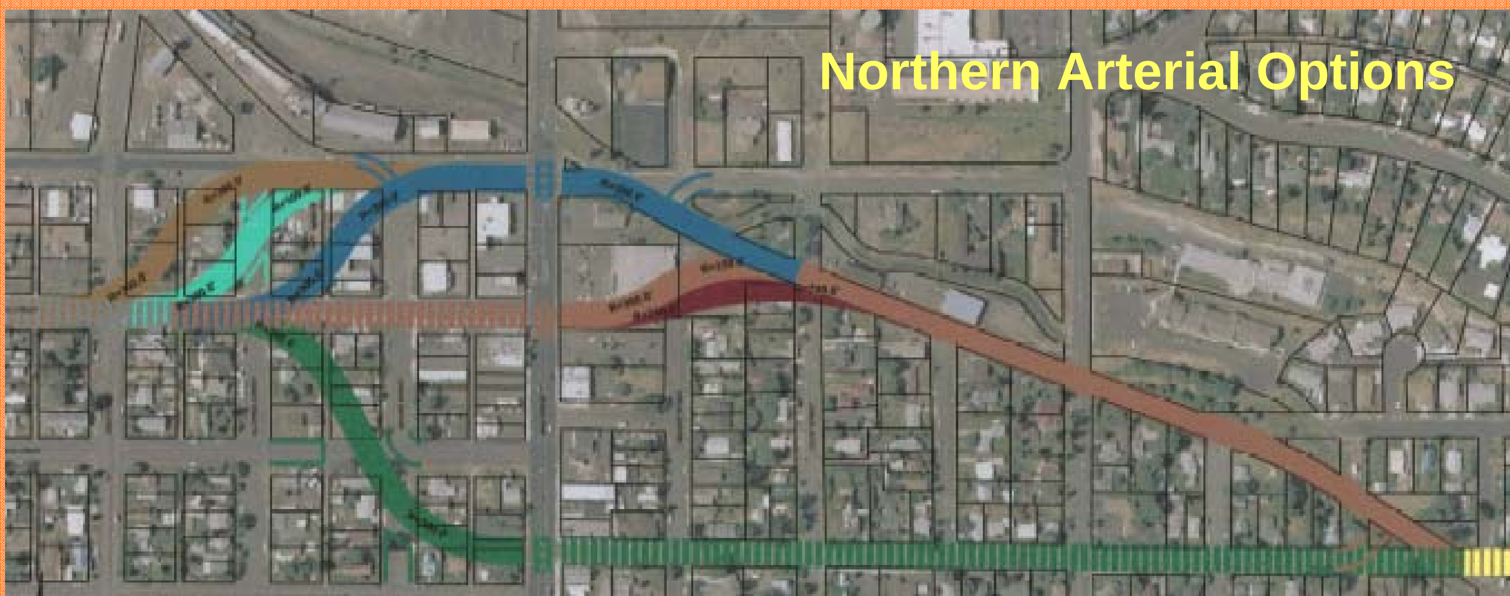
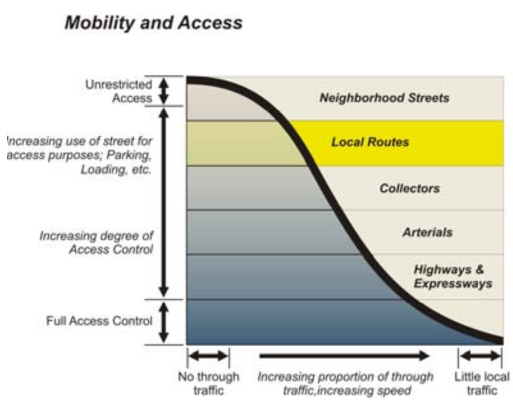
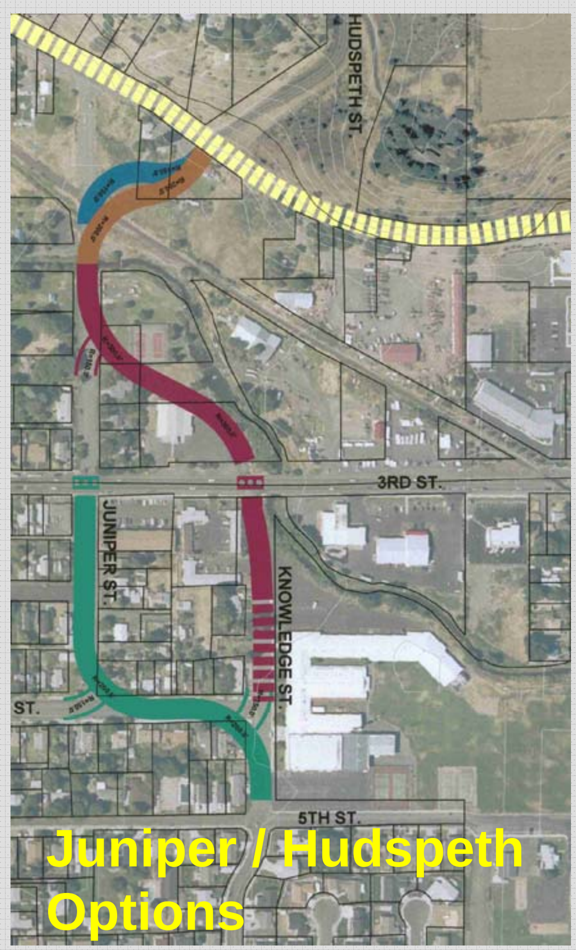
Prineville Transportation System Plan 2005







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Introduction

In 1994, the City of Prineville developed a transportation system plan *(TSP)* to serve as a guide for the management of existing transportation facilities and the design and implementation of future facilities. After its adoption by the City Council, the plan also constituted the transportation element of the Comprehensive Plan. A major update and revision of the 1994 TSP was completed in 1998. The Draft 1998 TSP update was reviewed by the City Council but not adopted. Since adoption of the Prineville TSP in 1994, and completion of the Draft 1998 TSP update, a number of significant issues have been raised and discussed, including:

- Expansion of the Prineville Urban Growth Boundary (UGB) to include the Hudspeth property and other residential lands in south Prineville.

- New and updated forecasts for population and employment growth in the Prineville urban area, and their consistency with Crook County and State of Oregon projections.

- Partial completion of the Northern Arterial.

- Renewed discussion of traffic control options for Highway 126 corridor improvements in downtown Prineville (e.g. two-way vs. one-way couplet along Third Street, reconfiguration of the "Y" intersection with the possible construction of a roundabout and/or new connection to Second Street.

- Need for a systems development charge (SDC) to help pay for local transportation capacity improvements and keep pace with growth.

Given these issues, and the fact that Prineville's Draft TSP is already six years old, the Oregon Department of Transportation (ODOT) agreed to assist the City of Prineville in revising and updating their transportation plan.

This revised TSP represents a significant update of the Draft 1998 TSP. When adopted by the City Council, this revised TSP will supersede the existing 1994 TSP as the Transportation Element of the Comprehensive Plan and will serve as the new guide for providing transportation facilities within the City of Prineville. The revised TSP includes the following chapters:

Chapter 1 *Introduction* - Describes the planning process and how the transportation system plan was developed and updated. Describes the Goal 12 and the purpose of the Transportation Planning Rule and also defines the requirements specific to the City of Prineville. This chapter also describes other plans, such as the Oregon Transportation Plan and Oregon Highway Plan (1999), which include elements that require consistency with the Prineville TSP.

Chapter 2 *Goals and Objectives* - Defines the goals and objectives for the transportation planning process.

Chapter 3 *Inventory* – Summarizes the current inventory of Prineville's transportation system including the location and characteristics for each travel mode.

Chapter 4 *Current Transportation Conditions* – Evaluates the current transportation system including existing traffic volumes, volume-to-capacity (V/C) ratios, levels of services (LOS) and capacity deficiencies.

Chapter 5 *Growth and Travel Forecasts* - Forecast future 2025 traffic volumes, levels of service and transportation system deficiencies.

Chapter 6 *Alternatives Street System Analysis* - Analyzes key street system improvement alternatives.

Chapter 7 *The Transportation System Plan* - Represents the transportation system plan itself, including elements for all travel modes. This Chapter will replace the Transportation Element of the Prineville Comprehensive Plan.

Chapter 8 *Funding Options and Financial Plan* - Describes available options and a financial plan, including local funding sources to pay for future transportation improvements.

The revised TSP includes the following appendices:

Appendix A Summary of Existing Plans and Policies

Appendix B TPR Compliance Table
Provides a table which summarizes (item-by-item) how the revised TSP complies with the requirements of the Transportation Planning Rule.

Appendix C Major Transportation System Street Inventory

Appendix D Growth and Travel Forecasts

Appendix E Transportation Systems Funding Sources

Appendix F Public Meeting Notices, Agenda and Comments

Appendix G Draft TSP Review Comments

Appendix H Recommended Changes to Comprehensive Plan and Land Development Ordinance to Implement the TSP

Transportation System Plan Requirements

The revised Prineville TSP must meet the requirements of Statewide Planning Goal 12 and its implementing division, the Transportation Planning Rule (OAR Chapter 660, Division 12). Goal 12 affects all levels of government, and requires that transportation plans be coordinated among all jurisdictions.

Statewide Planning Goal 12 - Transportation

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

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

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

To date, the City of Prineville has addressed transportation planning issues through a number of planning documents including the following *(these documents are reviewed in more detail in Appendix A - Review of Existing Plans and Policies)*:

- The existing City of Prineville Transportation System Plan (TSP) prepared by David Evans and Associates in 1994;
- The Draft 1998 Transportation System Plan update prepared by W&H Pacific in 1998;
- The City of Prineville Downtown Enhancement Plan prepared by David Evans and Associates in 1997;
- The updated City of Prineville Comprehensive Plan is scheduled for adoption in 1999; and
- The City of Prineville Land Development Ordinance No. 1057 adopted in March, 1998.

- The Prineville Smart Development Code Assistance, prepared by Angelo-Eaton, 2000.

The Transportation Planning Rule

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

Overview

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

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

The TPR affects all jurisdictions, with requirements that vary based on population size and the geographic location of each jurisdiction. It also sets forth a schedule for compliance. Jurisdictions outside of MPOs, such as Prineville, were to have completed their plans by 1997, and then regularly update them thereafter at each periodic review (660-012-0055(5)).

Transportation Planning Rule Requirements for Prineville

The City of Prineville falls into the jurisdictional category of cities with a population between 2,500 and 25,000 that are located outside of a major urban area. In preparing its local transportation system plan, Prineville must "establish a system of transportation facilities and services adequate to meet identified local transportation needs and shall be consistent with regional TSPs and adopted elements of the state TSP." The specific requirements of the TPR, as well as an analysis of the City of Prineville's current levels of compliance, are outlined in Appendix B - TPR Compliance Table.

Oregon Transportation Plan

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

Inventory

In its inventory of existing facilities, the OTP identifies several transportation facilities of significance in Prineville.

The Ochoco Highway (Highways 126 west of Prineville and 26 through and east of Prineville) is a highway of statewide significance. As defined in the Oregon Highway Plan, the function of a statewide highway is "to provide connections and links to larger urban areas, ports and major recreation areas that are not directly served by interstate highways."

Prineville currently has very limited intercity bus service provided by Oregon Breeze Ways with one connection to Bend and Portland per day. Greyhound Bus Lines no longer provides intercity bus service in Prineville. Limited service for the elderly and disabled is provided by the mini-bus service of the Soroptomist International of Prineville. A truck/rail intermodal freight facility is also identified in Prineville. The City of Prineville Railway owns this facility; however, it has not been operated for several years since all truck/rail transfer operations were moved to Portland.

Minimum Levels of Service by 2012

The minimum levels of service expected to be in place by 2012 set standards for performance for each mode of travel and for all jurisdictions[1]. The following levels of service apply to Prineville.

Local public transit services and elderly and disadvantaged service providers should regularly connect with intercity passenger services. Prineville has demand responsive minibus service which will pick up and carry senior citizens to any destination within a five-mile radius of downtown. Connections to the intercity bus are possible with this service.

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

[1] See also the Oregon Department of Transportation, Public Transportation Plan.

Lines no longer provides service between Prineville and Portland or connections to and from other cities in either Bend, Madras, or Biggs Junction (I-84). There is limited intercity bus (one trip per day) between Prineville, Bend and Portland via *Central Oregon Breeze*.

- *Local transit and elderly and disadvantaged services should be coordinated with intercity bus services.* Prineville's demand responsive minibus service will pick up and deliver senior citizens to the intercity bus services at their convenience.

- *Highway freight accessing intermodal truck/rail terminals or moving within Oregon should experience level of service C or better on Oregon highways during off-peak periods.* Note: the Oregon Highway Plan was adopted in 1999 and included a significant change in highway policy performance measures, switching from a level of service (A-F) to "volume to capacity" (V/C) measure. Originally, the Ochoco Highway, a highway of statewide importance, was to operate at "level of service C" or better throughout the day with the street system improvements outlined in the Prineville TSP. This performance measure was changed to those V/C ratios summarized in Table 1-1 below, which include categories for the designation of the National Highway System (NHS) routes within and through the Prineville UGB. Both the City of Prineville and Crook County have expressed desire for a revision to the OHP by designating both US 26 and OR 126 as freight routes.

- *Branch rail lines within Oregon should be maintained to allow a minimum speed of operation of 25 miles per hour whenever upgrading can be achieved with a favorable benefit-cost ratio.* The City of Prineville Railway is classified as a line-haul carrier and is therefore limited to rail yard operating speeds of 20 mph.

- *Maximum volume-to-capacity ratios for state highways are included in the Oregon Highway Plan.* The improvements outlined in the chapter of this report titled "The Transportation System Plan" would allow all of the highways in Prineville to meet the maximum volume-to-capacity ratios specified in the Oregon Highway Plan (OHP)[2]. See *Appendix A – Review of Existing Policies and Plans*.

- *Bicycle and pedestrian networks should be developed and promoted in all urban areas to provide safe, direct and convenient access to all major employment, shopping, educational and recreational destinations in a manner that would double person trips by bicycle and walking.* The bicycle plan presented in the chapter of this report titled "The Transportation System Plan" specifies that bicycle lanes be present on all collector and arterial roadways. In general, the trigger point for adding bike lanes to existing roadways would be daily traffic volumes exceeding 2,500-3,000 vehicles. Roadways which provide direct access to schools would be high priority. *Secure convenient bicycle storage available to the public should be provided at all major employment and shopping centers,*

[2] 1999 Oregon Highway Plan.

park and ride lots, passenger terminals and recreation destinations. The policies and ordinances necessary to support this requirement will be prepared separately from this report.

The 1999 Oregon Highway Plan

The 1999 Oregon Highway Plan defines policies and investment strategies for Oregon's state highway system for the next 20 years. It further refines the goals and policies of the Oregon Transportation Plan and is part of Oregon's Statewide Transportation Plan. The Highway Plan is reviewed in greater detail in *Appendix A - Review of Existing Plans and Policies*, including state policies that are to be coordinated and adopted within local TSPs.

As required by the TPR,[3] and since the adoption of the 1999 Oregon Highway Plan, local jurisdictions, when amending their Comprehensive Plans or TSPs, are to be consistent with the 1999 OHP mobility standards and access management policies[4]. Table 1-1 summarizes the OHP mobility standards for state highways within the Prineville UGB. Also included in **Table 1-1** are suggested mobility standards for local (City) intersections, which will be tested and confirmed as part of the Draft TSP process. Access management policies contained within the OHP are integrated in the Prineville TSP for consistency.

[3] Oregon Administrative Rules, (TPR) 660-120-0015.

[4] Oregon Administrative Rules, 734, Division 51.

Table 1-1 Mobility Standards for Prineville UGB Area – Volume-to-Capacity Ratios for State Highways[1]

Highway Route No.	From	To	Volume-to-Capacity Ratios			Highway Category
			STA2	Posted Travel Speed < 45 mph	Posted Travel Speed > = 45 mph	
US 26	Prineville UGB	OR 126 ("Y")		.80	.75	Region
OR 27	US 26	First St	.95			District
OR 27	First St	Prineville UGB		.85	.80	District
OR 126	Prineville UGB	O'Neil Hwy		.70	.70	State / Expressway
OR 126	O'Neil Hwy	US 26 ("Y")		.80	.75	State / NHS
OR 126	Locust St	Knowledge St	.90			State / NHS
OR 126	Knowledge St	Prineville UGB		.80	.75	State / NHS
OR 370 (O'Neil)	Prineville UGB	OR 126		.85	.80	District
OR 380 (Paulina)	US 26	Prineville UGB		.85	.80	District

1. Oregon Highway Plan, 1999.
2. Special Transportation Areas, adopted by Oregon Transportation Commission, 2004.
3. Traffic on non-state highway approaches that must either stop or yield shall not exceed the V/C for District highways. 2. Special Transportation Areas, adopted by Oregon Transportation Commission, 2004.

TEA-21 and SAFETEA

The Transportation Equity Act for the 21st Century (June 1998), better known as TEA-21, authorizes a six-year federal funding program to include highway, highway safety, transit and other surface transportation programs. TEA-21 builds on the initiatives established in the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 by continuing and improving current programs, and adding new initiatives to meet the nation's challenges to improve safety, protect and enhance communities and the natural environment, and advance economic growth through efficient and flexible transportation. Since 1993, a series TEA-21 "extensions" have been proposed and adopted in the U.S. The first was titled "Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003" (SAFETEA). There is current legislation in Congress to finalize a full re-authorization of SAFETEA.

Crook County

Crook County - Prineville Area Comprehensive Plan

The Crook County - Prineville Area Comprehensive Plan was prepared in response to Goal 12, and enacted in 1978. The City of Prineville is preparing its own Comprehensive Plan and expects to adopt it in 2005.

Crook County Transportation System Plan (2003-2005)

The TPR requires coordination amongst county and city transportation system plans. The Crook County Transportation System Plan was prepared for Crook County by H. Lee & Associates in 2003-2005. In same cases, and for some proposed projects in the Crook County TSP, the Prineville UGB planning area is included. A summary of the transportation section of the comprehensive plan and the Crook County TSP are included in *Appendix A -Review of Existing Plans and Policies.*

The Existing City of Prineville TSP

In 1994, the City of Prineville prepared and adopted a TSP to meet the requirements of the TPR. In 1998 the City of Prineville prepared a Draft TSP update. The 1998 Draft TSP includes the following plan elements which are required in order to satisfy the TPR.

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

In this 2005 TSP, items 1 through 4 are addressed in Chapter 7 of this report titled "The Transportation System Plan." The transportation financing program (Item # 6 above) is presented in Chapter 8 titled "Funding Options and Financial Plan." TPR compliance issues specific to the 2005 TSP are also addressed in *Appendix B - TPR Compliance Table*.

The policies and land use regulations (Item #5 above) are contained in *Appendix H – Recommended Changes to Comprehensive Plan and Land Development Ordinance to implement the Transportation System Plan.* Appendix H includes land use and subdivision ordinance amendments to protect transportation facilities for their identified functions. In particular, these amendments included street standards and access control measures. Land use and subdivision ordinance amendments to require bicycle parking facilities and facilities for safe, convenient, and direct pedestrian and bicycle access within and between residential, commercial, employment, and institutional areas were also addressed.

Revisions to the City of Prineville Transportation System Plan

The City of Prineville has completed a substantial amount of planning to date, including preparation of the 1994 Transportation System Plan and Draft 1998 TSP update. In revising its Draft 1998 TSP, the City will accomplish the following:

- Address changes to the City's Urban Growth Boundary (UGB) which have occurred since the adoption of the TSP;
- Update population and traffic projections;
- Review and update projects to assure that the projects proposed and prioritized in the TSP accurately reflect the growth forecasts, and goals and objectives of the community;
- Address and reconcile adopted City street design, access management and other transportation standards with both Crook County transportation policies and standards and 1999 Oregon Highway Plan Access Management and LOS standards;
- Re-assess funding options and revise the Financial Plan; and
- Address any remaining TPR compliance issues.

The Planning Process

The revised Prineville TSP was developed through a series of technical analyses combined with systematic input and review by the City, the Transportation Advisory Committee, Planning Commission and City Council, and the public. The planning process is described on the following pages and the planning area is described at the end of this chapter.

Developing a Transportation System Plan

Key elements of the process include:

- Involving the community in the planning process
- Reviewing existing plans and transportation conditions
- Defining goals and objectives
- Developing population, employment and travel forecasts
- Developing and evaluating transportation system alternatives
- Developing the transportation system plan
- Developing a funding plan and capital improvement program

Community Involvement

The existing Draft 1998 TSP provided a foundation for the development of the 2005 TSP. Community involvement was an important part of the development of both documents. For the Draft 1998 TSP, community interaction was achieved in two ways: holding open community meetings and meetings with a previously formed Transportation Advisory Committee.

For the preparation of the <u>Draft 1998 TSP</u>, the TAC was reconvened and met four times. The TAC revisited and discussed a wide range of transportation issues with an emphasis on the alternatives for downtown circulation, airport area access, Crooked River crossings, and north/south connections. The reconvened TAC included representatives from the business community, trucking interests, seniors and others.

In addition to the TAC, a Joint Planning Commission/City Council was formed and met four times to aid in the development of the Draft 1998 TSP. A Public Open House meeting was also held prior to each of the Joint Planning Commission/City Council meetings to provide the general public with an opportunity to discuss transportation planning in the City of Prineville. Each round of public meetings was preceded by the preparation and release of a newsletter, which announced the upcoming meeting schedule and identified key issues.

Finally, a Management Team, consisting of ODOT, DLCD, and City staff, met with the consultant on a regular basis over the course of the revised plan development to provide guidance and input into all phases of the process.

In the preparation of the 2005 TSP, the TAC was restructured to include representatives from the City, Crook County, ODOT, DLCD, School District and a major industry (Les Schwab). The TAC met six times to review, comment and recommend refinements of the Draft TSP findings. The Draft 2005TSP findings were also presented and discussed with Prineville Planning Commission and City Council, through a series of three separate meetings.

All Prineville residents were invited to attend three separate public information meetings. At each meeting the Draft TSP findings were shared. Public comments and concerns were noted and summarized in refinement of the TSP. Advanced notification of the three public meetings and three Planning Commission/City Council meetings were posted with the following media:

- Central Oregonian Newspaper
- Bend Bulletin
- Crestview Cable

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 development process. They are described in the chapter titled "Goals and Objectives".

Future Transportation System Demands

As required by the Transportation Planning Rule, the TSP must address a 20-year forecasting period. The original 20-year travel forecasts developed for the Draft 1998 TSP were based on projections of population and employment by different land use categories within the Urban Growth Boundary. These forecasts were updated in the revised 2005TSP using the methodology described in the chapter titled "Growth and Travel Forecasts."

