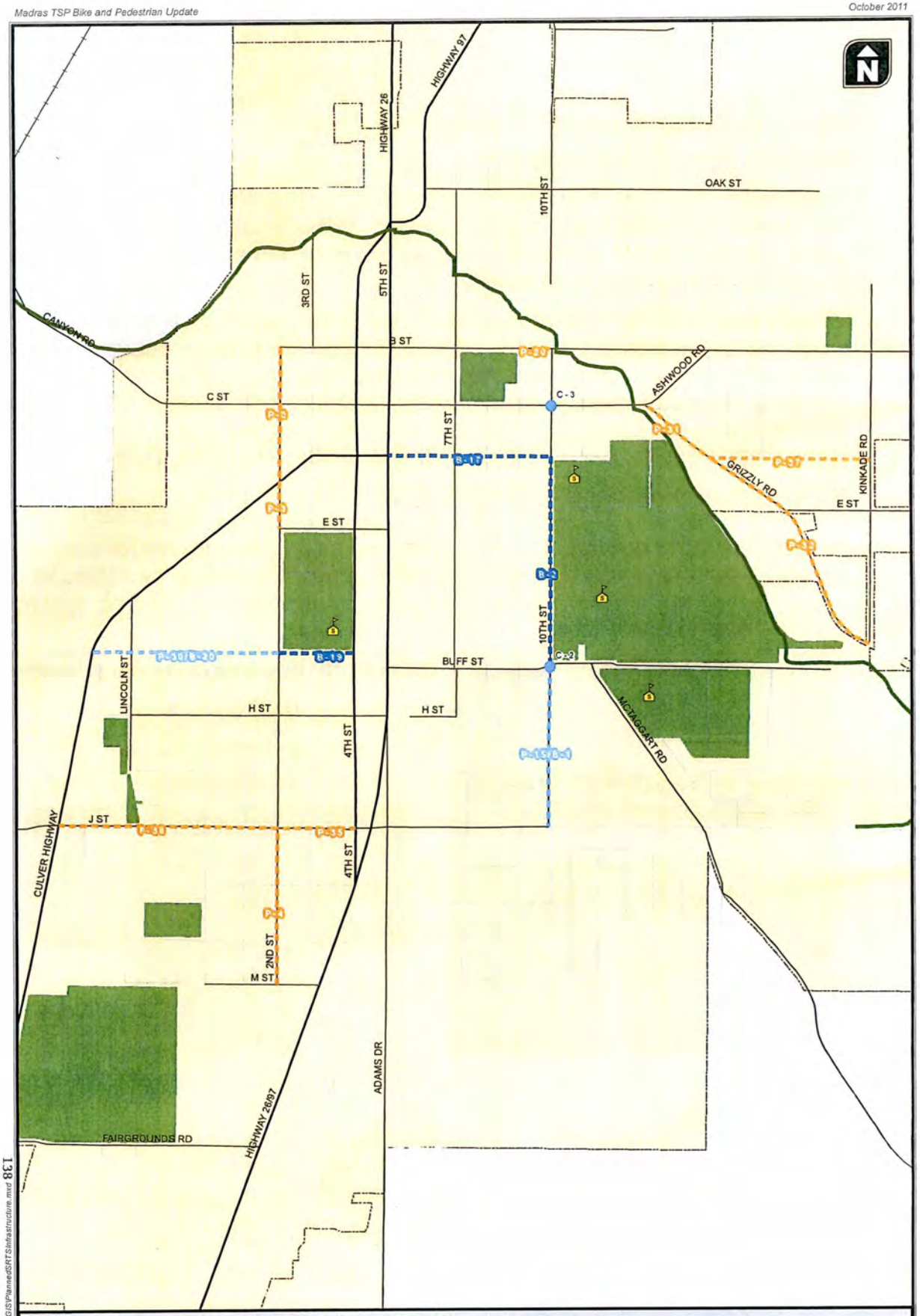
Table F-4 Planned Shared-Use Path Projects

Project ID	Street Name/ Intersection	Description	Project Cost	Length (ft)	Priority Score	Cost/ Priority Category
S-9	**Fairgrounds Road**	**Culver Highway to US 97/26**	**Already Committed**	**N/A**	**-**	**-**
S-4	Buff Street	Willow Creek Trail to City View Street	$ 150,000	1,781	0.75	
S-1	**2nd Street**	**M Street to Fairgrounds Road**	**$ 125,000**	**1,475**	**0**	
S-3	3rd Street	Willow Creek Trail to Cedar Street	$ 136,000	1,609	0.25	
S-2	**3rd Street**	**Cedar Street to Depot Street**	**$ 296,000**	**3,507**	**0.25**	
S-6	E Street	Bridge from School to Grizzly Road	$ 247,000	619	0.75	
S-7	**E Street**	**E Street to City View Street**	**$ 58,000**	**691**	**0.5**	
S-10	Fairgrounds Road	US 97/26 to Adams Drive	$ 87,000	1,032	0.25	
S-8	**Fairgrounds Road**	**Adams Drive to McTaggart Road**	**$ 354,000**	**4,187**	**0.25**	
S-11	Loop Trail	Bike/Skate Park to Youth Fishing Pond	$ 318,000	3,765	0.75	
S-13	**Loop Trail**	**McTaggart Road to J Street**	**$ 227,000**	**2,685**	**0.25**	
S-12	Loop Trail	Culver Hwy at H Street to Canyon Road	$ 400,000	3,455	0.75	
S-15	**McTaggart Road**	**Strawberry Lane to McTaggart Road**	**$ 66,411**	**601**	**0.5**	
S-14	US 97	Safeway to Meadowlark Lane	$ 500,000	1,990	1	
S-5	**Claremont Drive**	**Loucks Road to Ashwood Road**	**$ 435,000**	**5,146**	**0.25**	



Planned SRTS Infrastructure
- Bike Lane
- Bike Lane and Sidewalk
- Sidewalk
- Crossing Improvement
- School
- Willow Creek Trail
- Park
- City Limits
- Urban Growth Boundary

Planned SRTS Infrastructure

alta PLANNING + DESIGN

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Figure 5-4

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C-1	Planned Intersection Crossing Improvement Projects

Description: Crosswalk Striping/Signage

Purpose: Provide a combination of crosswalk striping and/or signage at intersections to alert drivers that pedestrians may be crossing. These locations represent crossings where low to moderate pedestrian volumes are expected and no striping is currently provided or is in need of replacement.

Projects could include installation of 10-foot wide staggered continental crosswalk striping and/or advanced crossing warning sign (W11-2) on one or more intersection approaches. The estimated cost to implement these treatments at each intersection is $1,500, assuming sign costs average $500 each and striping costs average $500 per intersection.

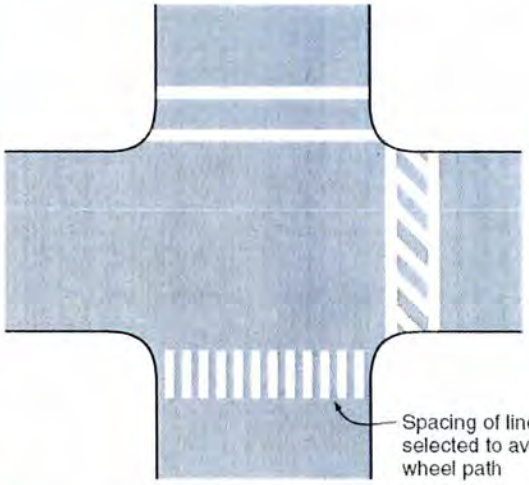
High-priority Projects: C-2, C-6, C-7, C-8, C-9, C-10, C-11, C-14, C-18

Medium-priority Projects: C-1, C-4, C-5, C-25

Project Cost (2012 dollars): $1,500 is estimated as an average cost for each intersection, but actual costs may vary depending on the number of crossings and signs installed.

Example Application:

Figure 3B-19. Examples of Crosswalk Markings



W11-15*

W11-15P*
(optional)

W11-15a*

Source: MUTCD

C-2	Planned Intersection Crossing Improvement Projects

Description: Enhanced Intersection Crossing Treatments

Purpose: Provide enhanced intersection crossings for unsignalized and signalized intersections in downtown Madras. Treatments range from geometric improvements aimed to "narrow" the roadway and reduce speeds, supplemental striping and pavement markings, and Intelligent Transportation Solutions (ITS). ITS treatments identified include: Rectangular Rapid Flashing Beacon, pedestrian countdown signal, leading pedestrian interval, and traffic signal progression. Treatments are not limited to those identified here.

High-priority Projects: C-12, C-13, C-15, C-16, C-17, C-19, C-20, C-21, C-22, C-23, C-24, C-33

Medium-priority Projects: C-31, C-32, C-34

Project Cost (2012 dollars): Average cost for each intersection estimated at $10,000. ctual costs may vary depending on the crossing treatment applied.

Typical Applications:

C-3	Planned Intersection Crossing Improvement Projects

Description: Rapid Rectangular Flashing Beacon, Crosswalk Striping and Signage

Purpose: A Rectangular Rapid Flashing Beacon (RRFB) can improve the visibility of crossings and call attention to the pedestrian crossing. The RRFB can be used to supplement pedestrian and school crossing warning signs with a diagonal downward arrow, located at or immediately adjacent to a marked crosswalk. RRFBs only illuminate upon activation by a pedestrian. Activation can be accomplished either through a pedestrian push-button or a pedestrian detection device. After the unit is actuated, the signal produces an irregular flash pattern similar to police or emergency vehicles. An RRFB should only be installed to function as a warning beacon and not as a traffic control device.

Higher-priority Projects: C-26, C-27

Medium-priority Projects: C-3, C-28, C-29, C-30

Project Cost (2012 dollars): Average cost per intersection estimated at $30,000 to $50,000. Actual costs may vary depending on the crossing treatment applied.

Typical Application:

P-1	Planned Sidewalk Projects

Description: Sidewalk

Purpose: Provide off-street pedestrian facilities on one or both sides of street, includes widening (as needed).

Higher-priority Projects: P-3, P-26, P-28, P-29, P-35, P-44

Medium-priority Projects: P-1, P-2, P-5, P-6, P-8, P-10, P-11, P-13, P-14, P-15, P-16, P-17, P-20, P-19, P-18, P-21, P-22, P-23, P-27, P-31, P-33, P-38, P-39, P-40, P-41, P-42, P-43

Lower-priority Projects: P-4, P-7, P-9, P-12, P-24, P-25, P-30, P-32, P-34, P-36, P-37, P-45

Project Cost (2012 dollars): Estimates range from $17,300 to $465,000, depending on the length of each section and one- or both sides of street. Assumes 6-foot sidewalks at $30/linear foot without curb, $50/linear foot including curb.

Typical Application:

B-1	Planned Bike Lane Projects

Description: Bike Lanes

Purpose: Bike lanes are a striped portion of the road that forms an area specifically for bicyclists. Bike lanes increase the visibility of bicyclists to motorists by providing a designated space on the road.

Some bike lane projects require pavement widening to provide a 5-foot wide bike lane on each side of the road.

Higher-priority Projects: B-1, B-2, B-10, B-11, B-28, B-30, B-31, B-32, B-33

Medium-priority Projects: B-3, B-5, B-6, B-12, B-14, B-15, B-16, B-23, B-29

Lower-priority Projects: B-8, B-27

Project Cost (2012 dollars): $17,300-$465,000 is estimated, depending on the length of each section and whether pavement widening is required.

Costs assume $0.40 per linear foot for continuous stripe, and bike symbols every 1000 feet. A 30-percent contingency factor is assumed and no right-of-way costs are included in the cost estimates. When pavement width is less than 34 feet (two 12-foot lanes, two 5-foot lanes), additional pavement was assumed at a cost of $5 per square foot.

Typical Application:

B-2	Planned Bike Lane Projects

Description: Marking/Signs

Purpose: On those roadways where bicyclists and motorists use the same travel lanes (shared roadways) or bicyclists travel on a narrow shoulder (shoulder bikeways), signage and markings may remind motorists to share the road with bicyclists. Signage on rural roads could include a bike warning sign (W11-1) with the supplemental plaque "ON ROADWAY" (OBW1-5) for short segments and the additional rider "NEXT XX MILES" if it is a continuous condition. On residential or other low-volume roads markings could include "sharrows" that indicate that bikes may be on the road with motor vehicles.

Medium-priority Projects: B-4, B-7, B-9, B-13, B-17, B-18, B-19, B-20, B-22, B-21, B-24, B-25, B-26

Project Cost (2012 dollars): The cost of these improvements will vary based on the number of pavement markings applied and/or the number of signs installed. Cost estimates assume $0.40 per linear foot, which can be allocated to signage and/or markings. A 30-percent contingency factor is assumed and no right-of-way costs are included in the cost estimates.

Typical Application:

W11-1*

Example of a "sharrow" pavement marking on a residential street. Source: MUTCD

S-1	Planned Shared-use Path Projects

Description: Shared-use Path

Purpose: Shared-use paths will help facilitate travel by bicycle and other non-motorized forms of transportation.

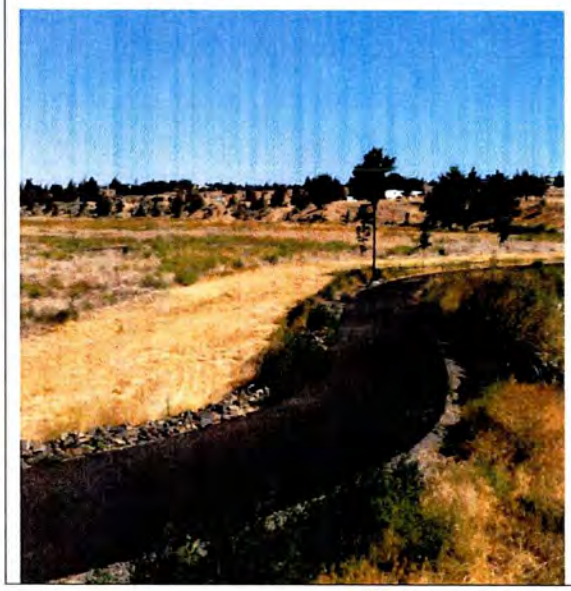
Higher-priority Projects: S-4

Medium-priority Projects: S-1, S-3, S-2, S-6, S-7, S-10, S-8, S-11, S-13, S-12, S-15, S-14

Lower-priority Projects: S-5

Project Cost (2012 dollars): Path segments range in cost from $58,000 to $500,000, which assumes $65 per lineal foot of path for lighting, design, and construction. An additional cost of $150,000 is assumed for each bridge required. The cost estimates are based on previous construction costs for shared-use paths recently constructed in Madras. Right-of-way costs are not included in the estimate project cost.

Typical Application:



CHAPTER 6: TRANSPORTATION SYSTEM PLAN UPDATE

This section provides an updated functional classification map, street design standards, access management standards, and mobility standards for the City of Madras. These updated elements of the Transportation System Plan are based on the findings provided in Technical Memorandum 2A and Sections A and B of this memorandum.

ROADWAY SYSTEM PLAN

Based on the findings of the 1998 Transportation System Plan, evaluation of 2001 conditions, and evaluation of the three concept areas identified for future growth, an updated roadway system plan was developed. The city's roadway system plan provides guidance as to how to best facilitate travel within the city by addressing the following issues:

- Reducing the reliance on the US 97/US 26 corridor for local trips;
- Meeting the goals, objectives, and policies of the 1999 Oregon Highway Plan (OHP) and City of Madras Comprehensive Plan;
- Reducing the reliance on single occupied vehicles through the redistribution of residential, commercial, and industrial land uses;
- Providing a roadway functional classification system and corresponding roadway design standards, and
- Improving roadway connectivity, including new and improved streets to meet future capacity, circulation, and safety needs.

FUNCTIONAL CLASSIFICATION

The purpose of classifying roadways is to create a mechanism through which a balanced transportation system can be developed that facilitates mobility for all modes of transportation. A given roadway's functional classification determines its intended purpose, the amount and character of traffic that it is expected to carry, commitment to serve and promote non-auto travel, and its design standards.

The classification of a given street is intended to convey the requirements, capabilities, and capacity of each respective roadway while recognizing that roadway's contribution to the overall transportation system. It is imperative that the classification of streets is considered in relation to adjacent properties, the land uses that they serve, and the modes of transportation that can be accommodated. Further, each street must be

appropriately designed to accommodate local travelers (i.e., passenger cars, heavy trucks, pedestrians, and bicycles). The public right-of-way must also provide sufficient space for utilities to serve adjacent land uses.

The updated City of Madras Transportation System Plan incorporates five functional categories:

- City Expressways
- Arterials
- Major Collectors
- Minor Collectors
- Local Streets

In addition, this TSP update provides highway segment classifications for US 97 and US 26 within the City of Madras UGB.

Statewide Highways

Within the Madras UGB, US 26 and US 97 are classified as Statewide Highways under the 1999 Oregon Highway Plan (OHP). As defined by the 1999 OHP:

> Statewide Highways typically provide inter-urban and inter-regional mobility and provide connections to larger urban areas, ports, and major recreational areas that are not directly served by Interstate Highways. A secondary function is to provide connections for intra-urban and intra-regional trips.

In addition to these statewide highways, Oregon Highway 361 (Culver Highway), designated as a District Highway, also passes within Madras's UGB. As defined by the 1999 OHP:

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

The 1999 OHP also recognizes that the management objective for a particular section of highway depends on the function of the roadway as well as on surrounding land uses. As a result, a subset of highway classifications has been developed to address mobility/accessibility issues where highway accessibility may become more of priority than high-speed, continuous-flow operation. An explanation of each urban highway segment classification follows. Table C1 is a summary of the proposed locations for each highway segment classification for US 97 and US 26 with the Madras UGB.

Expressways

Expressways are complete routes or segments of existing two-lane and multi-lane highways and planned multi-lane highways that provide for safe and efficient high-speed and high-volume traffic movements. Their primary function is to provide for interurban travel and connections to ports and major recreation areas with minimal interruptions. A secondary function is to provide for long distance intra-urban travel in metropolitan areas. In urban areas, speeds are moderate to high. Usually there are no pedestrian facilities and bikeways may be separated from the roadway.

Urban Other

The objective of an Urban Other segment designation is to move through traffic efficiently while also meeting the access needs of nearby properties. Access can be provided to and from individual properties abutting an Urban Other segment, but the strong preference is to limit such access, providing it instead on connecting local roads and streets. Transit turnouts, sidewalks, and bicycle lanes are accommodated.

Urban Business Area

The Urban Business Area (UBA) is a highway segment designation that recognizes existing or planned areas of commercial activity or various types of commercial activity centers within the UGB. This designation may be applied within UGBs on District, Regional, or Statewide Highways where vehicular accessibility is important to continued economic viability. The primary objective of the state highway in an Urban Business Area (UBA) is to maintain existing speeds while balancing the access needs of abutting properties with the need to move through traffic.

Table C1: Proposed Highway Segment Designations

Highway	Milepost (street / location)		Highway Segment Classification			
	Begin	End	Expressway	Other	UBA	STA
US 26	MP 115.86 (NW Cherry Lane)	MP 117.16 (Madras UGB)	X			
US 26	MP 117.16 (Madras UGB)	MP 117.58 (US 97)		X		
US 97	MP 89.65 (NE Cherry Lane)	MP 91.44 (Madras UGB)	X			
US 97	MP 91.44 (Madras UGB)	MP 91.94 (US 26)		X		
US 97 / US 26	MP 91.94 (US 26)	MP 92.14 ("A" Street)		X		
US 97 / US 26	MP 92.14 ("A" Street)	MP 92.47 ("E" Street)				X
US 97 / US 26	MP 92.47 ("E" Street)	MP 93.04 ("J" Street)			X	
US 97 / US 26	MP 93.04 ("J" Street)	MP 97.18* (US 26)		X		
US 97	MP 97.18* (US 26)	MP 115.62* (Central Ave.-Terrebonne)	X			
US 26	MP 0.00 (US 97)	MP 1.16 (SW Dover Lane)	X			
OR 361	MP 0.00 (US 26 & US 97)	MP 0.89 (Madras UGB)		X		
OR 361	MP 0.89 (Madras UGB)	MP 2.27 (SW Colfax Lane)		X		

* Milepost calculated based on Equation: MP 93.12 = MP 96.04

A UBA may apply to an existing area of commercial activity or future center or mode of commercial activity in a community located on a District, Regional or Statewide Highway where speeds are 35 mph (55 kilometers per hour) or less. ODOT has indicated that the designation of UBAs on Statewide Highways should be limited to only those special circumstances where, from a system-wide perspective, the need for local access clearly

equals or is greater than the need for mobility for an existing designation. For a new designation, the need for local access must be greater than the need for mobility. Vehicular accessibility is often as important as pedestrian, bicycle, and transit accessibility. Safe and regular street connections are encouraged. Transit turnouts, sidewalks, and bicycle lanes are accommodated.

Special Transportation Area

The primary objective of managing highway facilities in an existing or future Special Transportation Area (STA) is to provide access to community activities, businesses, and residences and to accommodate pedestrian movement along and across the highway in a downtown, business district, and/or community center (including those in unincorporated communities) as defined by Oregon Administrative Rule (OAR) 660-22.

An STA is a highway segment designation that may be applied to a highway segment when a downtown business district or community center straddles the state highway within a UGB or in an unincorporated community in accordance with Action 1B.9 Direct street connections and shared on-street parking are encouraged in urban areas and may be encouraged in unincorporated communities. Direct property access is limited in an STA. Local auto, pedestrian, bicycle, and transit movements to the business district or community center are generally as important as the through movement of traffic. Traffic speeds are slow, generally 25 mph (40 kilometers per hour) or less.

City Expressways

City Expressways are intended to primarily serve truck traffic and automobile traffic traveling through the City of Madras Urban Growth Area. City Expressways will be access controlled, divided four-lane roadways with separated multi-use paths for pedestrian and bicycle traffic. Full-access points along City Expressways will be limited to designated Major Collector Street or higher classification facilities. All other access (i.e., Minor Collector, local street, and private roadways or driveways) to City Expressways will be limited to right-in/right-out access.

Arterials

Arterials are roadways that are primarily intended to serve traffic entering and leaving the urban area. Arterials tend to carry significant intra-urban travel between downtown areas and outlying residential areas. While arterials may provide access to adjacent land, that function is subordinate to the travel service provided to major traffic movements. Arterials are the longest-distance, highest-volume roadways within the UGB. Although focused on serving longer distance trips, pedestrian and/or bicycle activities are often associated with the arterial streetscape. Bike facilities are typically provided in the form of a "bike lane" along these roadways.

Major Collectors

Major collector facilities link arterials with the local street system. As implied by their name, major collectors are intended to collect traffic from local streets and sometimes from direct land access, and channel it to arterial facilities. Major collectors are shorter than arterials and tend to have moderate speeds. Bike facilities are typically provided in the form of a "bike lane" along these roadways.

Minor Collectors

Minor collector facilities are a subset of collectors used to provide direct land access service and traffic circulation to local neighborhoods. These facilities tend to carry lower traffic volumes at slower speeds than major collectors. On-street parking is more prevalent and bike facilities may be provided in the form of a "bike lane" or shared with autos on the roadway.

Local Streets

Local streets are primarily intended to provide access to abutting land uses. Local street facilities offer the lowest level of mobility and consequently tend to be short, low-speed facilities. As such, local streets primarily serve passenger cars, pedestrians, and bicyclists; heavy truck traffic should be discouraged. On-street parking is common and sidewalks may be present depending on the volume of traffic on the local road and the density of residential land use and in commercial areas.

FUNCTIONAL CLASSIFICATION PLAN

Using the five roadway designations described, all current and future streets within the city have been designated in the Functional Classification Plan presented in Figure C1. The major roadway designations shown in Figure C1 are summarized below. (Note: The designations may apply to only a portion of the roadways listed below. Refer to Figure C1 for the applicable sections.)

City Expressways

- Proposed Truck By-Pass

Arterials

- US 26 (Hwy. 53) - Warm Springs
- Oregon Highway 361 (Culver Highway)

- US 26 (Hwy. 360) - Prineville
- US 97 (Hwy. 4)
- Hall Road Extension (Hwy. 361 to Hwy. 4)

Major Collectors

- Wright Street
- Cherry Lane
- Deimers Road
- Earl Street
- Conroy Street
- Glass Drive (Canyon Road)
- "B" Street (2nd to east UGB)
- 2nd Street (C" to "J")
- "C" Street
- Loucks Road
- 10th Street
- Claremont Drive
- Bean Drive Extension (Ashwood to UGB)
- Buff Street (5th to McTaggart)
- "J" Street
- McTaggart Road
- Adams Road
- Hall Road
- Fairgrounds Road

Minor Collectors

- US 26 Frontage Road (UGB to Jersey)
- Jersey Street
- Mill Street
- US 26 Frontage Road (Cherry to Earl Extension)
- Adler Street
- Hess Street
- US 26 Frontage Road (Cherry to Hogan)
- Hogan Street (Michals to Hwy. 53)
- 7th Street
- 3rd Street Extension (Oak Extension to "B")
- "E" Street (1st to Hwy. 4)
- "E" Street Extension (Grizzly to "J")
- Grizzly Road
- "H" Street (Hwy. 361 to 5th)
- Buff Street Extension (McTaggart to Claremont)
- Marshall Street (Hwy. 361 to "I")

- Michals Street (Hogan to Earl)
- Birch Lane (UGB to Depot)
- Depot Road (Birch to Hwy. 53)
- Hillcrest Extension (Kinkade Extension to Oak)
- Kinkade Avenue
- Cedar Street
- Oak Street
- 2nd Street ("J" to "M")
- "M" Street (Marshall Extension to Hwy. 4)
- Overlook Drive (Fairgrounds Extension to Burns)
- Burns Lane (UGB to Overlook)
- Colfax Lane (Hwy. 361 to Hwy. 4)

Local Streets

- The remaining roads in the city are designated as local streets.

New Roadways

As part of the TSP Update process, conceptual alignments for future collector roadways were identified as shown in Figure C1. The purpose of identifying these potential future roadways was to:

- provide for appropriate future roadway infrastructure to serve areas with future development potential;
- increase the connectivity of future development with respect to existing neighborhoods and infrastructure;
- provide access to property through multiple locations; and
- provide the city with guidelines for roadway alignments as future development occurs.

The need for the facilities identified in Figure C1 will be driven by future development within the City's UGB. It should be stressed that the location of the potential new roadways is approximate and that the actual roadway alignment will need to be determined based on identified constraints and specific development plans for individual areas.

Street Design Standards

Street design standards are based on the functional and operational characteristics of streets such as travel volume, capacity, operating speed, and safety. They are necessary to ensure that the system of streets, as it develops, will be capable of safely and efficiently serving the traveling public while also accommodating the orderly development of adjacent lands.

Figures C2 and C3 illustrate typical cross sections for the various roadways identified in the functional classification system. The typical roadway cross sections comprise the following elements: right-of-way, number of travel lanes, bicycle and pedestrian facilities, drainage, and optional amenities such as landscape strips. The cross sections illustrated in Figures C2 and C3 are intended for planning and design purposes for new road construction as well as for those locations where it is physically and economically feasible to improve existing streets.

The typical cross sections present standards for roadways that allow for flexibility in defining the actual roadway width through optional features such as landscape strips and on-street parking. The use of on-street parking and planter strips would be subject to the discretion of the City of Madras, which would determine whether such amenities are required on a given street. Table C2 summarizes the street design standards for the different roadway classifications.

Table C2: Street Design Standards

Classification	Cross Section	Minimum ROW	Turn Lanes	Travel Lanes	Bike Lane	Sidewalks	On-Street Parking	Landscape Strip
Expressway	4 lanes	98 feet	Yes [1]	12 feet	No [2]	No [2]	No	Optional
Urban Other	4 lanes	98 feet	Yes [1]	12 feet	Yes	Yes	No	Optional
UBA	2 lanes	56 feet	Optional [1]	12 feet	Yes	Yes	No	Optional
STA	2 lanes	70 feet	Optional [1]	12 feet	Yes	Yes	Yes	Optional
City Expressway	4 lanes	98 feet	Yes [1]	12 feet	No [2]	No [2]	No	Yes
Arterial	2 lanes	80 feet	Optional [1]	12 feet	Yes	Yes	No	Optional
Major Collector	2 lanes	70 feet	Optional [1]	12 feet	Yes	Yes	No	Optional
Minor Collector	2 lanes	60 feet	No	12 feet	No	Yes	Optional	Optional
Local Street	2 lanes	54 feet	No	Not striped (32 feet paved width)	No	Optional	Optional	Optional

ROW = Right-of-Way
[1] Minimum width = 14 feet
[2] Bicycle and pedestrian traffic are to be accommodated by a 12-foot multi-use path.

The optional availability of streetscape treatments such as landscape strips, pedestrian refuges, and bike lanes may be valuable to the city in the future as an instrument by which the character of roadways can be influenced. The City of Madras would also have the prerogative of allowing narrower local streets in their development projects, thereby creating an ability to reduce impervious surface and provide site-specific standards for roadway improvement projects that reflect local conditions. Narrower streets may also be desirable in some neighborhood areas to deter cut-through or speeding traffic on local streets. It should be noted that ODOT would have the ultimate authority as to which improvements are made along US 26, US 97, and Highway 361.