Street System Alternatives

Once the travel forecasts were developed, a series of street system improvement options were evaluated for key areas of concern. The Improvement Options evaluated included 1) improvements to downtown traffic circulation along the Third Street corridor; 2) improvements to the Highway 126 / 26 intersection; 3) improved opportunities to cross the Crooked River; and, 4) improvements to the north/south collector street system. After comparing the options and sub-options available under each of the Improvement Options with the goals and objectives established at the beginning of the process and with criteria for determining the benefits and costs of each alternative, a recommended street system plan was selected.

Transportation System Plan

The TSP was then developed for each mode of transportation. The street system plan was developed from the alternatives evaluation described above. The bicycle and pedestrian plans were developed based on 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.

Capital Improvement Program and Funding Analysis

The capital improvement program was developed from the short-term improvements and the recommended street system plan, while the funding analysis examined methods for financing these improvements. These elements are described in the chapter titled "Funding Options and Financial Plan."

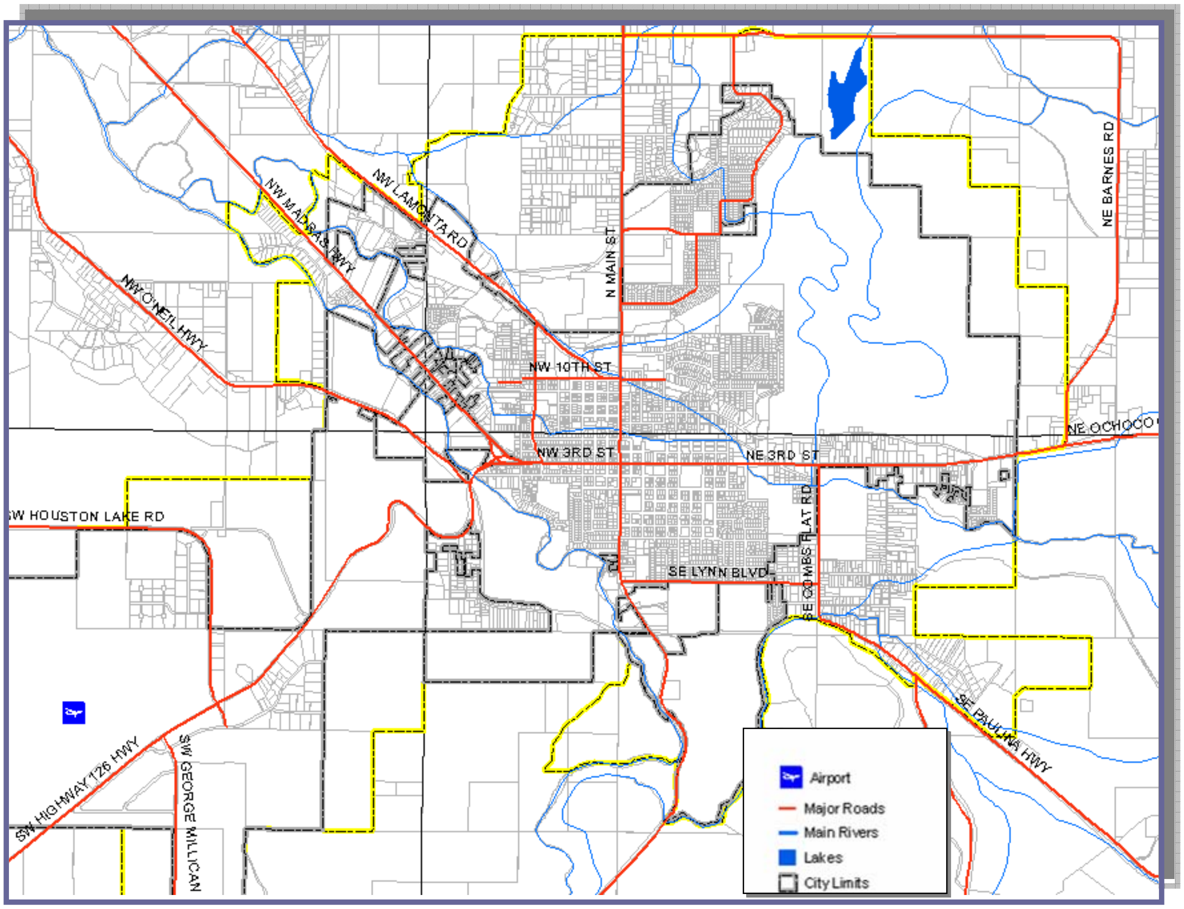
THE PLANNING AREA

Prineville is the county seat and the largest city in Crook County. Located about 50 miles east of the Cascade Mountain Range, the city is situated in the geographic center of the state. The planning area, shown on **Figure 1-1**, is bounded by the city's urban growth boundary. The roadway system in the existing Comprehensive Plan consists of five state highways and a system of arterial, collector, and local roads.

Highways 26 and 126 are the two most important highways in Prineville. The Ochoco Highway is a highway of statewide significance. It consists of Highway 126 to the west of Prineville, providing a route through the Cascades to the Willamette Valley, and Highway 26 through and to the east of Prineville, providing access to the eastern half of Oregon and to Idaho. To the west, Highway 26, also known as the Madras-Prineville Highway, provides a direct northwesterly route through the Cascades to Portland, about 150 miles away. Between Madras and Prineville, Highway 26 is designated a highway of regional significance. Both Highway 26 and Highway 126 connect with Highway 97 about 20 miles east of the city for north/south access.

In addition to Highways 26 and 126, three other highways originate or terminate in Prineville. Highway 27, also known as the Crooked River Highway, runs southward to the Prineville Reservoir and beyond. The O'Neil Highway runs westerly from Prineville and terminates about 20 miles away at Highway 97, just north of Redmond. The Paulina Highway also provides access to the Prineville Reservoir before continuing eastward to Paulina and into Grant County.

Figure 1-1: Prineville TSP Planning Area

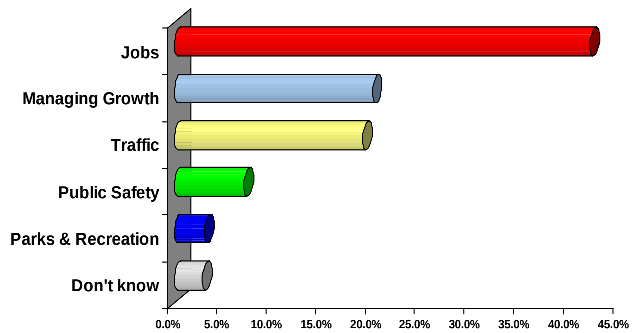


Background

The following goals and objectives were initially developed as part of the 1994 and 1998 Draft TSP planning processes and were validated by the Transportation Advisory Committee (TAC), Joint Planning Commission/City Council Committee and Management Team as part of the TSP update process. These goals and policies are intended to guide the development of the revised Transportation System Plan. Throughout the planning process, each element of the plan was evaluated against these parameters. Chapter 7, which is the Transportation System Plan itself and will be adopted as the Transportation Element of the Comprehensive Plan, includes those policies which are intended to guide transportation system planning and development into the future.

In August, 2004 the City of Prineville completed the Community Opinion Survey[1]. A total of 350 Prineville residents were interviewed in the survey. A number of general questions were asked pertaining to issues that residents feel are critical. As shown in **Figure 2-1**, "jobs" is the biggest issue in Prineville. "Managing growth" and "traffic" were virtually tied for the second and third major issues facing Prineville residents.

Figure 2-1 Prineville's Major Issues



Other open-ended questions in the survey were used to gauge how Prineville residents view growth, how they prioritize tax dollars towards public services, and how Public Works tax dollars should be spent. The community response was:

Growth A majority of Prineville residents want Prineville to retain a "small town/community feel."

Funding Priority The top three funding priorities are for public works (water, sewer and streets); public safety and law enforcement, and planning and growth management.

Public Works Investment The top three public works funding priorities are improving roads, drainage and sidewalks (also building new sidewalks).

The opinions and priorities of Prineville residents were used to refine the TSP goals and objectives.

[1] City of Prineville, Community Opinion Survey, August, 2004. The Results Group.

Overall Transportation Goal

Develop an urban area transportation system which enhances the livability of Prineville and accommodates growth and development through careful management of existing and future transportation facilities. Specific goals for the Prineville TSP include:

GOAL: ***Reduce congestion, improve circulation, and provide safe side-street access along Highway 126, Third Street, and Main Street.***

Objectives

A. Develop a safe and efficient arterial and collector system which maintains the integrity of the downtown business district and minimizes the impact on street-side parking.

B. Develop parallel, local streets to state highways to reduce conflict points on the highway system.

C. Improve intersection operations by enhancing traffic signal operations, installing new traffic signals (where warranted), actuating and coordinating traffic signals, and/or increasing sight distance as needed.

D. Provide signage directing vehicles to business, industrial, and recreational centers.

GOAL: ***Provide additional north/south and east/west arterial and collector streets.***

Objectives

A. Provide additional crossings over Ochoco Creek to improve traffic circulation and reduce congestion on Main Street.

B. Define planned improvements to reduce the number of dead-end streets, skewed intersections, and dog-leg routes, particularly on arterial and collector streets.

GOAL: ***Improve truck circulation through and around the city.***

Objectives

A. Reduce the impact of truck traffic on Third Street and on Main Street.

B. Refine plans and designs, and complete the Northern Arterial route with signage to destinations and highways.

GOAL: ***Increase the use of alternative travel modes through improved safety and service.***

Objectives

A. Provide additional sidewalks and improve existing sidewalk pavement for pedestrian safety and access.

B. Provide additional bicycle routes and plan regular maintenance of existing routes for bicyclist safety and access.

C. Provide pedestrian and bicycle access between subdivisions and neighborhoods, especially when direct motor vehicle access is not possible.

D. Identify appropriate and economically feasible local and inter-city public transportation services.

GOAL: ***Preserve the function, capacity, level of service and safety of the transportation system.***

Objectives

A. Adopt access management standards, level of service policies and street design standards (including new standards for "local" streets) which balance the need for access with the need for automobile, pedestrian and bicycle safety and with the need for efficient movement of through traffic and which are consistent and compatible with those standards adopted by ODOT (1999 Oregon Highway Plan) and Crook County.

B. Work with ODOT to support airport facility improvements (including access to/from the airport and industrial areas) identified in the current airport master plan for Prineville Municipal Airport. *(Note: from the Interim Corridor Strategy for Highway 126)*

C. Work with ODOT to maintain and upgrade the City of Prineville Railway tracks to allow a minimum speed of 25 mph wherever upgrading can be achieved with a favorable benefit cost ratio. *(Note: from the Interim Corridor Strategy for Highway 126)*

Transportation System Inventory

As part of the planning process, an inventory of the existing transportation system in Prineville was conducted. This inventory, which covered the street system as well as the pedestrian system, bikeways, public transportation, rail, air, water, and pipelines, has been updated and revised as part of the TSP update process. In addition to these transportation modes, transportation demand management measures were also reviewed. Lastly, census data was examined to assess trends in commuter travel mode distributions.

The transportation system inventory examined all modes of transportation in Prineville for people and goods. This section describes each mode and, when possible, the approximate usage of that mode.

Roadways

As part of the 2005 TSP update, current traffic conditions on the existing streets and highways were measured and examined (focused on the p.m. peak hour), based either on recent historic counts (since 2002), or directly recorded in January, 2005. Data collection included a physical inventory of the City's arterial and collector roads and a traffic count program that measured volumes at about 25 street or intersection locations. The results of the inventory were used to define existing street capacities based on intersection operations analyses and state and local mobility standards. These data are summarized in Chapter 4, Existing Conditions.

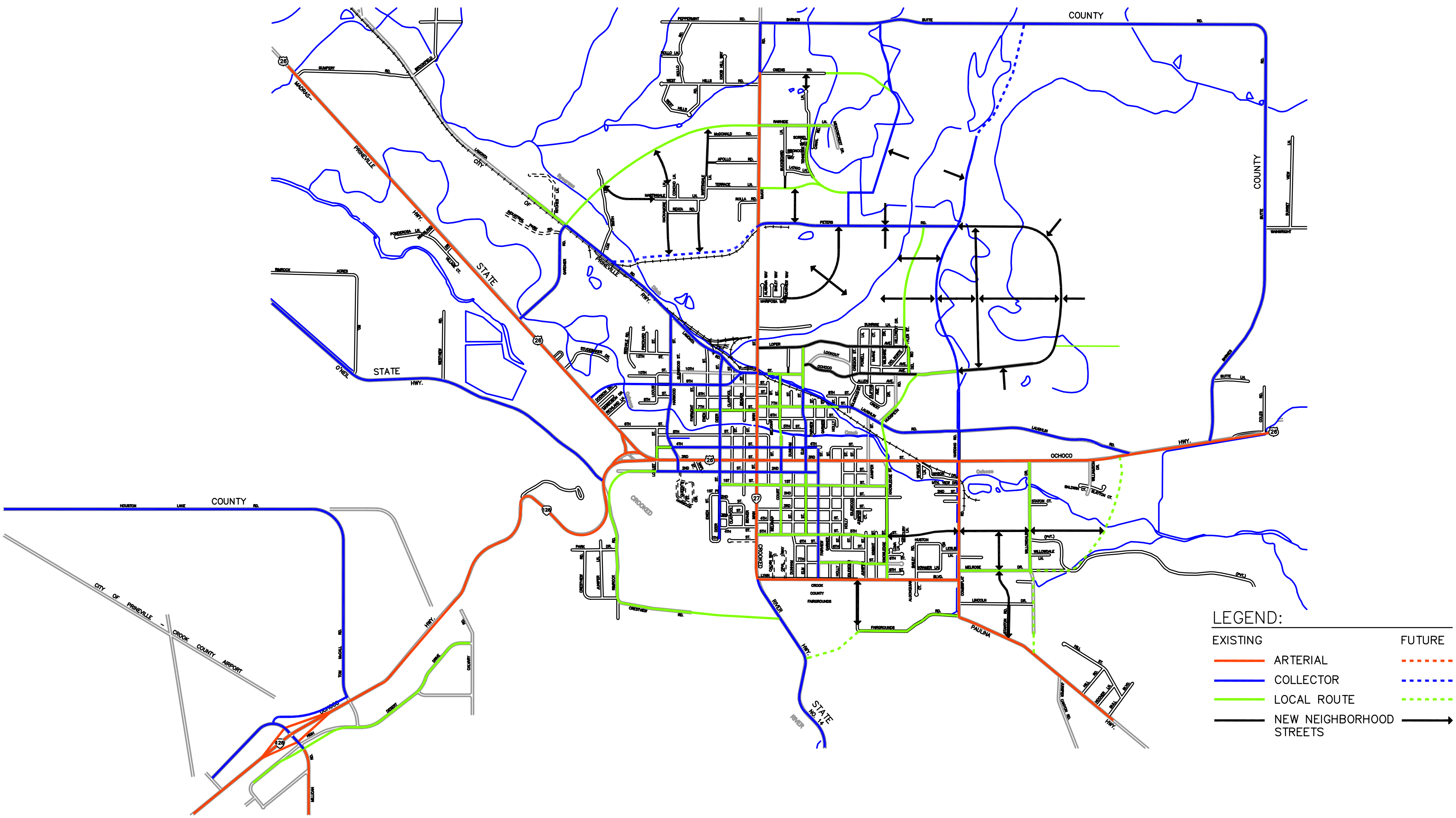
Physical Inventory

The existing street system inventory was conducted for all highways, arterial roadways, and collector roadways within Prineville as well as those in Crook County which interact with city streets. 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 limit
- general pavement conditions

Figure 3-1 shows the roadway functional classification and jurisdiction as well as the location of traffic signals. **Appendix C** lists the complete inventory.

Highways. Prineville is served by five state highways: Ochoco Highway, Madras-Prineville Highway, Crooked River Highway, O'Neil Highway, and Paulina Highway. These roadways are managed and maintained by ODOT. The *1999 Oregon Highway Plan (OHP)* classified the state highway system into four categories: Interstate, Statewide, Regional, and District. See Chapter 1 for further discussion of the OHP.



SOURCE: ODOT BASE MAP

CITY OF PRINEVILLE TRANSPORTATION SYSTEM PLAN

EXISTING STREET FUNCTIONAL CLASSIFICATION

FIGURE 3–1

W&H PACIFIC
8405 SW NIMBUS AVE.
BEAVERTON, OR 97008
(503) 626-0455

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Table 3-1 summarizes the Oregon highway classification within Prineville.

Table 3-1
State Highway Classification

Highway - Description	1999 OHP
Ochoco Highway - Highway 126 to the west of Prineville and Highway 26 through and east of Prineville. It is the focus of the downtown commercial development and carries the greatest amount of traffic in the city.	Statewide
Madras Highway - Highway 26 west of Prineville. Between Madras and Prineville, Highway 26 has a regional classification. (It is classified with statewide importance on all other segments but this one.) This route is the most direct route from Prineville to Portland, about 150 miles northwest.	Regional
Crooked River Highway - (Highway 27) extends south from Highway 26 (Third Street) providing access to the Prineville Reservoir and beyond.	District
O'Neil Highway - runs parallel to Highway 126 between Prineville and Redmond. It serves primarily as access for the adjacent land uses.	District
Paulina Highway - located in the southeast quadrant of Prineville, providing access to the Prineville Reservoir and Grant County.	District

Arterial Roadways. Arterial streets form the primary roadway network within and through a region. They provide a continuous road system which distributes traffic between neighborhoods and districts. Generally, arterial streets are high capacity roadways which carry high traffic volumes with minimal localized activity. Major arterial streets tend to be higher volume, larger capacity roadways than minor arterial streets.

In Prineville, the arterial network consists of state, county, and city streets. Highways 26 and 126 merge on the west side of the City to form a single roadway bisecting Prineville from east to west. Named Third Street within city limits, Highway 26 is the primary corridor of commercial development, and is designated a major arterial street. Main Street is the north-south major arterial. Other major arterial streets include county roads: Lynn Boulevard and Combs Flat Road. Minor arterial streets include: Lamonta Road, Laughlin Road, Tenth Street, Ninth street (west of Main Street), First Street, Harwood Street, Fairview Street, and Juniper Street.

Collector Roadways. Collector streets connect local neighborhoods or districts to the arterial network. Generally, they do not connect together to form a continuous network because they are not designed to provide alternative routes to the arterial street system.

Both Prineville and Crook County have designated collector roads. Within city limits, collector streets include Deer Street and Elm Street, which are the remaining north-south roads crossing Ochoco Creek; roads such as Fifth Street and Court Street, which collect traffic in residential neighborhoods; as well as roads serving schools, industrial districts, and other areas. Outside of the city limits, state roads such as Paulina Highway and O'Neil Highway and county roads such as Juniper Canyon Road, McKay Road, Lamonta Road and Barnes Butte Road collect traffic destined for the City from more remote areas.

Street Layout

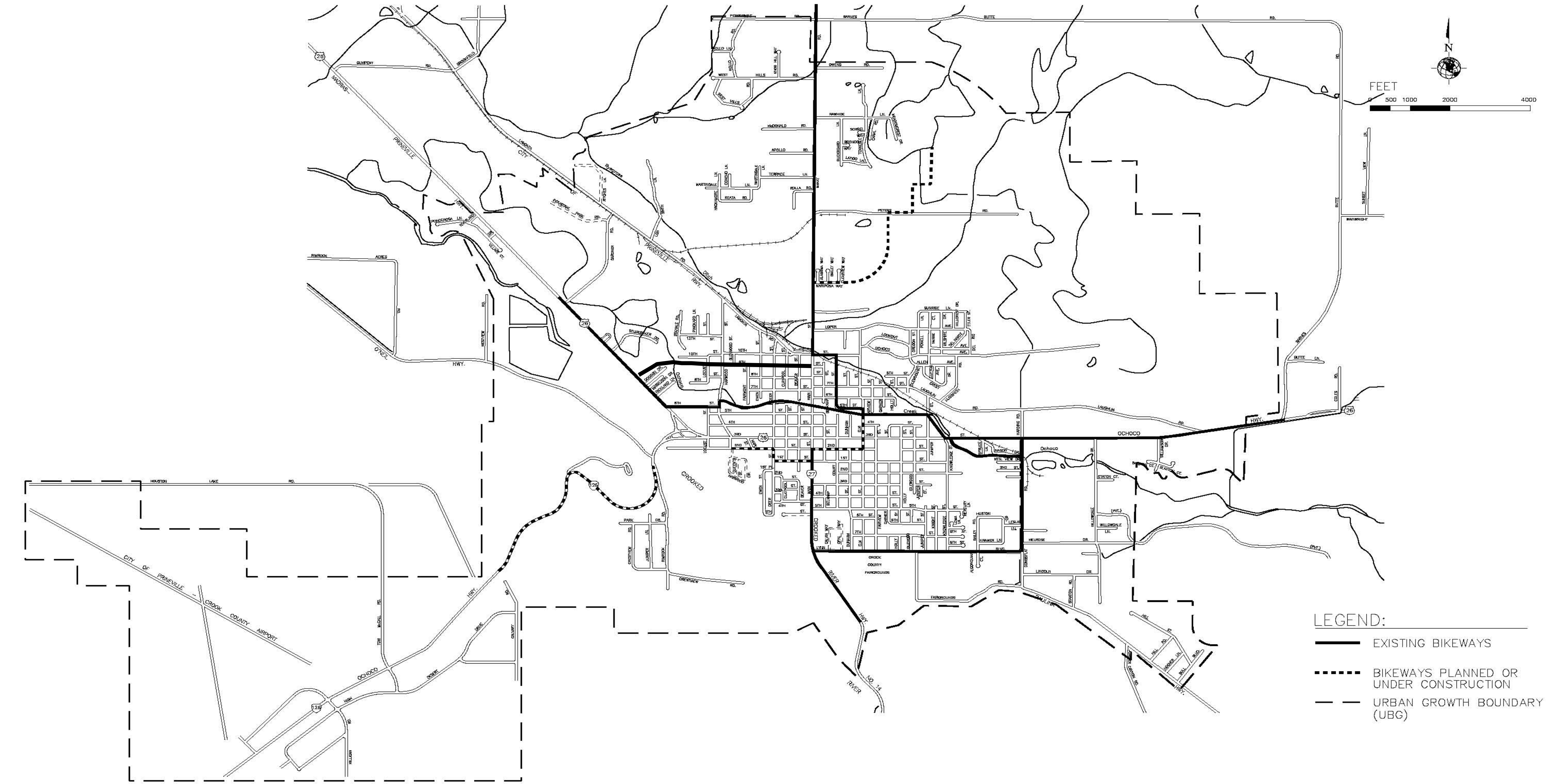
Most Prineville roadways are laid out in a grid pattern. Block sizes are typically 330 feet by 330 feet. Several natural features interrupt the grid system, causing discontinuities and odd-shaped blocks. These features include the steep rimrock walls on the west side of the city, Crooked River, Ochoco Creek, and the hills in the northeast quadrant which form Ochoco Heights. Manmade features such as large school lots and the railway also divide up the city.

One of the major circulation barriers is Ochoco Creek and the surrounding park. Ochoco Creek runs east/west through town north of Fourth Street. There are seven creek crossings spaced an average of four to five blocks apart (about one quarter of a mile). Four of these crossing are located downtown: Harwood Street (minor arterial), Deer Street (collector), Main Street (major arterial), and Elm Street (collector). Two others are located east of the commercial core: Juniper Street (minor arterial) and Combs Flat Road (major arterial). The seventh creek bridge was recently constructed as part of the 9th Street extension to US 26. Main Street is the most frequently used crossing.

Bikeways

Prineville has three designated bike routes through town, as shown in **Figure 3-2.** One existing route runs east-west along Highway 26 within the Urban Growth Boundary while the other runs north-south on North Main Street from Ochoco Creek to the Urban Growth Boundary. The third bike route runs north-south on Highway 27 at 3rd Street, connecting with the playing fields south of town.

The east-west bike route is a separate bike path for most of its length. It is begins as a 10-foot wide bike path on the north side of Highway 26, and extends about 1.25 miles. Within the City, the bike lane leaves the highway at West Sixth Street to become a bike path along Ochoco Creek. When the creek crosses Third Street, the bikeway returns to the roadway. From this point eastward, it runs along the shoulder of the roadway. New bicycle lanes were included as part of the 9th Street Extension to US 26, expanding the City’s east-west bikeway system.



SOURCE: ODOT BASE MAP/DEA LAYER DATA

CITY OF PRINEVILLE
TRANSPORTATION
SYSTEM PLAN

EXISTING BIKEWAY

Figure 3-2

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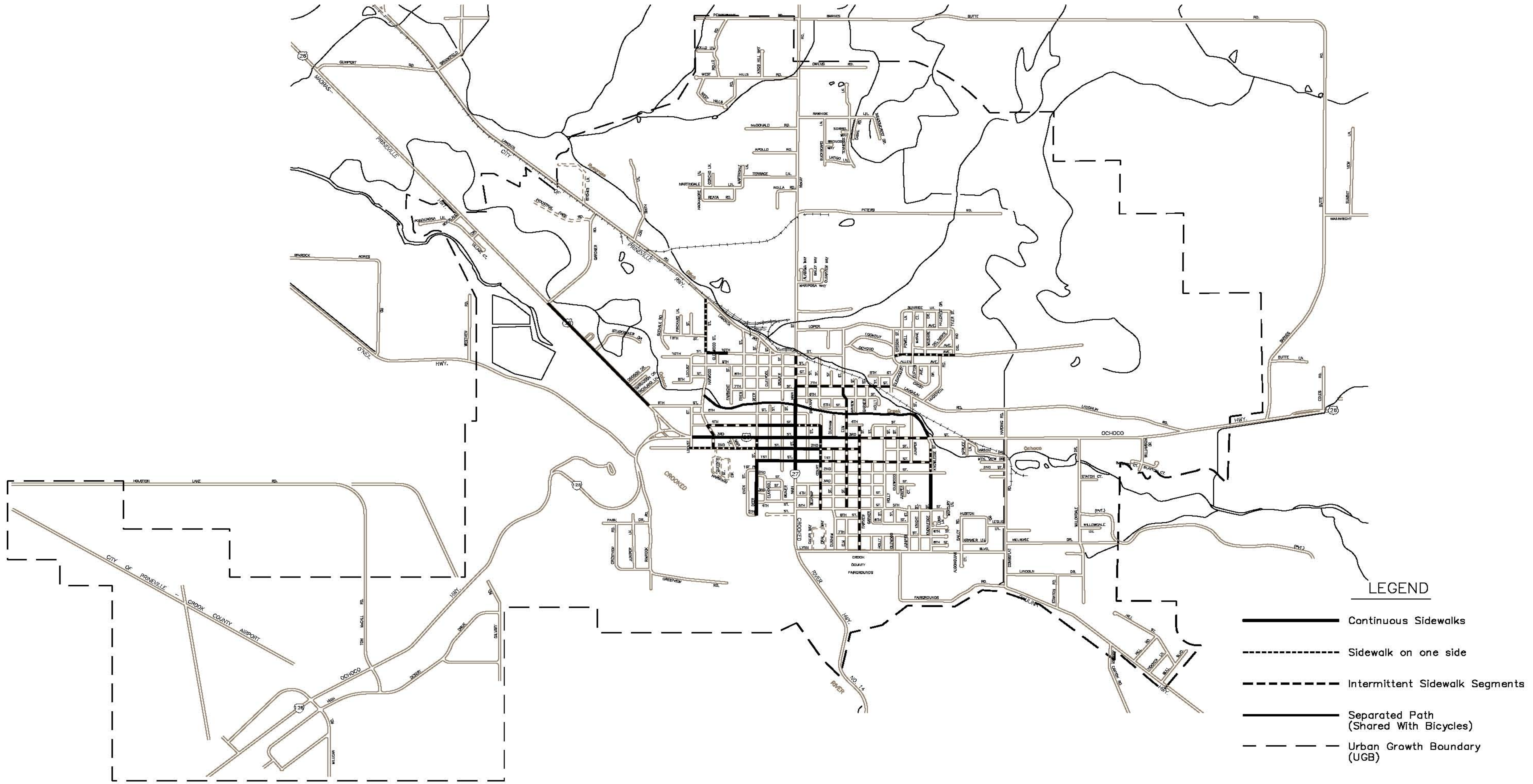
The existing north-south route starts at the Ochoco Creek bike path and zig-zags along Elm Street, Fifth Street, and Court Street, sharing the roadway with vehicles before it turns west onto Tenth Street becoming a bike lane, and finally turns north again onto Main Street. It continues northward along Main Street and McKay Road to the Urban Growth Boundary at Barnes Butte Road as bike lanes.

The Highway 27 bike route includes bike lanes that continue southward from 3rd Street. At First Street, it will turn westward, and then it will turn southward again along Main Street, providing bicycle access to the playing fields opposite the fairgrounds.

Pedestrian System

Most of Prineville's arterial and collector roadways, with the exception of the downtown core, do not have any sidewalks for pedestrians, as shown in **Figure 3-3**.   Many of the roads which do have sidewalks do not have continuous paved paths on both sides of the road. Some have sidewalks on one side only, while others have pieces of sidewalks along certain parcels but not along others. Often, the paved section switches from one side of the street to the other, forcing the pedestrians to cross back and forth or to walk in the street. Although Prineville does have very wide streets, offering some space between pedestrians and motorized vehicles, a curb and sidewalk provide a visual barrier that is far more comforting to pedestrians.

Some new residential development has been including sidewalks as part of the street. The TSP chapter will address the need for including sidewalks as part of the street standards. In addition to sidewalks in some parts on Prineville, the two separated bike paths can also be used by pedestrians. The Ochoco Creek path is protected from traffic and provides fairly direct access to the Crook County Middle and Elementary Schools on Knowledge Street.



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CITY OF PRINEVILLE TRANSPORTATION SYSTEM PLAN

EXISTING SIDEWALKS

Figure 3-3

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Public Transportation

Public transportation in Prineville consists of local minibus/van shuttle service, and bus line shuttle service to/from Portland with connection to Redmond and Bend. The city has no local fixed route transit service at this time.

For elderly and disabled residents, the Soroptomists Club sponsors a minibus service. This service operates between 9:00 a.m. and 4:00 p.m. five days a week (Monday through Friday) and on special occasions. It currently has three mini-vans with paid drivers and a two-way radio system. The service is available in areas within five miles of downtown and was established to provide transport to necessary services such as shopping and doctor visits as well as the senior center. It is funded by donations from clients, fares are set at $1 per one-way trip. Approximately 65 to 70 people use the minibuses each day. Daily minibus service (ADA, chair-left equipped) is also provided to Redmond and Bend for medical trips only. These trips cost $10 per round trip

Other medical trip service in Central Oregon serving Prineville is provided by Deschutes County and Central Oregon Cabulance, with varying fare schedules.

The Central Oregon Breeze provides intercity bus service between Bend, Prineville and Portland. As of December, 2004, the Central Oregon Breeze schedule includes a single bus departure from Prineville to Portland at about 12:20 p.m., returning at about 5:25 p.m., with continued service to Redmond and Bend. Adult fares at $40 one-way and $73 round trip, with additional fuel charges.
Greyhound Bus Lines ceased providing direct and daily bus service in Central Oregon

In addition to public transportation, the Crook County School District operates a school bus system. There are 26 buses (routes), 23 of which serve schools in Prineville as follows:

- All 23 Prineville buses access High School on Lynn Boulevard.
- 11 of those buses access both the Cecil Sly School and the Middle School on Second Street.
- 4 buses serve the Crooked River School at First and Fairview Streets.
- 6 buses serve the Ochoco Grade School at Highway 26 and Fourth Street.
- Three special needs buses may serve all schools on any given day.

All 26 buses leave and return to the bus garage located near the intersection of Lamonta and Lon Smith Roads. The buses are out-bound from the garage between 6:00 a.m. and 8:00 a.m.. They are in town distributing students between 7:30 a.m. and 8:15 a.m.. The buses return to the bus garage between 7:55 a.m. and 8:10 a.m.. The buses leave the garage again around 2:30 p.m. and are distributing students to their homes between 3:20 and 4:30 p.m.. The majority of buses return to the garage around 5:00 p.m. with some returning as late as 6:30 p.m..

Rail Service

The City of Prineville Railway provides transport primarily for the timber products industry in Prineville and Crook County. It was established in 1918, and is city-owned and operated. The tracks extend westward from Prineville, connecting with Burlington Northern/Santa Fe Railroad and Union Pacific Railroad lines near Redmond. This connection allows customers to ship goods to domestic and international destinations.

The railway is classified as an originating/terminating carrier or a line-haul carrier and operates under “Yard Limit” which limits the operating speed to 20 mph. “Yard limits” mean that the railway is operated from a switch list rather than train orders or block signals and can enter any track any time.

Intermodal truck to rail connections are possible for the railway; however, they are not currently in use. The facilities still exist but all intermodal operations were relocated to Portland.

At this time, the railroad provides no commercial passenger service. However, the Crooked River Dinner Train, based in Redmond, uses the tracks for various rail tours (chartered service) through the Crooked River Valley.

At-grade railroad crossings are located throughout the city. Some of these crossings cause occasional commuter delays; however, accidents involving passenger vehicles and railroad cars are very infrequent. The crossings at North Main Street, Lamonta Road and on East Third Street (Hwy 126/26) are all equipped with a "pedestrian flange crossing" or "omni rubber crossing". This enables pedestrians and bicyclists to cross the rails easily by providing a surface level with the top of the rails.

Air Service

In 1995, the City of Prineville annexed the “City-County Airport Area” (Resolution No. 794), thus including the Prineville Municipal Airport within the city limits. The Prineville Municipal Airport, located west of the city, is used by most of the large local business, commercial, and heavy industrial firms as well as the United States Forest Service. It is served by one fixed-base operator. It is a general aviation airport and is included in the National Plan of Integrated Airports (NPIAS). The approach category allows speeds of 91 knots or more but less than 121 knots and airplanes with wingspans up to but not including 49 feet. It has two runways: 10/28 (5000' x 60') and 15/33 (4000' x 40'), both are paved. The Oregon Continuous Aviation System Plan (ODOT, 1997) recommends that Runway 10/28 be increased to 5730' x 75'. There were approximately 30 general aviation aircraft based at the airport in 1994, of these 25 were single engine, 2 were multi-engine, 2 were turbo jets and 1 was “other”. There were an estimated 4,500 operations at the airport in 1994, which utilized approximately 4% of the airport’s capacity.[1]

For commercial passenger service, the Redmond Airport is located about 20 miles west in Deschutes County.

Water Service

Prineville has no waterborne services.

Pipeline Service

Prineville is served by a major natural gas distribution line. This distribution line extends eastward from the main line, which parallels Highway 97 through the north-south central Oregon corridor, and is operated by Cascade Natural Gas.

Transportation Demand Management Measures

In addition to inventorying the transportation facilities in Prineville, the 1994 TSP also reviewed transportation demand management measures that are currently in place.

Alternative Work Schedules

Four major employers account for a significant percentage of the jobs in Prineville. The employer, number of employees, and shift schedules are shown in **Table 3-2.** Most of these employers already stagger the departure times of their workers, which reduces the peak hour traffic and congestion. The departure times from employer to employer are also staggered, further spreading traffic volumes over a longer period of time.

[1] Source: *Oregon Continuous Aviation System Plan, Vol. I-III,* Oregon Department of Transportation, Aeronautics Section, March 1997.

Table 3-2
Shift Schedules of Major Employers

Employer	Number of Employees	Shift Schedules
Les Schwab Tire Company	912	Staggered departure between 1:00 p.m. and 2:30 p.m.
Clear Pine Moldings	580	Staggered departure shifts at 2:30 p.m., 3:00 p.m., and3:30 p.m.
Wood Grain (formerly American Molding)	300	About 200 employees (day shift) depart at 3:30 p.m., 100 employees arriving (swing shift) between 3:30-4:00 p.m.
Crook County School District	360	Teachers generally depart between 3:30- p.m. but many stay later. Office employees depart at 5:00 p.m.
US Government (Ochoco National Forest)	410	Departure at 4:30 p.m.

Note: The number of employees is based on Chamber of Commerce data from 2004. The shift schedules are based on phone conversations in 2005.

Carpooling

The Central Oregon Rideshare provides ride-matching services to encourage carpooling. The program was developed by the Oregon Department of Energy, ODOT, OSU Extension Service, Central Oregon Community College, and Central Oregon Environmental Center to promote more livable communities.

The Rideshare program began in mid-September of 1993 and has established a database of about 100 people. Interested drivers call a toll-free number, provide information about their trip, and are supplied with a list of others in their general area.

Travel Mode Distribution

Although automobile is the primary mode of travel for most residents in the Prineville area, some alternative modes are used as well. Modal split data is not available for all types of trips; however, the 1980. 1990 and 2000 census data do include statistics for journey to work trips as shown in **Table 3-3.**

Table 3-3
Journey to Work Trips

	1980		1990		2000	
Trip Type	Trips	Percent	Trips	Percent	Trips	Percent
Private Vehicle	1,645	85.8	1,958	90.4	3,844	93.1
Drove Alone	*1,330*	*69.4*	*1,633*	*75.4*	*2,933*	*71.0*
Carpooled	*315*	*16.4*	*325*	*15.0*	*911*	*22.1*
Public Transportation	0	0.0	0	0.0	10	0.2
Bicycle	NA	0.0	10	0.5	34	0.8
Walk	174	9.1	120	5.5	131	3.2
Other	67	3.5	7	0.3	21	0.5
Work at Home	31	1.6	71	3.3	89	2.2
Total	1,917	100.0	2,166	100.0		100.0

Source: U.S. Bureau of Census
NA = Not Available from census statistics

Most Prineville residents travel to work via automobile. The percentage of automobile users has actually increased by more than 7 percent in the last 20 years from nearly 86 percent to more than 93 percent. The number of single-occupancy vehicles is also increasing. In 1980, about 69 percent of the Prineville residents drove to work alone. In 2000, about 71 percent drove alone, a 2 percent shift over the 20-year period. At the same time, carpooling rates have increased more than 5 percent from about 16 percent in 1980 to 22 percent in 2000. There is some reported public transportation commuting as part of the 2000 Census. All of these data, when viewed collectively, indicate a significant growth in commuter trips between Prineville and the Bend/Redmond area, perhaps due in large part to the recent closure of Prineville's lumber mills, and the readily available and affordable new housing in Prineville.

Bicycle usage is fairly low (less than 1 percent) at the present time, but there are currently few roadways with dedicated bicycle lanes on them. In addition to bicycle lanes, bicycle parking, showers, and locker facilities can help to encourage bicycle commuting to work. Pedestrian activity is at a moderate level but walking is decreasing as a mode of travel to work. In years past many citizens have expressed concern about the high traffic volumes, especially on Third Street. They find the traffic volumes intimidating when walking downtown.

Though they are not alternative modes, transportation demand management measures such as carpooling, flexible work hours, and telecommuting also contribute to a reduction in peak hour, single occupancy vehicle activity.

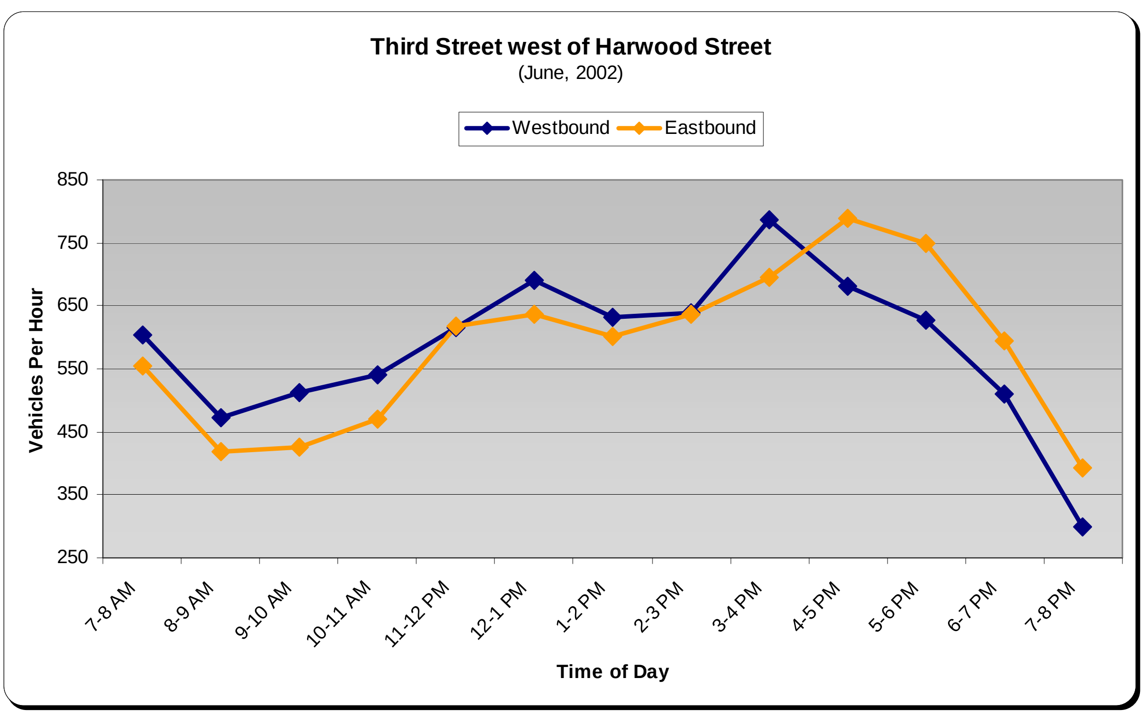
Although these trends indicate an increasing dependence on the automobile for work commuting, the growing population and employment opportunities, relatively short travel distances, level terrain, and clear weather conditions are favorable for other modes of transportation – especially for non- work-related purposes. The state-wide emphasis on providing pedestrian and bicycle facilities along with roadways encourages the use of these modes.

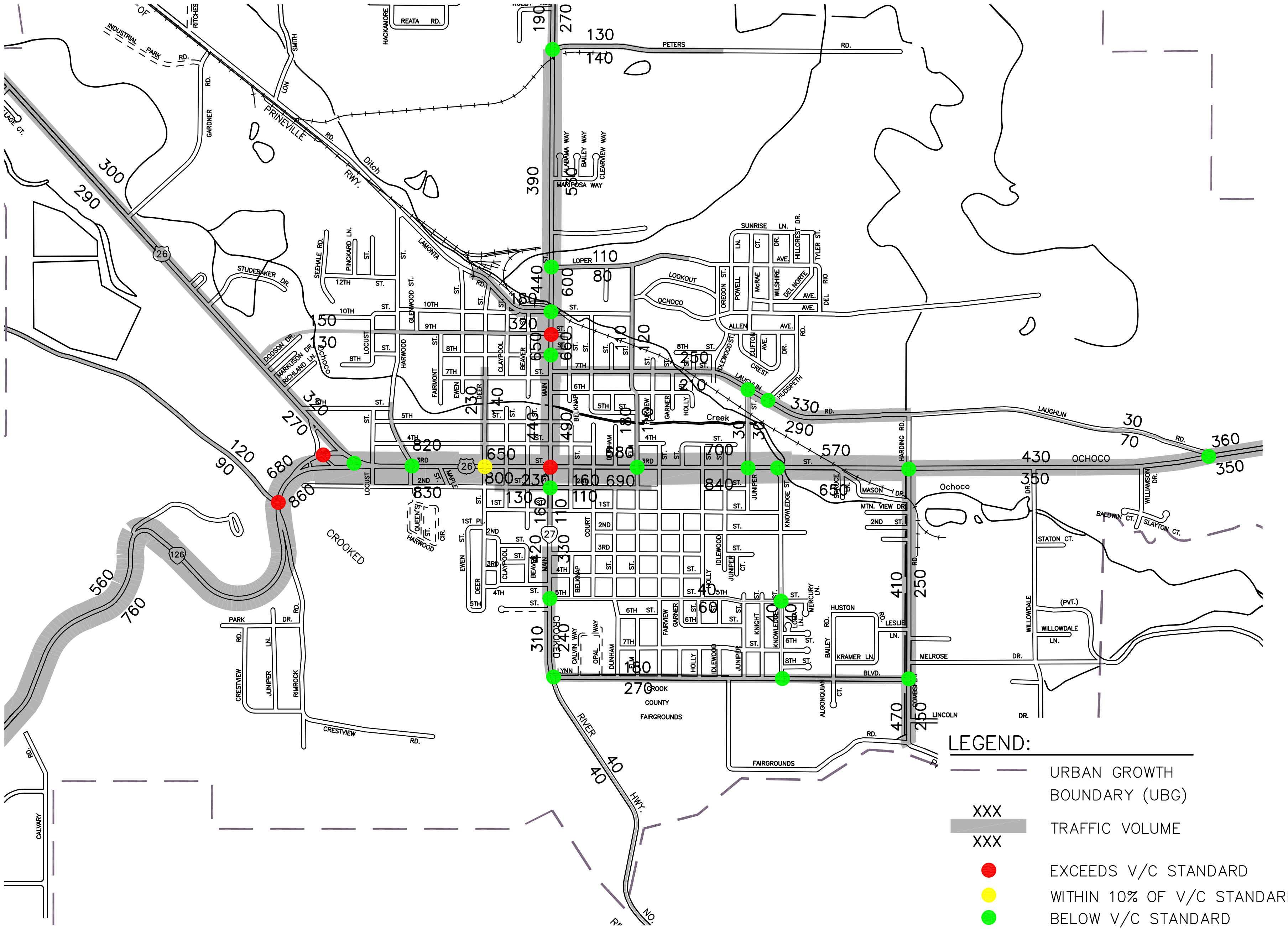
2005 Traffic Conditions

For all of the analysis in the TSP the Design Hour Volume (DHV) was established, which usually reflects the evening peak, one-hour period, which generally occurs from 4:30-5:30 p.m. Existing traffic volumes at major intersections within Prineville were originally measured during various months throughout 2002-2004, including additional counts collected in January, 2005. These data were adjusted to 2005 conditions based on seasonalization adjustments and growth rates derived from ODOT's annual traffic volume data. The 2005 two-way, p.m. peak hour traffic volumes are shown on **Figure 4-1**. The widest bandwidth illustrates that the highest volumes occur on Third Street, with about 1,680 vehicles entering and exiting from the "Y" intersection of Highways 26 and 126.