Under the street standards, City Expressways will have a right-of-way of 98 feet. The City Expressway cross-section will be consistent with the ODOT Expressway cross-section and consist of two 12-foot-wide travel lanes in each direction, a raised 14-foot median, and a separated 12-foot multi-use path. In addition, 10-foot landscape strips will be provided on both sides of the facility. Arterial streets will have a right-of-way

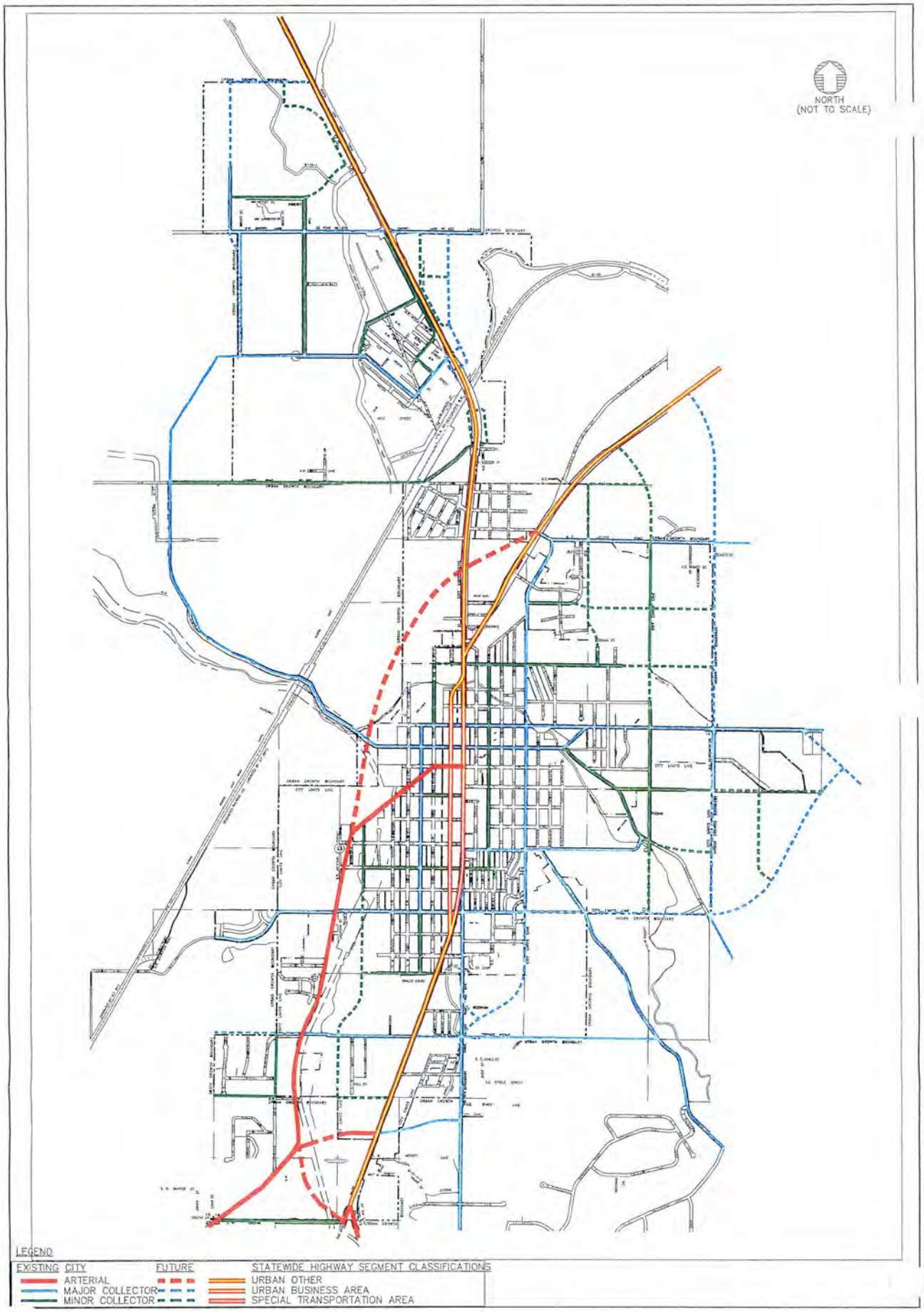
requirement of 80 feet. The street cross-section will consist of two 12-foot-wide travel lanes, an optional center left-turn lane, and appropriate pedestrian and bicycle facilities. Landscape strips will be provided at the discretion of the city.

Major collector streets will have a right-of-way requirement of 70 feet and a required cross-section consisting of two 12-foot-wide travel lanes and an optional center left-turn lane. Bike lanes are required. Optional landscape strips and on-street parking may also be required at the discretion of the city.

Minor collector streets will have a right-of-way requirement of 60 feet and a required cross-section consisting of two 12-foot-wide travel lanes. No bike lanes will be required; however, landscape strips and on-street parking can be required at the discretion of the city.

Local streets will have a right-of-way requirement of 54 feet, a 32-foot-wide paved cross section, and 6-foot wide sidewalks. Requirement of adjacent landscape strips may be made at the discretion of the city.

Adjacent landscape strips may be required at the discretion of the city. The landscaping strips are located between street and sidewalk on arterial and collector facilities to provide a buffer between cars and pedestrians. Providing a landscaping strip between the street and sidewalk will allow for an area with no obstructions or impediments that would prevent or discourage pedestrian movements. Further, the landscape strips can be used for the location of street signs, power poles, and utility easements to provide for unimpeded pedestrian movements.



PROPOSED FUNCTIONAL CLASSIFICATION MAP

CITY OF MADRAS COMPREHENSIVE PLAN AND TRANSPORTATION SYSTEM PLAN UPDATE

APRIL 2001

FIGURE C1

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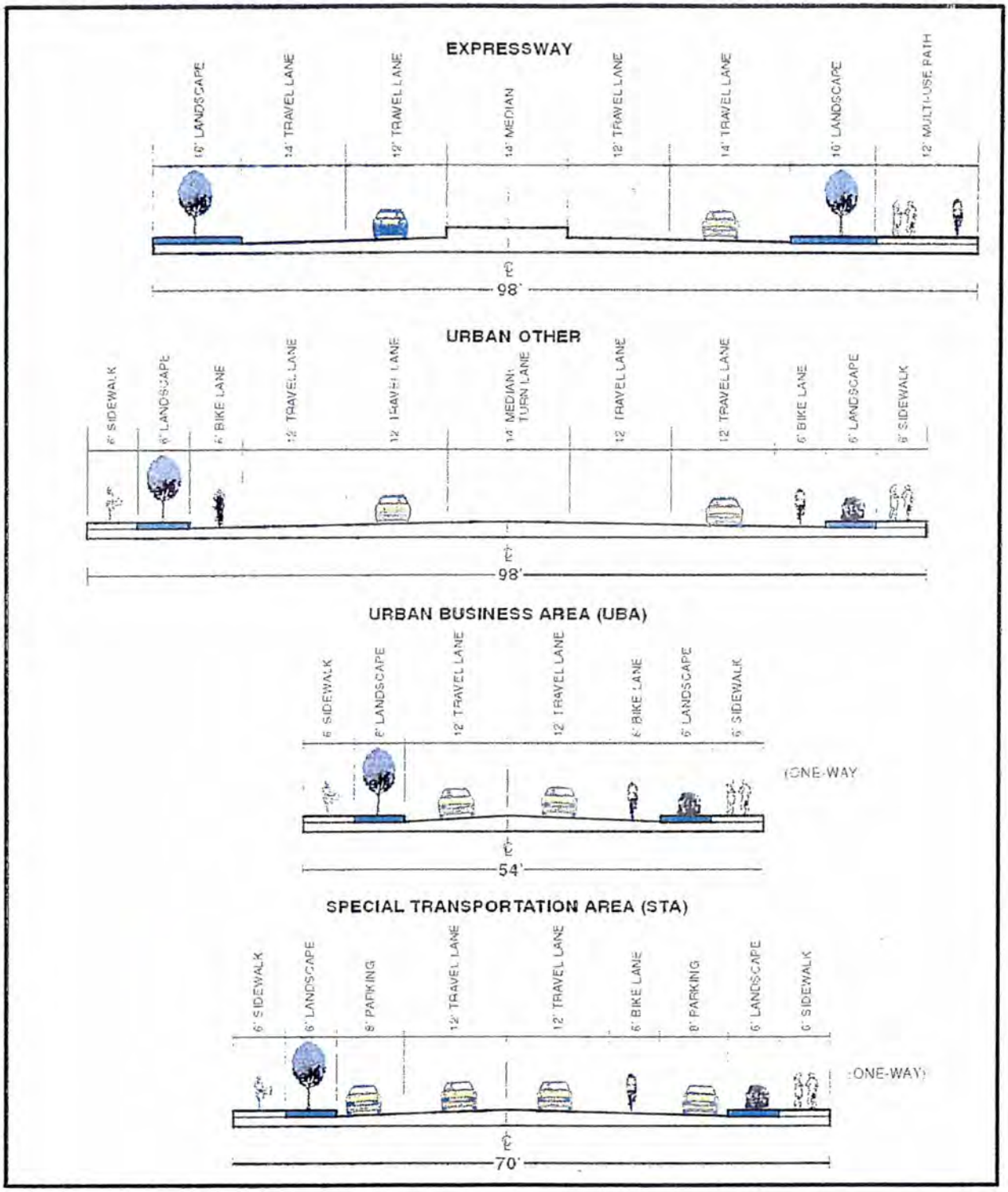


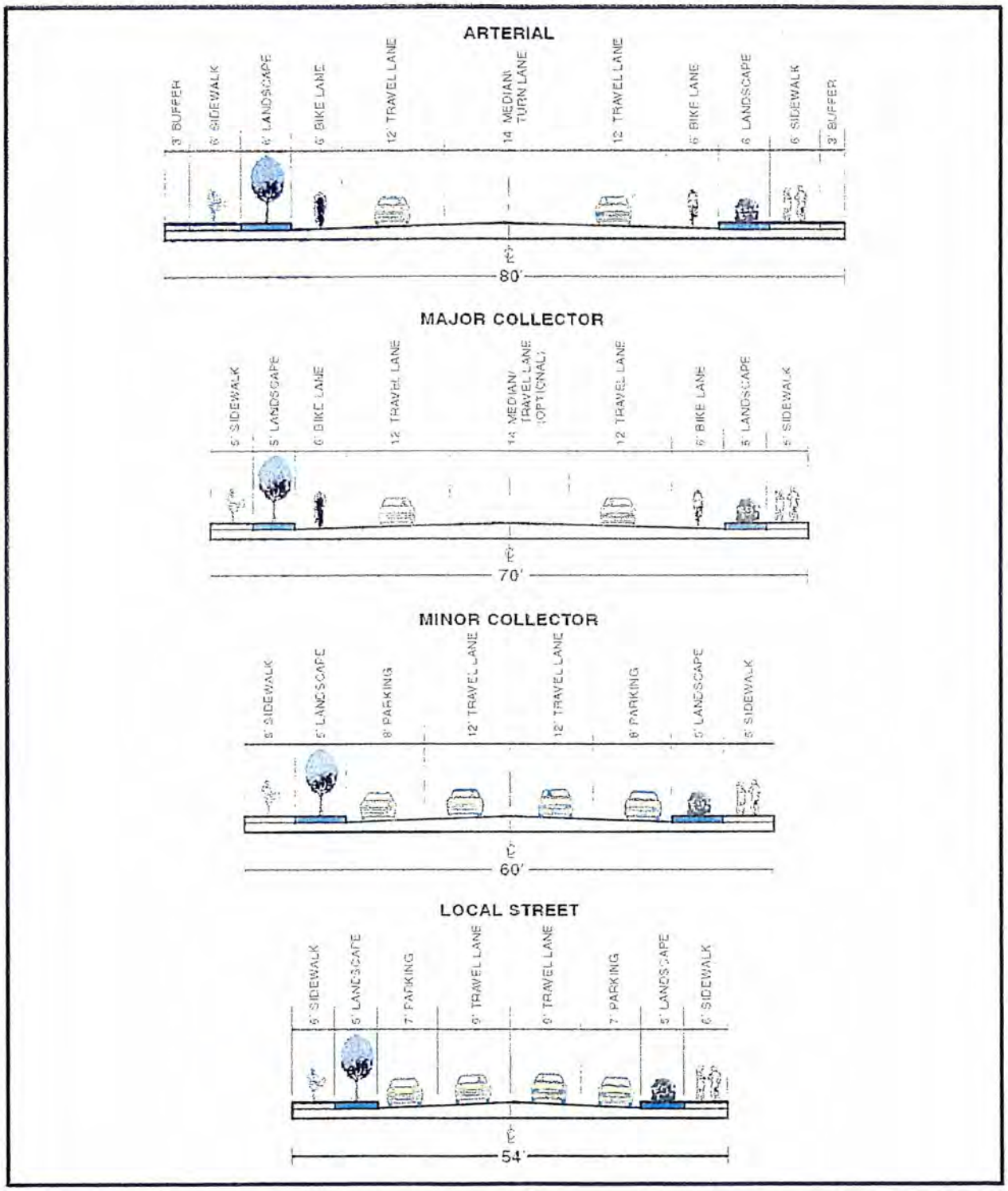
TYPICAL CROSS-SECTIONS

CITY OF MADRAS COMPREHENSIVE PLAN AND TRANSPORTATION SYSTEM PLAN UPDATE

APRIL 2001

FIGURE C2

4139\DWGS\TECH. MEMO. #2B\4139XSEC.CDR



TYPICAL CROSS-SECTIONS

CITY OF MADRAS COMPREHENSIVE PLAN AND TRANSPORTATION SYSTEM PLAN UPDATE

APRIL 2001

FIGURE C3

4139DWG\STECH MEMO #2B\4139XSEC.CDR

Modern Roundabout Design and Operation Consideration

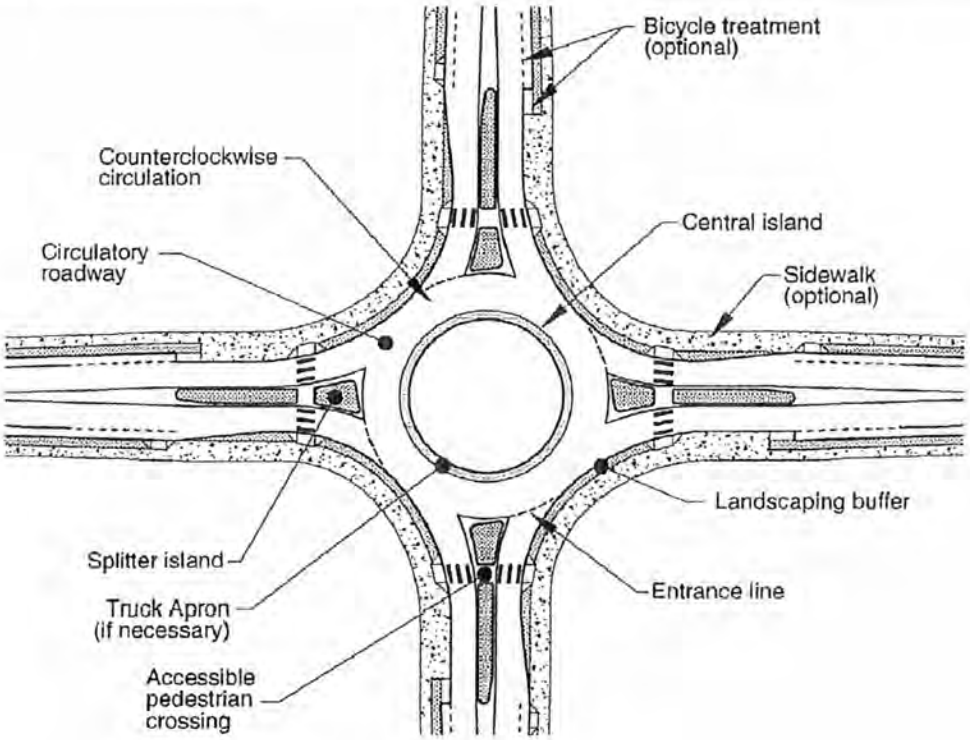
Modern roundabouts are a form of intersection design that provide safe and efficient flow of traffic within a certain range of traffic volume. Numerous research studies in the U.S. and abroad have shown that the operation of roundabouts is highly dependent on its geometric design and the characteristic of the traffic volume it serves. The detailed information on the safety, operations, and design of roundabout is provided in Roundabouts: An Informational Guide, published by the Federal Highway Administration (FHWA). The document stipulates that before the details of the geometry are defined, three fundamental elements must be determined in the preliminary design stage:

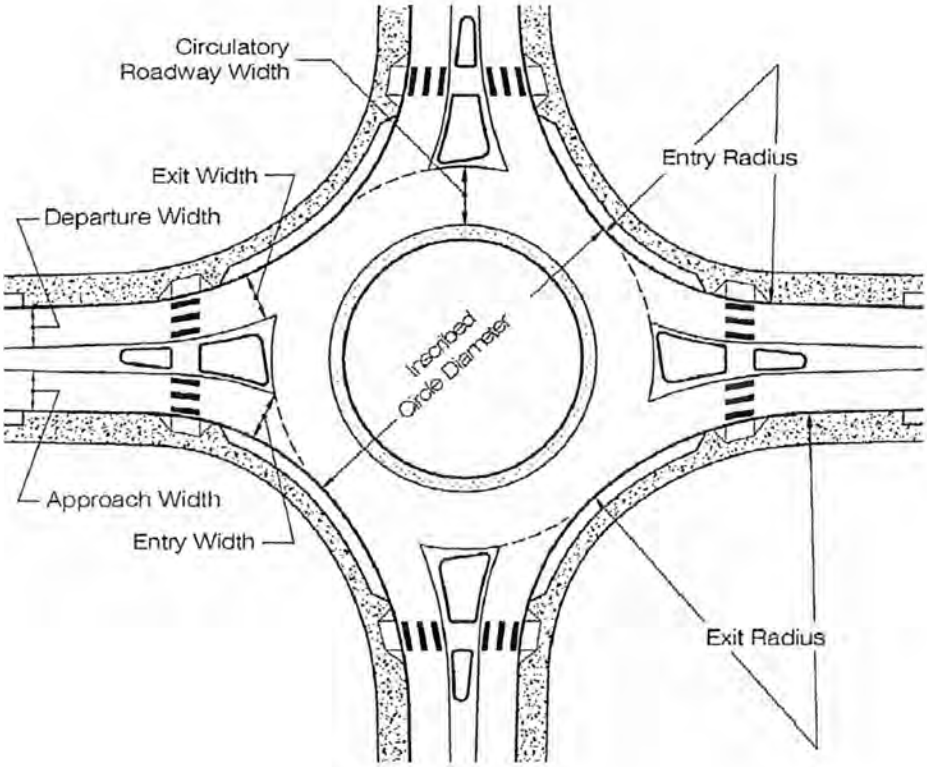
1. The optimal roundabout size;
2. The optimal position; and
3. The optimal alignment and arrangement of approach legs.

The document also highlights following critical design principals for roundabouts:

- Speed Profiles
- Design Speed
- Vehicle Paths
- Speed-Curve Relationship
- Speed Consistency

Other design considerations like design vehicle and non-motorized design users, among others, are also discussed in detail in the document. A volume-to-capacity (v/c) ratio of 0.85 is recommended as the operational standard of a roundabout. Exception to the v/c ratio standard is recommended when long-term analysis is conducted. Figure 10 shows key features and dimensions of modern roundabout.





KEY ROUNDABOUT FEATURES AND DIMENSIONS
MADRAS, OREGON

FIGURE **10**

K:\H_P...and\profile\7976 - Madras TSP Amendment\dwgs\figs\Fig 11.dwg Oct 10, 2006 - 1:29pm - sonta Layou... Fig 10

City of Madras Roundabout Standard

City of Madras and Jefferson County are planning to build several modern roundabouts around the city. In an effort to ensure that proper engineering standards are used when constructing roundabouts in and around the city, the following design guidelines are recommended to be followed:

1. Roundabouts: An Informational Guide published by FHWA
2. A Policy on Geometric Design of Highways and Streets (Green Book), published by AASHTO
3. Manual on Uniform Traffic Control Devices, published by FHWA

Table 1 shows the recommended inscribed circle diameter ranges that are provided in Exhibit 6-19 of the roundabout guide.

Table 1
Recommended Inscribed Circle Diameter Ranges From Exhibit 6-19 of the Roundabouts: An Informational Guide

Site Category	Typical Design Vehicle	Inscribed Circle Diameter Range *
Mini-Roundabout	Single-Unit Truck	45 - 80 feet
Urban Compact	Single-Unit Truck / Bus	80 - 100 feet
Urban Single Lane	WB-50	100 - 130 feet
Urban Double Lane	WB-50	150 - 180 feet
Rural Single Lane	WB-67	115 - 130 feet
Rural Double Lane	WB-67	180 - 200 feet

* Assumes 90 degree angles between entries and no more than four legs.

Intersections of roadway facility types should consider all forms on intersection to ensure safe operating environment. Subject to a discretionary analysis by the Public Works Department, a modern roundabout is the initially preferred form of intersection between two major collectors or higher facilities. Based on City of Madras staff review of roundabouts in the region, a modern roundabout with an inscribed circle diameter of 190 feet and right-of-way of 252 feet diameter shall be dedicated as default, if no safety and operational analysis is presented to justify a smaller inscribed circle diameter. A

roundabout with smaller inscribed diameter might be approved at a certain location if a 20-year traffic safety and operation analysis determines that a smaller roundabout will operate adequately in the long-term. It is recommended that such a safety and operational analysis be conducted at all proposed/planned roundabouts before a final design is approved.

Planned Roundabouts

City of Madras and Jefferson County are planning to construct modern roundabouts at the following locations:

- Kinkade Avenue / Oak Street / City View Street
- Kinkade Avenue Extension / Bean Drive Extension
- "J" Street Extension / Bean Drive Extension
- "J" Street Extension / Grizzly Road
- Fairground Road Extension / Grizzly Road
- Fairground Road Extension / McTaggart Road

[Modern Roundabout Design and Operation Consideration, City of Madras Roundabout Standard, and Planned Roundabouts, added by passage of Ordinance No. 785, December 12, 2006.]

Guidelines for Arterial / Collector Intersection Improvements

In addition to roadway cross-section standards, the City should adopt standards for intersection improvements. As intersection improvements are made at arterial/collector intersections in the city, the following general guidelines should be considered:

- maintain adequate signing of side streets (stop signs and visible street signs);
- provide street lighting at intersections to increase visibility; and
- provide proper channelization (striping, raised medians, etc.) of movements to/from the arterial.

Relation to Development Activities

At the time development activities are proposed, the City of Madras, when appropriate, will require three-quarter street improvements or a minimum of two 12-foot travel lanes, whichever is greater, as part of a given project's conditions of approval. The conditions of approval should require that roadways adjacent to development activities be constructed to comply with the street standards presented in this TSP. Section D, Development Review Standards, provides sample development review guidelines that are recommended for adoption by the city.

Relation to County Facilities

The Jefferson County Transportation System Plan identified roadway standards for county facilities. The County's right-of-way requirement for Rural Access Roadways is 60 feet, as compared to the 54-foot requirement identified for local streets in this TSP. Although the County's Rural Access Roadways may be applicable to some roadways within the City of Madras Urban Growth Boundary the roadway standards contained in the City of Madras TSP do not conflict with the county's standards. The county's Rural Access Roadway standards are intended for roads that do not exhibit substantial traffic volumes now but may be expected to expand in the future, hence the additional right-of-way requirement. By comparison, the 54-foot right-of-way required on city roads designated as being local streets reflects the expectation that these roadways will not require additional widening in the long-term future. The city's minor collector designation would be an appropriate counterpart to the county's Rural Access Roadway designation.

Parking Restrictions

To ensure adequate intersection sight distance, curbside parking should be prohibited within 25 feet of the edge of a given intersection.

ROADWAY IMPROVEMENT PROGRAM

Transportation improvements that will be required to meet both short- and long-term needs in the City of Madras over the next 20 years are listed in Table C3. The projects are listed in priority order and have been divided into three time periods; 0 to 5 years, 5 to 10 years, and 10 to 20 years. A more detailed description of each improvement project is provided in **Section B, Street System Evaluation and Improvement Analysis**.

Table C3: Roadway Improvements

Project #	Improvement Description	Estimated Cost*
	Near-Term, High Priority Projects (0-5 Years)	
1	2nd Street Improvements (B" Street to "M" Street)	$930,000
2	"J" Street Extension (10th Street to Grizzly Road)	$990,000
4	10th Street Improvements (Buff Street to "J" Street)	$760,000
7	Maple Street Extension (1st Street to US 26/US 97) (Ordinance 785, December 12, 2006)	$240,000
8	1st Street Extension (Maple Street to "B" Street) (Ordinance 785, December 12, 2006)	$900,000
9	"H" Street Extension (Marshall Extension to Madison Street)	$90,000
10	Bean Drive Extension (Meadow Lark to "B" Street) (Ordinance 785, December 12, 2006)	$2,040,000
12	Cherry Lane Improvements (Wright Street to US 26)	$620,000
22	Mill Street and Jersey Street Improvements	$260,000
~~27~~	~~Adler Street Improvements~~ This project removed from list as it has already been built and is not identified in Jefferson County TSP. (Ordinance No. 785, December 12, 2006)	~~$800,000~~
35	Adams Drive / 10th Street Connection	$690,000

Project #	Improvement Description	Estimated Cost*
	Mid-Term Projects (5-10 Years)	
3	Kinkade Road Improvements ("B" Street to Grizzly Road)	$650,000
5	"M" Street Extension (Marshall Extension to Madison Street)	$110,000
6	Fairgrounds Road Extension (US 26/US 97 to Grizzly Road) (Ordinance 785, December 12, 2006)	$190,000
11	US 26/US 97 - Colfax Lane Realignment & Signal	$820,000
13	"E" Street Improvements (Grizzly Road to Kinkade Road)	$110,000
14	Oak Street Extension (16th Street to City View Street) (Ordinance 785, December 12, 2006)	$320,000
16	Depot Road/US 26 Intersection Improvements	$3,290,000
20	Jersey Street Extension (Mill Street to the Wright Street Ext.)	$580,000
24	Diemers Road Extension (Cherry Lane to Glass Drive)	$470,000
30	~~Cedar Street Extension~~ This project removed from the list as Marigold Street, which runs parallel to Cedar Street, is proposed to be extended to Bean Drive. (Ordinance 785, December 12, 2006)	$ 0.00
32	10th Street Improvements ("A" Street to "B" Street)	$2,310,000
34	Marshall Street Extension ("I" Street to Loafers Lane)	$740,000
	Long-Term Projects (10-20 Years)	
15	Grizzly Road Improvements ("C" Street to UGB)	$650,000
17	"J" Street/US 97 Intersection Realignment	$9,000,000
18A	US 26/US 97 North Junction Realignment	$15,920,000
18B	Limited Access Truck By-Pass	$3,510,000
18C	"J" Street/Truck By-Pass Intersection Improvements	$300,000
18D	Truck By-Pass (US 26/US 97 and OR-361 Connection)	$1,050,000

Project #	Improvement Description	Estimated Cost*
19	Cherry Lane/US 26 Intersection Improvements	$300,000
21	Earl Street/US 26 Intersection Improvements	$3,160,000
23	Wright Street Extension (Wright Street to US 26)	$640,000
25	Easterly US 26 Frontage Road (Cherry Lane to Earl Street)	$450,000
26	Easterly Earl Street Extension (Cherry Lane to US 26)	$450,000
28	~~Lakeside Drive Extension.~~ This project is replaced by the Kinkade Avenue Extension and is not included in the Jefferson County TSP. (Ordinance No. 785, December 12, 2006)	$0.00
29	Hillcrest Street Extension (Loucks Road to Oak Street)	$370,000
31	Kinkade Road Extension (Brown Drive to "B" Street) (Ordinance No. 785, December 12, 2006)	$2,000,000
33	Fairgrounds Road Extension (East UGB to OR-361)	$460,000
36	Hall Road Extension (OR-361 to US 97)	$320,000
37	Overlook Drive and Burns Road Improvements	$430,000
38	South Junction Traffic Signals	$600,000
39	Loafers Lane Extension (Marshall Street Ext. to US 26/US 97)	$170,000
41	Bean Drive Extension (Ashwood Road to "J" Street Extension) (Ordinance No. 785, December 12, 2006)	$310,000
42	North-South UGB Road #1 ("B" Street to "J" Street) (Ordinance No. 785, December 12, 2006)	$370,000
43	"J" Street Extension (Grizzly Road to Bean Drive Extension) (Ordinance No. 785, December 12, 2006)	$570,000
44	East-West UGB Road #1(City View Street to Future Growth Area) (Ordinance No. 785, December 12, 2006)	$840,000
45	"E" Street Extension (Kinkade Avenue to Ashwood Road) (Ordinance No. 785, December 12, 2006)	$390,000

* Estimated costs are in 2001 dollars and include 15-percent for engineering and 30-percent for contingency. The cost estimates do not include right-of-way acquisition, sewerage, and/or utility relocation.

ACCESS MANAGEMENT STRATEGIES

As the City of Madras continues to develop, the arterial/collector/local street system will become more heavily relied on for a variety of travel needs. Consequently, it will become increasingly important to manage access on the existing and future arterial/collector street system as new development occurs. Access locations on roadway sections need to be properly located to ensure safe and efficient travel along a given transportation facility. Access locations should be placed appropriately to limit potential conflicting turning movements, weaving maneuvers over short distances, and congestion along facilities.

The Oregon Transportation Planning Rule (TPR) defines access management as a set of measures regulating access to streets, roads, and highways from public roads and private driveways. The TPR requires that new connections to arterials and state highways be consistent with designated access management categories. One objective of the TSP Update was to develop an access management policy that maintains and enhances the integrity (capacity, safety, and level of service) of the City's streets. From a policy perspective, ODOT has legal authority to regulate access points along US 26, US 97, and Oregon Highway 361 within the City's UGB. The City of Madras will manage access on other collector and local streets within its jurisdiction to ensure the efficient movement of traffic and to enhance safety.

Access management standards vary depending on the functional classification and purpose of a given roadway. Roadways in the upper echelon of the functional classification system (i.e. arterials) tend to have stringent spacing standards, while facilities ranked lower in the functional classification system allow more closely spaced access points. The following discussion presents the hierarchical access management system for roadways in Madras.

ODOT ACCESS MANAGEMENT STANDARDS

The 1999 Oregon Highway Plan (Reference 1) specifies an access management classification system for state facilities and has classified US 26 and US 97 as being Statewide Highways. Although the City of Madras may designate state highways as arterial roadways within their transportation system, the access management categories for these facilities will be required to follow the guidelines of the 1999 Oregon Highway Plan and standards set forth in Oregon Administrative Rule (OAR) 734-51.