The hourly traffic pattern on Third Street in Prineville is illustrated in **Figure 4-2.** Third Street, west of Harwood Street, is the point where Highways 26 and 126 merge and enter the city. The highest traffic volumes are found between 3:00 p.m. and 6:00 p.m., with over 750 vehicles per hour, westbound and eastbound. From 11:00 a.m. to 2:00 p.m., traffic volumes are steady, with a small peak during the lunch hour, varying between 575 and 700 vehicles per hour in either direction (excluding the peak hour). Traffic volumes grow gradually prior to that period and decrease rapidly after 6:00 p.m.

Figure 4-2 - Hourly Traffic Patterns





CITY OF PRINEVILLE TRANSPORTATION SYSTEM PLAN

2005 WEEKDAY PM PEAK HOUR TRAFFIC VOLUMES

Figure 4-1

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2005 Street Capacity

Delay-Based Level of Service

Transportation engineers have established various standards for measuring traffic capacity of roadways or intersections.[1] The most often-sited standard is associated with a particular level of service (*LOS*) one wishes to provide. The LOS concept requires consideration of factors of traffic delay, travel speed, frequency of interruptions in traffic flow, relative freedom for traffic maneuvers, driving comfort and convenience and operating cost. Six standards have been established ranging from Level A where traffic flow is relatively free to Level F where the street system is totally saturated or jammed with traffic. **Table 4-1** summarizes the delay-based level of service criteria for signalized intersections, which have been applied, historically, in many Oregon cities and counties over the past several decades.

Volume-to-Capacity Measured Level of Service

As required by the TPR,[2] and since the adoption of the 1999 Oregon Highway Plan, local jurisdictions, when amending their Comprehensive Plans or TSPs, are to be consistent with the 1999 OHP mobility standards. **Table 4-2** summarizes the OHP mobility standards for state highways and suggested standards for city intersections within the Prineville UGB.

The 1999 OHP mobility standards were established to better address and assess the performance of intersections (both signalized and unsignalized) and driveways. These standards were defined by ODOT as an objective measure of the volume-to-capacity of an intersection, rather than delay to drivers. The highway mobility standards are expressed in V/C ratios, which are defined as "the peak hour traffic volume (vehicles/hour) on a highway section divided by the maximum volume that the highway section can handle." The closer the V/C ratio is to 1.0, the more congested traffic is.

[1] Transportation Research Board, *Highway Capacity Manual*, Special Report 209. National Research Council, 1985.

[2] Oregon Administrative Rules, (TPR) 660-120-0015.

Table 4-1
Delay-Based Level of Service Designation for Signalized Intersections

Level of Service	Traffic Flow	Comments	Maneuverability
A Desirable	Free	Traffic flows freely with no delays.	Drivers can maneuver easily and find freedom in operation.
B Desirable	Stable	Traffic still flows smoothly with few delays.	Some drivers feel somewhat restricted within groups of vehicles.
C Desirable	Stable	Traffic generally flows smoothly but occasionally vehicles may be delayed through one cycle. Desired urban area design level.	Backups may develop behind turning vehicles. Most drivers feel somewhat restricted.
D Acceptable	Approaching Unstable	Traffic delays may be more than one cycle during peak hours but excessive back-ups do not occur. Considered acceptable urban area design level.	Maneuverability is limited during short peak periods due to temporary back-ups.
E Unsatisfactory	Unstable	Delay may be great and up to several signal cycles. Short periods of this level may be tolerated during peak hours in lieu of the cost and disruption attributed to providing a higher level of service.	There are typically long queues of vehicles waiting upstream of the intersections.
F Unsatisfactory	Forced	Excessive delay causes reduced capacity. Always considered unsatisfactory. May be tolerated in recreational areas where occurrences are rare.	Traffic backed up from other locations and may restrict or prevent movement of vehicles at the intersection.

Within Prineville, the mobility standards vary, with unique V/C ratios for each highway category. For highways with posted speeds of 45 miles per hour (mph) or greater, the V/C standard ranges from .75 (Region and Statewide highways) to .80 (District highways). For highways with lower posted speed limits than 45 mph, the V/C standard ranges from .80 to .85, respectively. Between the western UGB and O'Neil Highway, OR 126 is designated a statewide expressway with a V/C ratio of .70. Within the downtown Prineville area, OR 126 from Locust to Knowledge and OR 27 from Third Street to First Street are designated as Special Transportation Areas (STA)[3]. Within the STA, the V/C mobility standard for Third Street is .90 (Statewide highway) and OR 27 is .95 (District highway).

[3] Oregon Transportation Plan – Policy 1B. Definition of **Special Transportation Area:** The primary objective of managing highway facilities in an existing or future Special Transportation Area 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. 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 an urban growth boundary or in an unincorporated community …..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 miles per hour or less.

Table 4-2 Mobility Standards for Prineville UGB Area – Volume-to-Capacity Ratios for State Highways[1] and Local Streets

Highway Route No.	From	To	Volume-to-Capacity Ratios			Highway Category
				Posted Travel Speed		
			STA2	< 45 mph	> = 45 mph	
US 26	Prineville UGB	OR 126 (“Y”)		.80	.75	Region
OR 27	US 26	First St	.95			District
OR 27	First St	Prineville UGB		.85	.80	District
OR 126	Prineville UGB	O’Neil Hwy		.70	.70	State / Expressway
OR 126	O’Neil Hwy	US 26 (“Y”)		.80	.75	State / NHS
OR 126	Locust St	Knowledge St	.90			State / NHS
OR 126	Knowledge St	Prineville UGB		.80	.75	State / NHS
OR 370 (O’Neil)	Prineville UGB	OR 126		.85	.80	District
OR 380 (Paulina)	US 26	Prineville UGB		.85	.80	District
Prineville Streets				.90		

1. Oregon Highway Plan, 1999.
2. Special Transportation Areas, adopted by Oregon Transportation Commission, 2004.
3. Traffic on non-state highway approaches that must either stop or yield shall not exceed the V/C for District highways.

For the purposes of the Draft 2005 TSP, all local (city) intersections are measured based on a V/C standard of .90. Intersection performance was calculated for existing conditions based on the traffic counts taken in recent years (2002-2005) and adjusted to 2005, p.m. peak hour conditions. The analysis of existing conditions was conducted assuming existing intersection traffic control, intersection geometry, and signal phasing (where signalized).

The 2005 p.m. peak hour V/C is summarized separately for signalized and unsignalized intersections on in **Table 4-3.** The analysis of existing conditions shows several intersections exceeding the respective V/C standard:

- Third Street (OR 126) / Main Street (OR 27)
- OR 126 / O’Neil Highway (eastbound left-turns at stopped approach to OR 126)
- OR 126 / US 26 (southbound left-turns at stopped approach within “Y”)
- Main Street / 9th Street (eastbound traffic at stopped approach to Main Street)
- Main Street / 7th Street (westbound traffic at stopped approach to Main Street)

Based on the evaluation of existing conditions, the TSP Alternatives Analysis will need to address the following critical areas regarding street and highway capacity:

Third Street Corridor

The major signalized intersections on 3rd Street at Harwood, Deer, Elm and Combs Flat Road are all operating within the V/C standard, but indicate a higher level of usage, particularly at Deer Street. The new signal at Harwood Street may help ease these conditions. The Third Street/Main Street intersection continues to be the most heavily traveled point within the downtown Prineville area. Alternatives to easing traffic demand along Third Street should be identified and evaluated, including the option of improved circulation and access to Second Street (as an alternative to Third Street) at the west end of downtown Prineville.

The "Y" Intersection

The western entrance to Prineville at the junction of US 26 and OR 126 will become more congested with growing traffic conditions. Higher levels of truck traffic through the "Y" configuration, controlled by two separate stop signs and yield indicators with single-lane merging at critical points is already problematic. Alternatives to easing traffic demand and better facilitation of through, truck traffic should be identified and evaluated in the Alternatives Analysis, including the option of a new roundabout to replace the existing "Y" configuration.

Northern Arterial

The major, unsignalized intersections along North Main Street are currently accommodating more east-west traffic than the existing system can handle. With the partial completion of the Northern Arterial, with direct connection between Main Street and US 26 via 9th Street, these conditions will only worsen over time, if left unattended. The Alternatives Analysis of the TSP will need to evaluate the impacts of the completed Northern Arterial, with the final connection between Main Street and Laughlin Road, as relief to the congestion at Main Street and along Third Street.

Table 4-3 Existing Intersection Level of Service – Prineville TSP

Signalized Intersections	LOS[1]	Delay[2]	V/C[3]	V/C Standard
Us 26 & Harwood Street	B	11.4	0.73	.90
US 26 & Deer Street	B	19.3	0.83	.90
US 26 & Main Street	C	28.8	0.90	.90
Us 26 & Elm Street	B	14.4	0.66	.90
US 26 & Combs Flat Road	B	12.3	0.63	.75
Main Street & 10th Street	A	8.1	0.44	.90
Unsignalized Intersections	**LOS**	**Delay**	**V/C (WM)[4]**	
OR 126 & Millican	C	24.6	0.06 (SB)	.70/.80
OR 126 & Tom McCall	F	64.1	0.43 (SB)	.70/.80
OR 126 & O'Neil Highway	F	198.7	1.10 (EB)	.80
OR 126 & US 26				
Southbound – Stop Controlled	F	60.1	0.87 (SB)	.80
Northbound Left – Stop Controlled	D	26.5	0.39 (NBL)	.80
US 26 & Juniper Street	F	80.8	0.36 (NB)	.90
US 26 & Knowledge Street	E	49.2	0.58 (NB)	.90
US 26 & Laughlin Road				
Northbound Left - Stop Controlled	A	9.0	0.01 (NBL)	.80
Southbound Right – Stop Controlled	B	10.2	0.02 (SBR)	.80
Southbound Left – Stop Controlled	C	16.3	0.19 (SBL)	.80
US 26 & 9th Street	C	19.6	0.30 (SWL)	.80/.85
Main Street & Peters Street	B	14.0	0.24 (WBL)	.90
Main Street & Loper Street	C	20.6	0.35 (WB)	.90
Main Street & 9th Street	F	275.0	1.45 (EB)	.90
Main Street & NE 7th Street	F	117.7	1.07 (WB)	.90
Main Street & NW 7th Street	C	17.2	0.08 (EB)	.90
Main Street & 2nd Street	E	38.8	0.58 (EB)	.90
Main Street & 5th Street	B	14.6	0.02 (EB)	.90
Main Street & Lynn Street	D	27.9	0.19 (EB)	.90
Juniper Street & 7th Street	B	13.4	0.13 (NB)	.90
Hudspeth Street & 7th Street	B	12.8	0.08 (SW)	.90
Knowledge Street & 5th Street	A	9.4	0.05 (SB/NB)	.90
Knowledge Street & Lynn Street	B	12.9	0.09 (SB)	.90
Combs Flat Road & Lynn Street	D	30.3	0.70 (EB)	.90

1. LOS = Level of Service
2. Delay = in Average Seconds per Vehicle
3. V/C = Volume to Capacity Ratio
4. (WM) = Worst Movement Reported for Unsignalized Intersections

Accident History – State Highways

A summary of historical traffic accidents (2002-2004) on state highways within the Prineville UGB is provided in Appendix C. As shown, in 2002 O'Neil Highway (OR 370) is listed with a crash rate exceeding statewide averages for similar highways in Oregon. Similarly in 2003, Paulina Highway (OR 380) is listed with crash rates exceeding statewide averages for similar highways in Oregon. In 2004 there were no reported accidents along either highway.

Crooked River Highway (OR 27) is listed with several accidents, in 2002 and 2003 with significantly higher crash rates exceeding statewide averages. A statewide average for 2004 was not available, but the OR 27 rate in 2004 is likely higher (compared to statewide rates in 2002 and 2003). Most of the accidents along OR 27 were intersection-related, unrelated to weather and usually occurred during daylight conditions. Several of these accidents were rear-end collisions, and a number of these rear-end accidents were located at the intersection of 3rd Street and Main Street (OR 37). The accident rate has fallen significantly since 2002. In 2002 there were a total of 13 accidents on OR 27. In 2003 and 2004 the number has dropped in half to 5.

Safety Priority Index System (SPIS)

The SPIS is a method developed by ODOT for identifying hazardous locations along state highways. The SPIS score is based on a three-year history of crash data and considers crash frequency, rate and severity. To become a SPIS site, a location must meet one of the following criteria:

- Three or more crashes have occurred at the same location over the previous three years
- One or more fatal crashes have occurred at the same location over the previous three years.

Within Prineville there are two SPIS sites along OR 126, one at Deer Street and the second at Main Street. Each site has a large percentage of rear-end accidents. At Deer Street, the accident rate is high and likely a result of higher speed, eastbound traffic approaching the first traffic signal at Deer Street. At Main Street, the higher accident rate is largely due to the large volume of traffic approaching the intersection from all directions; and complicated by the signal phasing on Main Street , limited to permissive phasing for north- and south-bound left-turn movements,

Methodology to Estimate Future Travel Volumes

This chapter presents the methodology and assumptions used to develop future travel demand forecasts for the Prineville Urban Growth Boundary (UGB) area, for the 20-year period beginning in 2005. The chapter also includes an analysis of the impact of growth on traffic operations at selected intersections within the Prineville urban area.

Background and General Assumptions

The method used to estimate future traffic conditions for the Prineville TSP is based on procedures in the 2001 Transportation System Planning Guidelines prepared by the Oregon Department of Transportation. These guidelines identify three levels of transportation forecasting and analysis that could be used in the Prineville TSP study:

Level 1 - Trending Forecast

A trending forecast projects future traffic volumes from historical growth trends of vehicle traffic. This forecasting method requires 20 years of historical data and is sufficient to project 20 years into the future. Growth trends can be determined from traffic volume data on the nearest state highway since most communities do not have a program to count vehicles. Since this analysis assumes past growth trends will continue into the future, the existing land use zoning must support this analysis. The analysis needs to evaluate how well the transportation system presently functions. Intersections must be evaluated since they have a considerable effect on the traffic flow. The volume of traffic needs to be related to the capacity that the intersection can accommodate.

Level 2 - Cumulative Analysis

This level of analysis is appropriate for a community with a sufficient level of data to support the cumulative analysis. In addition to trending historical growth patterns, Cumulative Analysis examines the existing and planned land uses to predict future development growth and to forecast the traffic generated from that development. It is an effective method of evaluating areas that do not have an extensive street network and that have grown at a fairly uniform rate. It is useful in analyzing existing and future land uses, intersection capacity, traffic signal warrants and street networks. This level of analysis evaluates the present street network of a small city and provides a means to analyze the effects of traffic and population growth, highlight potential problems and develop alternative solutions. A Level 2 analysis requires all the data in the Level 1 analysis as well as the following additional data:

- A method to identify the number of through trips. This is best accomplished with an origin and destination (O & D) study, or review and update of an old O & D study if no major routes have been added or deleted. An extensive license plate survey may be appropriate if it is taken over a long enough time frame and includes the AM and PM peak hour(s) of traffic.
- An in-depth assessment of planned land uses is needed to develop a probable

forecast of the amount of traffic that could be generated at build out of the planning area.

Level 3 - Transportation Model

Generally the Transportation Model has been used in areas with an existing population of 15,000 or greater with an extensive street network. It can be a valuable tool in analyzing complex networks where there are several simultaneous or alternative solutions, and by providing information on the effects of changing land use zoning and traffic trends. It evaluates the present network and highlights existing and future problems by means of a transportation model and traffic engineering analysis. Combined with this analysis would be additional post processing evaluation of turning lane requirements, intersection capacity and signal warrants. Transportation modeling reference materials are provided at the end of this section.

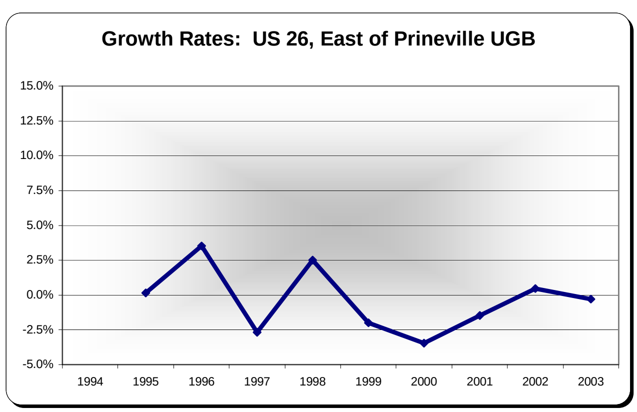
Given the limited resources of the Prineville TSP Update and study, the City and ODOT agreed to develop future travel demand forecasts based on a Level 1 analysis. Two major factors influenced this decision:

- The time required to construct a travel demand model to ODOT Guidelines[1] for the Prineville UGB area would greatly extend the TSP development schedule; making a Level 3 methodology prohibitive to completing the TSP update in a timely manner.
- The time and resources required to conduct (a) origin-destination surveys in the Prineville UGB area and (b) detailed demographic forecasts were also found to exceed the study's resources; making a Level 2 methodology impractical.

Traffic Forecasts

Historic traffic volume data along state highways within the Prineville urban area were summarized for the most recent 20-year trend (1982-2002). An average of these growth trends was calculated for the 20-year period beginning in 2003. As shown in **Table 5-1**, the annual traffic growth trend, on average, is about 1.81 percent along state highways within Prineville. This average growth rate reflects the historic growth in traffic due to new land developments within the Prineville UGB and greater Crook County, but also growth in inter-city travel. It is important to note that the average growth rate also reflects years in which state highway traffic declined, primarily as a result to declining economic conditions within Central Oregon, but in some specific cases due to mill closings within Prineville (1997-2000, 2002). See **Figure 5-1**.

Figure 5-1



[1] *Travel Demand Model Development and Application Guidelines*, Oregon Department of Transportation 1995.

The closing of local mills likely resulted in fewer work-related trips in the Prineville area immediately following the mill closures.

Table 5-1 ODOT Historical Traffic Growth Data – Prineville Area Traffic Growth Rate

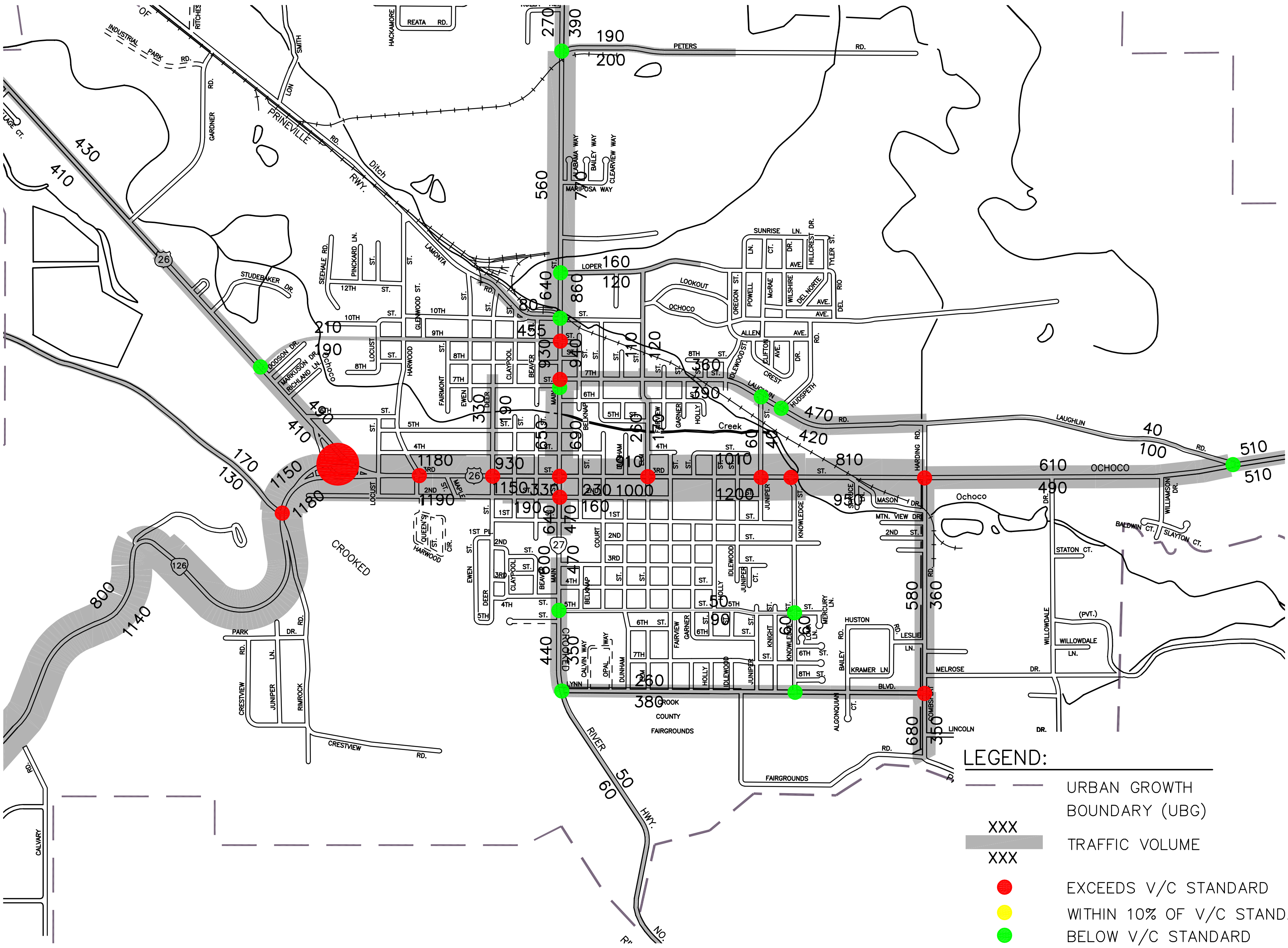
State Highway	ODOT Hwy #	M.P.	Location	2003	2023	RSQ	AVERAGE ANNUAL GROWTH RATE
OR 27	14	0.25	.01 mi south of 3rd	5,400	8,300	0.7596	**2.17%**
	14	0.58	.01 mi north of Lynn	3,900	6,100	0.7278	**2.26%**
	14	0.6	.01 mi south of Lynn	1,000	1,600	0.874	**2.38%**
OR126 / US 26 (east of "Y")	41	16.5	.01 mi west of Tom McCall	9,300	12,900	0.9058	**1.65%**
		16.5	.01 mi east of Tom McCall	9,700	13,800	0.8925	**1.78%**
		17.91	.01 mi west of O'Neil hwy	10,500	16,400	0.8522	**2.25%**
		17.93	.01 mi east of O'Neil hwy	12,700	17,900	0.9073	**1.73%**
		18.27	.01 mi east of Locust	13,900	20,400	0.723	**1.94%**
		19.4	Ochoco Creek Br.	11,700	16,400	0.9178	**1.70%**
		19.74	.01 mi west of Paulina hwy	10,000	12,400	0.8073	**1.08%**
		19.76	.01 mi east of Paulina hwy	7,500	9,800	0.7244	**1.35%**
		20.75	East of P'ville CL	4,500	6,700	0.7151	**2.01%**
US 26 (east of "Y")	360	20.06	.01 mi NW of 6th Street	6,100	8,800	0.667	**1.85%**
O'Neil Highway	370	17.66	.01 mi west of OR 126	2,200	3,000	0.8481	**1.56%**
Paulina Highway	380	0.01	.01 mi south of US 26	4,500	6,000	0.8337	**1.45%**

Source: ODOT Website, Last Updated 9/14/2004

AVERAGE ANNUAL GROWTH RATE (AAGR) **1.81%**

The year 2005 design hour volumes at Prineville intersections were factored to 2025 based on a 20-year trend, increased annually by 1.81 percent. **Figure 5-2** identifies the projected 2025 design-hour traffic volumes based on the average annual growth rates identified in **Table 5-1** (see *Appendix D* for definition of design hour traffic conditions)**.** As shown, future traffic volumes are expected to be highest on Third Street between the WYE connection (US 26/OR 126) and Juniper Street.