Impact on Local Development Activities

Future developments along both US 26 and US 97 (zone changes, comprehensive plan amendments, redevelopment, new development, and/or changes in existing uses) will be required to meet the access management spacing standards for state highways as outlined in the OAR 734-51. OAR 734-51 spacing standards for statewide and district

highways are presented in Tables C4 and C5, respectively. For example, as shown in Table C4, a new development will need to maintain a 990-foot spacing (centerline-to-centerline) between accesses for an Urban Other statewide highway segment with a posted speed of 45 mph.

Table C4: Access Management Spacing Standards (in Feet*) for Statewide Highways (1) (2) (3) (4)

Posted Speed (5)	Rural		Urban			
	Expressway	Other	Expressway	Other	UBA	STA
≥55	5,280	1,320	2,640	1,320		
50	5,280	1,100	2,640	1,100		
40 & 45	5,280	990	2,640	990		
30 & 35		770		770	720	(6)
≤25		550		550	520	(6)

Source: (OAR 734-051-0190)
Note: The numbers in parentheses [(1)] refer to explanatory notes that follow Table C7
* Measurement of the approach road spacing is from center to center on the same side of the roadway.

Table C5: Access Management Spacing Standards (in Feet*) for District Highways (1) (2) (3) (4)

Posted Speed (5)	Rural		Urban			
	Expressway	Other	Expressway	Other	UBA	STA
≥55	5,280	700	2,640	700		
50	5,280	550	2,640	550		
40 & 45	5,280	500	2,640	500		
30 & 35		400		400	350	(6)
≤25		400		400	350	(6)

Source: (OAR 734-051-0190)
Note: The numbers in parentheses [(1)] refer to explanatory notes that follow Table C7
* Measurement of the approach road spacing is from center to center on the same side of the roadway.

Existing legal, permitted or grandfathered driveway connections and public street intersection spacing are not required to meet the spacing standards immediately upon adoption of this TSP Update. However, existing permitted or grandfathered connections that do not conform to the design goals and objectives of the roadway classification will be upgraded as use of the property changes in nature or intensity requiring application for a new approach permit. Modifications to an approach can be required at any time to address a safety problem or capacity issue that exists or becomes apparent. By statute, the City of Madras and ODOT are required to ensure that all safety and capacity issues are addressed. Proposed land use actions that do not comply with the designated access spacing policy will be required to apply for either a major or minor deviation from standards adopted by ODOT.

In cases where proposed highway approaches/accesses are unable to meet the spacing standards listed in Tables C4 and C5, proposed land use actions will be required to apply for either a Minor or a Major Deviation to the spacing standards per OAR 734-51. Summaries of the Minor Deviation spacing limits for statewide highways and district highways are presented in Tables C6 and C7. Any request to deviate beyond these limits is considered a major deviation.

Table C6: Access Management Spacing Standards
Minor Deviation Limits (in Feet*) for Statewide Highways (1) (2) (3) (4)

Posted Speed (5)	Rural		Urban			
	Expressways	Other	Expressways	Other	UBA	STA
≥55	(none)	(950)	(none)	(870)		
	[none]	[1,150]	[none]	[1,000]		
50	(none)	(700)	(none)	(640)		
	[none]	[900]	[none]	[810]		
40 & 45	(none)	(560)	(none)	(530)		
	[none]	[810]	[none]	[740]		
30 & 35		(400)		(350)	(350)	
		[675]		[600]	[600]	
≤25		(280)		(250)	(250)	
		[525]		[400]	[400]	

Source: (OAR 734-051-0190)
Note: The numbers in parentheses [(1)] refer to explanatory notes that follow Table C7.
* Measurement of the approach road spacing is from center to center on the same side of the roadway.
(____) = Driveway Spacing Minor Deviation Limit.
[____] = Public Street Spacing Minor Deviation Limit.

Table C7: Access Management Spacing Standards
Minor Deviation Limits (in Feet*) for District Highways (1) (2) (3) (4)

Posted Speed (5)	Rural		Urban			
	Expressways	Other	Expressways	Other	UBA	STA
≥55	(none)	(650)	(none)	(650)		
	[none]	[660]	[none]	[660]		
50	(none)	(475)	(none)	(475)		
	[none]	[525]	[none]	[525]		
40 & 45	(none)	(400)	(none)	(400)		
	[none]	[475]	[none]	[475]		
30 & 35		(275)		(275)	(250)	
		[325]		[325]	[305]	
≤25		(200)		(200)	(175)	
		[245]		[245]	[200]	

Source: (OAR 734-051-0190)
Note: The numbers in parentheses [(1)] refer to explanatory notes that follow Table C7.
* Measurement of the approach road spacing is from center to center on the same side of the roadway.
(____) = Driveway Spacing Minor Deviation Limit.
[____] = Public Street Spacing Minor Deviation Limit.

Notes on Tables C4, C5, C6, and C7: (Source: OAR 734-051-0190)

(1) These access management spacing standards are for unsignalized approaches only. Signal spacing standards supercede access management spacing standards for approaches.

(2) These access management spacing standards do not retroactively apply to legal approaches in effect prior to adoption of OAR 734-051-0010 through OAR 734-051-0480, except or until any redevelopment, change of use, or highway or interchange construction projects, highway or interchange modernization projects, or any other roadway project as determined by the Region Manager, such as preservation, safety and operation projects that affect curb placement of sidewalks, which affect these legal approaches occurs. At that time the goal is to meet the appropriate access management spacing standards, but at the very least to improve current conditions by moving in the direction of the access management spacing standards. (See OAR 734-051-0190(2)(b).)

(3) When in-fill development occurs, the goal is to meet the appropriate access management spacing standards. This may not be possible and at the very least the goal is to improve the current conditions by moving in the direction of the access management spacing standards. Thus, in-fill development should not worsen current approach spacing. This may involve appropriate mitigation, such as joint access. (See OAR 734-051-0190(2)(c).)

(4) In some cases an approach will be allowed to a property at less than the designated access management spacing standards or minor deviation limits, but only where a right of access exists, the designated access management spacing standards or minor deviation limits cannot be accomplished, and that property does not have reasonable access, thus the property would become landlocked without the approach to the state highway. See OAR 734-051-0320(3). Other options should be considered such as joint access. (See OAR 734-051-0190(2)(d).)

(5) Posted (or Desirable) Speed: Posted speed can only be adjusted (up or down) after a speed study is conducted and that study determines the correct posted speed to be different than the current posted speed. In cases where actual speeds are suspected to be much higher than posted speeds, the Department reserves the right to adjust the access management spacing accordingly. A determination can be made to go to longer access management spacing standards as appropriate for a higher speed. A speed study will need to be conducted to determine the correct speed.

(6) Minimum access management spacing for public road approaches is the existing city block spacing or the city block spacing as identified in the local comprehensive plan. Public road connections are preferred over private driveways and in STA's driveways are discouraged. However, where driveways are allowed and where land use patterns permit, the minimum access management spacing for driveways is 175 feet (55 meters) or mid-block if the current city block spacing is less than 350 feet (110 meters).

CITY STANDARDS

Table C8 identifies the minimum public street intersection and private access spacing standards for the City of Madras roadway network as they relate to new development and redevelopment. These access spacing standards shall be applied to all facilities within the City of Madras except for the segments of US 26, US 97, and OR 361 that are not defined as City Expressways. These non-City Expressway segments shall comply with OAR 734-51. Table C9 identifies standards for private access driveway widths. In cases where physical constraints or site characteristics limit the ability for the access spacing standards listed in Tables C8 and C9 to be met, the City of Madras should retain the right to grant an access spacing variance. County facilities within the

City's UGB should be planned and constructed in accordance with these street design standards.

Table C8: Minimum Intersection Spacing Standards [1]

Functional Classifications	Public Street (feet)	Private Access Drive (feet)
City Expressway	Full-Access shall only be provided at the following locations [2]: US 97, US 26, "C" Street-Canyon Road, "J" Street, Fairgrounds Road, OR 361, and US 26/97 South Junction	No access shall be allowed to properties with alternative access. Properties without alternative access, will be allowed temporary right-in/right-out approaches [3].
Arterial	600	300[4]
Major Collector	300	100[4]
Minor Collector	200	50
Local	150	30

1 Access spacing measured from centerline to centerline.

2 All other public street access points shall be restricted to right-in/right-out access only through the installation of raised longitudinal medians.

3 All private access roadways or driveways shall be restricted to right-in/right-out access only through the installation of raised longitudinal medians.

4 Private access to arterials will not be allowed unless to reasonable alternative access exists for a parcel.

Table C-9: Private Access Driveway Width Standards

Land Use	Minimum (feet)	Maximum (feet)
Single-Family Residential	12	24*
Multi-Family Residential	24	30
Commercial	30	40
Industrial	30	40

* The maximum width for a single-family residential unit may be adjusted for homes with garages for three or more vehicles.

Access Variance (Deviation) Process

Except as otherwise established in OAR 734-51 for State highways, access variances may be provided to parcels for which roadway frontage, topography, or location would otherwise preclude issuance of a conforming permit and which either have no reasonable access or cannot obtain reasonable alternative access to the public road system. In such a situation, a request for deviation from adopted management standards and policies may be granted by the City of Madras for a single connection to a property that cannot be accessed in a manner that is consistent with the spacing standards. All access variances to City Expressways shall be temporary in nature, and the access to the City Expressway shall be restricted to right-in/right-out access only through the installation of raised longitudinal medians. These temporary approaches will be removed once alternative access is provided to the property.

Under the variance process, the permit may carry a condition that the access may be closed at such time that reasonable access to a local public street becomes available. Approval conditions may also require a given land owner to work in cooperation with adjacent land owners to provide either joint access points, front and rear cross-over easements, or a rear access on future redevelopment. In addition, approval of a conditional permit might require turning movement design standards to ensure safety and managed access.

Management Techniques

From an operational perspective, the City of Madras should consider implementing access management measures to limit the number of redundant access points along roadways. This will enhance roadway capacity and benefit circulation. Improvements that should be considered include:

- planning for and developing intersection improvement programs in order to regularly monitor intersection operations and safety problems;
- purchasing right-of-way and closing driveways; and
- installing positive channelization and driveway access controls as necessary.

Enforcement of the access spacing standards should be complemented with the availability of alternative access points. Purchasing right-of-way and closing driveways without a parallel road system and/or other local access could seriously effect the viability of the impacted properties and/or the surrounding transportation system. Thus, if an access management approach is taken, alternative access should be developed prior to "land-locking" a given property. Specifically, providing key collector facilities such as those identified in Figure C1 would provide alternative access to land adjacent

to major roadways such as US 26, US 97, and Oregon Highway 361, thereby reducing or eliminating the need to provide new direct highway access to multiple properties.

As part of every land use action, the City of Madras should evaluate the need to impose the following development conditions for a given development proposal to maintain and/or improve traffic operations and safety along the arterial and collector roadways.

- Crossover easements should be provided on all compatible parcels (considering topography, access, and land use) to facilitate future access between adjoining parcels. Figure C4 illustrates how this process would facilitate compliance with access management objectives over time.

- Conditional access permits should be issued to developments with proposed access points that do not meet the designated access spacing policy and/or do not have the ability to align with opposing driveways.

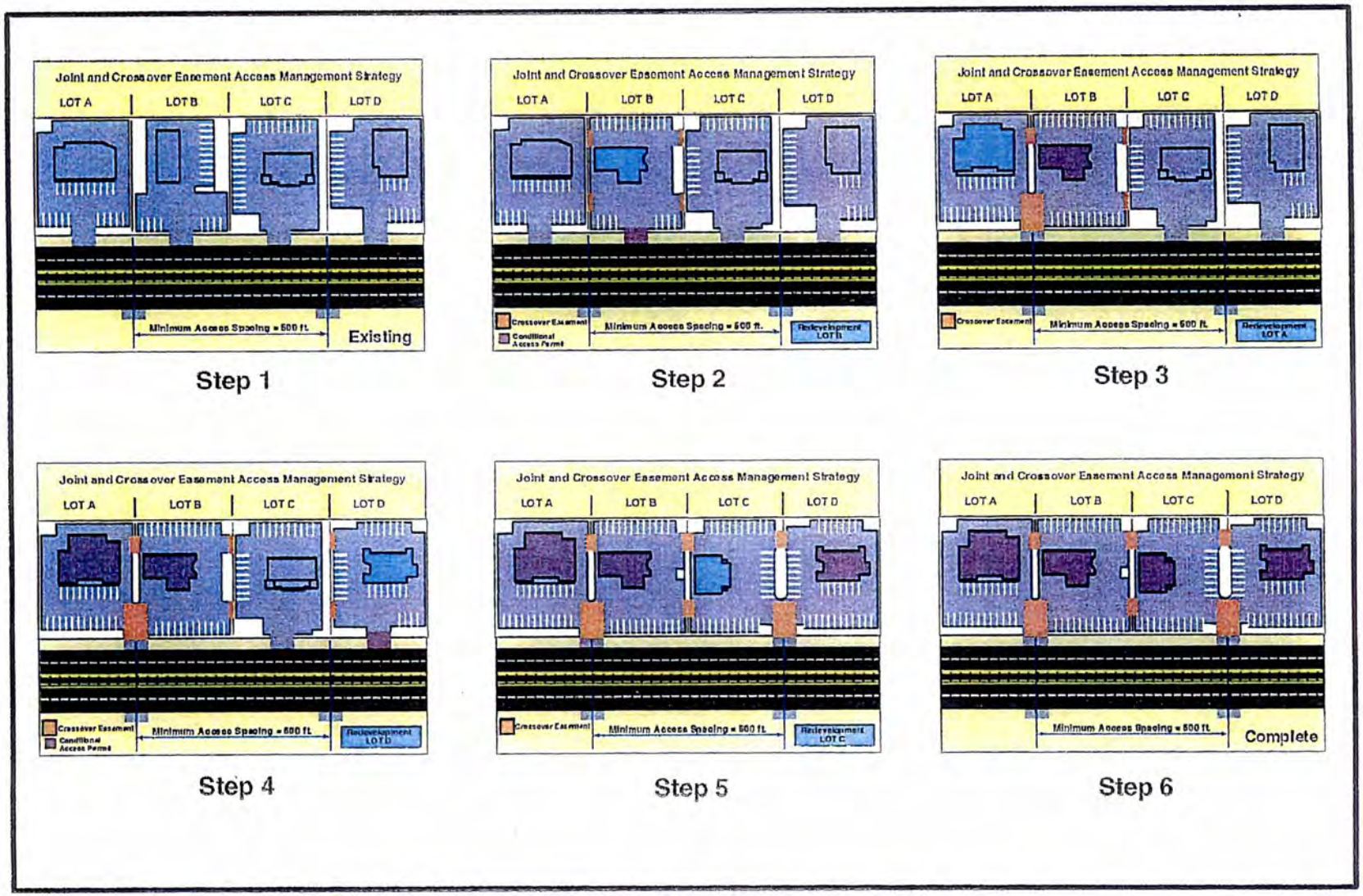
- Right-of-way dedications should be provided to facilitate the planned roadway system in the vicinity of proposed developments.

- Three-quarter street improvements, including at a minimum two 12-foot travel lands (sidewalks, curb and gutter, bike lanes/paths, and/or travel lanes) should be provided along site frontage that do not have full-buildout improvements in place at the time of development.

Figure C4 illustrates how, by using these guidelines, all driveways and roadways along a given facility will eventually comply with the access spacing policy set for a particular segment of roadway as development and redevelopment occur in the study area. It should be noted that not every parcel can or should be addressed through the process illustrated in Figure C4 and described in Table C10. The topography of the parcel, type of proposed or adjoining use, and/or highway frontage may preclude a development from using consolidated or crossover access points (e.g., consolidating access for a commercial business and an industrial or agricultural land use would be inappropriate).

Table C10: Example of Recommended Land Use Process

Step	Process
1	EXISTING - Lots A, B, C, and D currently have site-access driveways that neither meet the access spacing criteria of 500 feet nor align with driveways or access points on the opposite side of the highway. Under these conditions motorists are put into situations of potential conflict (conflicting left turns) with opposing traffic. Additionally, the number of side-street (or site-access driveways) intersections decreases the operation and safety of the highway.
2	REDEVELOPMENT OF LOT B - At the time that Lot B redevelops, the local jurisdiction would review the proposed site plan and make recommendations to ensure that the site would promote future crossover or consolidated access. Next, the local jurisdiction would issue conditional permits for the development to provide crossover easements with Lots A and C, and ODOT would grant a conditional access permit to the lot. After evaluating the land use action, ODOT would determine that Lot B does not have alternative access, nor can an access point be aligned with an opposing access point, nor can the available lot frontage provide an access point that meets the access spacing criteria set for this segment of highway.
3	REDEVELOPMENT OF LOT A - at the time Lot A redevelops, the local jurisdiction and ODOT would undertake the same review process as with the redevelopment of Lot B (see Step 2); however, under this scenario ODOT and the local jurisdiction would use the previously obtained crossover easement at Lot B to consolidate the access points of Lots A and B. ODOT would then relocate the conditional access of Lot B to align with the opposing access point and provide safe and efficient access to both Lots A and B. The consolidation of site-access driveways for Lots A and B will not only reduce the number of driveways accessing the highway, but will also eliminate the conflicting left-turn movements on the highway by aligning the access with the opposing access points.
4	REDEVELOPMENT OF LOT D - The redevelopment of Lot D will be handled in the same manner as the redevelopment of Lot B (see Step 2).
5	REDEVELOPMENT OF LOT C - The redevelopment of Lot C will be reviewed once again to ensure that the site will accommodate crossover/consolidated access. Using the crossover agreements with Lots B and D, Lot C would share a consolidated access point with Lot D and would also have alternative frontage access via the shared site-access driveway of Lots A and B. By using the crossover agreement and conditional access permit process, the local jurisdiction and ODOT will be able to eliminate another access point and align the opposing access points.
6	COMPLETE - After Lots A, B, C, and D redevelop over time, the number of access points will be reduced and aligned, and the remaining access points will meet the Category 4 access management standard of 500-foot spacing.



ACCESS MANAGEMENT - CROSSOVER EASEMENT EXAMPLE

CITY OF MADRAS COMPREHENSIVE PLAN AND TRANSPORTATION SYSTEM PLAN UPDATE

APRIL 2001

FIGURE C4

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MOBILITY STANDARDS

Mobility standards provide a gauge with which to evaluate the operational performance of a roadway. For state-controlled roadways, ODOT has established highway mobility standards based on the volume-to-capacity ratios during peak-hour operating conditions. For roadways controlled by the City of Madras, the City has established intersection level-of-service (LOS) standards based on average control delay and volume-to-capacity ratios.

ODOT Standards

The highway mobility standards established within the 1999 Oregon Highway Plan shall apply to all state highway facilities within the Madras UGB. Table C11 is a summary of the maximum volume-to-capacity ratios for peak-hour operating conditions.

Table C11: 1999 OHP Highway Mobility Standards

Highway Category	Land Use Type/Speed Limits					
	Inside Urban Growth Boundary				Outside Urban Growth Boundary	
	STAs	MPO	Non-MPO outside of STAs where non-freeway speed limit <45 mph	Non-MPO where non-freeway speed limit ≥ 45 mph	Unincorporated Communities	Rural Lands
Interstate Highways and Statewide (NHS) Expressways	N/A	0.80	0.70	0.70	0.70	0.70
Statewide (NHS) Freight Routes	0.85	0.80	0.75	0.70	0.70	0.70
Statewide (NHS) Non-Freight Routes and Regional or District Expressways	0.90	0.85	0.80	0.75	0.75	0.70
Regional Highways	0.95	0.85	0.80	0.75	0.75	0.70
District/Local Interest Roads	0.95	0.90	0.85	0.80	0.80	0.75

Source: 1999 Oregon Highway Plan

City of Madras Standards

The City of Madras requires all intersections within the study area to maintain an acceptable level of service (LOS), upon full buildout of the proposed land use action. LOS standards for signalized intersections are based on the average control delay per vehicle, while LOS calculations for unsignalized intersections are based on the average control delay and volume-to-capacity ratio for the worst or critical movement. All LOS calculations should be made using the methods identified in the most recent version of the Highway Capacity Manual, published by the Transportation Research Board. The minimum acceptable level of service for signalized intersections is LOS "D" with a volume-to-capacity ratio of 0.95 or less, while the minimum acceptable level of service for unsignalized intersections is LOS "E" or LOS "F" with a volume-to-capacity ratio of 0.95 or less. Any intersections not operating at these standards will be considered unacceptable.

[Chapter 6 added by Ordinance No. 707, passed May 27, 2003 and amended by Ordinance No. 785, passed December 12, 2006.]

CHAPTER 7: DEVELOPMENT REVIEW STANDARDS

[Chapter 7 added by Ordinance No. 707, passed May 27, 2003]

INTRODUCTION

The issue of accommodating additional growth and its related increased traffic is a problem that many Oregon communities are facing. In most of these communities, the struggle revolves around the roadway infrastructure's ability to keep pace with approved development projects and other land use actions. This issue is especially prevalent along arterial roadways and commercial corridors, where development is typically approved in a piecemeal fashion. Over time, the cumulative impact of this development often leads to increased congestion, crashes, air pollution, and a loss of community livability.

A city's ability to accommodate additional growth while maintaining a safe and efficient roadway system will depend largely upon an informed decision-making process. In the case of proposed development projects and other land use actions, the decision-making process can be enhanced through the requirement of transportation impact studies.

A transportation impact analysis provides an objective assessment of the potential modal transportation impacts associated with a specific land use action (i.e., the development of vacant land, the redevelopment of an existing land use, and/or a comprehensive plan/zoning change). In particular, these studies are useful tools that help determine several important transportation related questions including:

- Can the existing transportation system accommodate the proposed development from a capacity and safety standpoint?
- What transportation system improvements would be necessary to accommodate the proposed development?
- How will access to the proposed development affect the traffic operations on the existing transportation system?
- What transportation impacts will the proposed development have on the adjacent land uses, including commercial, institutional, and residential uses?
- Will the proposed development meet current city standards for roadway design?

TRANSPORTATION IMPACT STUDIES

This section provides criteria and regulations to help developers and city officials determine when a transportation impact analysis should be prepared, what should be included in the transportation impact analysis, who is qualified to prepare such studies, and what standards the proposed land use action should be meeting.

When is a Transportation Impact Analysis Required?

Generally, a transportation impact analysis may be required when a development application and/or rezone application is filed with the City. Recognizing that not all developments will have an adverse impact on the transportation system, the City of Madras has developed criteria to help determine the need for and type of transportation impact analysis that will be required in relation to the proposed development. When a development meets Criterion A, B, C, or D, the City will typically require a complete transportation impact analysis.

A. The development generates 50 or more peak-hour trips or 500 or more daily trips.

B. An access spacing exception is required for the site access driveway(s) and the development generates 25 or more peak-hour trips or 250 or more daily trips.

C. The development is expected to impact intersections that are currently operating at the upper limits of the acceptable range of level of service during the peak operating hour.

D. The development is expected to significantly impact adjacent roadways and intersections that have previously been identified as high accident locations or areas that contain a high concentration of pedestrians or bicyclists such as school zones.

If it has been determined that a transportation impact analysis is not required based on the criteria presented above, the applicant's traffic engineer will be required to submit a transportation assessment letter to the reviewing agencies indicating why the proposed land use action is exempt. This letter should outline the potential trip-generating characteristics of the proposed land use action and verify that the site-access driveways or roadways meet sight-distance requirements and City of Madras roadway design standards.

Review Policy and Procedure

To provide a thorough land use application review, it is recommended that the following criteria be used in reviewing an application.

Subdivision and site plan review shall address the following access considerations:

1) Is the road system designed to meet the projected traffic demand at full build-out and are the functional roadway classification standards consistent with the proposed use?

2) Is access properly placed in relation to sight distance (i.e., does the driveway location meet both intersection and stopping sight distance requirements), driveway spacing, and other related considerations, including opportunities for joint or crossover access?

3) Is the driveway access for dwelling units on interior residential access streets rather than major roadways?

4) Is traffic movement within the site provided without having to use the peripheral road network?

5) Does the road system provide adequate access to buildings for residents, visitors, deliveries, emergency vehicles, and garbage collection?

6) Does the pedestrian path system link buildings with parking areas, entrances to the development, open space, and recreational and other community facilities (i.e., address the requirements of the Transportation Planning Rule)?

7) Does the site plan provide for potential future crossover or consolidated access, and/or alternative access?

RECOMMENDED CONDITIONS OF APPROVAL AND NECESSARY IMPROVEMENTS TO EVALUATE

As part of every land use action, the local (city or county) reviewing jurisdiction (and ODOT in land use actions involving direct access to state roadway facilities) will be required to evaluate the potential need of conditioning a development with the following items in order to maintain the existing operation and safety of existing facilities and provide the necessary right-of-way and improvements to develop the future planned transportation system.

1) Crossover easement agreements will be required on all compatible parcels (topography, access, and land use) to facilitate access between adjoining parcels.

2) Conditional access permits will be issued on new developments which have proposed access points that do not meet the designated access spacing policy and/or have the ability to align with opposing access driveways.

3) Right-of-way dedications will be required to facilitate the future planned roadway system in the vicinity of the proposed development.

4) Half-street improvements including at a minimum two 12-foot travel lanes (sidewalks, curb and gutter, bike lanes/paths, and/or travel lanes) should be provided along site frontages that do not have full-buildout improvements in place at the time of development.

ELEMENTS OF A TRANSPORTATION IMPACT ANALYSIS

As a guide in the preparation of a transportation impact analysis, the City of Madras recommends the following format be used to document the analysis.

1) Table of Contents

   - Listing of all sections, figures, and tables included in the report.

2) Executive Summary

   - Summary of the findings and recommendations contained within the report.

3) Introduction

   - Proposed land use action, including site location, building square footage, and project scope.

   - Map showing the proposed site, building footprint, access driveways, and parking facilities.

   - Map of the study area, which shows site location and surrounding roadway facilities.

4) Existing Conditions

- Existing site conditions and adjacent land uses.
- Roadway characteristics (all transportation facilities and modal opportunities located within the study area, including roadway functional classifications, street cross section descriptions, posted speeds, bicycle and pedestrian facilities, on-street parking, and transit facilities).
- Existing lane configurations and traffic control devices at the study area intersections.
- Existing traffic volumes and operational analysis of the study area roadways and intersections.
- Roadway and intersection crash history analysis.

5) Background Conditions (without the proposed land use action)

- Approved developments and funded transportation improvements in the study area.
- Traffic growth assumptions.
- Addition of traffic from other planned developments.
- Background traffic volumes and operational analysis.

6) Full Buildout Traffic Conditions (with the proposed land use action)

- Description of the proposed development plans.
- Trip-generation characteristics of the proposed development (including trip reduction documentation).
- Trip distribution assumptions.
- Full buildout traffic volumes and intersection operational analysis.
- Site circulation and parking.
- Intersection and site-access driveway queuing analysis.
- Recommended roadway and intersection mitigations (if necessary).

7) Conclusions

8) Appendix

- Traffic counts summary sheets.
- Accident analysis summary sheets.
- Existing, Background, and Full Buildout traffic operational analysis worksheets.
- Other analysis summary sheets such as queuing and signal warrant analyses.

To help summarize the sections described in the recommended Table of Contents, the City of Madras also recommends the following list of figures be included in the transportation impact analysis:

Figure 1: Site Vicinity Map

Figure 2: Existing Lane Configurations and Traffic Control Devices

Figure 3: Existing Traffic Volumes and Levels of Service, Weekday AM Peak Hour

Figure 4: Existing Traffic Volumes and Levels of Service, Weekday PM Peak Hour

Figure 5: Future Year Background Traffic Volumes and Levels of Service, Weekday AM Peak Hour

Figure 6: Future Year Background Traffic Volumes and Levels of Service, Weekday PM Peak Hour

Figure 7: Proposed Site Plan

Figure 8: Future Year Assumed Lane Configurations and Traffic Control Devices

Figure 9: Estimated Trip Distribution Pattern

Figure 10: Site-Generated Traffic Volumes, Weekday AM Peak Hour

Figure 11: Site-Generated Traffic Volumes, Weekday PM Peak Hour

Figure 12: Full Buildout Traffic Volumes and Levels of Service, Weekday AM Peak Hour

Figure 13: Full Buildout Traffic Volumes and Levels of Service, Weekday PM Peak Hour

TRANSPORTATION IMPACT ANALYSIS GUIDELINES AND PROCEDURES

To ensure consistently in the preparation and review of transportation impact analyses, the City of Madras has established a set of guidelines and procedures for all new studies. These guidelines and procedures include the following:

- Preparer qualifications
- Transportation impact analysis study area
- Horizon years and study periods
- Data collection guidelines
- Trip generation guidelines
- Trip distribution and assignment guidelines
- Minimum intersection operational standards
- Minimum access spacing standards

Preparer Qualifications

A professional engineer registered in the State of Oregon should perform transportation impact analyses. In addition, the preparer should have extensive experience in the methods and concepts associated with transportation impact studies.

Transportation Impact Analysis Study Area

The transportation impact analysis area should include, at a minimum, all site-access points and intersections (signalized and unsignalized) adjacent to the proposed site. In particular, if the proposed site fronts an arterial or collector street; the transportation

impact analysis should include all intersections along the site frontage and within the access spacing distances extending out from the boundary of the site frontage. This concept is graphically illustrated in Figure D1.

Beyond the minimum study area, the transportation impact analysis should evaluate all intersections that receive site-generated trips that make up at least 10% or more of the total intersection volume. In addition to these requirements, the Public Works Director (or his/her designee) shall determine any additional intersections or roadway links that might be adversely affected as a result of the proposed development. The applicant and the Public Works Director (or his/her designee) will agree on these intersections prior to the start of the transportation impact analysis.

Time Periods to be Analyzed in the Transportation Impact Analysis

To adequately assess the impacts of a proposed land use action, several study periods should be addressed in the transportation impact analysis. These study periods or horizon years consist of the following:

- **Exiting Year Analysis** - Assesses all existing study roadways, intersections, and land uses within the study area.