The 2025 design-hour hour traffic constitutes the "No-Action" alternative from which other alternatives (see Chapter 6) are compared. The No-Action alternative assumes no major long-term street or intersection improvements. The transportation system impacts of the No-Action alternative are discussed in the following section.



CITY OF PRINEVILLE TRANSPORTATION SYSTEM PLAN

2025 NO BUILD WEEKDAY PM PEAK HOUR TRAFFIC VOLUMES

Figure 5-2

W&H PACIFIC
8405 SW NIMBUS AVE.
BEAVERTON, OR 97008
(503) 626-0455

C:\Documents and Settings\juliab\Desktop\Prineville (Andy)\CAD\2025-NOBUILD-Traffic_Volumes <8 x 11> juliab 03/08/05 09:17

Future (2025) Traffic Operations and Performance

As discussed in Chapter 4, Existing Transportation Conditions, the 1999 Oregon Highway Plan (OHP) mobility standards were established to better address and assess the performance of intersections (both signalized and unsignalized) in the Prineville urban area. Standards were originally defined by ODOT as an objective measure of the volume-to-capacity of state highway intersections. The same measures have been applied to city street intersections in the TSP study for consistency. The mobility standards are expressed in V/C ratios, which are defined as "the peak hour traffic volume (vehicles/hour) at an intersection divided by the maximum volume that the intersection can handle." The closer the V/C ratio is to 1.0, the more congested traffic is.

Within Prineville, the mobility standards vary, with unique V/C ratios for each highway category and city streets, as summarized in **Table 5-2**.

Major Intersections

The analysis of future traffic conditions in the Prineville TSP focused on the critical intersections in downtown and along major streets throughout Prineville. These major intersections serve as the best indicators of overall system performance. **Table 5-2** compares existing (2005) and future (2025) V/C ratios with the mobility standards.

In 2005, the signalized intersection of US 26 and Main Street has a V/C ratio of .90 – matching the mobility standard. By 2025 the V/C ratio is expected to worsen to 1.31, well in excess of the mobility standard. For that matter, all of the signalized intersections along US 26 in Prineville are expected to exceed the mobility standard by year 2025.

Other study area intersections (unsignalized) are also expected to exceed the TSP mobility standards. In 2005, the intersections on OR 126 at O'Neil Highway and US 26 exceed the mobility standards. These conditions will significantly worsen by year 2025. In addition, by 2025 the OR 126/Tom McCall intersection will also exceed the mobility standards. On US 26, the intersections at Juniper Street and Knowledge Street will also exceed the mobility standards by 2025.

Major intersections along Prineville arterials are also expected to exceed the mobility standards by 2025, including the following:

- Main Street / 9th Street
- Main Street / 7th Street
- Combs Flat Road / Lynn Street

Chapter 6 of the TSP summarizes the various future transportation system alternatives intended to help alleviate the levels of traffic congestion expected by year 2025.

Table 5-2 Existing and Future Volume/Capacity Ratios and Mobility Standards for State Highways and Major City Streets – Prineville UGB Area

	2005 DHV			V/C Standard	2025 DHV
Signalized Intersections	LOS[1]	Delay[2]	V/C[3]		V/C
US 26 & Harwood Street	B	11.4	0.73	.90	.99
US 26 & Deer Street	B	19.2	0.83	.90	1.22
US 26 & Main Street	C	28.8	0.90	.90	1.31
US 26 & Elm Street	B	14.6	0.66	.90	.94
US 26 & Combs Flat Road	B	12.3	0.63	.75	1.02
Main Street & 10th Street	A	8.2	0.43	.90	.62
Unsignalized Intersections	LOS	Delay	V/C (WM)[4]		
OR 126 & Millican	C	24.6	0.06 (SB)	.70 / .80	0.18 (SB)
OR 126 & Tom McCall	F	64.1	0.43 (SB)	.70 / .80	1.65 (SB)
OR 126 & O'Neil Highway	F	198.7	1.10 (EB)	.80	2.16 (EB)
OR 126 & US 26					
Southbound – Stop Controlled	F	60.1	0.87 (SB)	.80	1.35 (SB)
Northbound Left – Stop Controlled	D	26.5	0.39 (NBL)	.80	0.80 (NBL)
US 26 & Juniper Street	F	80.8	0.36 (NB)	.90	1.21 (NB)
US 26 & Knowledge Street	E	49.2	0.58 (NB)	.90	1.82 (NB)
US 26 & Laughlin Road					
Northbound Left - Stop Controlled	A	9.0	0.01 (NBL)	.80	0.06 (NBL)
Southbound Right – Stop Controlled	B	10.2	0.02 (SBR)	.80	0.25 (SBR)
Southbound Left – Stop Controlled	C	16.3	0.19 (SBL)	.80	0.35 (SBL)
US 26 & 9th Street	C	19.6	0.30 (SWL)	.80 / .85	0.55 (SWL)
Main Street & Peters Street	B	14.0	0.24 (WBL)	.90	0.42 (WBL)
Main Street & Loper Street	C	20.6	0.35 (WB)	.90	0.78 (WB)
Main Street & 9th Street	F	275.9	1.45 (EB)	.90	4.03 (EB)
Main Street & NE 7th Street	F	117.7	1.07 (WB)	.90	2.00 (WB)
Main Street & NW 7th Street	C	17.2	0.08 (EB)	.90	0.48 (EB)
Main Street & 2nd Street	E	38.8	0.58 (EB)	.90	>9.90 (WB/EB)
Main Street & 5th Street	B	14.6	0.02 (EB)	.90	0.13 (EB)
Main Street & Lynn Street	D	27.9	0.19 (EB)	.90	0.36 (EB)
Juniper Street & 7th Street	B	13.4	0.13 (NB)	.90	0.27 (NB)
Hudspeth Street & 7th Street	B	12.8	0.08 (SW)	.90	0.29 (SW)
Knowledge Street & 5th Street	A	9.4	0.05 (SB/NB)	.90	0.07 (SB/NB)
Knowledge Street & Lynn Street	B	12.9	0.09 (SB)	.90	0.18 (SB)
Combs Flat Road & Lynn Street	D	30.3	0.70 (EB)	.90	1.23 (EB)

1. LOS = Level of Service
2. Delay = in Average Seconds per Vehicle
3. V/C = Volume to Capacity Ratio
4. (WM) = Worst Movement Reported for Unsignalized Intersections

Population Forecasts

Table 5-3 includes the City of Prineville Urban Growth Boundary (UGB) and Crook County population forecasts. Both forecasts indicate considerable growth within the next two decades. Prineville's UGB population forecast indicates an average annual growth (straight-line forecast) of approximately 3.2 percent, somewhat higher than the 1.81 percent growth rate in traffic (based on historic trend).

The analysis and findings of the Prineville TSP Update (in this and subsequent chapters) is based on the Level 1, trend forecasts derived from historic traffic growth in Prineville. Both the traffic and population growth trends should be monitored over the next several years. Adjustments to traffic growth projects, analysis of future traffic conditions and possible adjustments to the TSP findings and recommendations should be reconsidered within the next five years (by 2010). See *Appendix H* for recommended policies relating to TSP updates.

Table 5-3 Prineville UGB Area and Crook County – Existing and Future Population

	Prineville UGB	Crook County
2003 Population	11,600	20,900 (est)
2023 Population	21,778	37,138
Growth: 2003-2023	10,178	16,238
Projected Annual Growth Rate:	3.2%	2.9%
Source:	Prineville Urban Growth Boundary Expansion Evaluation Report, April 2004.	Draft Crook County TSP, September, 2004

Alternatives Considered

A "No Action," TSP Build and TDM alternatives were developed, analyzed, and compared as part of the future street system analysis. The TSP Update focuses on the TSP Build alternative with detailed assessment of a number of street access, circulation and capacity enhancements. The 2025 travel patterns and roadway requirements and costs were analyzed and compared for the alternatives. The results of the analysis were presented to the TAG and Planning Commission/City Council, who then selected the system of improvements to be incorporated and prioritized into the Prineville TSP.

Any of the alternatives were developed with a number of options to address specific street system deficiencies and/or safety concerns. The list below briefly describes the alternatives.

<u>No Action Alternative</u> - Assumes that there will be no changes to the existing street system.

<u>TSP Build Alternative</u> - Evaluates a number of street system options to provide needed circulation, access, safety and capacity improvements focused within five major subareas. As illustrated in **Figure 6-1** the subareas include:

Subarea 1 – Improvements to junction of OR 126 and US 26 (safety, access and capacity).

Subarea 2 - Improvements to OR 126 access in the Prineville Airport and industrial area (safety, access and capacity).

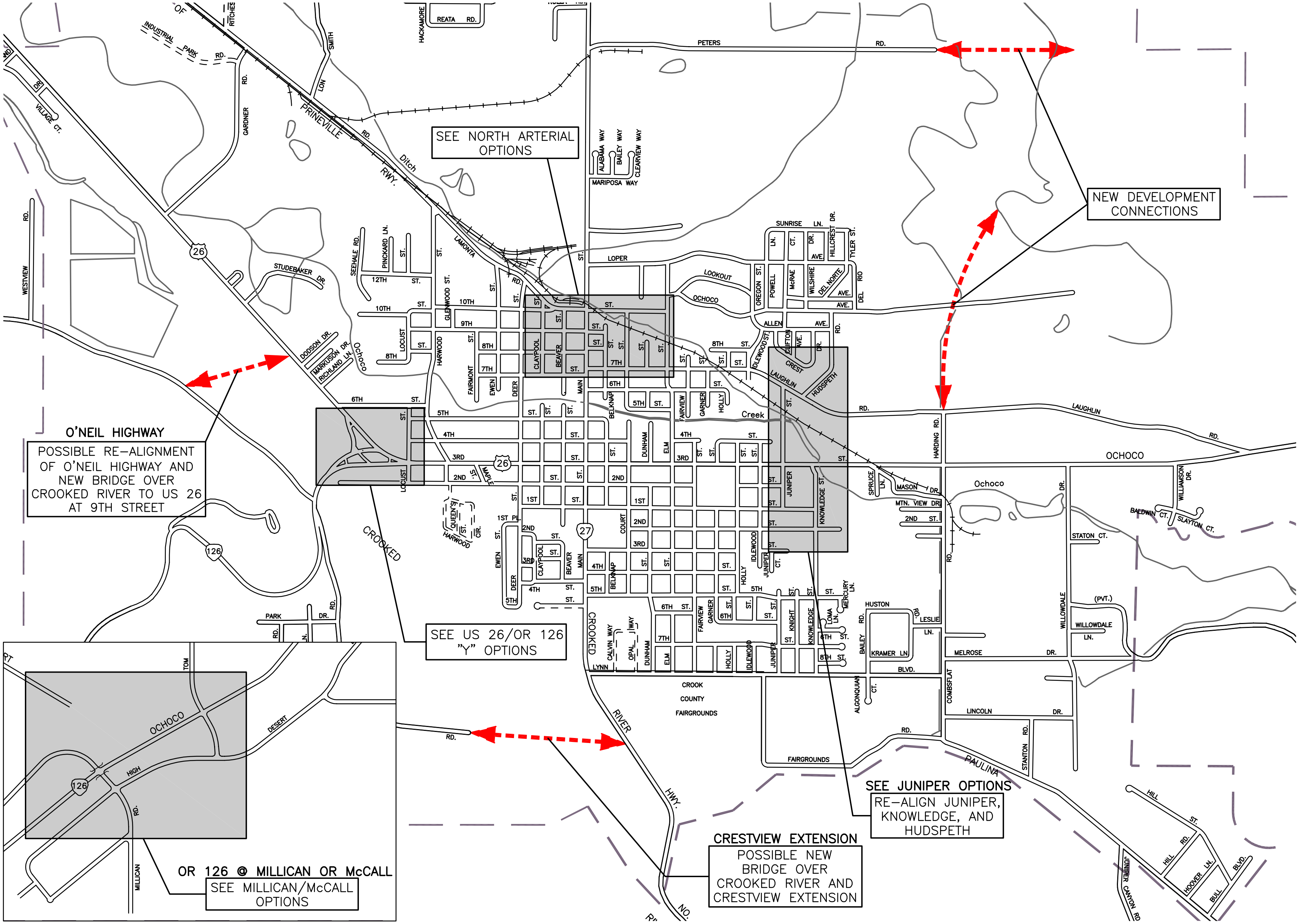
Subarea 3 - Improvements to Northern Arterial (safety, access, circulation, capacity and alternative modes).

Subarea 4 - Improvements to North/South collector street system including (a) Juniper/Knowledge/Hudspeth re-alignment, and (b) Holly Street Extension between 6th and 7th Streets and Elm Street Extension between 5th and 6th Streets (access, circulation, capacity, alternative modes).

Subarea 5 - Improvements to Crooked River crossings, including (a) O'Neil Highway re-alignment, and (b) Crestview extension (safety, access, circulation, and capacity).

Within some of the subareas a series of transportation system improvement options were considered and evaluated.

<u>Transportation Demand Management (TDM) Alternative</u> – In addition to the TSP Build Alternative, TDM considers and evaluates shifts in commuter travel behavior; either by *mode* (e.g. shift from "drive-alone" to walk or carpool/vanpool modes) or by *time of day* (e.g. shift in resident commuter travel times to avoid P.M. peak hour).



CITY OF PRINEVILLE TRANSPORTATION SYSTEM PLAN

MAJOR STREET IMPROVEMENTS UNDER STUDY

Figure 6-1

W&H PACIFIC
8405 SW NIMBUS AVE.
BEAVERTON, OR 97008
(503) 626-0455

Alternatives Evaluation

No Action Alternative

The No Action Alternative assumes that no changes will be made to the existing street system for the next 20 years. However, traffic volumes will increase in Prineville as population and employment continue to grow. By comparing the future traffic demand with the unchanged street system, one can determine where future traffic problems are likely to occur.

Chapter 5 described how future traffic forecasts were developed. The results of the No Action traffic forecast are shown in **Figure 5-2**. As described in Chapter 5, traffic volumes throughout the system are projected to increase by approximately 35 to 40 percent by year 2025.

As indicated in **Table 5-2**, growth in Prineville will result in deteriorated traffic conditions, below the mobility standards, along several critical sections:

- 3rd Street
- Main Street, north of 3rd Street, particularly between NW 7th and 10th Streets
- Main Street, immediately south of 3rd Street, and
- Major intersections along OR 126 at Tom McCall Road, O'Neil Highway and US 26

Increased congestion and delay in the No Action Alternative would have both environmental and socio-economic impacts. Air quality and noise levels would worsen along Third and Main Streets due to the increase in congestion. The environmental impacts would also affect the livability of Prineville, which might encourage new residents and businesses to locate elsewhere.

TSP Build Alternative

Various street improvement options that help define the TSP Build Alternative are described by major subarea within Prineville.

Subarea 1: Improve US 26 and OR 126 Junction

The analysis of future traffic conditions identified significant capacity deficiencies at the junction of US 26 and OR 126. The capacity of the existing lane configuration and traffic control is limited, state highway access to adjacent land uses is detrimental to efficient and safe highway operations, and pedestrian access through and across the junction is insufficient for safe and continuous operations. The level of traffic demand (2005 peak hour) at the junction already exceeds the OHP mobility standards in. These conditions are projected to grow significantly worse by year 2025, far exceeding the OHP mobility standards. It was assumed that a fully grade-separated interchange would be extremely costly and perhaps unwarranted within the 20-year planning horizon. The TSP

Update focused on two types of intersection traffic control measures to increase capacity and multi-modal access at the junction:

- Traffic signal
- Roundabout

Figure 6-2 summarizes the traffic analysis conducted for the various traffic control options at the US 26/OR 126 junction. As shown, the analysis of future traffic conditions indicates that a new traffic signal at the junction, even with additional turn lanes, would result in future traffic conditions that exceed the OHP mobility standard by 2025.

As an alternative, modern roundabouts are designed to provide traffic control for intersections with relatively high volumes. At roundabouts a deflection angle approaching the intersection creates a merging point with traffic in the roundabout, similar to freeway ramp operations. At traffic signals, traffic enters the intersection at 90 degree angles and a signal regulates traffic flow. This fundamental difference has an impact on intersection operations and safety.

There are many factors to be considered when installing a roundabout. The most notable pros and cons of roundabouts are listed in **Table 6-1.**

Consideration of the following issues were addressed as part of the roundabout analysis:

- Future traffic operations analysis[1], to determine consistency with OHP Mobility Standards
- Confirmation of 1- vs. 2-lane roundabout capacity needs within the 20-year TSP planning horizon
- General impact to existing businesses and school that front US 26 and OR 126, west of Locust Street
- Concept design connection of new connector to Second Street (eastbound only), and
- Future traffic impacts of the added Second Street connection, alleviating traffic on 3rd Street, and/or the possibility of a one-way couplet option.

Both the single-lane roundabout with slip-lanes and double-lane roundabout options provide sufficient capacity over the next twenty years and beyond. **Table 6-2** summarizes the various design, right-of-way and policy issues that will need to be addressed following completion of the 2005 Prineville TSP Update. The conclusion of the TSP analysis indicates that the roundabout with slip lanes is the preferred alternative. However, the City and ODOT should pursue both roundabout concept options, and narrow the analysis to a final, recommended design for eventual construction.

[1] Coordination with ODOT Salem Technical Services Branch (design concept assessment) and Region (Traffic Engineer) was conducted to confirm the data, approach, parameters and findings of the roundabout analysis.

Table 6-1
Roundabouts: Pros and Cons

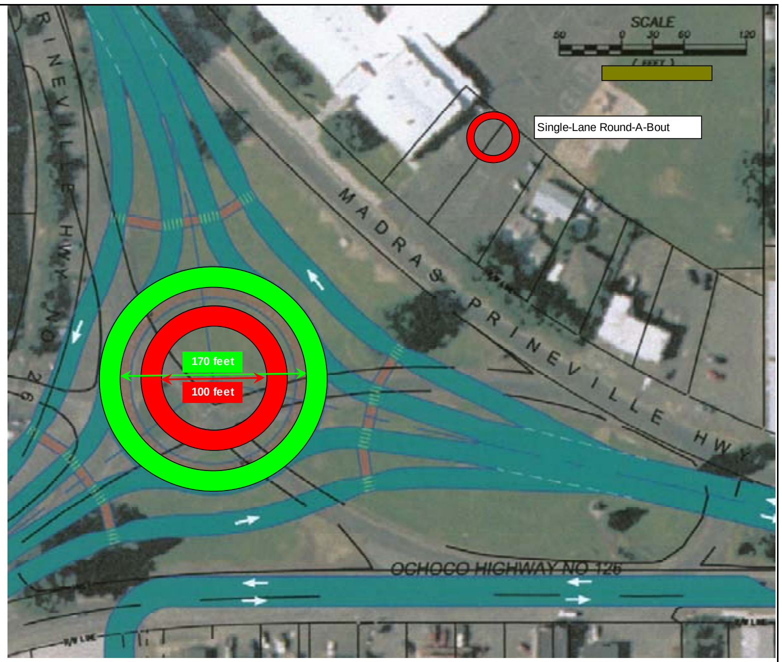
Pros	Cons
Traffic Operations	
• In general, roundabouts provided for more capacity and have less delay than traffic signals as traffic in a roundabout is not stopped where as a traffic signal has yellow and all-red times that must be provided. • Since vehicles are continuously entering and exiting the roundabout without stopping, queuing is often reduced. • Roundabouts can often have lower average vehicle delays and better levels of service than conventional intersections. • Roundabouts regulate vehicular speeds, as vehicles are forced to slow down to maneuver through the roundabout. • Roundabouts allow U-turns to be made relatively easy and safe and can improve access to street segments where left turns are prohibited.	• Drivers who are unfamiliar with roundabouts may be confused and violate normal operations by stopping at inappropriate times or violate yield controls, which can impact operations and safety.
Traffic Safety	
• Roundabouts are considered safer as they have 75 percent fewer vehicle conflict points than conventional intersections. • Roundabouts have fewer and less sever collisions. The Insurance Institute for Highway Safety analyzed before and after conditions for locations that have had roundabouts installed and found 39 percent decrease in collisions, 76 percent decrease in collisions with injuries, and 90 percent decrease in fatal collisions. • Head-on and broadside collisions are typically the most dangerous collisions and these types of collisions cannot occur at roundabouts.	• There is a potential for an increased frequency of minor collisions such as rear-end and low speed sideswipes. • Drivers who are unfamiliar with roundabouts may have some initial confusion, which could lead to violations that result in minor collisions.
Pedestrian Safety	
• Pedestrians only have to cross one single-lane direction of traffic at a time, and have considerably less exposure to vehicles than at conventional intersections.	• There are no protected pedestrian movements like you would find at traffic signals. • Roundabouts do not have the same audible queues used by visually-impaired pedestrians at other types of intersections. • The sight lines for drivers looking for pedestrians is different than at a standard intersection as they are approaching the intersection at an angle and are yielding vs. stopping.

Table 6-1 (cont.)
Roundabouts: Pros and Cons

Bicycle Safety

- There are mixed results regarding bicycle safety at roundabouts. The roundabout design can incorporate elements that help protect bicycles like "escape ramps" to bypass the roundabout.
- Sight lines are different at a roundabout and drivers are making a lot of decisions regarding entering and exiting a roundabout and bicyclists are not always seen or looked for.

General Considerations



- Roundabouts typically require more space and right-of-way than a standard intersection.
- There is debate on whether a roundabout should be used in locations with highly unbalanced traffic flows.
- Access points leading up to a roundabout are impacted
- Roundabouts typically require more landscaping and potentially irrigation. The landscaping or center island can also be used for public art or designed as a City gateway.
- Roundabouts should not be located at intersections with sight distance constraints or locations with very high semi-truck turning volumes.
- Roundabouts should not be used in the middle of a coordinated signal system.

Table 6-2
US 26 / OR 126 Junction

US 26 Intersection	MUTCD Warrants* Met?		
	#1	#2	#11
OR 126	Yes	Yes	Yes

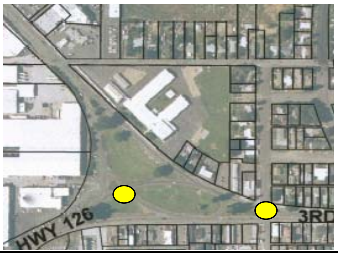
* Based on 2025 projected traffic conditions

FIGURE 6-2: US 26 / Hwy 126 Junction Improvement Options

Volume / Capacity
(Mobility Standard: .80)

	2005	2025 No Action	2025 Build Alt.

Existing Lane Configuration &Traffic Control



Southbound left-turns and eastbound left-turns are stop-controlled.

	2005	2025 No Action	2025 Build Alt.
Existing	0.87	1.98	*not considered*

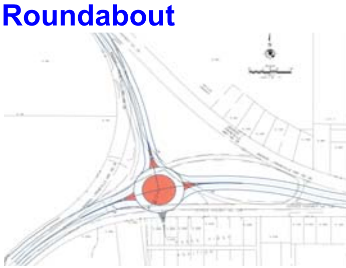
Traffic Signal - "T" Intersection

	EBND Left	EBND Thru	WBND Thru	WBND Right	SBND Left	SBND Right	2005	2025 No Action	2025 Build Alt.
Option #1	1	1	1	1*	1	1*	0.74	1.01	0.88
Option #2	1	2	1	1*	2	1*	0.62	0.83	0.81

(Number Travel Lanes by Movement)

** Free right-turn lanes.*

Roundabout



Roundabout V/C Key
.## / .##
Sidra / G2

	2005	2025 No Action	2025 Build Alt.
Single-Lane	0.87 / 0.85	1.43 / 1.27	1.32 / 1.12
Double-Lane	0.41 / 0.40	0.65 / 0.66	0.56 / 0.64

Roundabout with Slip-Lanes

Roundabout V/C Key
.## / .##
Sidra / G2

	2005	2025 No Action	2025 Build Alt.
Roundabout with Slip-Lanes	0.49 / 0.56	0.71 / 0.82	0.69 / 0.77

Subarea 2: Improve OR 126 Access in the Prineville Airport Industrial Area

The airport industrial area was recently annexed into the City and is developing rapidly as an employment center. Four major options to improve OR 126 access and circulation were evaluated:

Option 1: Tom McCall Road Overcrossing

Option 2: Millican Road Undercrossing

Option 3: Tom McCall Road Undercrossing

Option 4: Millican / Tom McCall Split-Diamond

Analysis of future (2025) traffic conditions on OR 126 in the airport area reveal that volumes at both Millican Road and Tom McCall Road are sufficiently high enough to warrant traffic signals (see **Table 6-3**).

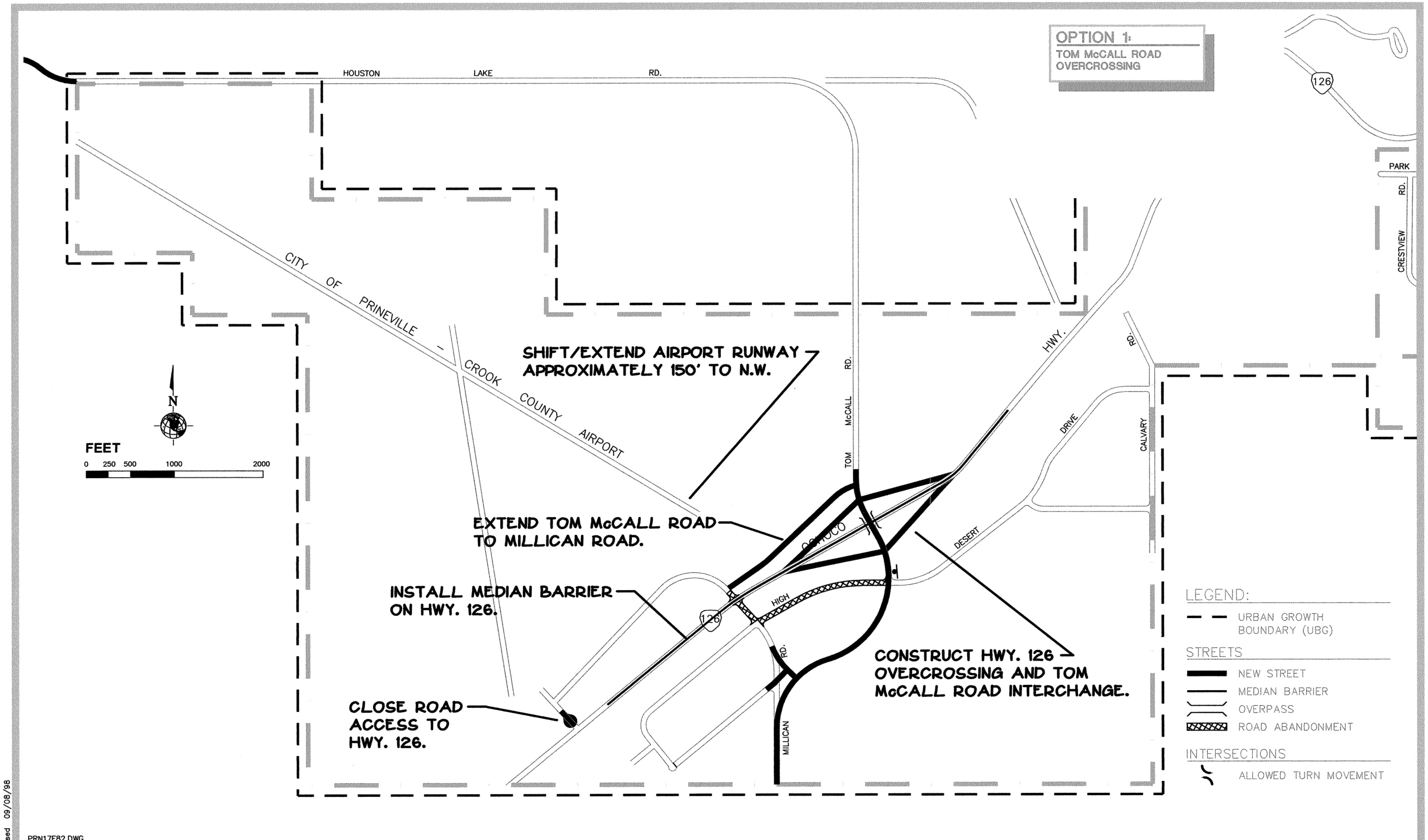
Table 6-3
OR 126 - Airport Area
Traffic Signal Warrant Analysis Summary

OR 126 Intersection	MUTCD Warrants* Met?		
	#1	#2	#11
Millican Road	Yes	Yes	Yes
Tom McCall Road	Yes	Yes	Yes

* Based on 2025 projected traffic conditions

While the installation of traffic signals on OR 126 at either Millican Road, Tom McCall could result in acceptable levels of service at the intersection in the near future. However, the installation of new traffic signals, particularly at the edge of Prineville's UGB, will introduce significant delay to state highway traffic; and may even introduce undesirable safety conditions in the area. Any of the interchange options would significantly reduce traffic conflicts by providing improved access management and greater capacity to accommodate the growth instate highway traffic, particularly truck movements through the area. These interchange options are also more consistent with the access management standards outlined in the 1999 Oregon Highway Plan. **Table 6-4** provides a planning-level cost analysis of the four options.

As shown in **Figure 6-3**, the Tom McCall interchange option (Option #1) was found to be the most desirable interchange option that optimized OR 126 operations, provided improved access and safety to the industrial area, and minimized the impact to the airport area operations.



CITY OF PRINEVILLE TRANSPORTATION SYSTEM PLAN

AIRPORT AREA / HIGHWAY 126 ACCESS CONCEPTUAL IMPROVEMENT OPTIONS

Figure 6-3

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Table 6-4
OR 126 - Airport Area Access Improvement – Option #1
Cost Analysis in 2005 Dollars (millions)

	Streets					
Option	**Traffic Signals**	**Approach Lanes**	**Highway Widening**	**Ramps**	**Bridge**	**Total**
Option 1	$0.5	$1.13	$1.14	$1.00	$1.63	$5.40

Subarea 3: Improvements to Northern Arterial

The Prineville Northern Arterial was first identified in the Draft 1998 TSP. Portions of the Northern Arterial have already been completed, including that section of 9th Street from US 26 to Main Street. The 2005 TSP study focused planning and conceptual engineering analysis for those sections needed to complete the Northern Arterial. An examination of alignment options at Main Street and routing along the railroad right-of-way between the 9th Street area and 7th Street was completed.

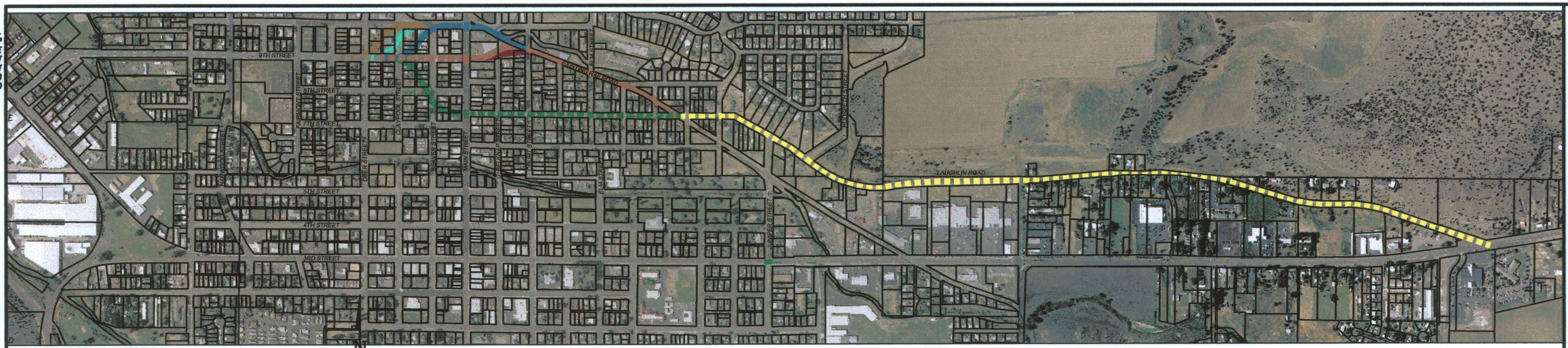
Analysis of future traffic conditions revealed that the fully improved Northern Arterial provides significant relief to peak hour traffic conditions along 3rd Street. As shown in **Figure 6-4** and listed below, three major options to complete the Northern arterial were identified and evaluated:

Option 1: Transition 9th Street to 7th Street west of Main Street, align along 7th Street from Main Street to Laughlin Road, align along Laughlin Road from 7th Street to US 26

Option 2: Extend 9th Street from Main Street to Prineville Railway right-of-way, align along Prineville Railway right-of-way to Laughlin Road, align along Laughlin Road from 7th Street to US 26

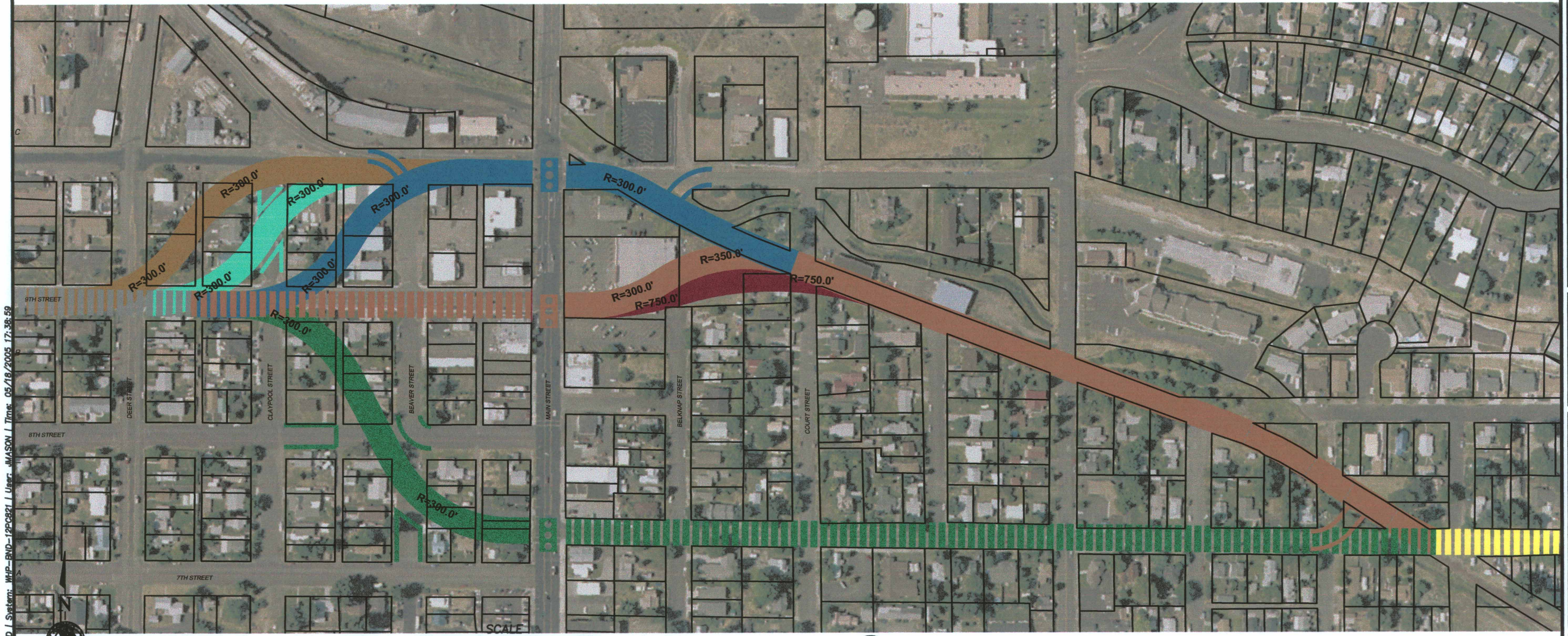
Option 3: Transition 9th Street to 10th Street west of Main Street, align along Prineville Railway right-of-way to Laughlin Road, align along Laughlin Road from 7th Street to US 26

For all options it was assumed that the intersection of the Northern Arterial at Main Street would be signalized, with separate turn-lanes on all approaches. Analysis of future (2025) traffic conditions revealed that the City’s mobility standard would be achieved at the Northern Arterial intersection of Main Street.



SCALE 500 0 250 500 1000 (FEET) 1 INCH = 1000 FT

NORTH ARTERIAL OVERALL PLAN 1 EX1.0
SCALE: 1"=1000'



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NORTH ARTERIAL/MAIN STREET DETAIL 2 EX1.0
SCALE: 1"=240'

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ODOT/CITY OF PRINEVILLE
PRINEVILLE TRANSPORTATION SYSTEM PLAN
NORTH ARTERIAL EXHIBIT

PRINEVILLE/CROOK OREGON

SCALE:	PROJECT NO.	DRAWING FILE NAME:
VARIES	32079	32079-ROAD-CONCEPT

Figure 6-4

DESIGNED BY: BCJ CHECKED BY: BCJ
DRAWN BY: JAM APPROVED BY:
LAST EDIT: PLOT DATE: 05/18/05
DATE BY REV# REVISION CK'D APPR

SHEET 1/4
EX1.0

All three options would have some environmental impacts.

Socioeconomic impacts would be considerable for Option #1, as it would significantly affect the 7th Street corridor neighborhood. Additional right-of-way would need to be acquired from properties adjacent to 7th Street, east of Main Street. New right-of-way would need to be acquired west of 7th Street under Option 1, and some existing businesses and residents would need to be relocated.

Option #2 would require new right-of-way immediately east of Main Street, and the relocation of an existing grocery store. The portion of the Prineville Railway between 7th Street and about 9th Street would need to be converted to public, arterial street use. Additional right-of-way would likely be needed along this section of the Prineville Railway to accommodate the Northern Arterial.

Socioeconomic impacts would also be considerable for Option #3. Additional right-of-way would need to be acquired from properties between 9th and 10th Streets, immediately west of Main Street. Some existing businesses and residents would need to be relocated. East of Main Street the socioeconomic impacts for Option #3 are similar to Option #2.

Table 6-5 provides a planning-level cost analysis of the three options to complete the Northern Arterial.

Table 6-5
Northern Arterial Completion: Cost Analysis in 2005 Dollars (millions)

Option	**Street**		**Total**
	ROW*	**Road**	
Option 1 – 7th Street		$1.02	$1.02
Option 2 – 9th Street		$1.00	$1.00
Option 3 – 10th Street		$1.46	$1.46
Laughlin Road – 7th Street to US 26 **			
Within ROW		$1.30	$1.30
Expanded ROW	$1.41	$1.30	$2.71

** Costs do not include estimates for new ROW (other than along Laughlin Road) and the cost to remove and re-locate existing residential and commercial buildings.*
*** Costs are consistent for all three options.*

Subarea 4: Improve City North/South Collector Street System

Options to improve Prineville's North/South collector street system include extensions of Court Street across Ochoco Creek, consolidation of Knowledge and Juniper Street at 3rd Street (with improved connection to Hudspeth at Laughlin Road), extension of Elm Street south of 5th Street, extension of Holly Street between 6th and 7th Streets, and connections north of Laughlin to serve the developing north side of Prineville.

Court Street Extension

The Court Street Extension option would extend N. Court Street over the Ochoco Creek to provide another north-south route. The purpose of this alternate route would be to reduce traffic volumes at the Main Street and Elm Street intersections with 3rd Street and provide improved circulation for vehicles, bicyclists, and pedestrians. It would also shorten trips which currently travel out of a direct path because of the lack of creek crossings, including emergency response vehicles from the City's Fire Hall located just south of Ochoco Creek.

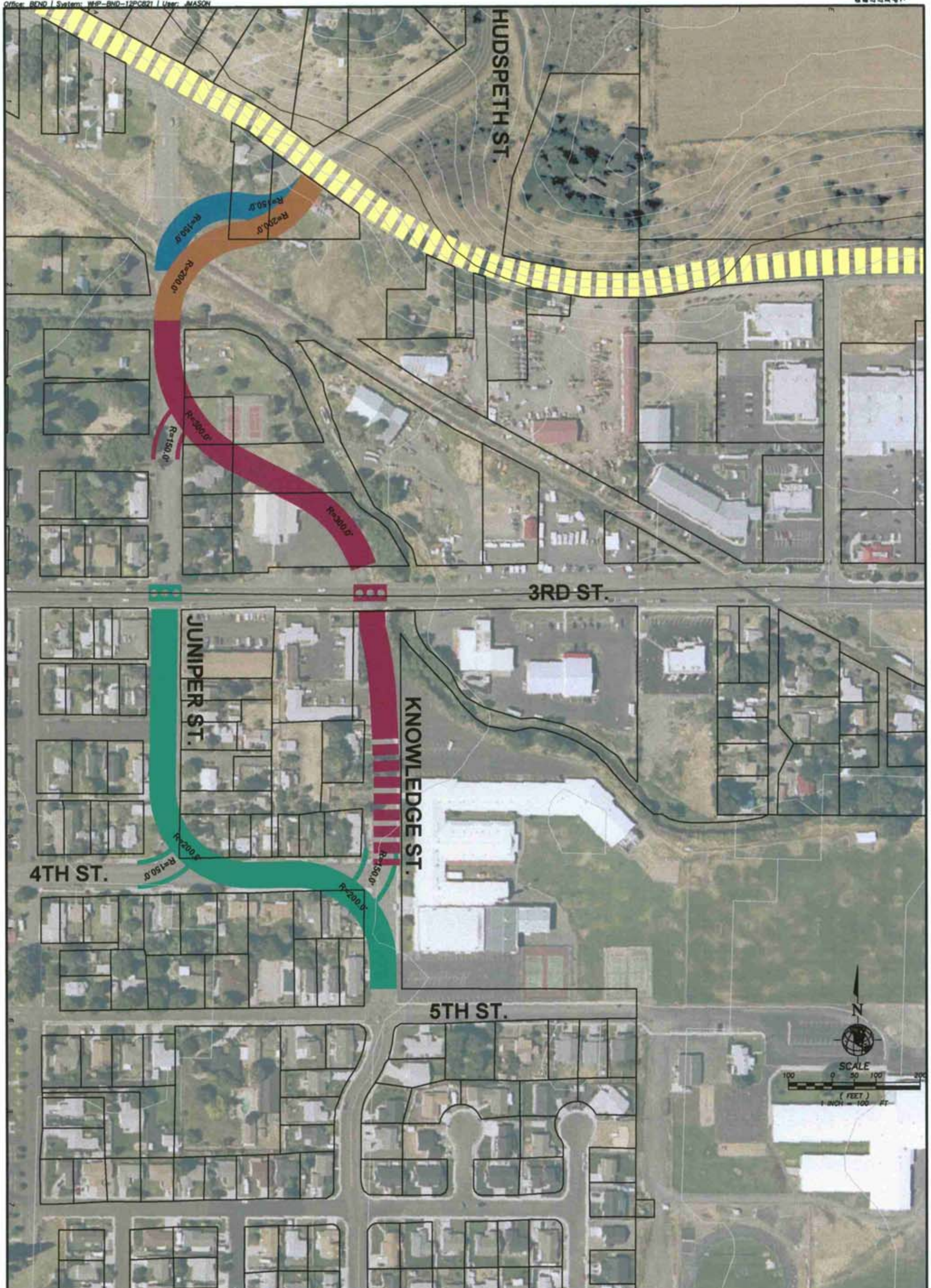
The Court Street Extension was estimated at about $ 1.4 million, including a new bridge, and street section to City collector standards. This option would not require any substantial right-of-way costs, but it would add another roadway through the park along Ochoco Creek.

A review of traffic volumes along Main Street and Elm Street indicates that the N. Court Street connection would provide substantial reduction in local neighborhood traffic on those roadways. The impacts of this option would result from the Ochoco Park and Ochoco Creek crossings. The creek crossing could have potential water impacts from roadway run-off. Park users, particularly walkers, runners, and bicyclists, would have one additional roadway crossing as a result of this option.