- **Background Analysis** - Assesses the expected roadway, intersection, and land use conditions in the year the proposed land use action is expected to be fully built out, without the expected traffic from the proposed land use action. This analysis should include all in-process developments, or those city-approved developments that are expected to be fully built out in the proposed land use action horizon year.

- **Full Buildout Traffic Analysis** - Assesses the expected roadway, intersection, and land use conditions resulting from the background growth and the proposed land use action assuming full build-out and occupancy.

Within each horizon year, specific consideration should be directed to the time period(s) that experience the highest degree of network travel. These periods typically occur during the weekday morning (7:00 a.m. to 9:00 a.m.) and weekday evening (4:00 p.m. to 6:00 p.m.) peak community hours. The transportation impact analysis should always address the weekday a.m. and p.m. peak hours when the proposed land use action is expected to generate 25 trips or more during the peak time periods. If the applicant can demonstrate that the peak-hour trip generation of the proposed land use action is negligible during one of the two peak study periods and the peak trip generation of the land use action corresponds to the roadway system peak, then only the worst-case study period need be analyzed.

Depending on the proposed land use action and the expected trip-generating characteristics of that development, consideration of non-peak travel periods may be

appropriate. Examples of land uses that have non-typical trip generating characteristics include schools, restaurants, nightclubs, and churches. The Public Works Director (or his/her designee) and applicant should discuss the potential for additional study periods prior to the start of the transportation impact analysis.

Traffic Count Requirements

Once the transportation impact analysis periods have been determined, turning movement counts should be collected at all study area intersections to determine the base traffic conditions. These turning movement counts should typically be conducted during the weekday (Tuesday through Thursday) between 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m., depending on the proposed land use. Historical turning movement counts may be used if the data are less than 12 months old, but must be factored to meet the existing traffic conditions.

Trip Generation for the Proposed Development

To determine the impacts of a proposed development on the surrounding transportation network, the trip-generating characteristics of that development must be estimated. Trip-generating characteristics should be obtained from one of the following acceptable sources:

- Institute of Transportation Engineers (ITE) Trip Generation Manual (latest edition).
- Specific trip generation studies that have been conducted for the particular land use action for the purposes of estimating peak-hour trip-generating characteristics. The Public Works Director (or his/her designee) should approve the use of these studies prior to their inclusion in the transportation impact analysis.

In addition to new site-generated trips, several land uses typically generate additional trips that are not added to the adjacent traffic network. These trips include pass-by trips and internal trips and are considered to be separate from the total number of new trips generated by the proposed development. The procedures listed in the Trip Generation Handbook (ITE) should be used to account for pass-by and internal trips.

Trip Distribution

Estimated site-generated traffic from the proposed development should be distributed and assigned on the existing or proposed arterial/collector street network. Trip distribution methods should be based on a reasonable assumption of local travel patterns and the locations of off-site original/destination points within the site vicinity.

Acceptable trip distribution methods should be based on one of the following procedures:

- An analysis of local traffic patterns and intersection turning movement counts can be used as long as the data have been gathered within the previous 12 months.
- A detailed market study specific to the proposed development and surrounding land uses can be used to determine the specific influence area. Site-generated traffic within the identified influence area should be distributed based on principles and concepts associated with the gravity model theory.

Intersection Operation Standards

To identify impacts of the proposed land use action on the transportation system, the transportation impact analysis must compare the existing, background, and full buildout intersection traffic volumes to the minimum intersection operation standards. The City of Madras evaluates intersection operational performance based on levels of service and "demand-to-capacity" (d/c) calculations.

Intersection Demand-to-Capacity Analysis

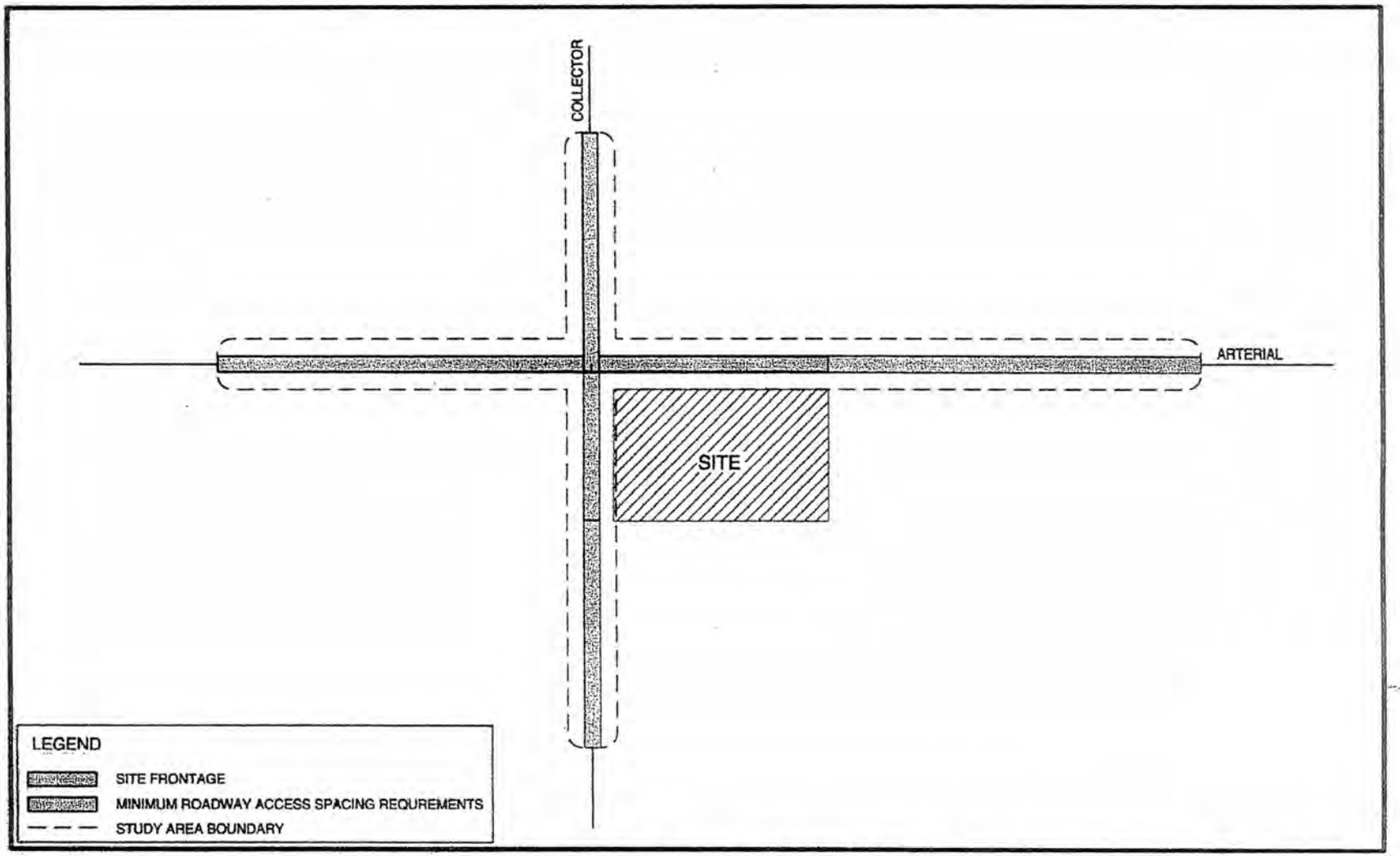
A capacity analysis should be performed at all intersections within the identified study area. The methods identified in the latest edition of the Highway Capacity Manual, published by the Transportation Research Board, are to be used for all intersection capacity calculations. The City of Madras requires that all intersections within the study area must maintain a d/c ratio of 0.95 or less.

Intersection Levels of Service

The City of Madras requires all intersections within the study area to maintain an acceptable level of service (LOS) upon full buildout of the proposed land use action. LOS calculations for signalized intersections are based on the average control delay per vehicle, while LOS calculations for unsignalized intersections are based on the average control delay and volume-to-capacity ratio for the worst or critical movement. All LOS calculations should be made using the methods identified in the most recent version of the Highway Capacity Manual, published by the Transportation Research Board. The minimum acceptable level of service for signalized intersections is LOS "D" while the minimum acceptable level of service for unsignalized intersections is LOS "E" or LOS "F" with a d/c ratio of 0.95 or less. Any intersections not operating at these standards will be considered to be unacceptable.

Transportation Impact Analysis Checklist

As part of the transportation impact analysis review process, all transportation impact analyses submitted to the City of Madras must satisfy the requirements illustrated in the Checklist for Acceptance of Transportation Impact Analyses. A sample checklist is provided as Attachment D1.



TRANSPORTATION IMPACT ANALYSIS
STUDY AREA

CITY OF MADRAS COMPREHENSIVE PLAN AND
TRANSPORTATION SYSTEM PLAN UPDATE
MARCH 2001

FIGURE
D1

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CHAPTER 8: FUNDING OPTIONS AND FINANCIAL PLAN

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

The Madras TSP identifies the need for over $17,000,000 (1995) dollars in funding to finance the transportation system improvements over the next 20 years. It is expected that transportation system improvements will be made to city streets, county roads, and state highways within the Madras Urban Growth Boundary. This TSP cost estimate only covers the costs associated with constructing new transportation system improvements and does not cover any costs associated with maintaining the current or future system. This funding analysis assumes that there will be a cost sharing of future improvements by Madras, Jefferson County, and ODOT. Close coordination on scheduling and funding transportation improvements will be vital for the timely construction of the identified transportation system improvements.

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

At the present time, the City of Madras is doing a good job of making street, pedestrian, and bicycle improvements within the City on an annual basis. Projects that are funded are typically identified in the public facilities plan and have been identified and prioritized by the Public Works Department. This yearly capital outlay funding has been successful in financing a small number of projects each year. But the success of the program is limited due to inadequate City funding and does not address needed transportation system improvements within the study area outside the city limits. In order to implement the TSP, the City of Madras will need to work closely with ODOT and Jefferson County to increase funding for transportation projects and to consider needed improvements throughout the urban area.

This section of the TSP discusses the various funding and financing options that may be available to the City of Madras to meet its 20 year transportation funding needs. Included in this chapter is a review of historic street improvement funding sources, potential new revenue sources, a review of transportation system funding requirements, and general recommendations for financing future transportation system improvements. In addition, a brief analysis of how Jefferson County and ODOT finance transportation system improvements is included to provide a context on how the different governmental agencies can work together in the future.

HISTORIC STREET IMPROVEMENT FUNDING SOURCES

The City of Madras accounts for transportation related revenues and expenditures in three separate funds. Each fund is accounted for separately in the annual fiscal year budget. These include the Street Tax, Public Facilities Plan, and Industrial Park.

State Street Tax Fund:

The purpose of the Madras State Street Tax Fund is to maintain, rehabilitate, improve and expand city streets, drainage systems, sidewalks and traffic control devices in an orderly and cost effective program. A summary of the State Street Tax Fund over the last four years is detailed in Tables 8-1 and 8-2.

Revenues received from the State of Oregon, such as gas taxes and vehicle registration fees, provided more than 56% of the State Street Fund revenues in the 1995/1996 budget year. Systems Development Fees (SDF) for storm drains and streets provide the other significant revenue source.

The major street construction project during the 1995/1996 budget year was the completion of the "C" Street Reconstruction. Major street maintenance expenditures will be devoted to the implementation of a Pavement Management System (PMS), asphalt overlays, crack sealing and pothole repair.

The capital outlay expenditures from the State Street Tax Fund are shown on Table 8-3. During the 1995/1996 fiscal year, the City of Madras dedicated a total of $83,860 or 42% of capital outlay expenditures to street, walkway and bikeway improvements within the community. These funds were used to finance the painting of bike lanes, ADA curb ramps and sidewalks along Buff Street, and the reconstruction of "C" Street.

Table 8-1
Madras Street Tax Fund: Historical Revenues

Description	1992/1993	1993/1994	1994/1995	1995/1996
Cash on Hand	$58,752	$24,796	$110,000	$ 48,000
Shared Revenues				
• Bike Grant	$0	$0	$5,000	$5,000
Other Agencies				
• SCA Funds	$12,500	$0	$25,000	$12,500
• State Funds	$153,257	$180,674	$189,260	$196,740
• Transportation Plan	$0	$0	$67,500	$67,500
Miscellaneous Charges	$1,066	$251	$500	$500
Current Services Charges				
• SDF-Storm Drains	$10,206	$9,092	$15,000	$25,000
• SDF-Streets	$0	$13,176	$40,000	$60,000
Interest on Investments	$741	$3,215	$3,000	$2,800
Transfers-Industrial Site	$0	$70,000	$0	$0
Total Revenues	**$236,523**	**$301,204**	**$455,260**	**$418,040**

Table 8-2
Madras Street Tax Fund: Historical Expenditures

Description	1992/1993	1993/1994	1994/1995	1995/1996
Personal Services	$41,910	$27,547	$49,745	$60,523
Material and Services	$65,789	$84,782	$91,050	$96,900
Capital Outlay	$88,048	$63,744	$290,320	$198,860
Equipment Replacement	$15,980	$16,330	$15,000	$15,000
Operating Contingency	$0	$0	$9,145	$46,757
Unappropriated Ending Balance	$24,796	$108,801	$0	$0
Totals	**$236,523**	**$301,204**	**$455,260**	**$418,040**

Table 8-3
Madras Street Tax Fund: Capital Outlay Expenditures

Description	1992/1993	1993/1994	1994/1995	1995/1996
Bicycle Path	$0	$3,285	$11,420	$3,860
Building Improvement	$0	$0	$2,500	$5,000
Equipment Purchases	$1,817	$6,314	$10,000	$10,000
Facilities Improvements	$0	$0	$100,000	$20,000
Storm Sewers	$8,777	$9,806	$15,000	$25,000
Street Expansion	$0	$0	$25,000	$0
Street Improvements	$77,453	$44,339	$126,400	$60,000
Transportation Plan	$0	$0	$0	$75,000
Total Capital Outlay	**$88,048**	**$63,744**	**$290,320**	**$198,860**

Public Facilities Plan

The Madras Public Facilities Plan is in compliance with OAR 660-11-000, the Public Facilities Rule. A summary of the Public Facilities Plan Fund revenues and expenditures over the last four years is shown on Tables 8-4 and 8-5. The purpose of this fund is to finance infrastructure construction associated with growth within the community. Revenues for the Public Facilities Plan is generated through a variety of sources including grants, loan proceeds, bond sales, construction warrants, and Local Improvement District (LID) assessments. The disbursement of funds from the Public Facilities Plan Fund is for all public infrastructures needed to permit orderly growth and development in the community. Specific areas that have been targeted include the Industrial Park, Downtown, and the overall housing stock within Madras. Transportation system improvements are included as part of the annual expenditures from this fund. During the 1995/1996 budget year, the City of Madras used the majority of the available funds to finance a total of $417,750 on transportation related infrastructure projects within downtown.

Table 8-4
Madras Public Facilities Plan Fund: Historical Revenues

Revenue Sources	1992-1993	1993-1994	1994-1995	1995-1996
Cash on Hand	$32,648	$26,674	$1,000	$1,000
Shared Revenues:				
- CDB Grant	$0	$0	$300,000	$270,000
- Industrial Site Loan/Grant	$0	$343,534	$410,000	$0
- ISTEA Grant	$0	$0	$387,750	$387,750
- Beautification Grant	$0	$0	$25,000	$0
- Property Owner	$0	$0	$30,000	$30,000
Reimbursement Charges For Services	$0	$14,710	$0	$0
LID Assessment	$2,541	$1,851	$4,595	$1,850
Interest on Investment	$1,376	$345	$1,000	$200
Total Revenues	**$36,566**	**$387,114**	**$1,159,345**	**$690,800**

Table 8-5
Madras Public Facilities Plan Fund: Historical Expenditures

Expenses	1992-1993	1993-1994	1994-1995	1995-1996
Capital Outlay:				
- CDB Grant	$0	$255	$300,000	$270,000
- Infrastructure	$385	$43,774	$447,345	$418,800
- Water Project	$9,507	$338,320	$410,000	$0
Interfund Transfers	$0	$2,000	$2,000	$2,000
Unappropriated Ending Balance	$26,674	$2,764	$0	$0
Total Fund Expenses	**$36,566**	**$387,114**	**$1,159,345**	**$690,800**

Industrial Site Fund

The City of Madras has the responsibility for the sale and lease of properties at the Madras Industrial Park. A summary of the Industrial Site Fund revenues and expenditures over the last four years is shown on Tables 8-6 and 8-7. The City maintains control of industrial park leases and sales to actively promote economic activity and diversification. This promotion is done in conjunction with the Economic Development for Jefferson County (EDJ) organization. One of the critical objectives of this fund is to finance public works infrastructure to retain existing businesses and to attract new business to Madras. The City spent approximately $130,000 during the 1995/1996 budget year to extend the existing City rail spur line north across Cherry Lane to the Air Development Park.

Table 8-6
Madras Industrial Site Fund: Historical Revenues

Revenue Source	1992-1993	1993-1994	1994-1995	1995-1996
Cash on Hand	$257,529	$346,352	$200,000	$298,000
Revenues From Other Agencies:				
- OEDD Grant - RR Extension	$0	$0	$0	$129,700
- Community Forestry	$0	$0	$40,000	$0
Charges for Services	$6,971	$1,027	$500	$1,000
Use of Money and Property:				
- Interest on Investments	$13,444	$15,437	$10,000	$10,000
- Industrial Site Sales	$104,399	$68,474	$50,000	$12,200
- Industrial Site Leases	$7,116	$7,180	$8,000	$15,000
- Interfund Loan - Airport	$2,000	$2,000	$6,000	$6,000
Total Revenues	**$391,459**	**$440,470**	**$314,500**	**$471,900**

Table 8-7
Madras Industrial Site Fund: Historical Expenditures

Expenses	1992-1993	1993-1994	1994-1995	1995-1996
Materials and Services:				
- Industrial Site Improvements	$6,057	$28,038	$110,500	$50,000
- Industrial Site Promotion	$17,924	$10,868	$50,000	$30,000
- Miscellaneous Expenses	$681	$117	$1,000	$500
- Street Lights	$1,316	$1,316	$2,000	$2,000
Capital Outlay:				
- Industrial Park Expansion	$7,128	$0	$119,000	$326,070
Interfund Transfers:				
- General Fund	$12,000	$12,000	$12,000	$21,000
- State Street Tax	$0	$70,000	$0	$0
Operating Contingency	$0	$0	$20,000	$42,330
Unappropriated Ending Balance	$346,352	$318,131	$0	$0
Total Fund Expenses	**$391,459**	**$440,470**	**$314,500**	**$471,900**

ALTERNATIVE REVENUE SOURCES [1]

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

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[1] This section of the TSP was written before passage of Measure 11, subsequently modified by Measure 50 which further limits property tax and the ability of local to raise funds locally.

Property Taxes

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

The historic dependence on property taxes is changing with the passage of Ballot Measure 5 in the early 1990's. With the 1995/1996 budget year, Ballot Measure 5 will be fully implemented. In brief, Ballot Measure 5 limits the property tax rate for purposes other than payment of certain voter approved general obligation indebtedness. With full implementation in the current budget year, the tax rate for all local taxing authorities is limited to $15 per $1,000 of assessed valuation. As a group, all non-school taxing authorities are limited to $10 per $1,000 of assessed valuation. All tax Bases, serial and special levies are subject to the tax rate limitation. Excluded from the limitation is debt service used to retire voter approved general obligation bonds. Ballot Measure 5 requires that all non-school taxing districts property tax rate be reduced if together they exceed $10 per $1,000 of assessed valuation by the County. If the non-debt tax rate exceeds the constitutional limit of $10 per $1,000 of assessed valuation, then all of the taxing districts' tax rates are reduced on a proportional basis. This proportional reduction in the taxing rate is commonly referred to as compression of the tax rate.

The City of Madras had a compressed property tax rate from the 1991/1992 through the 1993/1994 budget years. Over the last two years, the City of Madras has limited the City tax rate to conform to the actual or estimated Ballot Measure 5 compression rate. For the 1995/1996 budget year, the City of Madras taxed properties at a rate of $5.36 per $1,000 assessed valuation which is the Ballot Measure 5 compression rate. At that tax rate and with the 6% constitutional allowed increase, the City of Madras plans levied $540,088 in property taxes. Of this total, $477,559 was targeted to the general fund, while $62,525 was allocated to retire general obligation debt.

Historically, Madras has not used property taxes to fund public works functions. In the 1995/1996 budget year, the City dedicated only 1.55% of the general fund derived from property taxes, to the Public Works Department. Rather, the City of Madras has relied almost exclusively on State of Oregon shared revenues to fund both public works maintenance and new construction. The shared revenues are derived from the local allocation of State gas tax and vehicle registration fees. In recent years, the City of Madras has supplemented public works funding through local Systems Development Charges (SDCs) and State grants.

DEBT FINANCING

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

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

General Obligation Bonds

General obligation bonds (GO) are voter approved bond issues and represent the least expensive borrowing mechanism available to municipalities. GO bonds are typically supported by a separate property tax levy specifically approved for the purposes of retiring debt. The levy does not terminate until all the debt is paid off. The property tax levy is distributed equally throughout the taxing jurisdiction according to assessed value of property. General obligation debt is typically used to make public improvement projects that will benefit the entire community.

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

Limited Tax General Obligation Bonds

Limited tax general obligation bonds (LTGO) are similar to general obligation bonds in that they represent an obligation of the municipality. However, a municipality's obligation is limited to its current revenue sources and is not secured by the public entity's ability to raise taxes. As a result, LTGOs do not require voter approval. However, since the LTGOs are not secured by the full taxing power of the issuer, investors typically require a higher rate of return than they would from a more secure, tax-backed general obligation issue. Since LTGOs are not voter approved, they are subject to limitations under Ballot Measure 5.

Local Improvement District Bonds

The Oregon Revised Statutes allow local governments to form Local Improvement Districts (LIDs) to construct public improvements. LIDs are most often used by cities to construct local projects such as streets, sidewalks or bikeways. The Statutes allow formation of a district by either city government or property owners. Cities that use LIDs are required to have a local LID ordinance that provides a process for district formation and payback provisions. Through the LID process, the cost of local improvements is generally spread out among a group of property owners along a public street or within a specified area. The cost can be allocated based on property frontage or other methods such as traffic trip generation. The types of allocation methods are only limited by the Local Improvement Ordinance.

The cost of LID participation is considered an assessment against the property which is a lien equivalent to a tax lien. Individual property owners typically have the option of paying the assessment in cash or applying for assessment financing through the City. Since the passage of Ballot Measure 5, cities have most often funded local improvement districts through the sale of special assessment bonds. Although the interest rates for these special assessment bonds are higher than GO bonds, they are not subject to the limitation of Ballot Measure 5.

The City of Madras has a Local Improvement Ordinance in place. The City requires property owners to sign a LID non-remonstrance form in lieu of making frontage improvements as a condition of receiving building permits. The City of Madras has not historically used LIDs on a regular basis to fund the construction of local public improvements. However, the City expects use of LIDs will become more common in the future for neighborhood transportation projects.

In addition to forming LIDs based on property frontage, the Madras ordinance allows LID assessments to be allocated in other ways. This flexibility is important as the benefit of specific improvements, such as a street-widening project, is not always dependent on the amount of frontage of individual properties. The Madras LID ordinance enables the City to form multiple types of LIDs regardless of property frontage.

Jefferson County also has a Local Improvement Ordinance that covers the unincorporated areas of the County. The County's use of LIDs has been significantly less than Madras. County personnel have expressed reservations about using LIDs as a financing tool to fund transportation projects because of the impacts on the Public Works Department budget. When Jefferson County has formed a LID, the County's up-front contribution has come directly out of the Public Works Department's operating budget. Because of this process, the County Public Works Department has not promoted the use of LIDs to finance transportation improvements on County roads. The

Public Works Department would rather require that property owners and developers construct public transportation improvements to city standards within incorporated city urban growth boundaries. By requiring conformance to city standards at the time of development, there would not be a need to form a LID in the future. In addition, such a policy would also enable the cities to accept county roads when new properties are annexed and eliminate the need for Jefferson County to improve roads to individual city standards.

One of the challenges of utilizing a local improvement district is managing the risk of prepaid assessments. Property owners typically have the option to pre-pay assessments in order to forgo paying continued interest payments. However, when the city first issues bonds it commits to meeting a specific stream of debt service payments at certain rates to investors. When a prepayment occurs, the city loses expected interest payments in future years.

Consequently, the city must actively invest such prepayments in order to maintain previously expected cash flows. The challenge of investing numerous small streams of prepayments can be administratively daunting. More often than not prepayments are left in low interest earning accounts. As a result, when the city is required to make debt service payments, it is forced to make up the difference of a low savings rate and the higher borrowing cost of the issue. To counter this potential difficulty, a city can structure bonds to allow for early redemption. This helps to mitigate the risks posed by prepayments. However, since the predictability of debt service streams are less sure, the investor will require a higher rate of return, thus leaving the city, and ultimately the assessed property owners, with a higher cost of borrowing.

Special Tax Revenue Bonds

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

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

SYSTEMS DEVELOPMENT CHARGES

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

The City of Madras has a SDC dedicated solely to transportation. The fee is collected when new building permits are issued within the corporate city limits. Madras calculates the fee based on trip generation of the proposed development. For a single-family residence, the City calculates the rate based on the assumption that a typical household will generate 9.5 vehicle trips per day. Non residential use calculations are based on employee ratios for the type of business or industrial uses. The City of Madras transportation SDC has been a revenue source for the State Street Tax Fund since the 1993/1994 budget year and currently generates 24% of the total State Street Tax Fund revenues. During the 1995/1996 budget year, transportation SDC fees generated approximately $60,000 to the State Street Tax Fund. The SDC fees will help fund construction of the transportation network throughout the City.

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

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

VEHICLE REGISTRATION FEES

The Oregon Vehicle Registration Fee is currently $30 every 2-years for regular passenger vehicles and is allocated to the State, counties and cities for road funding. Cities receive 15.57%, counties 24.38%, while the State retains 60.05%. Oregon counties are granted authority to impose a vehicle registration fee that covers the entire county. The Oregon Revised Statutes allows Jefferson County to impose a biannual registration fee for all passenger cars licensed within the County. Although both counties and special districts have this authority, vehicle registration fees have not been imposed by local jurisdictions. In order for a local vehicle registration fee program to be viable in Jefferson County, all the incorporated cities and the county would need to formulate an agreement which would detail how the fees would be spent on future street construction and maintenance.

GRANTS AND LOANS

The City of Madras has been very successful in obtaining a number of grants in recent years to assist with transportation related projects. Examples include the ISTEA grant used to improve the downtown street system and the bikeway grant used to construct the bike path along Willow Creek. The majority of the grant and loan programs available today are geared towards economic development, and not specifically for construction of new streets.

Typically, grant programs target areas that lack basic public works infrastructure needed to support new or expanded industrial businesses. Because of the popularity of some grant programs such as the Oregon Special Public Works Fund, the emphasis has shifted to more of a loan program. The loan programs often require an equal match from the local jurisdiction as a condition of approval. Although Madras should continue to pursue public works grants in the future, the City should not base their long-term capital improvement funding on future grants or loan programs. Rather, the City should continue to pursue federal and state grants for site specific projects to retain and attract new businesses, and to assist with area specific improvements. Two common State grant/loan programs are described below.

ODOT Immediate Opportunity Grant Program

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

- Funding used to improve public roads;

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

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

Oregon Special Public Works Fund

The Special Public Works Fund (SPWF) program was created by the 1995 State Legislature as one of the several programs for the distribution of funds from the Oregon Lottery to economic development projects in communities throughout the State. The program provides grant and loan assistance to eligible municipalities for the construction of public infrastructure. Projects funded through the program must support commercial and industrial development that result in permanent job creation or job retention. To be awarded funds, each infrastructure project must support businesses wishing to locate, expand, or remain in Oregon.

A SPWF award can be used for improvement, expansion, and new construction of public sewage treatment plants, public water supply treatment and distribution facilities, public roads, and public transportation.

While SPWF program assistance is provided in the form of both loans and grants, the program emphasizes loans. This assures that funds will return to the State over time for reinvestment in local economic development infrastructure projects. The maximum loan amount per project is $11,000,000 and the term of the loan cannot exceed the useful life of the project, or 25 years, whichever is less. Interest rates for loans funded with State of Oregon Revenue Bonds are based on the rate the State may borrow through the Oregon Economic Development Department Bond Bank.

The Department may also make loans directly from the SPWF and the term and rate on direct loans can be structured to meet project needs. The maximum amount of a direct loan from the SPWF is $500,000 per project, but may not exceed 85% of the total project cost.

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

ODOT FUNDING OPTIONS

The State of Oregon provides funding for all highway related transportation projects through the Statewide Transportation Improvement Program (STIP). The STIP is administered by the Oregon Department of Transportation (ODOT). The STIP outlines the schedule for ODOT projects throughout the State. The STIP, which identifies transportation for a three year funding cycle, is updated on an annual basis.

Starting with the 1998 budget year, ODOT is identifying projects for a 4 year funding cycle. In developing this funding program, ODOT must verify that the identified projects comply with the Oregon Transportation Plan (OTP), ODOT Modal Plans, Corridor Plans, compliance with local comprehensive plans, and ISTEA planning requirements. The STIP must fulfill ISTEA planning requirements for a staged, multi-year, statewide, intermodal program of transportation projects.

Specific transportation projects are prioritized based on a review of the ISTEA planning requirements and the different State plans. ODOT consults with local jurisdictions before highway related projects are added to the STIP.

The highway related projects identified in the Madras TSP would be considered for future inclusion in the STIP. The timing of including specific projects will be determined by ODOT based on an analysis of all the project needs within Region 4. The TSP will provide ODOT with a prioritized project list for the Madras Urban Area for the next 20 years. The City of Madras, Jefferson County, and ODOT will need to communicate on an annual basis to review the status of the STIP and the prioritization of individual projects within the US Highway 97 and 26 highway corridors. Ongoing communication will be important for the City, County, and ODOT to coordinate the construction of both local and state transportation projects.

ODOT also has the option of making some highway improvements as part of their ongoing highway maintenance program. The type of road construction projects that can be included within the ODOT maintenance programs includes intersection realignments, addition of turn lanes, and striping for bike lanes. The addition of a left-turn lane, from US Highway 26 onto Depot Road, is the type of project that may be constructed through the ODOT maintenance program.

ODOT maintenance crews using Sate equipment usually do not construct projects. The maintenance crews do not have the staff or specialized road equipment needed for large construction projects.

An ODOT funding technique that will likely have future application to the Madras TSP is the use of state and federal transportation dollars for off-system improvements. Until the passage and implementation of ISTEA, state and federal funds were limited to transportation improvements on highways. ODOT now has the authority and ability to fund transportation projects that are located outside the boundaries of the highway. The

criteria for determining what off-system improvements can be funded has not yet been clearly established. It is expected that this new funding technique will be used to finance local system improvements that reduce traffic on state highways or reduce the number of access points for future development along state highways.

JEFFERSON COUNTY FUNDING OPTIONS

The Madras TSP area includes roads that are under the maintenance jurisdiction of Jefferson County. The City/County Urban Growth Area Management Agreement (UGAMA) stipulates that Jefferson County retains jurisdiction of county roads within the Urban Growth Boundary until:

1. Annexation; and

2. The roads are brought up to urban standards.

At present, there are a number of county roads still within the corporate limits of Madras. Jefferson County provides maintenance on all the county roads within the Madras area while the City has maintenance responsibility for city streets and former county roads that have been annexed and upgraded to city standards.

Jefferson County allocates limited funding to the City of Madras through a countywide revenue sharing program. In the 1995/1996 budget year, the city's share totaled $9,000. These funds are deposited directly into the City's general fund and are not dedicated specifically for either transportation system maintenance or new construction.

In past years, Jefferson County has contributed funding for individual street projects based on allocations of a former five-year road plan. However, in recent years the County has not provided funding to Madras for construction projects because the County has had to fund major road repair projects elsewhere. After the County completes work on a new road inventory, it is expected funding for incorporated cities transportation projects will be made available.

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

A short-term serial levy has received the most consideration by Jefferson County as a funding method to supplement limited property taxes and State revenue sharing monies for county transportation system improvements. The serial levy would likely be

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

MADRAS TRANSPORTATION SYSTEM PLAN FUNDING REQUIREMENTS

The Madras TSP identifies a range of transportation improvements that will be needed during the next 20 years. Overall, a total of five transportation system alternatives have been selected for funding as part of the Madras TSP. These improvements, shown on Table 8-8, are for improvements along the State Highway system and improvements to the local street network within the Madras Urban Area. The preliminary estimated cost for the six transportation improvement options is $15,033,140. ODOT will be considered the funding agency for the transportation improvements located within the US Highway 97 and 26 corridors. The City of Madras and Jefferson County will be the primary funding agencies for the local improvements within the city limits and the unincorporated urban area. The specific project alternatives recommended for funding are detailed below:

Table 8-8
Madras Improvement Options: Funding Requirements

Project Description	Cost Estimate
ODOT Projects	
North US Highway 97/26 Intersection	$1,500,000
South US Highway 97/27 Couplet	$900,000
US Highway 26 Traffic Signals	$500,000
Subtotal	**$2,900,000**
Local Projects	
Walkway and Bikeway	$4,050,140
Basic Street Grid	$6,265,000
Industrial Park Connection	$1,818,000
Subtotal	**$12,133,140**
Total Funding Requirements	**$15,033,140**

Oregon Department of Transportation Projects

ODOT will need to be the primary funding source for future improvements to the US Highway 97/26 intersection at the north end of Madras and the South US Highway 97/26 couplet at the south end of Madras. In addition, ODOT would likely be the primary funding source for those local improvements that would reduce the amount of local traffic on the State highways within the urban area. The ODOT related transportation improvement projects include:

US Highway 97/26 Intersection

At the present time, two alternatives have been identified to improve the north US Highway 97/26 intersection. Shown as improvement Alternative 5A in the TSP, they include the realignment of US Highway 97 south on 6th Street to Oak Street. At the intersection of Oak Street and US Highway 26, a signal would be installed. The preliminary cost estimate of $1,500,000. The recommendation is for the improvements to be constructed in the near term, during the next 5 year planning cycle.

South US Highway 97/26 Couplet

Transportation System Plan improvement Alternative 7 would reroute a portion of the US Highway 97/26 (5th Street) northbound traffic along a section of the existing Adams Drive right-of-way. This improvement option also would include the future connection of a section of Adams Drive, south of the highway realignment to 10th Street. The south Highway couplet improvement project has a preliminary engineering cost estimate of $814,000. This cost would be expected to be shared by ODOT, the City of Madras, and Jefferson County. The local share would be expected to include revenue obtained through transportation system development fees applied to new residential development that would use the Adams Drive/10th Street connection for access.

US Highway 26 Traffic Signals

Transportation System Plan improvement Option 9 identifies the need to install two traffic signals along US Highway 26 in the vicinity of the Madras Industrial Park. Two traffic signals, estimated to cost approximately $500,000, would be constructed at the US Highway 26/Cherry Lane Intersection and the US Highway 26/Earl or Hess Streets intersections. It is expected that these two traffic signals would be installed and maintained by ODOT. Installation of the signals would occur when they met the required traffic and safety warrants.

Local Projects

Basic Street Grid Improvements

An extensive list of local street improvements has been identified in TSP Option 3. The purpose of these improvements will be to continue to improve the street grid pattern throughout the city and the urban area. The total costs of the basic street grid improvements is expected to cost approximately $6,265,000. Funding for these improvements would mainly come from the City of Madras, and Jefferson County. Some of the basic grid street improvements that would reduce reliance on the state highways could be funded by ODOT in the future. The locally generated funds would include revenues generated by SDC fees for new developments and LIDs.

Industrial Park Connection

The Madras Industrial Park connection project is detailed in TSP Option 8. It is considered an important project to improve safety for trucks moving between the

Industrial Park and downtown Madras, and farm trucks and machinery that access the agricultural areas west of Madras. The industrial park connection is planned to be done in two phases. The expected project cost is $1,818,000. Primary funding for this project would come from local revenues. ODOT may consider participating in financing part of this improvement if it can be shown that the level of local traffic on US Highway 26 will be reduced.

MADRAS TRANSPORTATION SYSTEM PLAN FUNDING STRATEGY

The City of Madras, Jefferson County, and ODOT will need to coordinate and cooperate on a funding strategy to fund the expected $17.5 million Capital Improvement Plan. It is recommended that ODOT continue as the lead agency in funding the transportation related improvements along the US Highway 97 and US Highway 26 corridors. The City of Madras will need to continue as the lead local government in financing local transportation system improvements. Jefferson County would be expected to assist in funding improvements to county roads within the Madras Urban Area.

In order to increase funding to implement the Madras TSP, the City, County, and ODOT will all need to consider a range of possible funding sources during the next 20 years. The recommended funding strategy for the Madras TSP is detailed below.

City of Madras

The City of Madras Capital Improvement Program should concentrate on funding improvements to the basic street grid and pedestrian and bikeway systems. The adoption of the TSP will provide an extensive list of local transportation related projects that should be constructed over the next 20 years. Madras will need to increase funding to construct the identified projects. Likely funding sources include increasing the existing transportation SDC for basic street improvements and increasing the use of LIDs for pedestrian and bikeway projects. The City will need to work closely with Jefferson County, and ODOT on developing funding strategies for non-city urban roads and State highway improvements.

Transportation System Development Charge

The Madras transportation SDC fee is expected to generate $60,000 during the 1995/1996 budget year. The amount of revenue received from the SDC is tied directly to construction activity within the City. After the City adopts the TSP, consideration should be given to increasing the transportation SDC fee. The SDC fee revenue should be dedicated to financing part or all of the local street grid improvements over the next 20-year planning cycle.

Local Gas Tax

Based on a preliminary analysis conducted by the City, it may be possible to generate $30,000 to $40,000 for transportation projects from a local gas tax. Ongoing discussions should continue with Madras, Prineville, and Redmond regarding a tri-city local gas tax. If a local gas tax is implemented, the Madras revenues should be dedicated towards funding street grid system improvements. It is recommended that Madras continue with the evaluation of a local gas tax and consider including Jefferson County in any local gas tax proposal.

Local Improvement Districts

The City of Madras has a strong Local Improvement District (LID) Ordinance which permits the formation of districts for transportation related projects. The City has not actively used LIDs in the past to fund local street projects. Madras will need to consider using LIDs as a funding technique to finance construction of local street, pedestrian and bikeway projects adopted as part of the TSP. It is recommended that the City of Madras implement a program to target future LIDs for pedestrian and bikeway improvements within residential areas of the City. As part of such a LID program, the City should consider funding a portion of the LIDs to make them affordable to property owners. Priority for future LIDs should include improving sidewalks and bikeways in the vicinity of the schools, and improving pedestrian and bike corridors across US Highway 97/26.

County and ODOT Coordination

Jefferson County will need to be the lead-funding agency for the improvement of county roads within the Madras Urban Area. Both the City and County should consider formulating a joint Capital Improvement Plan for the Madras Urban Area. Such a CIP would be a refinement of the Madras and Jefferson County Transportation System Plans. This refined CIP should include the entire street, pedestrian, and bikeway projects that have been identified for the Madras Urban Area. As part of the process of formulating a joint Urban Growth Area CIP, Jefferson County should be encouraged to adopt a transportation SDC fee, and join the discussions on adoption of a local gas tax. Jefferson County and the City of Madras will need to work closely together on funding techniques that will finance the transportation system improvements.

All transportation related improvements on US Highway 97 and US Highway 26 are assumed to be funded by ODOT. With the adoption of the TSP, ODOT will consult the City of Madras before any highway-related projects are added to the State Transportation Improvement Program (STIP) plan. In the future, ODOT may have the

ability to assist in funding some of the basic street grid projects that reduce dependence on State highways. As the City of Madras plans local street improvement projects, ODOT should be consulted to determine whether state transportation funds could be used for specific local transportation projects.

Jefferson County

Jefferson County has jurisdiction of all the local roads outside the City of Madras and inside the Urban Growth Area. As the urban area is developed, it is expected that county roads will be upgraded to city standards and turned over to the City at time of annexation. The County's contribution to the Madras TSP should include:

- Funding the extension of county roads detailed as part of the basic street grid improvement option;
- Funding to bring the non-city urban area roads up to city standards; and
- Funding the expansion of the pedestrian and bikeway systems throughout the urban area.

Adoption of a countywide transportation SDC will likely be the best funding technique to bring non-city roads up to city standards. Another possible funding technique will be consideration of a county gasoline tax.

Jefferson County will not likely be in a position to increase funding for transportation related projects in the Madras Urban Area until after work has been completed on a new county road inventory. As discussed earlier in this chapter, Jefferson County is currently involved with developing a detailed inventory of the entire County transportation system. Likewise, the County will then consider adopting a road classification for all arterial and collector roads under their jurisdiction. Until the inventory and road classification process is completed, it will be difficult to make projections on what are the most viable funding techniques to enable Jefferson County to bring urban area roads up to city standards.

Transportation System Development Charges

Jefferson County should continue to evaluate the feasibility of adopting a countywide transportation SDC. The existing Madras SDC would be a good model for the County to use in the unincorporated areas. If a transportation SDC is adopted by Jefferson County, the fees collected within the Madras Urban Area should be dedicated to bringing county roads up to city standards. This funding strategy can also be used to help finance the basic street grid improvements. As discussed above, Jefferson County will not likely be in a position to consider adopting a transportation SDC until after work has been completed on the county road inventory and road classification.

Local Gas Tax

The passage of a local gas tax measure could be a new funding source for Jefferson County. All funds generated by such a tax would need to be dedicated towards transportation projects within the County. It is recommended that Jefferson County participate with the City of Madras in discussions with other local communities regarding a possible regional gas tax.

Oregon Department of Transportation

ODOT will be responsible for funding all highway related transportation projects within the Madras TSP boundaries. Other than consulting with the City as part of the STIP process, ODOT has the authority to prioritize highway projects based on their own analysis and evaluation. The detailed study completed on the north US Highway 97/26 intersection is an example of this independent ODOT process. The adoption of the Madras TSP will provide ODOT with highway related transportation projects that are important to Madras and Jefferson County.

The one new ODOT funding technique that should be considered for the Madras TSP is possible use of State money to fund off-system improvements that reduce reliance on State highways. A policy to enable ODOT to use this possible new funding technique is still being formulated as the Madras TSP is being completed. It is recommended that the City of Madras consult ODOT on a yearly basis regarding State funding options for local street improvements.

Existing and Potential Pedestrian and Bicycle Funding Sources

In recent years the City has been successful in obtaining grants from the Oregon Parks and Recreation Department and the Oregon Department of Transportation (ODOT) to construct several multi-use trail projects and other improvements that benefit

pedestrians and bicyclists. The City's local funding contribution has come out of the Transportation Operations Fund.

Intergovernmental revenues, franchise fees, and service/utility fees will likely continue to be the primary sources of revenue for the Transportation Operations Fund in future budget cycles. Gas tax increases and fee increases will continue to be dependent on the state of the economy and voter approval. The state gas tax increased by 25 percent on January 1, 2011 and constitutes the first rise in the Oregon gas tax since 1993. However, the tax increase should not be considered a long-term funding source given the improved fuel efficiency of new vehicles, the rise in ownership of hybrid and electric vehicles, and the increased use of alternative fuels.

The City should continue to apply for grant funding from state programs that have been utilized in recent years to fund capital improvements. Additionally, the City should consider applying for grants from a variety of other programs.

Table 1 summarizes key characteristics of many federal and state funding sources and their applicability to pedestrian and bicycle projects included in the Madras TSP Bike and Pedestrian Update. Each funding source in the table is linked to a description in the sections that follow.

As shown in Table 1, there are 15 state and federal funding sources with a variety of purposes that could be applied to bike and pedestrian projects in Madras. Some sources can be applied to bike and pedestrian projects if they are a component of a larger project (i.e. transit improvements, or highway improvements), while other funds are dedicated for recreational purposes. A general summary of bike and pedestrian project types that are expected to be applicable for funding through each source is provided, although not all projects of that type may be applicable. For this reason, the City should review full funding guidelines provided by the administration agencies to understand all requirements and applicability to a project prior to completing a formal application.

The funding potential identified in table 1 is generally intended to identify those funds that are expected to be more likely to fund one or more bike or pedestrian projects included in the Madras TSP. It is also loosely based on factors such as number of competing applications expected relative to annual funding available, previous success, and how well specific projects in Madras align with the purpose of each funding source.

Table 1 - Existing and Potential Funding Sources for Madras Bike and Pedestrian Projects

Source ID	Source Title	Award Cycle	Intended Use	Applicable Pedestrian and Bicycle Project Types	Administration Agency	Deadline	Construction Eligible?	Local Match	Previously Utilized Source?	Funding Potential	Funding Comments	Link
1	**Federal Transit Administration Discretionary Grant Programs**	Annual	Pedestrian and bicycle projects associated with a larger transit improvement	Sidewalk, bikeways, crossing improvements	Federal Transit Administration	Varies	Yes	20%	No	Low	Limited transit in City	http://www.fta.dot.gov/grants/13094.html
2	New Freedom Program	Annual	Accessible transportation improvement projects in areas with individuals with disabilities	sidewalk, crossing improvements	Federal Transit Administration	Varies	Yes	20%	No	Low	Limited availability of funds	http://www.fta.dot.gov/grants/13093_3549.html
3	**Rivers, Trails, and Conservation Assistance Program**	Annual	Technical assistance for recreation and conservation projects. Does not fund implementation.	Shared-use paths	National Park Service	August	No	None	No	Low	Limited applications	http://www.nps.gov/ncrc/programs/rtca/contactus/cu_apply.html
4	Flexible Federal Funds	Annual	Non-highway transportation projects, programs and services that improve modal connectivity, the environment, and operation of transportation system	Shared-use paths	ODOT	October	Yes; $50,000 min. and $2.1 million max.	10.27%	Yes, US 97 to Highway 361 Trail Project	Moderate		http://www.oregon.gov/ODOT/TD/TP/FlexFunds.shtml
5	**Highway Safety Improvement Program**	Annual	Address safety issues on highways and High Risk Rural Roads	All	ODOT	Varies	Yes	10%	No	Moderate	Must address bike and pedestrian crashes	www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/highway_safety_program.shtml
6	Surface Transportation Program	Annual	Surface projects and programs	All	ODOT	Varies	Yes	20%	No	Low	National competition	http://www.fhwa.dot.gov/safetealu/factsheets/stp.htm
7	**Transportation, Community, and System Preservation Program**	Annual	Community preservation and environmental conservation through transportation efficiency	Sidewalk, bikeways, crossing improvements	ODOT	January	Yes	20%	No	Low	National competition	http://www.fhwa.dot.gov/discretionary/tcsp2012info.htm
8	Oregon Parks and Recreation Local Government Grants	Annual	Primary use is recreation; transportation allowed. Construction limited to outside road right-of-way, only in public parks or designated recreation areas	Shared-use paths	OPRD	Varies	Yes	20-50%	Yes; Madras Bike & Skate Park	Moderate		http://www.oregon.gov/OPRD/GRANTS/local.shtml
9	**Recreational Trails Program**	Annual	Non-motorized trails	Shared-use paths	OPRD	October	Yes; $250,000 maximum	20%	Yes; C Street Pedestrian Bridge, Buff Street Pedestrian Bridge and Trail, North Y Trail	Moderate		http://www.oregon.gov/OPRD/GRANTS/trails.shtml
10	Land and Water Conservation Fund	Annual	Acquire land for public outdoor recreation or develop basic outdoor recreation facilities	Shared-use paths, bikeways, sidewalks	OPRD	Varies	Yes; $25,000 minimum	50%	No	Moderate		http://www.oregon.gov/OPRD/GRANTS/lwcf.shtml
11	**Bicycle and Pedestrian Program Grants**	Biennial	Primary use is transportation; recreation allowed	Sidewalk, bikeways, crossing improvements, shared-use paths	ODOT	Next in spring 2012	Yes; inside road right-of-way only, paved only	5%	Yes; "B" Street Bicycle and Pedestrian Improvements	Moderate		http://www.oregon.gov/ODOT/HWY/BIKEPED/grants1.shtml
12	Safe Routes to School	Biennial	Identify and reduce barriers for biking and walking to/from school	All	ODOT	Varies	Yes; $500,000 maximum	None	Yes; Buff Street/10th Street Intersection Improvements	Moderate		http://www.oregon.gov/ODOT/TS/saferoutes.shtml
13	**Statewide Transportation Improvement Program**	Biennial	Multi-year, statewide, intermodal program of transportation projects	Sidewalk, bikeways, crossing improvements	ODOT	Varies	Yes	Varies	No	Moderate		http://www.oregon.gov/ODOT/HWY/STIP/
14	Transportation Enhancements Program	Biennial	Primarily transportation; recreation allowed	All	ODOT	May	Yes; $1.5 million maximum (typical)	10.27%	Yes; US 97 - Fairgrounds Road to "L" Street Improvements	Moderate		http://www.oregon.gov/ODOT/HWY/LGS/enhancement.shtml
15	**Urban Trails Fund**	Undefined	Shared-use paths for non-motorized vehicles and pedestrians	Bikeways, sidewalks, Share-use paths	ODOT	Varies	Yes	20%	No	Low	Funding uncertain	Patricia Fisher (503-986-3528)

Table 2 provides a summary of the funding sources that are applicable to each type of project.

Table 2 - Funding Source by Project Type

Project Type	Potential Funding Sources[1]
Bike Lanes	1, 4, 5, 6, 7, 11, 12, 13, 14
Sidewalks	1, 2, 4, 5, 6, 7, 11, 12, 13, 14
Shared-use Paths	3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
Crossings	1, 2, 4, 5, 6, 7, 11, 12, 13, 14

[1] See Table 1 above for cross-reference of numbers to sources.

FEDERAL AND STATE FUNDING SOURCES

Federal funding is primarily distributed through a number of different programs established by Congress. The latest act, the Safe, Accountable, Flexible, Efficient Transportation Equity Act - a Legacy for Users (SAFETEA-LU), was enacted in August 2005 as Public Law 109-59

SAFETEA-LU authorized the federal surface transportation programs for highways, highway safety, and transit for the 5-year period 2005-2009. SAFETEA-LU legislation expired on September 30, 2009, but at the time of writing had been extended to March 31, 2012. It should therefore be noted that it is not possible to guarantee the continued availability of any listed SAFETEA-LU programs, or to predict their future funding levels or policy guidance. Nevertheless, many of these programs have been authorized in some form in repeated federal transportation reauthorization acts, and thus may continue to provide capital for improvements.

In Oregon, most federal monies are administered through ODOT and regional planning agencies. Most, but not all, of these programs are oriented toward transportation versus recreation, with an emphasis on reducing auto trips and providing inter-modal connections. Federal funding is intended for capital improvements and safety and education programs, and projects must relate to the surface transportation system. There are a number of programs identified within SAFETEA-LU that are applicable to bicycle and pedestrian projects. These programs are discussed below.

More information: http://www.fhwa.dot.gov/safetealu/index.htm

Federal Transit Administration Discretionary Grant Programs

The Federal Transit Administration (FTA) views walking and bicycling as modes that complement public transit, as many people either begin or end a trip on public transportation on foot or by bicycle. The FTA has recently issued a policy statement that defines a catchment area around transit stops within which bicycle and pedestrian projects are eligible for FTA financial support. All pedestrian projects within one-half mile and bicycle projects within three miles of a public transit stop are considered to have a de facto relationship with public transportation. Projects within this catchment area are thereby eligible for one of the grant programs administered by the FTA to fund the design, construction, and maintenance of pedestrian and/or bicycle projects that enhance or are related to public transportation facilities.

Projects that may be eligible due to geographic co-location with transit stops are also subject to additional statutory criteria, such as requirements to:

- Enhance economic development or incorporate private investment
- Enhance the effectiveness of public transportation project and relate physically or functionally to that project
- Establish new or enhanced coordination between public transportation and other transportation
- Provide a fair share of revenue for public transportation

Recipients of FTA funding will not be required to certify ridership numbers related to their projects within the catchment areas. Research has indicated that improved access to a stop or station typically results in increased ridership. However, pedestrian projects outside the half-mile radius may still apply for FTA funding if the increased distance from a transit stop is still considered comfortable for the pedestrian. In that case, a study showing the likelihood of increased ridership would be appropriate. Bicycle projects outside of the three-mile radius are not eligible for this exception.

More Information: http://www.fta.dot.gov/grants/13094.html;
http://edocket.access.gpo.gov/2009/pdf/E9-27240.pdf

New Freedom Program

SAFETEA-LU created a new formula grant program that provides capital and operating costs for transportation services and facility improvements that exceed those required by the Americans with Disabilities Act. Examples of pedestrian/accessibility projects funded in other communities through the New Freedom Initiative include installing Accessible Pedestrian Signals (APS), enhancing transit stops to improve accessibility, and establishing a mobility coordinator position. Madras should consider pursuing New

Freedom Initiative grants in the future for enhanced facility accessibility improvement projects laid out in the TSP Update, possibly in coordination with Cascades East Transit. Likely eligible improvements include mid-block and high visibility crossing improvements.

More information: http://www.fta.dot.gov/grants/13093_3549.html; or http://www.hhs.gov/newfreedom/

Rivers, Trails, and Conservation Assistance Program

The Rivers, Trails, and Conservation Assistance Program (RTCA) is a National Parks Service (NPS) program providing technical assistance via direct NPS staff involvement to establish and restore greenways, rivers, trails, watersheds, and open space. The RTCA program provides only for planning assistance - there are no implementation monies available. Projects are prioritized for assistance based on criteria including conserving significant community resources, fostering cooperation between agencies, serving a large number of users, encouraging public involvement in planning and implementation, and focusing on lasting accomplishments. This program may benefit trail development in Madras indirectly through technical assistance, particularly for community organizations, but should not be considered a future capital funding source.

More information: http://www.nps.gov/pwro/rtca/who-we-are.htm

Flexible Federal Funds

As an outcome of the 2009 Legislative Session, ODOT was asked to increase its investment in Non-Highway Transportation. In 2010, the Oregon Transportation Commission approved the formation of a new Flexible Funds Program. The intent of the program is to provide capital for transit, bicycle and pedestrian, and Transportation Demand Management (TDM). Projects must meet FHWA eligibility requirements for STP funding and must demonstrate that projects are "shovel ready". The minimum project size is $50,000 (federal share excluding match) and the maximum size is 10% of the available program funding, or approximately $2.1 million (federal share excluding match).

More information: http://www.oregon.gov/ODOT/TD/TP/FlexFunds.shtml

Highway Safety Improvement Program

This program is designed to help communities implement projects designed to achieve significant reductions in traffic fatalities and serious injuries on all public roads, bikeways, and walkways. This program includes the Railway-Highway Crossings Program and the High Risk Rural Roads Program. ODOT estimates that they will

receive an average of $14 million annually for this program through the lifetime of SAFETEA-LU.

More information: http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/highway_safety_program.shtml

Surface Transportation Program

The Surface Transportation Program (STP) provides states with flexible funds that may be used for a variety of projects on any Federal-Aid Highway including the National Highway System, bridges on any public road, and transit facilities. Bicycle and pedestrian improvements are eligible activities under the STP. This covers a wide variety of projects such as on-street facilities, off-road trails, sidewalks, crosswalks, bicycle and pedestrian signals, parking, and other ancillary facilities. SAFETEA-LU also specifically clarifies that the modification of sidewalks to comply with the requirements of the American with Disabilities Act (ADA) is an eligible activity.

As an exception to the general rule described above, STP-funded bicycle and pedestrian facilities may be located on local and collector roads which are not part of the Federal-aid Highway System. In addition, bicycle-related non-construction projects, such as maps, coordinator positions, and encouragement programs, are eligible for STP monies. ODOT estimates that they receive an average of $84 million annually for this program through the lifetime of SAFETEA-LU.

More information: http://www.fhwa.dot.gov/safetealu/factsheets/stp.htm

Transportation, Community, and System Preservation Program

The Transportation, Community, and System Preservation (TCSP) Program provides federal funding for transit-oriented development, traffic calming, and other projects that improve the efficiency of the transportation system, reduce the impact on the environments, and provide efficient access to jobs, services, and trade centers. The program is intended to provide communities with the resources to explore the integration of their transportation system with community preservation and environmental activities. The TCSP Program funds require a 20-percent match.

In most years, Congress has identified projects to be selected for funding through the TCSP program. Assuming that this method is used to allocate TCSP monies in the future, the City of Madras will need to work closely with ODOT and Members of Congress to gain access to this funding.

Relatively few Oregon communities have received monies from this program since 1999, and a majority of projects are highway-related efforts. The potential for winning funding for the TSP Update projects is thus rated as low, though it may be worth

pursuing for selected bicycle, pedestrian, and multimodal projects that meet the grant criteria if Madras has reason to believe that the local Congressional delegation would be willing to champion the project.

More information: http://www.fhwa.dot.gov/tcsp/

Oregon Parks and Recreation Local Government Grants

The Oregon Parks and Recreation Department (OPRD) administers a Local Government Grants program using Oregon Lottery revenues. The grants may pay for acquisition, development, and major rehabilitation projects for public outdoor park and recreation areas and facilities. The amount of money available for grants varies depending on the approved OPRD budget. Grants are available for three categories of projects: small projects (maximum $50,000 request), large projects (maximum $750,000 request, or $1,000,000 for land acquisition), and small community planning projects (maximum $25,000 request). Several projects identified in this Plan would meet the grant eligibility requirements.

More information: http://www.oregon.gov/OPRD/GRANTS/local.shtml

Recreational Trails Program

The Recreational Trails Program (RTP) of the federal transportation bill provides funding to states to develop and maintain recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses. Examples of trail uses include hiking, bicycling, in-line skating, and equestrian use. These monies are available for both paved and unpaved trails, but may not be used to improve roads for general passenger vehicle use or to provide shoulders or sidewalks along roads.

Recreational Trails Program funds may be used for:

- Maintenance and restoration of existing trails
- Purchase and lease of trail construction and maintenance equipment
- Construction of new trails, including unpaved trails
- Acquisition or easements of property for trails
- State administrative costs related to this program (limited to seven percent of a state's RTP dollars)
- Operation of educational programs to promote safety and environmental protection related to trails (limited to five percent of a state's RTP dollars)

In Oregon, the Recreational Trails Program is administered by the Oregon Parks and Recreation Department (OPRD) as a grant program. This grant is specifically designed to pay for recreational trails projects rather than utilitarian transportation-based projects. Proposed shared-use paths are the most likely facility type that could be funded through the Recreational Trails Program.

More information: http://www.oregon.gov/OPRD/GRANTS/trails.shtml

Land and Water Conservation Fund

The Land and Water Conservation Fund (LWCF) provides grants for planning and acquiring outdoor recreation areas and facilities, including trails. Funds can be used for right-of-way acquisition and construction. This grant program is administered by the Oregon Parks and Recreation Department.

Any TSP Update projects located in future parks could benefit from planning and land acquisition funding through the LWCF. Trail coordinator acquisition can be funded with LWCF grants as well, but historically few trails have been proposed compared to parks.

More information: http://www.oregon.gov/OPRD/GRANTS/lwcf.shtml

Bicycle and Pedestrian Program Grants

The Bicycle and Pedestrian Grant Program is a competitive grant program providing approximately $5 million every two years to Oregon cities, counties, and ODOT regional and district offices for design and construction of pedestrian and bicycle facilities.

Proposed facilities must be within public rights-of-way. Grants are awarded by the Oregon Bicycle and Pedestrian Advisory Committee and administered by ODOT.