Knowledge/Juniper Street Re-alignment

As shown in **Figure 6-5**, the re-alignment of Knowledge Street between 2nd Street and Juniper Street (at 1st Street) would provide the most direct street, pedestrian and bicycle access between the developing residential areas in North Prineville, with the Prineville Schools located south of OR 126. Future traffic demand indicates the need for a new traffic signal on 3rd Street at Juniper Street under this option. This improvement would eliminate the current dog-leg connection across OR 126 via Juniper Street and Knowledge Street, with a single highway crossing controlled by a traffic signal.

New public right-of-way would need to be acquired as part of this project.



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LAST EDIT:		PLOT DATE:	03/08/05

DATE	BY	REV#	REVISION	CK'D	APPR

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Figure 6-5

ODOT/CITY OF PRINEVILLE
PRINEVILLE TRANSPORTATION SYSTEM PLAN

KNOWLEDGE/HUDSPETH CONNECTION

PRINEVILLE/CROOK OREGON

SCALE: 1" = 100' | PROJECT NO. 32079 | DRAWING FILE NAME: 32079-ROAD-CONCEPT

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The Knowledge/Juniper Street alignment would have significant impact to future traffic by relieving north/south traffic demand on both Main Street and Elm Street. Construction costs (in 2005 dollars) were estimated at about $ .76 million, including a new traffic signal at 3rd Street and street section to City collector standards.

Elm Street and Holly Street Extensions

The purpose of this option would be to reduce traffic volumes at the Main Street intersection with 3rd Street by providing improved circulation for vehicles, bicyclists, and pedestrians linking north (especially the hospital) and south Prineville.

The Elm Street Extension option would extend S. Elm Street between 5th Street and 6th Street. The Holly Street Extension would extend S. Holly Street between 6th Street and 7th Street. The purpose of this option would also be to reduce traffic volumes at the Main Street intersection with 3rd Street by providing improved circulation for vehicles, bicyclists, and pedestrians linking north (especially the hospital) and south Prineville.

Construction costs in 2005 dollars were estimated at about $ 0.8 million for right-of-way and a new street section to City collector or local route standards. This option would not require any substantial right-of-way costs.

Subarea 5: Improve Crooked River Crossing Opportunities

There are two major opportunities to improve access across Crooked River: one north of OR 126 serving north Prineville; and the second south of OR 126 serving the Crestview area and south Prineville. Both options provide alternate route connections to OR 126 (3rd Street) with the potential to relieve future traffic congestion in the downtown Prineville area.

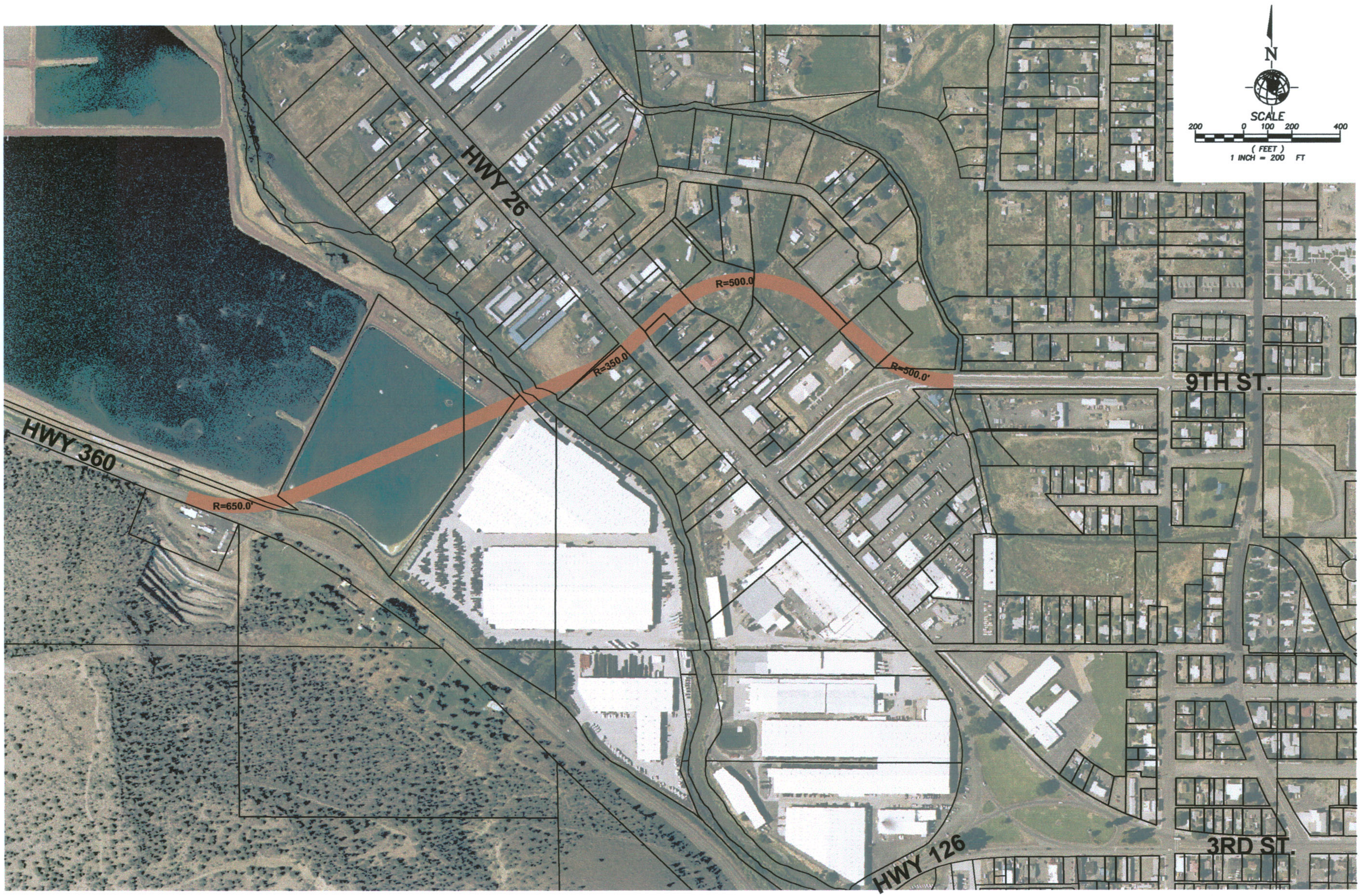
Two major options to improve opportunities to cross Crooked River were evaluated:

Option 1: Re-route O'Neil Highway to US 26

Option 2: Extend Crestview Road to Main Street

Option 1

As shown in **Figure 6-6** the re-alignment of O'Neil Highway would terminate at US 26 at the intersection of 9th Street. This option may require a short re-alignment of 9th Street to consolidate intersections, and OR 126 can be modified to include full median protection at the existing intersection of O'Neil Highway (prohibiting all left-turn vehicular movements).



HIGHWAY 26/HIGHWAY 360
INTERCHANGE CONCEPT
SCALE: 1"= 200'

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EX4.0

Figure
6-6

ODOT/CITY OF PRINEVILLE
PRINEVILLE TRANSPORTATION SYSTEM PLAN
HIGHWAY 26/HIGHWAY 360
INTERCHANGE CONCEPT

PRINEVILLE/CROOK OREGON

SCALE: 1" = 200'
PROJECT NO. 32079
DRAWING FILE NAME: 32079-ROAD-CONCEPT

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PLOT DATE: 04/04/05

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The re-routing of O'Neil Highway can help reduce the number of conflicting auto and truck turning movements at the current intersection of OR 126, which is problematic due to a number of factors: (1) close proximity to the Crooked River Bridge; (2) close proximity to the US 26/OR 126 junction; and, (3) immediate proximity to the OR 126 grade, which complicates the safe transition of side-street traffic with downhill and uphill traffic operations.

Option 1 would have environmental and socioeconomic impacts that would require further study and findings prior to construction.

Option 2

Rimrock Road connects to OR 126 at an intersection with an awkward angle of approach, but is the only public access road to the Crestview area. The Rimrock Road connection shares the same operational difficulties as the O-Neil Highway intersection, only there are little to no truck movements to and from the Crestview area. There is concern that emergency vehicles might be blocked from the Crestview area should anything happen to the Crooked River Bridge crossing.

Option 2 would have environmental and socioeconomic impacts that would require further study and findings prior to construction.

The extension of Crestview Road east to the Crooked River Highway may possibly conflict with some park land near the Crooked River Highway; however, conflicts with the park land would not be determined until a more detailed alignment is studied.

This option assumes that the Rimrock Road intersection with OR 126 would remain open, or partially open, until such time that highway traffic operations are deemed unsuitable. There are options to partially close the median to left-turning vehicles at Rimrock Road: (1) partial median closure to westbound (OR 126) left-turns; and, (2) full median closure, allowing only right-turns at Rimrock Road. The partial median closure option provides future safety enhancements on OR 126 by reducing some cross-median traffic movements (coupled with the re-alignment of O'Neil Highway), while retaining an alternative local route (via the Crestview Extension) for south Prineville traffic to access OR 126 and avoid downtown Prineville.

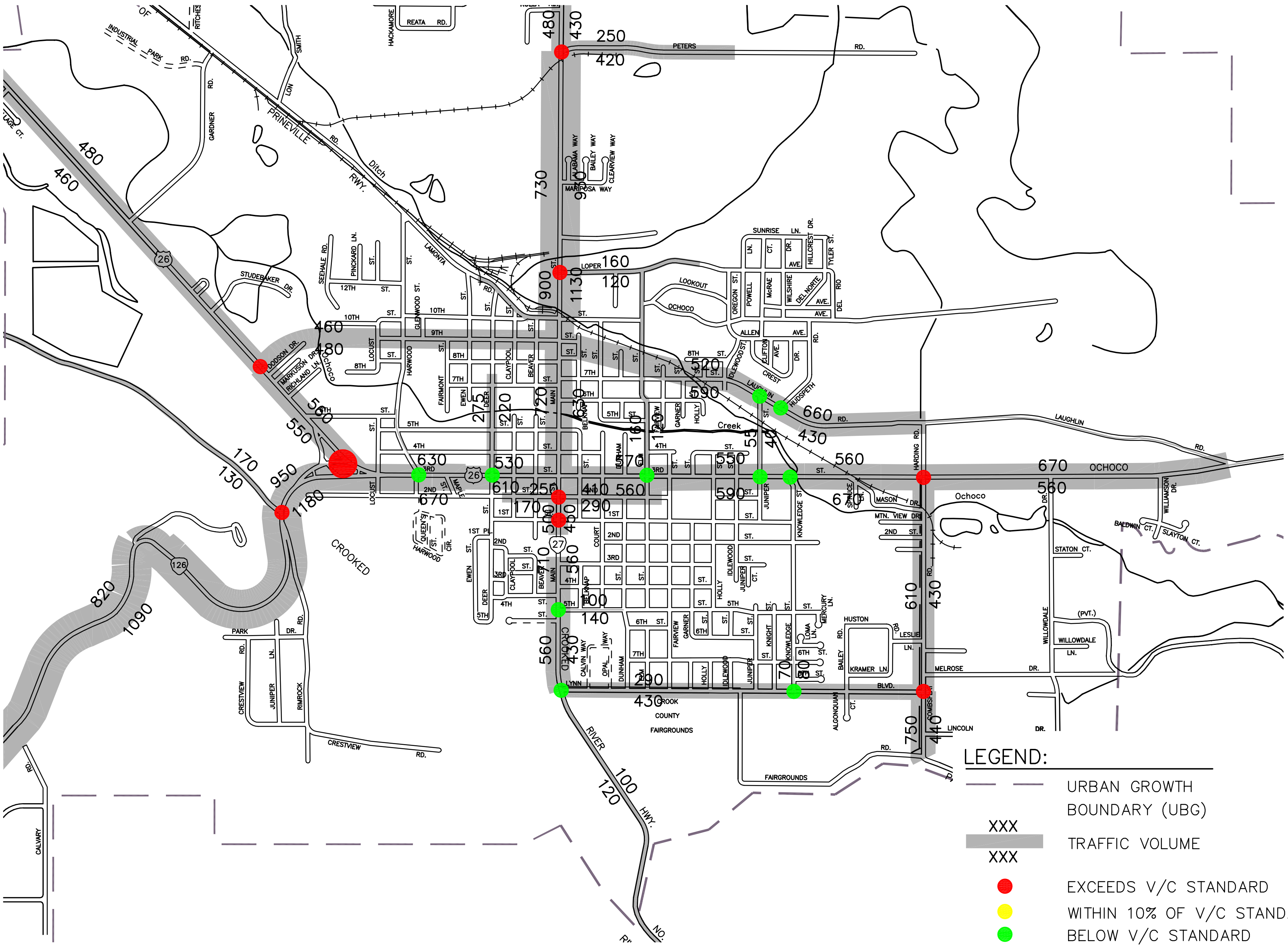
Table 6-6 summarizes the planning-level costs estimated for the two Crooked River crossing options.

Table 6-6
Crooked River Crossing Options: Cost Analysis
in 2005 Dollars (millions)

Option	Street	Bridge	Total
Option 1 – O'Neil Highway Re-Alignment	$1.35	$.97	$2.32
Option 2 - Crestview Extension	$1.08	$4.32-$8.64	$5.40-$9.72

Impacts of Build Alternative on 3rd Street Traffic

The combination of capacity improvements identified in the various build alternative options were generally tested to determine their combined impact on future traffic operations within the 3rd street corridor, most notably at Main Street. **Figure 6-7** summarizes the 2025 PM peak hour traffic volumes reflective of the Build alternative. The Build alternative has the potential to shift about 40% of the future (2025) peak hour traffic from 3rd Street major parallel routes like 2nd Street and Northern Arterial (9th Street). Future traffic operations were measured based on the Build alternative, and are summarized in **Table 6-7**. With the exception of the 3rd Street/Main Street intersection, all study area intersections are found to operate within the mobility standards in year 2025.



LEGEND:

URBAN GROWTH BOUNDARY (UBG)

XXX / XXX — TRAFFIC VOLUME

EXCEEDS V/C STANDARD

WITHIN 10% OF V/C STANDARD

BELOW V/C STANDARD

CITY OF PRINEVILLE
TRANSPORTATION
SYSTEM PLAN

2025 BUILD WEEKDAY PM PEAK HOUR TRAFFIC VOLUMES

Figure 6-7

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Table 6-7 Future, No-Action and Build Alternatives - Volume/Capacity Ratios and Mobility Standards for State Highways and Major City Streets – Prineville UGB Area

	2025 No-Action DHV	V/C Standard	2025 Build
Signalized Intersections	V/C[3]		V/C
US 26 & Harwood Street	.99	.90	.69
US 26 & Deer Street	1.22	.90	.67
US 26 & Main Street	1.31	.90	.94
US 26 & Elm Street	.94	.90	.48
US 26 & Combs Flat Road	1.02	.75	.71
Main Street & 10th Street *(unsignalized in 2025 Build)*	.62	.90	.87
Unsignalized Intersections			
OR 126 & Millican	0.18 (SB)	.70 / .80	New Interchange
OR 126 & Tom McCall	1.65 (SB)	.70 / .80	New Interchange
OR 126 & O'Neil Highway	2.16 (EB)	.80	see Re-alignment
OR 126 & US 26			
Southbound – Stop Controlled	1.35 (SB)	.80	see Roundabout
Northbound Left – Stop Controlled	0.80 (NBL)	.80	see Roundabout
US 26 & Juniper Street *(signalized in 2025 Build)*	1.21 (NB)	.90	.43
US 26 & Knowledge Street	1.82 (NB)	.90	0.38 (NB)
US 26 & Laughlin Road			
Northbound Left - Stop Controlled	0.06 (NBL)	.80	0.11 (NBL)
Southbound Right – Stop Controlled	0.25 (SBR)	.80	0.26 (SBR)
Southbound Left – Stop Controlled	0.35 (SBL)	.80	0.41 (SBL)
US 26 & 9th Street *(signalized in 2025 Build)*	0.55 (SWL)	.80 / .85	.70
Main Street & Peters Street *(signalized in 2025 Build)*	0.42 (WBL)	.90	.46
Main Street & Loper Street	0.78 (WB)	.90	1.11 (WB)
Main Street & 9th Street *(signalized in 2025 Build)*	4.03 (EB)	.90	.76
Main Street & NE 7th Street	2.00 (WB)	.90	0.45 (WB)
Main Street & NW 7th Street	0.48 (EB)	.90	0.35 (EB)
Main Street & 2nd Street *(signalized in 2025 Build)*	>9.90 (WB/EB)	.90	.54
Main Street & 5th Street	0.13 (EB)	.90	0.21 (EB)
Main Street & Lynn Street	0.36 (EB)	.90	0.45 (EB)
Juniper Street & 7th Street	0.27 (NB)	.90	0.36 (NB)
Hudspeth Street & 7th Street	0.29 (SW)	.90	0.41 (SW)
Knowledge Street & 5th Street	0.07 (SB/NB)	.90	0.07 (SB/NB)
Knowledge Street & Lynn Street	0.18 (SB)	.90	0.26 (SB)
Combs Flat Road & Lynn Street *(signalized in 2025 Build)*	1.23 (EB)	.90	.49

1. LOS = Level of Service
2. Delay = in Average Seconds per Vehicle
3. V/C = Volume to Capacity Ratio
4. (WM) = Worst Movement Reported for Unsignalized Intersections

Impacts of Transportation Demand Management (TDM)

Through transportation demand management *(TDM)*, the peak travel demands can be reduced or spread to different time periods to provide more efficiency in the transportation system. Further analysis was conducted to determine if these measures, either individually or collectively, would reduce the need for additional street capacity improvements by year 2025, beyond those identified in the Build alternative. The major effect of these programs would be on the home to work and return trips. This analysis, therefore, focused on those trips, looking at the reasonable upper limit that could be achieved by diverting trips through carpooling, mode shifts, and other TDM measures.

Table 6-8 compares the journey to work census data for 1980, 1990 and 2000, and the results of this analysis on vehicle trip reduction during the P.M. peak hour. The effect could be a reduction of 90-120 vehicle trips during the PM peak hour. This amounts to a reduction of about 3% of the "drive-alone" peak hour vehicle trips. This reduction is spread throughout the community and would not indefinitely eliminate but could postpone the need for more extensive cross-town arterial/highway capacity improvements.

Table 6-8

Potential Effect of Transportation Demand Management

Reduction of Peak Hour Vehicle Trips

Trip Type	Percent of Work Force 1980	1990	2000	PM Peak Hour Vehicle Trip Reductions
Drove Alone	69.4	75.4	71.0	**
Carpooled	16.4	15.0	22.1	
Bicycle	0.0	0.5	0.8	
Walk	9.1	5.5	3.2	10 - 15
Other	3.5	0.3	0.7	0 - 5
Work at Home	1.6	3.3	2.2	
Alternative Work Schedules				80-100
Total	100.0	100.0	100.0	90-120

** Reduction included with effect of TDM

The No Action and Build alternatives were originally evaluated based on future traffic conditions without the effect of TDM to determine the maximum new requirements. The effects of TDM should be monitored to determine if priorities in the future should be shifted. Adjustments to the 2025 Build alternative traffic volumes at the 3rd Street/Main Street intersection to reflect the TDM trip reductions. **Table 6-9** compares the mobility standards between the 2025 Build and TDM alternatives. As indicated, a modest achievement in the reduction of drive-along trip making would have very positive results.

The intersection of 3rd Street and Main Street will operate within the mobility standard as a result of the combined Build and TDM capacity and program improvements.

Table 6-9 Future TDM Alternative - Volume/Capacity Ratios and Mobility Standards – 3rd Street and Main Street Intersection

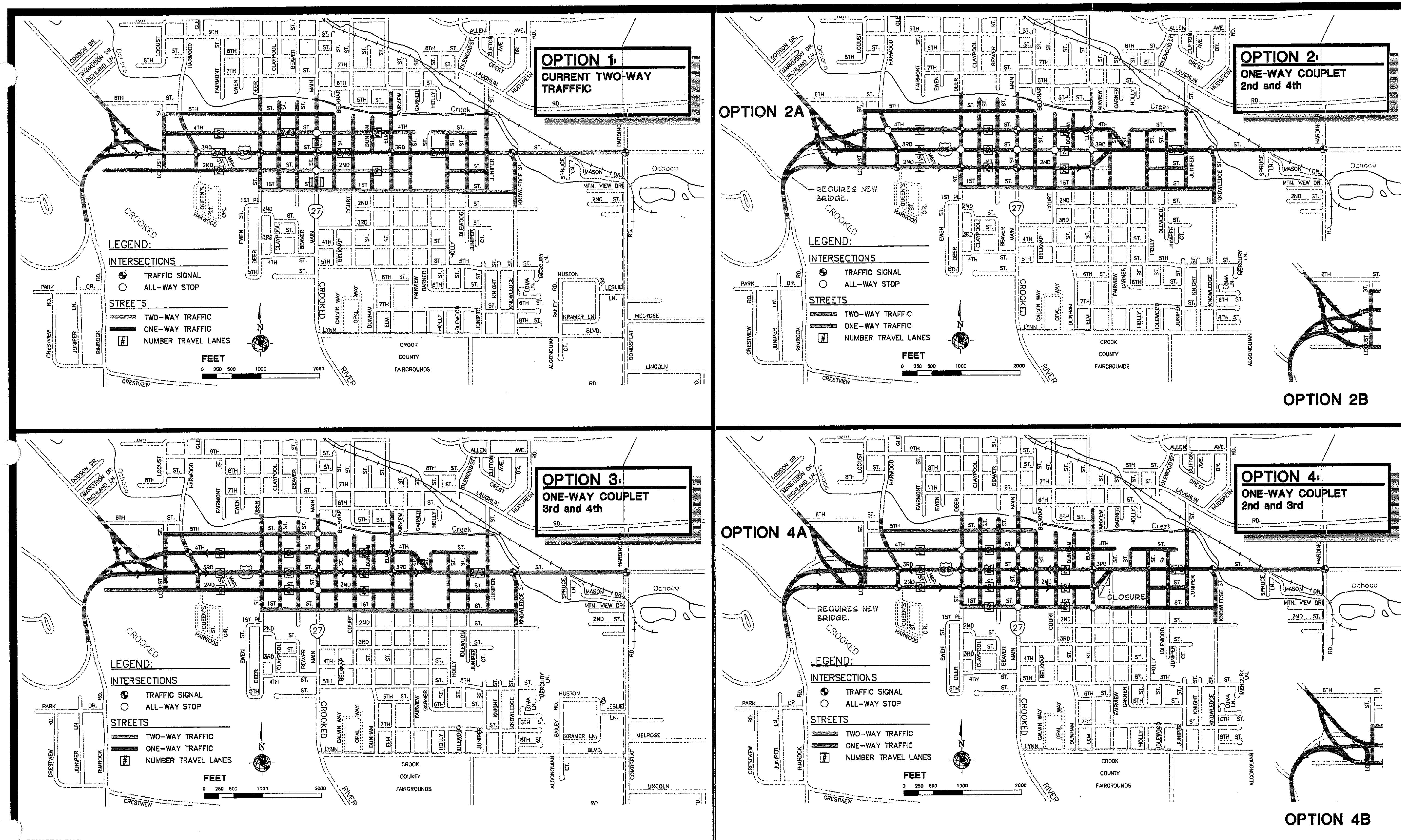
	2025 DHV: BUILD			V/C Standard
Signalized Intersections	LOS[1]	Delay[2]	V/C[3]	
US 26 & Main Street	D	35.8	.91	.90
	2025 DHV: TDM			V/C Standard
	LOS[1]	Delay[2]	V/C[3]	
US 26 & Main Street	C	34.5	.88	.90

Other Options Considered

Downtown Traffic Circulation-3rd Street Corridor

As noted in the 1994 TSP, the 3rd Street corridor is the principal area of future traffic congestion. As shown in **Figure 6-8,** four major options to improve downtown circulation were re-evaluated. Each of the options were evaluated inclusive of the recommended streetscape and pedestrian improvements identified in the Downtown Prineville Enhancement Plan (1997). The options include:

Option 1:	Retain Current Two-Way Traffic
Option 2a:	One-Way Couplet using 2nd and 4th Streets **with** new bridge over the Crooked River
Option 2b:	One-Way Couplet using 2nd and 4th Streets **without** new bridge over the Crooked River
Option 3:	One-Way Couplet using 3rd and 4th Streets
Option 4a:	One-Way Couplet using 2nd and 3rd Streets **with** new bridge over the Crooked River
Option 4b:	One-Way Couplet using 2nd and 3rd Streets **without** new bridge over the Crooked River



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CITY OF PRINEVILLE TRANSPORTATION SYSTEM PLAN

DOWNTOWN TRAFFIC CIRCULATION
CONCEPTUAL IMPROVEMENT OPTIONS

Figure 6-8

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Option 1

Other than the streetscape improvements identified in the Prineville Downtown Enhancement Plan, this option would generally maintain the existing traffic pattern. Congestion on 3rd Street would remain a significant issue. This option would not improve air quality and noise levels, nor would it provide any safety benefits because of the reduction in left-turn movements across opposing traffic. This option would not have the potential for water impacts because it would not involve any new creek crossings. There would also be no impacts to public park facilities.