More information: http://www.oregon.gov/ODOT/HWY/BIKEPED/grants1.shtml

Safe Routes to School

ODOT administers Oregon's portion of the national Safe Routes to School (SRTS) program. Under the Oregon Safe Routes to School Program, approximately $3.7 million has been available for grants between 2006 and 2010. The grants can be used to identify and reduce barriers and hazards to children walking or bicycling to school. ODOT estimates that they have received an average of $1.37 million annually for this program through the lifetime of SAFETEA-LU.

More information: http://www.oregon.gov/ODOT/TS/saferoutes.shtml

Statewide Transportation Improvement Program

The Statewide Transportation Improvement Program (STIP) is ODOT's short-term capital improvement program, providing project funding and scheduling information for the department and Oregon's metropolitan planning organizations. STIP project lists are updated every two years, with four-year project lists. Project lists are developed through the coordinated efforts of ODOT, federal and local governments, Area Commissions on Transportation, tribal governments, and the public.

In developing this program, ODOT must verify that the identified projects comply with the Oregon Transportation Plan, ODOT Modal Plans, Corridor Plans, local comprehensive plans, and SAFETEA-LU planning requirements (including this Pedestrian and Bicycle Master Plan). The STIP must fulfill federal planning requirements for a staged, multi-year, statewide, intermodal program of transportation projects. Specific transportation projects are prioritized based on federal planning requirements and the different state plans. ODOT consults with local jurisdictions before highway-related projects are added to the STIP. Stand-alone bicycle/pedestrian projects are an eligible funding category, and multi-modal roadway projects that contain a planned pedestrian or bicycle improvement can also be funded through this mechanism.

Oregon STIP funds currently have paid for or will pay for numerous stand-alone bicycle/pedestrian projects and programs, including Safe Routes to School programs and infrastructure improvements, bicycle parking at schools, preliminary engineering, construction, and rehabilitation of numerous path segments, and transportation demand management programs in communities around the State of Oregon. The current STIP also includes pavement preservation and modernization of a large number of multimodal facilities, which will benefit walking and bicycling infrastructure along those roadways. The adopted 2010-2013 STIP is already an excellent funding source for bicycle/pedestrian projects, and future updates to the STIP should be considered an important opportunity for projects identified in this plan.

More information: http://www.oregon.gov/ODOT/HWY/STIP/

Transportation Enhancements Program

The Transportation Enhancements (TE) program is intended to promote projects that improve all modes of transportation. A federal program administered by ODOT, the TE program is funded by a set-aside of Surface Transportation Program (STP) monies. Ten percent of STP funds are designated for Transportation Enhancement (TE) activities, which include the "provision of facilities for pedestrians and bicycles, provision of safety and educational activities for pedestrians and bicyclists," and the "preservation of abandoned railway corridors (including the conversion and use thereof for pedestrian and bicycle trails). Other TE categories are Historic Preservation; Landscaping and

Scenic Beautification; and Environmental Mitigation. Projects must serve a transportation need. TE grants can be used to build a variety of pedestrian, bicycle, streetscape, and other improvements that enhance the cultural, aesthetic, or environmental value of transportation systems. The statewide grant process is competitive.

More information: http://www.oregon.gov/ODOT/HWY/LGS/enhancement.shtml

Urban Trails Fund

The Urban Trails Fund (UTF) was created in 2009 by the Oregon Legislature, as part of HB 2001 (the Jobs and Transportation Act). The purpose of the Urban Trails Fund was to develop shared-use paths for non-motorized vehicles and pedestrians, within urban growth boundaries, to provide or improve links to roads and highways, footpaths, bike trails, and public transit. The UTF was specifically created in response to a gap in the current funding stream for projects outside of the public right-of-way that provide non-motorized transportation links.

The Urban Trails Fund was initially created by a one-time appropriation of $1.0 million, and was managed as a competitive grant program by ODOT. The Oregon Bicycle and Pedestrian Advisory Committee was the public advisory committee overseeing the Urban Trails Fund. The intention of the first round of funding was to demonstrate the value of the program with the hope that the Oregon Legislature will authorize additional program dollars in the future. If the program is continued in the future, shared-use path projects identified in this Plan are likely to compete well for grant awards.

More information: None available online; ODOT contact is Patricia Fisher (503-986-3528)

STATE RESOURCES

Oregon Transportation Infrastructure Bank

The Oregon Transportation Infrastructure Bank (OTIB) is a statewide revolving loan fund designed to promote innovative transportation solutions. Oregon's program was started in 1996 as part of a ten-state federal pilot program. Additional legislation passed in 1997 by the Oregon Legislature establishes the program in state law and includes expanded authority. OTIB may cover up to 100% of project costs. Eligible borrowers include cities, counties, transit districts, other special districts, port authorities, tribal governments, state agencies, and private for-profit and non-profit entities. Eligible projects include:

- Highway projects, such as roads, signals, intersection improvements and bridges

- Transit capital projects, such as buses, equipment, and maintenance or passenger facilities
- Bikeway or pedestrian access projects on highway right-of-way

Eligible project types include preliminary engineering, environmental studies, right-of-way acquisition, construction (including project management and engineering), inspections, financing costs, and contingencies.

Bicycle and pedestrian projects are explicitly eligible for loans, but Madras has not received funding through this source in the past. It also should be noted that a loan may facilitate the implementation of a project, but monies will still need to be identified to repay the loan. This program should primarily be seen as an implementation tool for projects identified in the TSP Update and not a funding source.

More information: http://www.oregon.gov/ODOT/CS/FS/otib.shtml

State Highway Trust Fund

Madras receives its share of state gas tax and weight mile tax receipts from the State Highway Trust Fund. These monies are currently contributed to the City's Transportation and Operations Fund, which is used to fund operations and maintenance as well as capital projects. The Oregon state gas tax increased by six cents a gallon in January 2011. Operations and maintenance needs of on-street bicycle and pedestrian facilities will continue to benefit from this funding source, and multimodal roadway projects paid for through this source may result in improved bicycle and pedestrian facilities, but it is unlikely to provide for stand-alone pedestrian or bicycle facilities in the future.

Oregon Revised Statute 366.514

Often referred to as the "Oregon Bicycle Bill," this law applies equally to bicycle and pedestrian facilities. The statute's intent is to ensure that future roads be built to accommodate bicycle and pedestrian travel. The statute requires the provision of bicycle and pedestrian facilities on all Major Arterial and Collector roadway construction, reconstruction, or relocation projects where conditions permit. The statute also requires that in any fiscal year, at least one percent of highway funds allocated to a jurisdiction must be used for bicycle/pedestrian projects. This amount could increase to 1.5 percent or higher in the future and could, therefore, present a greater opportunity for funding bicycle and pedestrian facilities.

More information: http://www.oregon.gov/ODOT/HWY/BIKEPED/bike_bill.shtml

LOCAL FUNDING OPTIONS

The following section describes local funding options available to the City of Madras for implementing bicycle and pedestrian projects contained within the TSP. Each description includes the potential funding level, the action needed to implement the option, the administrative cost of implementation, anticipated community acceptance of the action, and the types of projects that could be implemented through the option. All options discussed are legal in Oregon and in use in communities today. Some require specific action in order to establish the program for the first time.

Local Bond Measures

Local bond measures, or levies, are usually initiated by voter-approved general obligation bonds for specific projects. Bond measures are typically limited by time, based on the debt load of the local government or the project under focus. Funding from bond measures can be used for right-of-way acquisition, engineering, design, and construction of pedestrian and bicycle facilities. Transportation-specific bond measures featuring a significant bicycle/pedestrian facility element have passed in other communities, such as Seattle's "Closing the Gap" measure. Though this funding source is one that can be used to finance a multitude of project types, it must be noted that the accompanying administrative costs are high and voter approval must be gained.

Urban Renewal District/Tax Increment Financing

Urban Renewal Districts are separate taxing districts created to remove blight within a District as defined by State statute and local Urban Renewal Plans. Each Urban Renewal Plan has identified actions that will remove the blight within the District. Those actions are funded by debt financing (e.g., bonds) using the incremental tax revenue generated from improvements on private property that increase the tax assessable value of that property that then create additional property tax revenue. The additional tax revenue (i.e., tax increment) is then directed to the Urban Renewal District to be used for blight removal. This public finance method is referred to as Tax Increment Financing (TIF) and is limited to Urban Renewal in the State.

Madras has an Urban Renewal District that uses TIF to remove blight within the District. The City's Urban Renewal District has an Urban Renewal Plan which is called the Urban Renewal Action Plan which identifies, amongst other action, improving public infrastructure within the District to remove blight and also inspire development and redevelopment of private property within the District. It should be noted that TIF programs around the state have been performing poorly during the current economic downturn because property values have not risen steadily as expected.

System Development Charges

System Development Charges (SDCs) are typically tied to trip generation rates and traffic impacts produced by a proposed project. Upon City Council approval of such a policy, a developer may reduce the number of trips (and hence impacts and cost) by paying for on- or off-site pedestrian improvements that will encourage residents/tenants to walk or use transit rather than drive. In-lieu fees may be used to help construct new or improved pedestrian facilities as allowed by City Ordinance. SDCs are currently in use in Madras and by policy include bicycle and pedestrian facilities; the parks component of the SDC may also be applied towards building trails on park lands.

Local Fuel Tax

Every state collects an excise tax on fuel, and this includes diesel and biodiesel. Only nine states permit cities or counties to impose a local fuel tax, and Oregon is one of those states. Other Oregon cities, such as Eugene, have chosen to implement this mechanism in order to pay for street operation, maintenance and preservation activities. If the Madras City Council were to adopt a local fuel tax, improvements to the walking and biking infrastructure that have been identified in the TSP Update would be eligible for funding.

Transportation System Maintenance Fee

The revenue generated by a Transportation System Maintenance Fee (sometimes called a transportation maintenance fee or a street user fee) is commonly used for operations and maintenance of the street system, including maintaining on-street bicycle and pedestrian facilities, including routine sweeping of bicycle lanes and other designated bicycle routes. Like the local fuel tax, a transportation system maintenance fee is enacted by City Council in order to secure a dedicated funding source for bike and pedestrian facilities upkeep. Additionally, if the fee collection system can by tied to an existing collection system, the administrative costs will remain low. In light of the steady decline in the real value of State Highway Trust Fund revenues, a Transportation Utility Fee may make sense for Madras in the future.

Local Improvement Districts (LIDs)

Local Improvement Districts (LIDs) are most often used by cities to construct localized projects such as streets, sidewalks, or bikeways. Through the LID process, the costs of local improvements are generally spread out among a group of property owners within a specified area. The cost can be allocated based on property frontage or other methods such as trip generation. Though the costs of an LID project are borne primarily by the property owners, moderate administrative costs must be factored in, and the public involvement process must still be followed.

Economic Improvement Districts (EIDs)

Pedestrian improvements can often be included as part of larger efforts aimed at business improvement and retail district beautification. Economic Improvement Districts collect assessments or fees on businesses in order to fund improvements that benefit businesses and improve customer access within the district. Adoption of a mutually agreed upon ordinance establishing guidelines and setting necessary assessments or fees to be collected from property owners is essential to ensuring a successful EID. These districts may include provisions for pedestrian and bicycle improvements, such as wider sidewalks, landscaping, and ADA compliance.

Stormwater Green Streets Funding

Municipal water quality agencies are increasingly turning to green streets projects as a promising strategy to fulfill their mission to improve water quality by minimizing and treating stormwater runoff. Green streets improvements can often serve a secondary community benefit as traffic calming by adding on-site stormwater management to traffic circles, chicanes, and curb extensions. Fees collected by stormwater management agencies are commonly applied to a variety of projects, including capital investments. Depending on the agency culture, these capital investments may include green streets efforts. In order for these fees to be collected, the City of Madras Water/Wastewater Department will need to either increase rates or change current policies regarding revenue spending. The administrative costs of a green streets program can remain low as long as they are administered through an existing stormwater and wastewater fee program.

CITY OF MADRAS TRANSPORTATION FUNDING PLAN

Identified Street Improvement Projects

Approximately $17.4 million in transportation system improvements are projected to be required within the Madras Urban Area over the next 20 years (See Table 8-8 for a breakdown of expected project costs). It is assumed that ODOT will fund $5,400,000 or 35% of these costs for US Highway 97 and US Highway 26 improvement projects. The City of Madras would be responsible for funding $13,000,000 or 65% of the total transportation system costs over the next 20 years.

A review has been conducted of a range of alternative transportation funding mechanisms that are available to the City. This review was done in order to develop a list of options that are considered to be the most feasible methods to fund local projects. **A funding package combining SDC revenues, state gas tax revenues, Local Improvement Districts, as well as some type of debt financing mechanism backed**

by property taxes, represents the most feasible funding strategy available to the City to meet expected capital and maintenance funding needs.

Systems Development Charges [1]

The City of Madras already has a transportation SDC (SDC) fee in place. The current fee is computed based on a SDC of $600 per dwelling unit (9.55 ADT). Commercial and industrial SDC fees are calculated based on employees using the trip rates identified in the Uniform Traffic Manual. The City will need to consider increasing the transportation SDC to help fund local projects identified in the TSP.

A SDC is a means of requiring that new developments pay a fair-share of the capital costs of improvements needed to accommodate growth. State law allows the imposition of systems development charges for specified purposes. The requirements and limitations are found in the Oregon Revised Statutes (ORS) 223.297 to 223.314. This section of the report outlines the methodology for a transportation systems development charge. It identifies SDC funding options for projects to meet the long-range transportation needs of the City of Madras.

The basic methodology used to assess transportation SDC fees was to compare employment, dwelling units, and forecasted trips with street improvement needs for year

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[1] A new Transportation System Development Charge Study was conducted by FCS Group out of Redmond, Washington and adopted by the City Council on July 24, 2007. Refer to Appendix H, 2006 TSP Update. This notation added by City Recorder when TSP was updated in 2007.

2015. This section of the report describes the calculations upon which the charge per trip is based. The charge is calculated by dividing the eligible costs of transportation projects by the forecast trips that cause the need for improvements. The eligible costs are those which increase capacity and service.

Finally, the fee levied against a development is derived by determining the number of trips forecast and multiplying this by the per trip fee.

The growth assumptions for the City of Madras are documented elsewhere, but are summarized in Table 8-9. Table 8-9 lists anticipated increases in both residential development and employment between 1995 and 2015. In addition to the number of dwelling units and employment increases, Table 8-9 lists the average number of trips caused on a daily basis by these broad land use categories. These are the figures used in the computer-based transportation model used to assess the City of Madras' long-range transportation system needs.

As shown in Table 8-9, an increase of almost 40,000 daily trips within Madras is forecasted between 1995 and 2015.

Table 8-9
Forecasted Increase in Trip Generation From New Development
1995-2015

Development Type	Forecasted Increase in Number of Units	Trips/Unit	Forecast Increase in Number of Trips
RESIDENTIAL USES			
Single-family Dwelling Units	1,890	9.55 [1]	18,050
Multi-family Dwelling Units	270	6.47	1,747
NON-RESIDENTIAL DEVELOPMENT			
Commercial Employees	1,055	17.5	18,463
Industrial Employees	1,540	1.06	1,632
TOTAL TRIPS			**39,892** [2]

1 ITE Trip Generation Manual, 5th Edition, 1991

2 Assumes unincorporated land areas within UGB will be annexed to the City within 20-year plan life.

The key assumption for the SDC program is that these trips directly cause the need for improvements to the City's transportation system. The total cost of transportation projects under the City's jurisdiction is estimated to be $12,133,140. The basic concept behind project-based systems development charge is to divide the cost of needed projects by the number of trips expected to occur during the same time period. If the City of Madras seeks to recover all costs for construction of street projects from new development through SDC fees, the calculation is as follows:

$12,133,140 / 39,892 = $304.15 per trip.

Note that certain other costs associated with annual monitoring and compliance are also eligible for recovery under an SDC program and are permitted under the ORS. Bookkeeping and documentation associated with these compliance activities may not make the option attractive to Madras. Since the City of Madras already has a transportation systems development charge in place, the methodology needs to be reviewed only briefly.

Typically, SDC's are levied on new developments and are collected at the time of issuance of a building permit or as otherwise provided for by the ordinance.

One potential change to the City of Madras' SDC program is to change the basis upon which the fee is calculated. The amount of the transportation systems development charge levied against a development is most easily explained if it is based upon the average daily number of trips generated multiplied by the per trip fee calculated above. The trip rate for each use should be derived from the latest edition of the Institute of Transportation Engineers' Trip Generation Manual.

For residential uses, the fee is determined by multiplying the number of units by the per unit trip generation rate. For non-residential uses, the fee is determined by multiplying the gross floor area (measured in thousands of square feet) by the applicable trip generated rate. The City may also give the developer the option of submitting a detailed traffic study to establish a trip generation rate for a specific project. The traffic study must be prepared by a licensed traffic engineer in the State of Oregon and shall be prepared in accordance with the methodology contained in the Institute of Transportation Engineers' Trip Generation Manual.

The City of Madras has the option of choosing the amount of funding it wants to recover from new development to pay for needed long-range transportation improvements. To recover 100 percent of the $12,133,140 needed to fund all local projects, the SDC fee is calculated to be $304.15 per trip. If the City chooses to collect only half of the $12 million dollar amount, the SDC fee could be lowered to approximately $150 per daily trip.

Table 8-10 summarizes the trip generation rates and proposed SDC fees for a broad range of possible developments. Table 8-10 is a nearly complete list of land use categories and daily trip rates listed in the Institute of Transportation Engineer's Trip Generation Manual. The column headed by "ID #" refers to the land use category in Trip Generation and the column headed with "Trip Rate" lists the average daily trip rate taken directly from, or derived from, the same manual. The "Assumed Size" column lists a typical size for a building in this land use category. The building size is then used to calculate the number of trips and the proposed SDC fee.

Table 8-10 lists three options for the SDC fee. These are in columns headed with the descriptions "100% Recovery," "75% Recovery," "50% Recovery." These refer to the proportion of the $12 million needed for local projects that would be recovered from the SDC program. For example, if the development summarized in Table 8-9 occurs over the next twenty years and the City uses a $304.15 fee per trip, the City might reasonably expect to recover 100 percent of the funding needed for the $12 million list of projects. The fees for typical developments would be those shown in the "100% Recovery" column.

Table 8-10
SYSTEMS DEVELOPMENT CHARGE CALCULATIONS
Proposed SDC for City of Madras for Sample Developments

ID #	Land Use	Trip Rate	Unit	Assumed Size	Calculated Trips	100% Recovery	75% Recovery	50% Recovery
			per TGSF unless otherwise	Sq. ft.		$ 252.61	$ 189.46	$ 126.31
030	Truck Terminal	9.85		100,000	985.00	$ 248,820.85	$ 186,615.64	$ 124,410.43
110	General Light Industrial	6.97		100,000	697.00	$ 176,069.17	$ 132,051.88	$ 88,034.59
120	General Heavy Industrial	1.50		700,000	1050.00	$ 265,240.50	$ 198,930.38	$ 132,620.25
130	Industrial Park	6.97		400,000	2788.00	$ 704,276.68	$ 528,207.51	$ 352,138.34
140	Manufacturing	3.85		400,000	1540.00	$ 389,019.40	$ 291,764.55	$ 194,509.70
150	Warehousing	4.88		300,000	1464.00	$ 369,821.04	$ 277,365.78	$ 184,910.52
151	Mini-Warehouse	2.61		50,000	130.50	$ 32,965.61	$ 24,724.20	$ 16,482.80
170	Utilities	0.79		100,000	79.00	$ 19,956.19	$ 14,967.14	$ 9,978.10
210	Single Family Detached Housing	9.55	per DU	1	9.55	$ 2,412.43	$ 1,809.32	$ 1,206.21
220	Apartment	6.47	per DU	1	6.47	$ 1,634.39	$ 1,225.79	$ 817.19
221	Low-Rise Apartments	6.59	per DU	1	6.59	$ 1,664.70	$ 1,248.52	$ 832.35
222	High-Rise Apartments	4.20	per DU	1	4.20	$ 1,060.96	$ 795.72	$ 530.48
230	Residential Townhouse/Condo	5.86	per DU	1	5.86	$ 1,480.29	$ 1,110.22	$ 740.15
232	High-Rise Townhouse/Condo	4.18	per DU	1	4.18	$ 1,055.91	$ 791.93	$ 527.95
240	Mobile Home Park	4.81	per DU	1	4.81	$ 1,215.05	$ 911.29	$ 607.53
252	Congregate Care Facility	2.15	per DU	1	2.15	$ 543.11	$ 407.33	$ 271.56
270	Residential Planned Development	7.44	per DU	1	7.44	$ 1,879.42	$ 1,409.56	$ 939.71
310	Hotel	21.75 *		60,000	1305.00	$ 329,656.05	$ 247,242.04	$ 164,828.03
320	Motel	25.50 *		60,000	1530.00	$ 386,493.30	$ 289,869.98	$ 193,246.65
411	City Park	2.23	per acre	15	33.45	$ 8,449.80	$ 6,337.35	$ 4,224.90
412	County Park	2.99	per acre	30	89.70	$ 22,659.12	$ 16,994.34	$ 11,329.56
416	Campground/RV Park	74.38	per acre	20	1487.60	$ 375,782.64	$ 281,836.98	$ 187,891.32
430	Golf Course	8.33	per acre	50	416.50	$ 105,212.07	$ 78,909.05	$ 52,606.03
443	Movie Theater	77.79		20,000	1555.80	$ 393,010.64	$ 294,757.98	$ 196,505.32
491	Tennis Courts	33.33	per court	6	199.98	$ 50,516.95	$ 37,887.71	$ 25,258.47
492	Racquet Club	17.14		20,000	342.80	$ 86,594.71	$ 64,946.03	$ 43,297.35
493	Health Club	15.82 *		20,000	316.40	$ 79,925.80	$ 59,944.35	$ 39,962.90

Table 8-10
SYSTEMS DEVELOPMENT CHARGE CALCULATIONS
Proposed SDC for City of Madras for Sample Developments

ID #	Land Use	Trip Rate	Unit	Assumed Size	Calculated Trips	100% Recovery	75% Recovery	50% Recovery
			per TGSF unless otherwise	Sq. ft.		$ 252.61	$ 189.46	$ 126.31
494	Bowling Alley	33.33		20,000	666.60	$ 168,292.37	$ 126,292.37	$ 84,194.91
520	Elementary School	10.72		60,000	643.20	$ 162,478.75	$ 121,859.06	$ 81,239.38
530	High School	10.90		100,000	1090.00	$ 275,344.90	$ 206,508.68	$ 137,672.45
560	Church	9.32		20,000	186.40	$ 47,086.50	$ 35,314.88	$ 23,543.25
561	Synagogue	10.64		20,000	212.80	$ 53,755.41	$ 40,316.56	$ 26,877.70
565	Day Care Center	79.26		3,000	237.78	$ 60,065.61	$ 45,049.20	$ 30,032.80
566	Cemetery	4.16	per acre	10	41.60	$ 10,508.58	$ 7,881.43	$ 5,254.29
590	Library	45.50		30,000	1365.00	$ 344,812.65	$ 258,609.49	$ 172,406.33
610	Hospital	16.78		200,000	3356.00	$ 847,759.16	$ 635,819.37	$ 423,879.58
620	Nursing Home	5.50 *		150,000	825.00	$ 208,403.25	$ 156,302.44	$ 104,201.63
630	Clinic	23.79		150,000	3568.50	$ 901,438.79	$ 676,079.09	$ 450,719.39
710	General Office Building					-	-	-
	0-10,000 sq. ft.	24.60		10,000	246.00	$ 62,142.06	$ 46,606.55	$ 31,071.03
	10,001-25,000	19.72		20,000	394.40	$ 99,629.38	$ 74,722.04	$ 49,814.69
	25,001-50,000	16.58		40,000	663.20	$ 167,530.95	$ 125,648.21	$ 83,765.48
	50,001-100,000	14.03		80,000	1122.40	$ 283,529.46	$ 212,647.10	$ 141,764.73
	100,001-200,000	11.85		150,000	1777.50	$ 449,014.28	$ 336,760.71	$ 224,507.14
	200,001-300,000	10.77		250,000	2692.50	$ 680,152.43	$ 510,114.32	$ 340,076.21
	300,001-400,000	9.96		350,000	3486.00	$ 880,598.46	$ 660,448.85	$ 440,299.23
	400,001-500,000	9.45		450,000	4252.50	$ 1,074,224.03	$ 805,668.02	$ 537,112.01
	500,001-600,000	9.05		550,000	4977.50	$ 1,257,366.28	$ 943,024.71	$ 628,683.14
	600,001-700,000	8.75		650,000	5687.50	$ 1,436,719.38	$ 1,077,539.53	$ 718,359.69
	700,001+	8.46		800,000	6768.00	$ 1,709,664.48	$ 1,282,248.36	$ 854,832.24
715	Single Tenant Office Building	11.50		100,000	1150.00	$ 290,501.50	$ 217,876.13	$ 145,250.75
720	Medical-Dental Office Building	34.17		30,000	1025.10	$ 258,950.51	$ 194,212.88	$ 129,475.26
730	Government Office Building	68.93		20,000	1378.60	$ 348,248.15	$ 261,186.11	$ 174,124.07
733	Government Office Complex	25.00		140,000	3500.00	$ 884,135.00	$ 663,101.25	$ 442,067.50

Table 8-10
SYSTEMS DEVELOPMENT CHARGE CALCULATIONS
Proposed SDC for City of Madras for Sample Developments

ID #	Land Use	Trip Rate	Unit	Assumed Size	Calculated Trips	100% Recovery	75% Recovery	50% Recovery
			per TGSF unless otherwise	Sq. ft.		$ 252.61	$ 189.46	$ 126.31
750	Office Park	11.42		200,000	2284.00	$ 576,961.24	$ 432,720.93	$ 288,480.62
760	Research & Development Center	7.70		200,000	1540.00	$ 389,019.40	$ 291,764.55	$ 194,509.70
770	Business Park	14.37		200,000	2874.00	$ 726,001.14	$ 544,500.86	$ 363,000.57
812	Building Supply & Lumber Store	30.56		15,000	458.40	$ 115,796.42	$ 86,847.32	$ 57,898.21
814	Specialty Retail Center	40.67		20,000	813.40	$ 205,472.97	$ 154,104.73	$ 102,736.49
815	Discount Store	70.13		50,000	3506.50	$ 885,776.97	$ 664,332.72	$ 442,888.48
816	Hardware-Paint Store	51.29		20,000	1025.80	$ 259,127.34	$ 194,345.50	$ 129,563.67
817	Nursery (Garden Center)	36.08		10,000	360.80	$ 91,141.69	$ 68,356.27	$ 45,570.84
820	Shopping Center					-	-	-
	0-10,000 sq. ft	167.59		10,000	1675.90	$ 423,349.10	$ 317,511.82	$ 211,674.55
	10,001-50,000	91.65		40,000	3666.00	$ 926,068.26	$ 694,551.20	$ 463,034.13
	50,001-100,000	70.67		80,000	5653.60	$ 1,428,155.90	$ 1,071,116.92	$ 714,077.95
	100,001-200,000	54.50		150,000	8175.00	$ 2,065,086.75	$ 1,548,815.06	$ 1,032,543.38
	200,001-300,000	46.41		250,000	11602.50	$ 2,930,907.53	$ 2,198,180.64	$ 1,465,453.76
	300,001-400,000	42.02		350,000	14707.00	$ 3,715,135.27	$ 2,786,351.45	$ 1,857,567.64
	400-001-500,000	38.65		450,000	17392.50	$ 4,393,519.43	$ 3,295,139.57	$ 2,196,759.71
	500,001-600,000	36.35		550,000	19992.50	$ 5,050,305.43	$ 3,787,729.07	$ 2,525,152.71
	600,001-800,000	33.88		700,000	23716.00	$ 5,990,898.86	$ 4,493,174.07	$ 2,995,449.38
	800,001-1,000,000	32.09		900,000	28881.00	$ 7,295,629.41	$ 5,471,722.06	$ 3,647,814.71
	1,000,001-1,200,000	30.69		1,100,000	33759.00	$ 8,527,860.99	$ 6,395,895.74	$ 4,263,930.50
	1,200,001-1,400,000	29.56		1,300,000	38428.00	$ 9,707,297.08	$ 7,280,472.81	$ 4,853,648.54
	1,400,001+	28.61		1,500,000	42915.00	$ 10,840,758.15	$ 8,130,566.61	$ 5,420,379.08
831	Quality Restaurant	96.51		7,000	675.57	$ 170,655.74	$ 127,991.80	$ 85,327.87
832	High-Turnover (Sit Down) Restaurant	205.36		7,000	1437.52	$ 363,131.93	$ 272,348.95	$ 181,565.96
833	Fast Food Restaurant w/o Drive Thru	786.22		2,000	1572.44	$ 397,214.07	$ 297,910.55	$ 198,607.03
834	Fast Food Restaurant With Drive Thru	632.12		2,000	1264.24	$ 319,359.67	$ 239,519.75	$ 159,679.83
835	Drinking Place	15.49		3,000	46.47	$ 11,738.79	$ 8,804.09	$ 5,869.39

Table 8-10
SYSTEMS DEVELOPMENT CHARGE CALCULATIONS
Proposed SDC for City of Madras for Sample Developments

ID #	Land Use	Trip Rate	Unit	Assumed Size	Calculated Trips	100% Recovery	75% Recovery	50% Recovery
			per TGSF unless otherwise	Sq. ft.		$ 252.61	$ 189.46	$ 126.31
840	Automobile Care Center	26.35 *		10,000	263.50	$ 66,562.74	$ 49,922.05	$ 33,281.37
841	New Car Sales	47.91		25,000	1197.75	$ 302,563.63	$ 226,922.72	$ 151,281.81
844	Service Station	680.45 *		1,000	680.45	$ 171,888.47	$ 128,916.36	$ 85,944.24
845	Service Station w/Convenience Mkt	743.80 *		1,000	743.80	$ 187,891.32	$ 140,918.49	$ 93,945.66
846	Service Station w/Con Mkt & Car Wash	688.88 *		1,500	1033.32	$ 261,026.97	$ 195,770.22	$ 130,513.48
847	Car Wash	200.00 *		1,500	300.00	$ 75,783.00	$ 56,837.25	$ 37,891.50
848	Tire Store	47.15 *		5,000	235.75	$ 59,552.81	$ 44,664.61	$ 29,776.40
850	Supermarket	87.82 *		40,000	3512.80	$ 887,368.41	$ 665,526.31	$ 443,684.20
851	Convenience Market (24-hours)	737.99		2,000	1475.98	$ 372,847.31	$ 279,635.48	$ 186,423.65
854	Discount Supermarket	69.74 *		80,000	5579.20	$ 1,409,361.71	$ 1,057,021.28	$ 704,680.86
861	Discount Club	78.02		100,000	7802.00	$ 1,970,863.22	$ 1,478,147.42	$ 985,431.61
870	Apparel Store	37.00 *		5,000	185.00	$ 46,732.85	$ 35,049.64	$ 23,366.43
890	Furniture Store	4.34		30,000	130.20	$ 32,889.82	$ 24,667.37	$ 16,444.91
895	Video Arcade	40.00 *		3,000	120.00	$ 30,313.20	$ 22,734.90	$ 15,156.60
911	Walk-in Bank	140.61		6,000	843.66	$ 213,116.95	$ 159,837.71	$ 106,558.48
912	Drive-in Bank	265.21		3,000	795.63	$ 200,984.09	$ 150,738.07	$ 100,492.05
	Home Occupation			n/a		$0	$0	$0

NOTES: *** Indicates Weekday Rate Derived From Other Data**
TGSF = Thousands of Gross Square Feet

Note that in Table 8-10, residential development SDC fees would be based on the number of dwelling units (DU's). As proposed in Table 8-10, almost all commercial and industrial uses would be charged based upon building size. The sizes listed in Table 8-10 are only examples. In actual practice, the city building official or planner will meet with the developer or owner to determine the appropriate land use category and actual building size from which the SDC fee is calculated.

Cities or counties are sometimes concerned that their SDC will discourage desired development and choose to adjust the methodology as a matter of policy. In doing so, these agencies also accept the fact that by lowering SDC fees, they will need to find other funding sources to pay for needed transportation projects. Besides the option of choosing a lower recovery percentage, the City may consider other methods of reducing transportation SDC fees. Some of the options the City might consider are:

- Adjustments to account for "passer by" trips;
- Combining specific land uses into broader development categories; or
- Placing "caps" or maximums on the trip generation rate.

An adjustment to account for "passer-by" trips has an impact on commercial developments. For some uses within the retail sector, a variety of studies indicate some trips are "passer-by" trips. That is, the trip to an individual business is merely an intermediate stop as part of a longer trip made by a motorist who is passing-by. The argument is that since the motorist was using the street anyway, a lesser impact on the street system occurs than would with a non-passer-by trip. The only employment sector for which a passer-by component has been identified is the retail sector. Furthermore, not all retail businesses have a passer-by component. Using a passer-by adjustment would have no impact on SDC fees for residential development.

Another possibility for reducing the SDC fees for some businesses involves combining some categories. For example, careful examination of Table 8-10 reveals that restaurants have a wide range of trip generation rates. Fast food restaurants generate approximately seven times as many trips per thousand square feet than do quality restaurants. In an effort to encourage fast food restaurants, some cities establish a single "restaurant" category and apply the lower trip generation rate from the "quality restaurant" category. In doing so, these cities forego much of the SDC revenue from the development and must find other funding sources to accommodate the transportation needs caused by that restaurant.

Yet another common approach used by cities is to establish a "cap" or maximum rate to be used in the calculation of trips. This is sometimes set at 200 or 300 trips per thousand square feet. This has the effect of limiting the fees collected from fast food restaurants and convenience markets. Like other adjustments, a cap on trip rates reduces SDC fee collections and forces the cities to find other funding sources.

The SDCs stated above are substantially higher than those currently levied by the City of Madras. Additional types of funding will need to be considered in order to reduce the SDC requirements. The City will need to make a determination on what levels of SDCs best fit the City's overall growth strategy and development policies.

While an increased SDC fee program will provide increased annual revenues to the City for financing related capital projects, they will most likely not match exactly the timing of required capital projects. The City has two options for funding transportation projects depending on the timing of required capital. If the increased SDC inflows are initially greater than the capital requirements, then the City can build up a larger SDC fund balance in order to pay for those costs. If required transportation related project costs outpace inflows of charges, then some type of debt financing based on SDC and other revenues will need to be pursued.

Since SDCs are a less stable form of revenue than more secure forms such as property taxes, the City of Madras will likely need to secure debt paid by the SDC program with additional forms of revenue such as gas tax receipts. In the event that future SDC inflows were not sufficient to pay required debt service, then investors would have claim on additional pledged City revenues. Even with the pledge of other revenues, the City would have a higher cost of borrowing than it would with general obligation debt in order to compensate investors for the additional perceived risk associated with purchasing the City's SDC-based bonds.

General Obligation Debt Secured By Property Taxes

General obligation bond financing secured by property tax revenues is a common method of financing road improvements. Due to the tax's strong security, general obligation bonds are the least costly debt-financing tools available to local governments.

Oregon revised statutes provide that the total outstanding general obligation indebtedness of a city not exceed three percent of the city's true cash value. Bonds issued for water, sewer, and utility purposes are excluded from the 3% limitation. Based on the City's 1995 true cash value of $138 million and netting out legal deductions, the City's debt limit would be just over $4 million (Table 8-11). This is the remaining capacity that the City has available to issue additional general obligation debt for transportation or any other public improvements. Because the City is growing, it should be able to add more assessed value in future years to its tax roll and be able to increase the issuance limit for general obligation debt.

Table 8-11
City of Madras Street Fund Calculation of Legal Debt Limit

Time Cash Value	$138,000,000
	x 3%
	$ 4,140,000
Current Bonded Debt (Less Legal Deductions)	
Industrial Park Bonds	
Phase 1	- $500,000
Phase II	- $200,000
Sewer Bonds	- $1,650,000
Net Debt Subject to 3% Limitations	$0
Amount Available for Future Indebtedness	$ 4,140,000

Given the City's current debt limitation, bonds to cover the cost of some of the transportation improvement options can be issued up to $4,000,000. The role of general obligation bond financing in the City's overall funding program will be dependent on the willingness of the Council to dedicate some or all of the City's debt capacity to street improvements. The City will have the ability to issue GO bonds, with repayment by SDC fees. Since these bonds will be secured by the full faith of the City, the bond rates will have a lower interest rate. In addition, this funding technique would not require an increase to the City property tax rate.

MADRAS TRANSPORTATION SYSTEM PLAN FUNDING RECOMMENDATIONS

In the funding requirements section, a total of $17.5 million in State and Local transportation improvement projects were identified (Table 8-8). This total includes the funds needed for both State highway and local street system improvements. The analysis assumed that ODOT would continue to be the primary funding agency for the $5.4 million identified for improvements to US Highway 97 and 26 within the study area. ODOT conducted a detailed study of possible improvement options for the US Highway 97/26 intersection. This analysis assumed that any selected option would cost $4 million dollars. The City of Madras, with some possible financial assistance from Jefferson County, would have primary funding responsibility for the $12,133,140 in local transportation system improvements during the next 20 years.

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

The City of Madras, Jefferson County, and ODOT should implement the following actions to fund the TSP projects:

City of Madras

Increase Transportation SDC Fee

It is recommended that the City increase the current transportation SDC fee by 50 to 75 percent for new development. This action will enable Madras to finance $5.0-7.6 million of the local TSP improvement projects.

Jefferson County Funding Request

It is recommended that the City request that Jefferson County provide future funding to improve all non-city urban roads within the Madras UGB to city standards. This funding would be used to upgrade existing county roads and to extend future roads to improve the local street grid system.

General Obligation Bond Financing

It is recommended that the City use a portion of the City's bonding debt authority to issue General Obligation bonds to fund a portion of the TSP projects. The bonds should be secured with future SDC fee revenues to make the bonds attractive to investors. The funds obtained through a GO bond sale should be dedicated towards local street improvement projects identified within the TSP.

Local Gasoline Tax

It is recommended that the City adopt a 1 - 2 cent local gasoline tax dedicated towards maintenance of the transportation system.

ODOT Off-System Funding

It is recommended that the City request ODOT to use Off-System funds to finance a portion of the local street improvements that specifically reduce traffic on either US Highway 97 or 26 within the TSP boundaries.

Street Improvement LIDs

It is recommended that Madras implement a comprehensive Local Improvement District program targeted towards walkway improvements along city streets.

Jefferson County

Systems Development Charges (SDC) Fee

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

Local Gas Tax

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

Street Design Standards

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

Oregon Department of Transportation

North US Highway 97 / 26 Intersection

It is recommended that ODOT continue their evaluation of the North US Highway 97/26 intersection. When a recommended improvement option has been identified and approved, the Madras TSP will need to be amended.

Off-System Funding

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

CHAPTER 9: RECOMMENDED POLICIES AND ORDINANCES

In 1991, the Oregon Transportation Planning Rule (TPR) was adopted to implement State Planning Goal 12 (Transportation). The TPR was amended in May 1995 and September 1995. The TPR requires jurisdictions to adopt ordinances that support all transportation modes. In addition, the TPR requires all jurisdictions to complete a Transportation System Plan, and then adopt ordinances to implement that plan.

The City of Madras has previously adopted ordinances that generally support bicycle and pedestrian facilities, as directed by the TPR in Section 660-12-045(3). Recommendations for additional detail and clarification are included in this Chapter. In addition, this TSP recommends access management standards and street standards that should be implemented by policy and ordinance.

Jefferson County has not yet adopted ordinances to implement the TPR. For the portion of the Madras TSP that is included in the Madras UGB, the ordinances recommended for the urban area will apply. For the portions of the TSP that are located outside of the UGB, rural ordinances are recommended.

In addition to meeting the requirements of the TPR, the City of Madras is examining the potential for establishing mixed-use zones and possibly higher densities to mitigate some of the expected growth impacts on the transportation system. A suggested set of ordinances for providing some of these features are discussed following the Elements required by the TPR.

Finally, like many growing communities Madras has been considering how to best measure the potential impacts of rezoning and development on the transportation system. An ordinance that helps guide when a traffic impact study should be completed is included in this chapter for consideration.

ELEMENTS REQUIRED BY THE TRANSPORTATION PLANNING RULE

The applicable portion of the Transportation Planning Rule is found in Section 660-12-045 - Implementation of the TSP, which is included in Appendix H. In summary, the TPR requires that local governments revise their land use regulations to implement the TSP in the following manner:

- Amend land use regulations to reflect and implement the TSP.
- Clearly identify which transportation facilities, services, and improvements are allowed outright, and which will be conditionally permitted or permitted through other procedures.

- Adopt land use or subdivision ordinance measures, consistent with applicable federal and state requirements, to protect transportation facilities, corridors and sites for their identified functions, including the following topics:

  - Access management and control;

  - Protection of public use airports;

  - Coordinated review of land use decisions potentially affecting transportation facilities;

  - Conditions to minimize development impacts to transportation facilities;

  - Regulations to provide notice to public agencies providing transportation facilities and services of land use applications that potentially affect transportation facilities;

  - Regulations assuring that amendments to land use applications, densities, and design standards are consistent with the TSP.

- Adopt land use or subdivision regulations for urban areas and rural communities to provide safe and convenient pedestrian and bicycle circulation and bicycle parking, and to ensure that new development provides on-site streets and accessways that provide reasonably direct routes for pedestrian and bicycle travel.

- Establish street standards that minimize pavement width and total right-of-way.

These elements are discussed in the following sections, where they are grouped by similarity in terms of appropriate policy and ordinance.

Approval Process for Transportation Facilities

Section 660-12-045 (1) of the TPR requires that jurisdictions amend land use regulations to conform to the jurisdiction's adopted TSP. This section of the TPR is intended to clarify the approval process for transportation-related projects. Madras and Jefferson County must consider the level of review necessary for transportation projects, and include policy and ordinance language, such as the following recommendations, to give clear guidance:

1. Recommended Policies for Approval Process

Policies should clarify the approval process for different types of projects. It is recommended that the following policies be recommended as part of adopting the TSP:

A. Changes in the specific alignment of proposed public road and highway projects shall be permitted without plan amendment if the new alignment falls within a transportation corridor identified in the TSP.

B. Public road and highway projects involving the operation, maintenance, repair, and preservation of existing facilities that are consistent with the TSP, the classification of that roadway and approved road standards shall be allowed without land use review, except where specifically regulated (i.e., within a floodplain).

C. Dedication of right-of-way, authorization of construction and the construction of facilities and improvements, where the improvements are consistent with the TSP, the classification of the roadway and approved road standards shall be allowed without land use review.

D. When uses permitted outright under ORS 215.213(1)(m) through (p) and ORS 215.283(1)(k) through (n) are consistent with the TSP, the classification of the roadway and approved road standards, they shall be allowed without land use review.

E. Where changes in the frequency of transit, rail and airport services are consistent with the TSP, they shall be allowed without land use review.

F. For State projects that require an EIS or EA, the draft EIS or EA shall serve as the documentation for local land use review, if required. The appropriate procedure shall be followed:

(1) Where the project is consistent with theTSP, formal review of the draft EIS or EA;

(2) Where the project is consistent with the TSP, formal review of the draft EIS or EA and concurrent or subsequent compliance with applicable development standards or conditions;

(3) Where the project is not consistent with the TSP, formal review of the draft EIS or EA and concurrent completion of necessary goal exceptions or plan amendments.

2. Recommended Ordinances for Approval Process

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

For projects within the UGB and urban portion of Madras, however, there are significant differences in level of detail provided for the projects included in the TSP and the studies that are usually required for construction. For example, it is not possible to clearly identify the amounts of grading, cuts and fills, vegetation removal, or other environmental impacts in the TSP. These are frequently issues of great concern to the community. Clear identification of the impacts of a project through the land use review process affords the best opportunity to build community support and develop mitigation measures, if needed. Also, it is important to note that some transportation projects in rural areas may require goal exceptions or other findings to address State statutes or rules.

Therefore, it is recommended that the City of Madras and Jefferson County review transportation projects within the UGB as regulated land use actions, using conditional use language as contained in Appendix H. This language is recommended for inclusion in the supplementary provision section or as a new section within the development code.

3. Protecting the Existing and Future Operation of Facilities

Section 660-12-045(2) of the TPR requires that jurisdictions protect future operation of transportation corridors. For example, an important arterial for through traffic must have that function protected in order to meet the community's identified needs. In addition, the proposed function of a future roadway must be protected from incompatible land uses. It is also important to preserve the operation of existing and proposed transportation facilities, such as airports, that are vulnerable to the encroachment of incompatible land uses. A set of proposed ordinances to protect the function of general use airports is included below.
Other future transportation facilities that Madras may wish to protect include the space and building orientation necessary to support future transit, and right-of-

ways or other easements for accessways, paths, and trails. Policies are suggested below that will demonstrate the desire of the community to protect these transportation facilities.

Protection of existing and planned transportation systems can be provided by ongoing coordination with other relevant agencies, adhering to the road standards recommended in Chapter 7 of this Plan, and applying the policies and ordinances suggested below.

A. Recommended Policies for Protection of Transportation Facilities

1. **The function of existing and planned roadways as identified in the Transportation System Plan shall be protected through the application of appropriate access control measures.**

2. **Land use decisions shall include a consideration of their effect on existing or planned transportation facilities.**

3. **The function of existing or planned roadways or roadway corridors shall be protected through the application of appropriate land use regulations; for example, residential uses shall not have direct access off of a proposed arterial.**

4. **The function of existing or planned general use airports shall be protected through the application of appropriate land use designation, particularly as it pertains to airport-compatible uses.**

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

6. **The potential to establish or maintain accessways, paths, or trails shall be considered prior to the vacation of any public easement or right-of-way.**

B. Recommended Access Control Ordinances

Access Management standards are recommended in Chapter 7 of this TSP. Appendix K contains recommended policies and ordinance to support the access management standards.

4. Recommended Policies to Protect Public Use Airports

Section 660-12-045(2)(c) of the TPR requires all jurisdictions to adopt measures to protect pubic use airports. The following are examples of recommended policies to protect airports:

A. To avoid danger to the public safety from potential aircraft accidents, commercial and residential uses resulting in concentrations of people shall not be permitted beneath the airport approach surfaces and an area within 500 feet parallel from the runway centerline.

B. Land uses around the Madras Airport shall be required to provide an environment that will not be adversely affected by noise and safety problems and will be compatible with the airport and its operations.

C. The Madras Airport is recognized as an important transportation facility. Its operations, free from conflicting land uses, is in the best interests of the citizens of the City of Madras and Jefferson County; therefore, incompatible land uses will be prohibited on the lands adjacent to the airport.

D. The City of Madras shall encourage cooperation between the City, Jefferson County, and the Oregon Department of Transportation; Aeronautics Section when reviewing any land uses development near the Madras Airport.

E. The City of Madras, Jefferson County, and the Oregon Department of Transportation, Aeronautics Section shall work together in developing an Airport Master Plan for the Madras Airport.

F. The City of Madras will cooperate and coordinate with Jefferson County, and the Oregon Department of Transportation, Aeronautics Section in the protection of the Madras Airport and future expansion areas from potential adverse effects posed by incompatible land uses.

G. The City of Madras and Jefferson County shall create local Airport Advisory Committees for each airport. This committee shall be responsible for advising the sponsors during the development of Airport Master plans, implementing ordinances or in individual land use actions.

H. The land use element of the Madras Airport Master Plan shall become part of this comprehensive plan and guide land use decision making in the vicinity of these transportation facilities.

I. The Airport Runway Protection Zones shall be protected from development that could conflict with aircraft approach safety, or threaten surrounding development.

J. Development in highly hazardous areas, such as land within a floodway or under the Airport Runway Protection Zone will be restricted or prohibited.

K. Because of potential bird hazards to airborne aircraft, land uses beneath designated airport approach surfaces within 500 feet off the approach end of runway(s) accommodating piston engine aircraft, and within 10,000 feet of the approach end of runway(s) accommodating jet aircraft shall not create water impoundments, sanitary landfills, or sewer treatment plants.

L. The City of Madras and Jefferson County shall adopt and implement an Airport Overlay Zone supporting land use compatibility around the Madras Airport.

M. The City of Madras and Jefferson County support:

(1) Land Use Zoning with respect to the Airport land use plan and noise contours;

(2) A comprehensive capital-improvements program for land acquisition for airport expansion and safety; and

(3) Frequent updating of the Airport Master Plan and related land use plans to keep the planning program current with changes in community goals.

5. Recommended Ordinance to Protect Public Use Airports

Airport overlay zones are commonly used to protect smaller public use airports. Appendix L contains a recommended Airport Overlay Zone developed by the Oregon Department of Transportation, Aeronautics Section.

6. Process for Coordinated Review of Land Use Decisions

A lack of coordination between State and local decision processes can result in costly delays and changes in public road and highway projects, as well as some maintenance and operation activities. Section 660-12-045(2)(d) of the TPR requires that jurisdictions develop a process for the coordinated review of land use decisions affecting transportation facilities. The following recommended policies would demonstrate the community's desire to establish coordinated review. Ordinance language for coordinated review is provided within the suggested ordinances for Access Management.

7. Recommended Policies for Coordinated Review

A. The City of Madras / Jefferson County shall coordinate with the Department of Transportation to implement the highway improvements listed in the Six-Year Highway Improvement Program that are consistent with the TSP and comprehensive plan.

B. The City of Madras / Jefferson County shall consider the land use findings of ODOT's draft EISs and EAs as integral parts of the land use decision-making procedures. Other actions required, such as a goal exception or plan amendment will be combined with review of the draft EA or EIS and land use approval process. In addition, if a project must comply with standards or conditions to be allowed in a particular development zone, these conditions and standards will be applied during review of the draft EIS or EA.

8. Process for Applying Conditions to Development Proposals

Section 660-12-045(2)(e) of the TPR requires that jurisdictions develop a process that allows them to apply conditions to development proposals in order to minimize impacts on transportation facilities. These conditions are largely those that would be covered by the access management standards as suggested in Appendix L.

In addition, the Site Plan review process of the City of Madras and Jefferson County Codes should include a requirement to provide data on the potential traffic impacts of a project through a traffic impact study or, at the minimum, an estimation of the number of trips expected to be generated. Recommended language to be included under Site Plan Criteria can be found in Appendix J.

9. Regulations to Provide Notice to Public Agencies

A notice typically initiates review of land use actions. The Zoning and Subdivision Ordinances usually defines this process. These ordinances should be amended to provide for Notice to ODOT regarding any land use action that could potentially affect a State facility. Similarly, all actions by a city or county potentially affecting another jurisdiction's road should require notice to that jurisdiction's public works department. In addition, the policy should be to notice providers of pubic transit and special interest transportation groups such as truckers, railroad, bicyclists, pedestrians, and the disabled on any roadway or other transportation project.

Information that should be conveyed to reviewers is included in Appendix J.

10. Regulations Assuring Amendments are Consistent with the TSP

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

- **All development proposals, plan amendments, or zone changes shall conform to the adopted TSP.**

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

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

A statement should be added to the local ordinance and policy language governing zone changes and plan amendments as contained in Appendix J.

11. Safe and Convenient Pedestrian and Bicycle Circulation

Bicycling and walking are often the most appropriate mode for short trips. Especially in smaller cities like Madras where the downtown area is compact, walking and bicycling can replace short auto trips, reducing the need for construction and maintenance of new roads. However, the lack of safe and convenient bikeways and walkways can be a strong discouragement for these

mode choices. The TPR requires that jurisdictions plan for bicycling and walking as part of the overall transportation system.

12. Recommended Policies for Pedestrian and Bicycle Circulation

The current City of Madras and Jefferson County Comprehensive Plans do not provide policies to protect or promote bicycle and pedestrian transportation. To comply with the objectives of the TSP and the TPR, it is recommended that Madras and Jefferson County amend their Comprehensive Plans with policies such as the following to protect, support, and encourage bicycle and pedestrian travel.

A. In areas of new development the City of Madras / Jefferson County shall investigate the existing and future opportunities for bicycle and pedestrian accessways. Many existing accessways such as user trails established by school children distinguish areas of need and shall be incorporated into the transportation system.

B. Bikeways shall be established on all arterials and major collectors within the Madras Urban Growth Boundary.

C. Sidewalks shall be established on all arterials and collectors within the Madras Urban Growth Boundary.

D. Priority shall be given to accessways to major activity centers within the Madras Urban Growth Boundary, such as the downtown commercial center, schools, and community centers.

E. Bikeways and pedestrian accessways shall be connected to local and regional recreation and alternative travel routes.

F. Bikeways and pedestrian accessways shall be designed and constructed to minimize potential conflicts between transportation modes and adjacent uses. Design and construction of such facilities should follow the guidelines established by the Oregon Bicycle and Pedestrian Plan.

G. Maintenance and repair of existing bikeways and pedestrian accessways (including sidewalks) shall be consistent with the maintenance and repair of motor vehicle facilities.

H. Bicycle parking facilities shall be provided at all new multiplex (four units or more) residential, commercial, industrial, recreational, and institutional facilities. Showers and changing areas shall be

encouraged at all commercial, professional, industrial, and institutional facilities.

l. A citizens advisory committee shall be established to protect and promote bicycle and pedestrian transportation within the Madras Urban Growth Boundary.

13. Recommended Ordinances for Bicycle Parking

Section 660-12-045(3)(a) of the TPR deals with bicycle parking. Madras Zoning Ordinance #528 Article 4, Section 4.5 establishes the bicycle parking standards for the City of Madras. Article 4, Section 4.5 also adequately addresses the pertinent issues regarding bicycle parking and satisfies the requirements of Section 660-12-045(3)(a) of the TPR. However, because the lack of safe and convenient bicycle parking can waste resources and further discourage bicycling as a transportation mode, as well as irritate non-cyclists, Appendix J contains recommended amendments to Article 4, Section 4.5.

Jefferson County Land-Use Code Section 423 (Off-Street Parking Requirements) does not include provisions for bicycle parking. To remedy this, it is recommended that Jefferson County adopt the bicycle parking requirements established by the City of Madras (including the recommendations stated above) for new multi-family residential developments of four units or more, retail, office and institutional developments, and any park and ride lots within the Madras Urban Growth Boundary. Outside of the Urban Growth Boundary, it is suggested that Jefferson County adopt the bicycle-parking ordinance specified for rural areas.

14. Recommended Ordinances for Bicycle and Pedestrian Circulation and Access

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

The TPR specifies that, at a minimum, sidewalks and bikeways be provided along arterials and collectors in urban areas, and separate bicycle and providing

a "short cut" provides pedestrian facilities where these would safely minimize trips distances. The City of Madras should consider enhancing the existing City codes by adopting the recommended ordinances and additions as contained in Appendix J.

It is also recommended that Jefferson County adopt the Internal Circulation Requirements established by the City of Madras (including the recommendations stated above) as part of new multi-family residential developments of four units or more, commercial, industrial, and institutional developments within the Madras Urban Growth Boundary.

Adding the provisions contained in Appendix J will satisfy the objectives of the TPR by creating more favorable conditions for pedestrians and bicyclists within new developments. While current Design Standards within the Land Use Codes for Madras provide for sidewalks and bike paths, the City may decide that additional provisions could further encourage transportation alternatives.

In addition to the above provisions, the recommended bikeway and sidewalk road standards for new road construction or the reconstruction of existing roads within the Madras Urban Area should be enhanced to include specifications for bikeways and sidewalks as outlined in Appendix J.

MIXED-USE LAND USE ORDINANCES

Mixed-use development allows residential and commercial uses to occur within the same development or property. The practice of mixing uses, especially where somewhat higher densities than typical are allowed, may have a beneficial effect on transportation needs in a community. This is because trips become shorter, encouraging walking or bicycling, and employment is located adjacent to housing.

A mixed-use development is modeled on the small towns, neighborhoods, and villages that were common in the pre-World War II era. It has been observed that many quality of life issues, such as mobility, safety, and lack of congestion are often superior in the remaining enclaves of this type of development still found in older parts of our cities. Appendix M contains a model ordinance for consideration by the City of Madras.

MODEL TRAFFIC IMPACT STUDY ORDINANCE

Appendix N contains an example ordinance for determining when a traffic impact study might be needed.

EXHIBIT "2"

City of Madras
Comprehensive Plan Amendment

Proposed Amendments to:

- **Madras Comprehensive Plan**
- **Madras Transportation System Plan: Bicycle & Pedestrian Elements**

FINDINGS

Prepared by:

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Proposal Summary

File No.:	PA-11-1
Applicant:	City of Madras 71 SE "D" Street Madras, OR 97741 (541) 475-3388
Proposal:	To amend the Bicycle, Pedestrian, and related components the City of Madras Transportation System Plan (TSP). Such amendments update the respective infrastructure inventories, identify planned infrastructure, identify specific bicycle and pedestrian infrastructure projects, and updates the financial resources that may be available to the City.

Introduction

The City of Madras has received grant funding from the Oregon Department of Transportation's Transportation Growth Management Program (TGM) to update the bicycle and pedestrian elements of the City of Madras Transportation System Plan TSP. The City of Madras has contracted Kittleson and Associates to prepare the amendments to the TSP utilizing the TGM grant funding.

Conformance with Oregon Administrative Rules Chapter 660 (OAR 660)

Goal 1: Citizen Involvement (OAR 660-015)

To develop a citizen involvement program that insures that opportunity for citizens to be involved in all phases of the planning process.

Finding: The City's Citizen Involvement plan is identified on pages 12 through 14 in the City of Madras Comprehensive Plan. The City publicized the public meetings for the proposed plan amendments in a manner consistent with the provisions of method "A" on pact 13 of the City Comprehensive Plan. As such, the City has followed the City's Citizen Involvement Plan as applicable for this plan amendment process.

This planning effort was started by holding three (3) Technical Advisory Committee (TAC) meetings which were open to the public. The first TAC meeting was held on August 11, 2011, the second TAC meeting was held August 12, 2011, and October 10, 2011. The agenda for each meeting was posted at three (3) public places: City Hall, Jefferson County Annex and US Post Office. In addition, the City invited members of the TAC and interested parties to attend each of the TAC meetings.

The City also posted the agenda for the public hearings before the Planning Commission and City Hall at posted at three public places: City Hall, Jefferson County Annex and US Post Office. In addition, City staff published notice of the public hearings in the Madras Pioneer at 21 days prior to the public hearings but not more than 40 days before the public hearings.

Goal 12: Transportation

DIVISION 12

TRANSPORTATION PLANNING

660-012-0015

Preparation and Coordination of Transportation System Plans

(1) ODOT shall prepare, adopt and amend a state TSP in accordance with ORS 184.618, its program for state agency coordination certified under ORS 197.180, and OAR 660-012-0030, 660-012-0035, 660-012-0050, 660-012-0065 and 660-012-0070. The state TSP shall identify a system of transportation facilities and services adequate to meet identified state transportation needs:

(a) The state TSP shall include the state transportation policy plan, modal systems plans and transportation facility plans as set forth in OAR 731, Division 15;

FINDING: The City has, where appropriate, proposed amendments to its TSP that is consistent with the Oregon Highway Plan. The City's TSP addresses alternative modes of transportation (i.e. bicycle, pedestrian and public transit facilities) and therefore is a modal system plan which seeks to reduce the dependency on vehicular transportation, hence the proposed amendments. As such, the proposed amendments are consistent with the provisions of OAR 731 Division 15.

(b) State transportation project plans shall be compatible with acknowledged comprehensive plans as provided for in OAR 731, Division 15. Disagreements between ODOT and affected local governments shall be resolved in the manner established in that division.

FINDING: The City's current TSP is acknowledged by DLCD and is compatible as required by OAR 731 Division 15. The City and ODOT agree to the proposed amendments to the TSP.

(2) MPOs and counties shall prepare and amend regional TSPs in compliance with this division. MPOs shall prepare regional TSPs for facilities of regional significance within their jurisdiction. Counties shall prepare regional TSPs for all other areas and facilities:

(a) Regional TSPs shall establish a system of transportation facilities and services adequate to meet identified regional transportation needs and shall be consistent with adopted elements of the state TSP;

(b) Where elements of the state TSP have not been adopted, the MPO or county shall coordinate the preparation of the regional TSP with ODOT to assure that state transportation needs are accommodated;

(c) Regional TSPs prepared by MPOs other than metropolitan service districts shall be adopted by the counties and cities within the jurisdiction of the MPO. Metropolitan service districts shall adopt a regional TSP for areas within their jurisdiction;

(d) Regional TSPs prepared by counties shall be adopted by the county.

FINDING: The City does not have a population equal to or greater than 50,000 and therefore does not have a MPO. The City of Madras is not a County and therefore is not required to prepare a regional TSP as part of the proposed amendments to the City's TSP.

(3) Cities and counties shall prepare, adopt and amend local TSPs for lands within their planning jurisdiction in compliance with this division:

(a) Local TSPs shall establish a system of transportation facilities and services adequate to meet identified local transportation needs and shall be consistent with regional TSPs and adopted elements of the state TSP;

FINDING: The City's current TSP satisfies the identified local vehicular transportation needs and is consistent with the Jefferson County TSP. The City did identify on its own accord, that the current TSP did not satisfy the bicycle and pedestrian transportation needs of the City. As such, the City through a public process that inventoried existing facilities and identified needed system improvements has proposed to amend the TSP to more effectively plan and provide for the bicycle and pedestrian needs of the City of Madras. Additionally, the proposed amendments are consistent with the Jefferson County TSP and do not propose facilities beyond the City's UGB therefore, the proposed facilities will also be consistent with the Jefferson County TSP.

(b) Where the regional TSP or elements of the state TSP have not been adopted, the city or county shall coordinate the preparation of the local TSP with the regional transportation planning body and ODOT to assure that regional and state transportation needs are accommodated.

FINDING: The City has made a concerted effort in the 2003 and 2006 amendments to its TSP to coordinate vehicular transportation needs adjacent to the City's UGB by amending the TSP to be consistent with the applicable provisions of the Jefferson County TSP. Beyond that there are no elements of the Jefferson County TSP that are adopted in the City's TSP. Furthermore, the proposed amendments do not include provisions for planned facilities beyond the City's UGB and therefore are not required to consistent with the Jefferson County TSP.

(4) Cities and counties shall adopt regional and local TSPs required by this division as part of their comprehensive plans. Transportation financing programs required by OAR 660-012-0040 may be adopted as a supporting document to the comprehensive plan.

FINDING: As previously discussed, the City amended its TSP in 2003 and 2006 to ensure the City's TSP was consistent with the applicable provisions of the County TSP. Therefore, the City and County TSPs are considered to be consistent with each other and together provide a regional TSP. Accordingly each TSP has identified financing programs as required by OAR 660-

012-0040.

(5) The preparation of TSPs shall be coordinated with affected state and federal agencies, local governments, special districts, and private providers of transportation services.

FINDING: The City has coordinated the proposed amendments to the TSP by including ODOT, Jefferson County, the Bureau of Reclamation, North Unit Irrigation, Pacific Corp, Central Electric Cooperative, and Qwest in Technical Advisory Committee (TAC). Each agency was afforded the opportunity to identify concerns and comments. To the extent each agency provided comments, the City accommodated any concerns and comments of each agency in the proposed amendments to the TSP.

(6) Mass transit, transportation, airport and port districts shall participate in the development of TSPs for those transportation facilities and services they provide. These districts shall prepare and adopt plans for transportation facilities and services they provide. Such plans shall be consistent with and adequate to carry out relevant portions of applicable regional and local TSPs. Cooperative agreements executed under ORS 197.185(2) shall include the requirement that mass transit, transportation, airport and port districts adopt a plan consistent with the requirements of this section.

FINDING: There are no airport and port districts in the City of Madras that require coordination of long-range facility needs in the City. There is a public transit provider: Cascades East Transit (CET) although the proposed amendments to the City's TSP are limited to the bicycle and pedestrian modes and CET was not included in this planning effort.

(7) Where conflicts are identified between proposed regional TSPs and acknowledged comprehensive plans, representatives of affected local governments shall meet to discuss means to resolve the conflicts. These may include:

(a) Changing the draft TSP to eliminate the conflicts; or

(b) Amending acknowledged comprehensive plan provision to eliminate the conflicts;

(c) For MPOs which are not metropolitan service districts, if conflicts persist between regional TSPs and acknowledged comprehensive plans after efforts to achieve compatibility, an affected local government may petition the Commission to resolve the dispute.

FINDING: There are no conflicts identified between the City and ODOT or any other facility provider or user.

660-012-0020

Elements of Transportation System Plans

(1) A TSP shall establish a coordinated network of transportation facilities adequate to serve state, regional and local transportation needs.

(2) The TSP shall include the following elements:

(a) A determination of transportation needs as provided in OAR 660-012-0030;

FINDING: The City determined the needs for the proposed bicycle and pedestrian improvements for the transportation disadvantaged as identified in OAR 660-012-0030 (1)(B). Additionally, the City identified the need to address bicycle and pedestrian mobility for the appropriate students of the Jefferson County 509-J School District as identified in the Safe Routes to Schools Action Plans for the School District.

(b) A road plan for a system of arterials and collectors and standards for the layout of local streets and other important non-collector street connections. Functional classifications of roads in regional and local TSP's shall be consistent with functional classifications of roads in state and regional TSP's and shall provide for continuity between adjacent jurisdictions. The standards for the layout of local streets shall provide for safe and convenient bike and pedestrian circulation necessary to carry out OAR 660-012-0045(3)(b). New connections to arterials and state highways shall be consistent with designated access management categories. The intent of this requirement is to provide guidance on the spacing of future extensions and connections along existing and future streets which are needed to provide reasonably direct routes for bicycle and pedestrian travel. The standards for the layout of local streets shall address:

FINDING: The proposed amendments to the City's TSP do not identify any new arterial or collector roadways. The proposed amendments are limited to bicycle and pedestrian facilities.

(A) Extensions of existing streets;

(B) Connections to existing or planned streets, including arterials and collectors; and

(C) Connections to neighborhood destinations.

FINDING: As previously discussed, the proposed amendments to the City's TSP do not include provisions for new roadways. The proposed improvements are limited to bicycle and pedestrian needs and the needed infrastructure to support the identified needs. Therefore the proposed amendments do not include extension of streets, connecting existing and/or planned streets, or roadway connections to neighborhood destinations. The proposed amendments do identify needed extensions and/or connections of existing sidewalks, bike lanes and multi-use trails that will provide complete bicycle and pedestrian infrastructure. Furthermore, the proposed amendments do specifically address the need for complete streets (e.g. curbs, gutters, bike lanes, sidewalks, landscaping, street lighting) on City collector and arterial streets. The provision of complete streets on these roadways classified as such will allow neighborhoods to connect to high capacity streets that will safely and comfortably provide bicycle and pedestrian mobility outside of the neighborhoods throughout the City.

(c) A public transportation plan which:

(A) Describes public transportation services for the transportation disadvantaged and identifies service inadequacies;

(B) Describes intercity bus and passenger rail service and identifies the location of terminals;

(C) For areas within an urban growth boundary which have public transit service, identifies existing and planned transit trunk routes, exclusive transit ways, terminals and major transfer stations, major transit stops, and park-and-ride stations. Designation of stop or station locations may allow for minor adjustments in the location of stops to provide for efficient transit or traffic operation or to provide convenient pedestrian access to adjacent or nearby uses.

(D) For areas within an urban area containing a population greater than 25,000 persons, not currently served by transit, evaluates the feasibility of developing a public transit system at buildout. Where a transit system is determined to be feasible, the plan shall meet the requirements of paragraph (2)(c)(C) of this rule.

FINDING: The proposed amendments are limited to bicycle and pedestrian infrastructure needs and facilities. Therefore the proposed amendments do not address the above stated provisions.

(d) A bicycle and pedestrian plan for a network of bicycle and pedestrian routes throughout the planning area. The network and list of facility improvements shall be consistent with the requirements of ORS 366.514;

FINDING: The City has proposed amendments to the City's TSP that will more effectively provide for the bicycle and pedestrian needs. Not only will the proposed amendments provide a more robust network of bicycle and pedestrian facilities by identifying needed infrastructure that will create a complete bicycle and pedestrian infrastructure network but the amendments also include the provisions of the Madras and Buff Elementary School Safe Routes to Schools action plan. Therefore, the proposed amendments provide bicycle and pedestrian infrastructure for all community members. Additionally, the City of Madras consistently uses local transportation funds to leverage additional federal and state funds to construct needed multi-use trails, pedestrian street crossings, bridges, infill infrastructure and bicycle and pedestrian infrastructure along highways. As such, the City complies with the provisions of ORS 366.514.

(e) An air, rail, water and pipeline transportation plan which identifies where public use airports, mainline and branchline railroads and railroad facilities, port facilities, and major regional pipelines and terminals are located or planned within the planning area. For airports, the planning area shall include all areas within airport imaginary surfaces and other areas covered by state or federal regulations;

FINDING: Again, the proposed amendments are limited to bicycle and pedestrian infrastructure. Therefore any additional planning requirements of the TSP are beyond the scope of the proposed amendments.

(f) For areas within an urban area containing a population greater than 25,000 persons a plan for transportation system management and demand management;

FINDING: The current population of the City of Madras is 6,050 therefore the requirements for transportation system management and demand management are not required and are beyond the scope of the proposed amendments.

(g) A parking plan in MPO areas as provided in OAR 660-012-0045(5)(c);

FINDING: The current population of the City of Madras is 6,050 therefore the required parking plan for MPO's is not required of the City of Madras.

(h) Policies and land use regulations for implementing the TSP as provided in OAR 660-012-0045;

FINDING: The proposed amendments do not alter the existing development regulations or the City's Zoning and Land Division regulations that implement the provisions of the TSP to the extent that planned facility requirements are identified and required of development as required in the TSP.

(i) For areas within an urban growth boundary containing a population greater than 2500 persons, a transportation financing program as provided in OAR 660-012-0040.

FINDING: As previously state, the City's population is 6,050. The proposed amendments do include an update to the Finance Chapter of the City's TSP. The proposed amendments are also consistent with the required provisions of OAR 660-012-0040.

(3) Each element identified in subsections (2)(b)-(d) of this rule shall contain:

FINDING: The proposed amendments are limited to bicycle and pedestrian facility needs. As such compliance with the standards below will be based upon the need for the bicycle and pedestrian plan provisions.

(a) An inventory and general assessment of existing and committed transportation facilities and services by function, type, capacity and condition:

FINDING: The City and its consultant inventoried existing bicycle (i.e. bike lanes and multi-use trails, etc.) and pedestrian (i.e. sidewalks, pedestrian crossings, signage, curb ramps, etc.) located in the City of Madras UGB. The inventory did not evaluate the condition of existing sidewalks as funding did not allow. It should be noted that the City has a Sidewalk Ordinance that requires property owners to maintain the sidewalks adjacent to their property. Therefore, the assessment of existing condition of sidewalks is not necessary as there is a separate City standard that ensures sidewalks are functional.

(A) The transportation capacity analysis shall include information on:

(i) The capacities of existing and committed facilities;

(ii) The degree to which those capacities have been reached or surpassed on existing facilities; and

(iii) The assumptions upon which these capacities are based.

FINDING: The proposed amendments did not conduct a capacity assessment as specified above. It was assumed that if there were existing bicycle and pedestrian facilities that met City and or ODOT standards (i.e. sidewalk width, crossing standards, trail width, signage) then the facility had sufficient capacity. If, for example, it were found that there was no sidewalk in along a particular segment of a City road, then it was determined that there was no pedestrian transportation capacity and therefore needed facilities were identified and included in the proposed planned facilities.

(B) For state and regional facilities, the transportation capacity analysis shall be consistent with standards of facility performance considered acceptable by the affected state or regional transportation agency;

FINDING: Where there are proposed facilities within rights-of-way that is within the jurisdiction of ODOT, the facility analysis was completed accordingly as described above. Moreover, any needed capacity/facility was designed in a manner consistent with ODOT standards.

(C) The transportation facility condition analysis shall describe the general physical and operational condition of each transportation facility (e.g., very good, good, fair, poor, very poor).

FINDING: As previously discussed the proposed plan amendments did not include a condition analysis. The City will rely upon its Sidewalk Ordinance to ensure sidewalks are maintained to City and or ODOT standards as applicable.

(3)(b) A system of planned transportation facilities, services and major improvements. The system shall include a description of the type or functional classification of planned facilities and services and their planned capacities and performance standards;

FINDING: The City finds the above stated standard relates to vehicular transportation facilities, not bicycle and pedestrian facilities. Moreover, the City does not have classification for similar types of bicycle and pedestrian infrastructure. The City relies upon the standard cross-sections for each street classification for specific infrastructure design standards.

660-012-0040

Transportation Financing Program

(1) For areas within an urban growth boundary containing a population greater than 2,500 persons, the TSP shall include a transportation financing program.

FINDING: The City's population is 6,050 and the City's TSP does include a financing program. As part of the proposed amendments, the City proposed to update the provisions of the Finance Chapter within the TSP.

(2) A transportation financing program shall include the items listed in (a)-(d):

(a) A list of planned transportation facilities and major improvements;

FINDING: The proposed amendments to the TSP include a list of improvements identified in Tables F-1, F-2, F-3, and F-4.

(b) A general estimate of the timing for planned transportation facilities and major improvements;

FINDING: The planned projects identified in Tables F-1, F-2, F-3, and F-4 also have a project summary which includes an estimate of the timing for the planned facility and improvements.

(c) A determination of rough cost estimates for the transportation facilities and major improvements identified in the TSP; and

FINDING: The has estimated the cost of each planned bicycle and pedestrian project.

(d) In metropolitan areas, policies to guide selection of transportation facility and improvement projects for funding in the short-term to meet the standards and benchmarks established pursuant to 0035(4)-(6). Such policies shall consider, and shall include among the priorities, facilities and improvements that support mixed-use, pedestrian friendly development and increased use of alternative modes.

FINDING: The City is not located in a metropolitan area and therefore the above stated requirements are not applicable.

(3) The determination of rough cost estimates is intended to provide an estimate of the fiscal requirements to support the land uses in the acknowledged comprehensive plan and allow jurisdictions to assess the adequacy of existing and possible alternative funding mechanisms. In addition to including rough cost estimates for each transportation facility and major improvement, the transportation financing plan shall include a discussion of the facility provider's existing funding mechanisms and the ability of these and possible new mechanisms to fund the development of each transportation facility and major improvement. These funding mechanisms may also be described in terms of general guidelines or local policies.

FINDING: The proposed amendments to the City's TSP identify additional improvements to address the bicycle and pedestrian mobility needs. The City has distinctly made a policy decision to not fund the proposed bicycle and pedestrian facilities with System Development Charges (SDCs). As such, it was assumed that additional funding sources needed to be identified. The proposed amendments to the Finance Chapter of the TSP identifies outside funding sources that the City has utilized previously or could use in the future. Each funding source is generally described. Additionally, the amendments to the Finance Chapter improve the usefulness of the Chapter by providing a matrix of funding sources that identify the funding source type, funding cycles, minimum and maximum funding limits, and agency contact information.

(4) Anticipated timing and financing provisions in the transportation financing program are

not considered land use decisions as specified in ORS 197.712(2)(e) and, therefore, cannot be the basis of appeal under 197.610(1) and (2) or 197.835(4).

FINDING: The City understands the limitation stated above.

(5) The transportation financing program shall provide for phasing of major improvements to encourage infill and redevelopment of urban lands prior to facilities and improvements which would cause premature development of urbanizable lands or conversion of rural lands to urban uses.

FINDING: Again, the proposed amendments are limited to bicycle and pedestrian facilities, not vehicular facilities. The City finds the above stated requirements are related to vehicular transportation and therefore is not applicable to the proposed amendments.

GUIDELINES

A. PLANNING

1. All current area-wide transportation studies and plans should be revised in coordination with local and regional comprehensive plans and submitted to local and regional agencies for review and approval.

FINDING: The City has proposed amendments to the acknowledged City of Madras Comprehensive Plan. Furthermore, the City will submit the proposed amendments to the Oregon Departments of Land Conservation and Development and Transportation for review and approval.

2. Transportation systems, to the fullest extent possible, should be planned to utilize existing facilities and rights-of-way within the state provided that such use is not inconsistent with the environmental, energy, land-use, economic or social policies of the state.

FINDING: The City to the greatest extent possible has identified needed bicycle and pedestrian facilities within existing right-of-way. Where there are planned facilities outside of existing rights-of-way the City will either purchase property, acquire the necessary easements, or utilize the ability to exact improvements via the development process of which is required to satisfy the legal requirements for takings.

3. No major transportation facility should be planned or developed outside urban boundaries on Class 1 and II agricultural land, as defined by the U.S. Soil Conservation Service unless no feasible alternative exists.

FINDING: The City has not planned any transportation facilities beyond the Madras UGB.

4. Major transportation facilities should avoid dividing existing economic farm units and urban social units unless no feasible alternative exists.

FINDING: The City has not planned any transportation facilities on any existing farms or farm land (Class I or II soils).

5. Population densities and peak hour travel patterns of existing and planned developments should be considered in the choice of transportation modes for trips taken by persons. While high density developments with concentrated trip origins and destinations should be designed to be principally served by mass transit, low-density developments with dispersed origins and destinations should be principally served by the auto.

FINDING: The proposed amendments will provide multi-modal transportation options for the residents of Madras. Vehicular transportation continues to be the dominate mode of transportation for the City of Madras during the Peak PM hour. The proposed amendments will provide the abilty to utilize alternative modes of transportation during the Peak PM hour and thereby shift the modal split of the City. Moreover, the proposed amendments do not address public transit needs.

6. Plans providing for a transportation system should consider as a major determinant the carrying capacity of the air, land and water resources of the planning area. The land conservation and development actions provided for by such plans should not exceed the carrying capacity of such resources.

FINDING: The proposed bicycle and pedestrian related amendments to the City's TSP will not increase the demand for land, air or water resources as they will provide alternative modes of transportation. Furthermore, the planned bicycle and pedestrian facilities will not inspire development where there aren't sufficient public facilities, negatively impact natural resources and air quality.

B. IMPLEMENTATION

1. The number and location of major transportation facilities should conform to applicable state or local land use plans and policies designed to direct urban expansion to areas identified as necessary and suitable for urban development. The planning and development of transportation facilities in rural areas should discourage urban growth while providing transportation service necessary to sustain rural and recreational uses in those areas so designated in the comprehensive plan.

FINDING: The proposed bicycle and pedestrian facilities conform to the City of Madras Comprehensive Plan with respect to land uses. Moreover, the proposed facilities are consistent with the existing comprehensive plan and zoning designations of each property in the City and UGB. Therefore the proposed facilities provide multimodal transit to areas suitable for urban development within the City.

2. Plans for new or for the improvement of major transportation facilities should identify the positive and negative impacts on: (1) local land use patterns, (2) environmental quality, (3) energy use and resources, (4) existing transportation systems and (5) fiscal resources in a manner sufficient to enable local governments to rationally consider the issues posed by the construction and operation of such facilities.

FINDING: The proposed bicycle and pedestrian facilities do not identify improvement of "major transportation facilities" with exception of the proposed improvements to US Highway 97/26 which will improve bicycle and pedestrian mobility along the facility. These proposed

improvements support the land use patterns identified by the City of Madras Comprehensive Plan by supporting alternative modes of transportation and thereby improving bicycle and pedestrian mobility which reduces need for vehicular transportation and reduced off-street parking needs within the commercial zoning districts in the City.

The proposed improvements also will also maintain, if not improve, environmental quality by reducing the need for vehicular transportation which may reduce greenhouse gas emissions. The proposed facilities will also reduce energy use (petroleum fuel) for vehicular transportation and may reduce energy consumption. Finally, the impacts of fiscal resources of the City were also considered when identifying needed facilities (planned facilities). The City had determined that the improved provision for bicycle and pedestrian facilities will reduce the City's need to plan for new vehicular transportation facilities and also reduce maintenance demand as the improved bicycle mobility will reduce vehicular transportation demand.

3. Lands adjacent to major mass transit stations, freeway interchanges, and other major air, land and water terminals should be managed and controlled so as to be consistent with and supportive of the land use and development patterns identified in the comprehensive plan of the jurisdiction within which the facilities are located.

FINDING: The proposed bicycle and pedestrian facilities are not located adjacent to any major mass transit stations, freeway interchanges, or other major air (i.e. airport), land, or water terminals.

4. Plans should provide for a detailed management program to assign respective implementation roles and responsibilities to those governmental bodies operating in the planning area and having interests in carrying out the goal.

FINDING: The City proposes to utilize the existing management program which utilizes the authority, roles, and responsibilities of the City of Madras, Jefferson County and ODOT to implement the City's TSP and ensure the goals stated therein are accomplished

Conformance with City of Madras Comprehensive Plan

Section III – Goals and Policies

Goal 1 – To develop a Citizen Involvement program that insures the opportunity for all citizens to be involved in all phases of the planning process.

> **Policy – The City shall insure adequate citizen involvement in all phases of the planning process. To that end, the citizen involvement program is spelled out on Page 5 of this plan.**

FINDING: The City's Citizen Involvement plan is identified on pages 12 through 14 in the City of Madras Comprehensive Plan. The City publicized the public meetings for the proposed plan amendments in a manner consistent with the provisions of method "A" on pact 13 of the City Comprehensive Plan. As such, the City has followed the City's Citizen Involvement Plan as applicable for this plan amendment process.

This planning effort was started by holding three (3) Technical Advisory Committee (TAC) meetings which were open to the public. The first TAC meeting was held on August 11, 2011, the second TAC meeting was held August 12, 2011, and October 10, 2011. The agenda for each meeting was posted at three (3) public places: City Hall, Jefferson County Annex and US Post Office. In addition, the City invited members of the TAC and interested parties to attend each of the TAC meetings.

The City also posted the agenda for the public hearings before the Planning Commission and City Hall at posted at three public places: City Hall, Jefferson County Annex and US Post Office. In addition, City staff published notice of the public hearings in the Madras Pioneer at 21 days prior to the public hearings but not more than 40 days before the public hearings.

Goal 12 – To provide and encourage a safe, convenient and economical transportation system.

It is noted that the goals and policies in the City's Comprehensive Plan related to Goal 12 are not sufficient by themselves. As such, there are specific goals and objectives identified in the City's Transportation System Plan in Chapter 2. The City relies upon these goals and objectives to guide land use and transportation decisions. As such, the goals and objectives in the TSP are listed below with findings of compliance.

OVERALL TRANSPORTATION GOAL:

> **Develop a transportation system that enhances the livability of Madras and accommodates growth and development through careful planning and management of existing and future transportation facilities.**

GOAL 1: Improve and enhance safety and traffic circulation on the local street system.

> **Objectives:**

A. **Develop an efficient grid system for the community by improving the local street system.**
B. **Improve and maintain existing roadways.**
C. **Identify truck routes to reduce truck traffic in urban areas.**
D. **Examine the need for speed reduction and improved signalization in specific areas.**
E. **Identify local problem spots and recommend solutions; e.g. the junction of Highways 26 and 97.**

FINDING: The proposed amendments to the City's TSP will provide improved and enhanced safety and circulation for bicyclists and pedestrians in the City. Specifically, the proposed amendments have updated bicycle and pedestrian infrastructure inventories, identified needed facility improvements and accordingly developed planned projects to fulfill the bicycle and pedestrian infrastructure needs. Each planned project seeks to improve bicycle and pedestrian mobility and safety by utilizing both ODOT and City public improvement standards. Additionally, the proposed amendments to the TSP support the development of an efficient grid system for the community.

<u>GOAL 2:</u> Identify transportation system needs to accommodate developing or undeveloped areas.

Objectives:

A. **Provide policies and standards that address street connectivity, spacing and access management.**
B. **Integrate new streets into the City grid system with an emphasis on taking the pressure off of traditionally heavy traffic collectors.**
C. **Improve accesses into and out of Madras for goods and services**

FINDING: The proposed amendments to the City's TSP will improve bicycle and pedestrian mobility by identifying needed infrastructure in areas that likely to develop in the future but also in areas where development is not likely to occur. In the later case, the City has proposed to make a concerted effort to provide the necessary infrastructure in these areas. Additionally, the areas of the City that are not likely to see development occurring tend to be also the areas where those who are most disadvantaged are located. As such, the proposed amendments will improve bicycle and pedestrian connectivity with collector and arterial streets and identify needed infrastructure in areas where disadvantaged residents are located.

<u>GOAL 3:</u> Increase the use of alternative modes of transportation (walking, bicycling, and transit) through improved access, safety, and service.

Objectives:

A. **Provide sidewalks and safe crossings on arterial and collector streets.**
B. **Provide shoulders and rural collectors and arterials.**
C. **Provide appropriate walkways and bikeways where high use occurs or may occur.**
D. **Promote alternative modes and carpool programs through**

community awareness and education.

E. Plan for expanded transit service by sustaining funding to local transit efforts and seeking consistent state support.

FINDING: The proposed amendments to the City's TSP are squarely focused on this Goal and implementing objectives. Specifically, the proposed improvements in Tables F-1, F-2, F-3, and F-4 identify the needed infrastructure that will provide sidewalks, crossings, bike lanes, multi-use trails, and also infrastructure needed to provide safe routes to schools.

GOAL 4: Enhance the role of the Madras Airport as an important part of the health, safety and welfare of the area.

Objectives:

A. Improve emergency medical air access by providing instrument approach.
B. Continue runway improvements.
C. Improve access to the airport.
D. Continue to see matching funds for state and federal funds.

FINDING: The proposed amendments to the City's TSP are focused on bicycle and pedestrian mobility and infrastructure needs. As such, provisions of Goal 4 are not applicable to this plan amendment.

Conformance with City of Madras Zoning Ordinance (No. 723)

ARTICLE 8: AMENDMENTS

SECTION 8.1: AUTHORIZATION TO INITIATE AMENDMENTS - An amendment to the text of the Comprehensive Plan, this ordinance, or to the zoning and comprehensive or plan map may be initiated by either City Council, Planning Commission, or the Community Development Director in order for compliance with Oregon Revised Statutes, Oregon Administrative Rules and Statewide Planning Goals. A property owner may initiate a request for a map or text amendment by filing an application with the Community Development Director.

FINDING: The proposed amendments to the City of Madras Comprehensive Plan and Transportation System Plan (TSP) were initiated by the Community Development Director with the authority stated above.

SECTION 8.2: ZONE/PLAN MAP AMENDMENTS

A. Amendment to the Zone/Plan Map

1. Amendment to the Zone/Plan Map may be initiated by the Planning Commission, City Council, Community Development Director, Land Use Periodic Review, or by application of the property owner.

FINDING: The proposed amendments to the Comprehensive Plan will not result in a zone/map

amendment. The proposed amendments are limited to only the TSP.

2. **If the application is for a change of a quasi-judicial nature, the Planning Commission shall conduct a public hearing on the proposed amendment at its earliest practical meeting date after the proposal is submitted and shall follow the adopted rules for quasi-judicial hearings.**

FINDING: The proposed amendments are not considered a quasi-judicial amendment (i.e. property specific) rather encompass the entire City's transportation infrastructure and therefore is considered a legislative post-acknowledgement plan amendment (legislative PAPA).

3. **The Planning Commission shall provide a recommendation to the City Council based on findings-of-fact.**

FINDING: The Planning Commission is an advisory body to the City Council and has provided a recommendation to the City Council to approve the proposed TSP amendments.

4. **The City Council shall hold a public hearing and review the recommendation of the Planning Commission, along with any public testimony on the issue. The City Council must take final action on an amendment request and amendments shall be made by ordinance.**

FINDING: The City Council held a public hearing on April 24, 2012 to review the recommendation from the Planning Commission with regard to the proposed TSP amendments. During the public hearing the City Council provided the opportunity for the public to comment on the proposed amendments to the TSP. On April 24, 2012 the City Council approved the proposed amendments to the TSP of which are required be adopted by City Ordinance in accordance with the City Charter.

B. **Criteria for Amendments: The burden of proof is upon the applicant. The applicant shall show the proposed change is:**

1. **In conformity with all applicable state statutes.**

2. **In conformity with the applicable Statewide Planning Goals; and**

3. **In conformity with the Madras Comprehensive Plan, Zoning and Land Use Ordinance, and policies; and**

4. **That there is a change of circumstances or further studies justifying the amendment or mistake in the original zoning.**

FINDING: As previously discussed, the proposed amendments to the City of Madras Comprehensive Plan and Transportation System Plan are legislative in nature and accordingly not subject to comply with the provisions for quasi-judicial proceedings as the proposed amendments are not property specific. Accordingly, the City finds the above stated standards

are applicable to quasi-judicial plan amendments of which this proposal is not. Therefore, the City finds the above stated criteria are not applicable to the proposed plan amendments.

<u>SECTION 8.3: RECORD OF AMENDMENTS</u> - The City Community Development Department and the City Recorder shall maintain records of amendments to the text and zoning map of the ordinance.

FINDING: The above stated requirement applies to the proposed amendments.

<u>SECTION 8.4: LIMITATION ON REAPPLICATION</u> - No application of a property owner for a rezone shall be considered by the Planning Commission within a one (1) year period immediately following a previous denial of such request.

FINDING: The City finds the above stated limitation is related to quasi-judicial plan amendments and therefore is not applicable to the proposed legislative plan amendments.

<u>SECTION 8.5: NOTIFICATION OF DECISION</u> - Within five (5) working days after a final decision on an amendment to the Comprehensive Plan, Zoning and Land Development Ordinance text or plan/zone map, the City Community Development Department shall provide the applicant and the Department of Land Conservation and Development a complete copy of the City Council decision; and shall also provide notice of the decision to all persons who participated in the local proceedings and requested in writing that they be given notice. The notice shall meet the requirements of ORS 197.615.

FINDING: The City finds the above stated requirements applies to the proposed legislative amendments to the City's Comprehensive Plan and Transportation System Plan.

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Dept. of Land Conservations & Development
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