By maintaining the status quo, there would be minimal socio-economic impacts associated with this option. Merchants retain visibility by maintaining both eastbound and westbound traffic on 3rd Street which would address the concern centered around the through traffic. However, as congestion in downtown worsens, there may be incremental socio-economic impacts associated with poor circulation and difficult access.

Option 2 (a/b)

Option 2 would create a one-way couplet on Second and Fourth Streets to provide an alternate route to 3rd Street, which would remain two-way. The concept of this route would be to provide an alternate route for local users to bypass 3rd Street in order to avoid delay, while through traffic not familiar with the city would continue along 3rd Street. The elements of this option would include:

- *Second Street:* Provide a connection from OR 126 to W. Second Street and convert W. Second Street to eastbound traffic only. Between Elm Street and Fairview Street, connect E. Second Street with E. 3rd Street.
- *Fourth Street:* Between Fairview Street and Elm Street, connect E. 3rd Street with E. Fourth Street. Convert all of Fourth Street to westbound traffic only and extend it out to Highway 26 at the "Y" intersection.

Future (year 2018) traffic conditions along the Second/Fourth one-way couplet will likely operate well under capacity conditions - similar to those conditions estimated for Option #3 (see Table 8-2). Traffic conditions on 3rd Street would also likely operate below capacity.

Other benefits to the community would be minimal. The decrease in volumes on 3rd Street would result in some reduction in congestion and delay; however, only minor improvements in air quality and noise levels would result from this reduction. Minor safety benefits are achieved with Option 2 due to the reduction in left-turn movements across opposing traffic.

Option 2A would have some potential water impacts. The Second Street bridge across the Crooked River could increase roadway run-off into the river.

Option 3

Option 3 would create a one-way couplet along 3rd Street and Fourth Street between the "Y" intersection and about Holly Street. The couplet would allow eastbound traffic along 3rd Street and westbound traffic along Fourth Street. The elements of this option include:

- *3rd Street:* Convert traffic on 3rd Street to eastbound only from the "Y" intersection to about Fairview Street, where westbound traffic would split off onto Fourth Street.

- *Fourth Street:* Upgrade Fourth Street to one-way major arterial standards. Provide a new connection from 3rd Street between Garner Street and Fairview Street. And, extend Fourth Street from Locust Street to Highway 26.

The couplet configuration would significantly reduce congestion and delay by spreading the highway volumes over two roadways. This reduction would have a positive effect on air quality and noise levels. The couplet configuration would also have some safety benefits because of the reduction in left-turn movements across opposing traffic.

The major socio-economic factor associated with selecting roadways for the couplet was the direction on travel on 3rd Street. Merchants felt it was imperative to keep eastbound traffic on 3rd Street, letting westbound traffic use Fourth Street. The concern centered around the through traffic. Much of the through traffic is coming from the west, traveling eastbound on the departure trip traveling and westbound on the return trip. For the first half of the trip, merchants wanted the through traffic to see denser commercial development along 3rd Street. Eventually the development will balance out between the two couplet roadways, but initially it will favor 3rd Street.

Option 3 would reduce congestion and delays thereby improving air quality and noise levels. It would also reduce the number of left-turn conflicts in downtown.

Option 4 (a/b)

Option 4 would create a one-way couplet along Second Street and 3rd Street between the "Y" intersection and about Fairview Street. The couplet would allow eastbound traffic along Second Street and westbound traffic along 3rd Street. The elements of this option include:

- *Second Street:* Upgrade Second Street to one-way major arterial standards. Provide a new connection from 3rd Street between Fairview Street and Elm Street. Extend Second Street from Locust Street to Highway 26.

- *3rd Street:* Convert traffic on 3rd Street to westbound only from the "Y" intersection to about Fairview Street, where eastbound traffic would split off onto Second Street.

Option 4 would not keep eastbound traffic on 3rd Street, a concern established by the downtown Merchants in development of the original TSP. Future (year 2018) traffic conditions along the Second/3rd Street one-way couplet will likely operate well under capacity conditions - similar to those conditions estimated for Option #3 (see Table 8-2).

Option 4 would reduce congestion and delays thereby improving air quality and noise levels. It would also reduce the number of left-turn conflicts downtown. Option 4A would have some potential water impacts. The Second Street bridge across the Crooked River could increase roadway run-off into the river. However, Option 4b would not have the potential for water impacts because it would not involve any new creek crossings.

The one-way couplet options generally defuse congestion on 3rd Street and could improve the level of service at key intersections downtown. Options 2, 3 and 4 would both significantly reduce traffic congestion by providing additional capacity, and air quality and noise levels would be improved as a result; however, all of these options would have some socio-economic impacts. The re-direction of traffic would impact the downtown businesses and shoppers could be forced to travel out-of-direction in order to negotiate the one-way couplet. **Table 6-10** provides a cost analysis of the four main options and their suboptions in 2005 dollars.

Table 6-10
Downtown Street Circulation Options - Cost Analysis
in 2005 Dollars (millions)

		Streets				
Option	**Traffic Signals**	**ROW**	**Road**	**Sign/Stripe**	**Bridge**	**Total**
Option 1		$0.86	$0.48			$1.34
Option 2a	$1.73	$0.86	$2.35	$0.29	$7.20	$12.43
Option 2b	$1.73	$0.86	$1.92	$0.29		$4.80
Option 3	$1.15	$0.43	$1.01	$0.29		$2.88
Option 4a	$1.15	$1.01	$1.30	$0.29	$7.20	$10.95
Option 4b	$1.15	$0.58	$1.01	$0.29		$3.03

Summary and Recommendations

All of the street system improvement options were evaluated based on their estimated costs, traffic safety and circulation benefits, and socio-economic and environmental impacts. All options were presented and discussed with the TAC, Planning Commission/City Council and public. After considering the advantages and disadvantages of each option and sub option, the recommendations for the Preferred Alternative are as follows:

1) US 26 and OR 126 Junction (Subarea 1)

The recommended improvements at the junction of US 26 and OR 126 considered a number of issues:

- need to balance the appropriate level of highway design to ensure public safety consistent with the Oregon Highway Plan
- provide sufficient capacity to accommodate future traffic growth, both for autos and trucks
- provide sufficient design to accommodate trucks, bicycles and pedestrians around and through the junction
- provide optimum design features as the visual “gateway” to Prineville
- consideration of design constraints in proximity to the Crooked River Bridge, OR 126 grade and Les Schwab industrial center
- provide sufficient connectivity and circulation access for neighboring land uses without compromising public safety

Recommendation: A roundabout with slip lanes as illustrated in **Figure 6-9** best addresses these issues, and was found to have significantly greater capacity than a traffic signal. As part of the project preliminary and final design such issues as the number and treatment of roundabout travel lanes, adjacent land use circulation and access, and pedestrian and bicycle circulation and safety will be addressed.

Public input on a round-a-bout design shall be given to the traffic engineers for final design consideration for the intersection design. The final design shall consider and attempt to achieve better local access than what is currently shown on the concept.

2) OR 126 Access in the Prineville Airport Industrial Area (Subarea 2)

The analysis of future traffic conditions and consideration of appropriate design standards indicate that while installation of a traffic signal on OR 126 at Millican Road may be the most cost-effective solution, it is not an appropriate design solution for either OR 126 safety conditions, nor is it the most desirable solution for local truck access and safety and is inconsistent with the 1999 OHP access management standards.

Recommendation: It appears that the best long-term capacity, local trucking access and highway safety solution is best accommodated by Option 2 (Tom McCall interchange). This option will likely require public and private financial contributions. More precise cost estimates and a financial partnership plan can be determined following more detailed engineering of the recommended solution.

3) Complete Northern Arterial (Subarea 3)

All three major options to complete the Northern Arterial were found to have significant socioeconomic impacts. The 7th Street option was likely the most damaging to the existing residential neighborhood. The option to extend 9th Street to the Prineville Railway would significantly impact the existing grocery store, Price Slasher. Re-aligning the Northern Arterial to 10th Street would also impact several businesses and residents.

A series of individual stakeholder and public open house meetings were convened to directly address these major options. As outcome from these meetings it was concluded that the City, landowners and Price Slasher business managers had identified appropriate findings to begin site planning and negotiating a fair cost to relocate Price Slasher in the immediate area of the 9th Street extension option

Recommendation: The extension of 9th Street east of Main Street to the Prineville Railway, re-use of the railway as an arterial street and improvements to Laughlin Road were found to be the best solutions to complete the Northern arterial. The recommendation includes the relocation of the Price Slasher grocery store as a valued community asset, providing essential neighborhood-level shopping opportunities in north Prineville.

A social and economic impact analysis will be completed within six months of the adoption of this plan to provide further information to assist with decision making. At the time the study is complete the City will review and possible revise their decision.

4) Improve City North/South Collector Street System (Subarea 4)

Recommendation: The extension of Court, Elm and Holly Streets will result in improved collector street capacity in relief to congestion on Main Street and 3rd Street. The re-alignment of Knowledge Street to Juniper Street and the consolidation of Juniper and Hudspeth Streets at Laughlin Road provide the most direct street, pedestrian and bicycle connection between North Prineville area development and the Prineville schools.

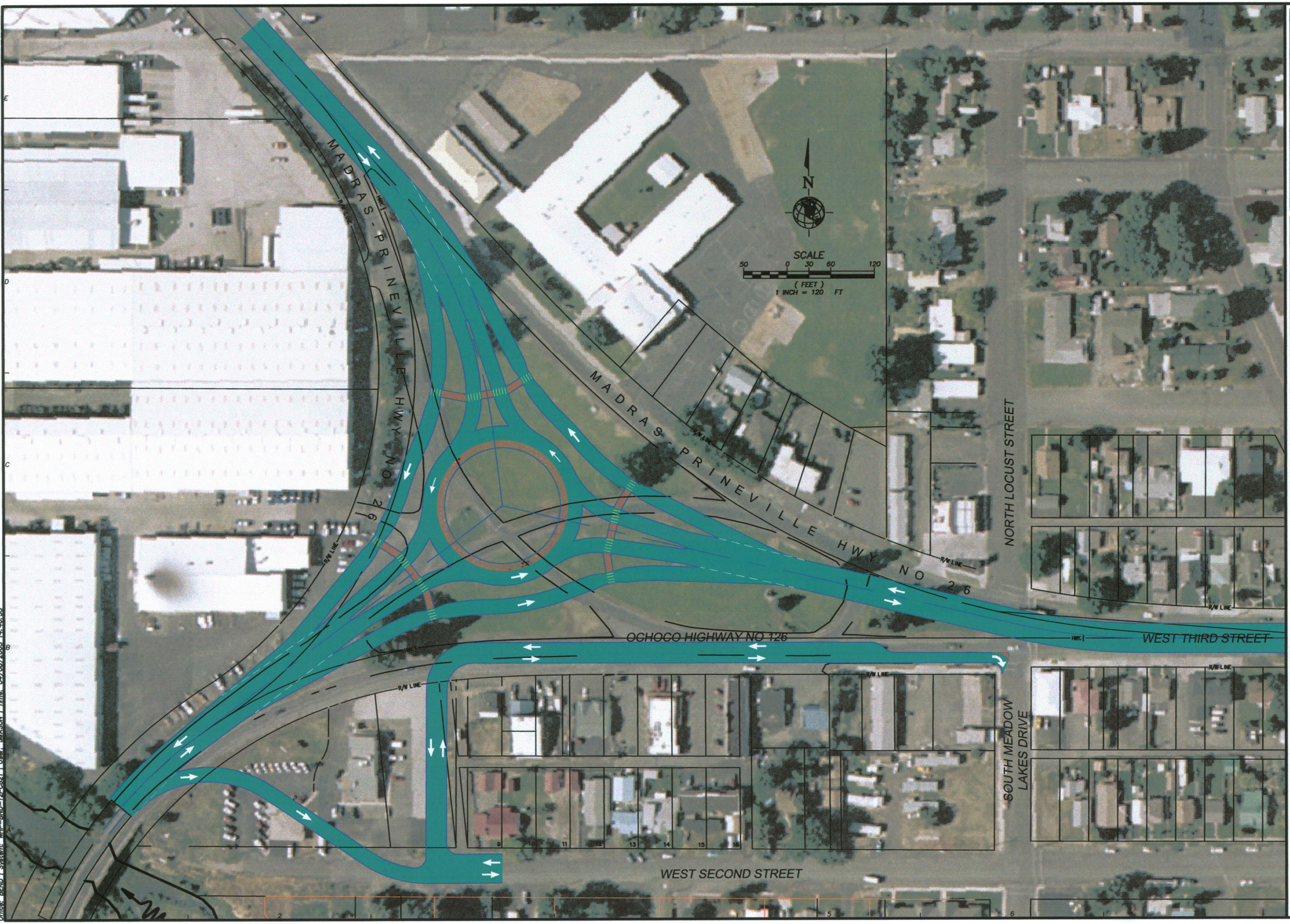


Figure 6-9

ODOT/CITY OF PRINEVILLE
PRINEVILLE TRANSPORTATION SYSTEM PLAN
WEST "WYE"
1 LANE ROUNDABOUT

PRINEVILLE/CROOK OREGON

SCALE: 1"=120'
PROJECT NO. 32079
DRAWING FILE NAME: 32079-1_lane_roundabout

W&H PACIFIC
920 Emkay, Suite C-100
Bend, Oregon 97702-1041
Planners • Engineers • Surveyors • Landscape Architects

DESIGNED BY:
DRAWN BY: JAM
LAST EDIT:
CHECKED BY:
APPROVED BY:
PLOT DATE: 04/08/05

DATE	BY	REV#	REVISION	CK'D/APPR

SHEET 1/1
EX1.0

5) Improve Crooked River Crossing Opportunities (Subarea 5)

Recommendation: The recommendations for improving opportunities to cross the Crooked River and improving safety on OR 126 include:

a. Extend Crestview Road to the Crooked River Highway to add second river crossing and provide partial median control of OR 126 at Rimrock Road.

b. Re-align and extend O'Neil Highway across the Crooked River to US 26 at 9th Street and provide full median control at the existing intersection of OR 126 and O' Neil Highway.

Other Long-Term Options - Downtown Traffic Circulation

Recommendation: The combination of Build and TDM alternatives were found to provide sufficient street capacity such that future (year 2025) traffic would operate along 3rd and Main Streets within the TSP mobility standards. These alternatives were found to be the least disruptive and best supportive of the existing land development pattern along 3rd Street in downtown Prineville. As regular update to the Prineville TSP, the City of Prineville and ODOT should continue to track and monitor traffic flows on 3rd Street to determine the appropriate timing when a one-way couplet should be re-evaluated and perhaps constructed (beyond the current 20-year planning horizon). Until then, retention of the current two-way traffic system and implementation of the TSP Build and TDM Alternatives are recommended. Based on the growth estimates developed as part of the 2005 TSP Update, the recommended long-term street system improvements will provide sufficient capacity, circulation/access and safety measures to accommodate growth in Prineville over the next 20 years.

Vision

The City's adoption of the Downtown Enhancement Plan is supported by the findings of the Prineville TSP Alternatives Analysis and recommendations. By indefinitely postponing the reconfiguration of the downtown circulation pattern towards a one-way couplet, the City of Prineville, with the collective support of the State and County, is making a conscious decision to invest in a strong, vibrant and more livable downtown area. In some cases, as the analysis of future traffic operations indicated (see Chapters 5 and 6), this investment comes at a "cost" of higher peak hour traffic congestion in the future on Third Street (particularly at Main Street). In part, this trade-off is being made with the expectation that alternative routes will be available for those who choose to avoid Third Street during the peak hours. These alternatives, together with the Northern Arterial, enhanced Second Street project, and north-south collector street projects are justified on the basis of this community choice.

Prineville's choice for a livable downtown area constitutes the vision from which many of the project and policy elements of the TSP are defined and integrated. The Prineville TSP includes plans for all modes of transportation and will be adopted as the Transportation Element of the City of Prineville Comprehensive Plan. Components of the street system plan include street classification and street width standards, access management standards, and street improvements. Suggested transportation demand measures are also included. Lastly, an implementation plan is presented.

Transportation Planning Policies

As the transportation Element of the Prineville Comprehensive Plan, the TSP will provide a policy foundation to guide City transportation-related decisions with a firm policy background in such areas as: overall system design, growth management, regional mobility, connectivity, circulation, efficiency, safety, accessibility, economic development, neighborhood livability, aesthetics, and citizen involvement.

A. General Transportation Plan Policies:

Prineville Transportation System Plan

1. The Prineville Transportation System Plan should contain goals, objectives, policies, plan maps, and project lists that will guide the provision of transportation facilities and services for the Prineville Urban Area. The Prineville Transportation System Plan will serve as the Transportation Element of the Prineville Comprehensive Plan. The Prineville Transportation System Plan should contain the following plan elements:

- *Street and Highways*
- *Transportation System Management*
- *Freight Mobility*
- *Bikeway Plan*
- *Pedestrian System*
- *Public Transportation*
- *Rail, Air, Water and Pipeline Service*
- *Transportation Demand Management*
- *Financial Plan*
- *Implementation Plan*

The *Prineville Airport Plan* is adopted as a separate planning document.

2. The *Prineville Transportation System Plan* should be updated, as necessary, to remain consistent with other regional and statewide plans.

Regional Mobility

3. A balanced system of transportation facilities and services should be designed to meet the regional travel patterns and mobility needs of residents, businesses, and industries.

Multi-modal Transportation System

4. The transportation system for Prineville should consist of an integrated network of facilities and services for a variety of motorized and non-motorized travel modes.

Connectivity and Circulation

5. The vehicle, bicycle, and pedestrian circulation systems should be designed to connect population and employment centers in Prineville, as well as provides access to local neighborhood residential, shopping, schools, and other activity centers.

Supportive of Land Use Plan Designations and Development Patterns

6. The provision of transportation facilities and services should reflect and support land use designations and development patterns as identified in the Prineville Comprehensive Plan. The design and implementation of transportation facilities and services should be based on serving current and future travel demand, residential densities, retail, and employment centers.

Growth Management

7. The construction of transportation facilities should be timed to coincide with community needs, and implemented in such a way as to minimize impacts on existing development.

8. Improvements to streets in addition to those in or abutting a development may be required as a condition of approval of subdivisions and other intensifications of land use.

9. To mitigate traffic impacts placed on area-wide transportation facilities by new development, Transportation System Development Charges, as defined by Oregon Revised Statutes and local government ordinances, should be collected.

System Efficiency

10. The Prineville Transportation System Plan should identify methods that citizens can use to commute to work and decrease overall traffic demand on the transportation system. Such methods include telecommuting, carpooling, vanpooling, flexible work schedules, walking, and bicycling.

Transportation Safety

11. Local governments should make as a high priority the design, construction, and operation of a safe transportation system for all modes of travel.

Public Safety

12. The rapid, and safe movement of fire, medical, and police vehicles should be an integral part of the design and operation of the transportation system.

Accessibility for People with Disabilities

13. The transportation system should be designed with consideration of the needs of people with disabilities by meeting the requirements set forth in the Americans With Disabilities Act.

Economic Development

14. Supportive of the mobility needs of businesses and industries, the transportation system should consist of the infrastructure necessary for the safe and efficient movement of goods, services, and people throughout the Prineville area. The Prineville Transportation System Plan should

include consideration of the area's rail, aviation, pipeline, and truck movement network.

Neighborhood Livability

15. Transportation facilities should be designed and constructed to minimize noise, energy consumption, neighborhood disruption, economic losses to the private or public economy and social, environmental and institutional disruptions, and to encourage the use of bikeways and walkways.

Aesthetics and Landscaping

16. Aesthetics and landscaping should be considered in the design of the transportation system. Within the physical and financial constraints of the project, landscaping should be included in the design of the transportation facility. Various landscaping designs, suitable plants, and materials should be utilized by local governments, private entities or individuals to enhance the livability of the area.

Intergovernmental Coordination and Consistency

17. The City of Prineville should coordinate their transportation planning and construction efforts with those of the Crook County, the State of Oregon Department of Transportation, and other affected agencies as appropriate. Local transportation plans will be consistent with those developed at the regional and state level.

Airport Compatibility

18. Land Uses around the Prineville Airport should be required to provide an environment compatible with the airport and its operation, and which will not be adversely affected by noise and safety problems.

19. Because of the potential hazards to airborne aircraft, land uses beneath designated approach surfaces within 10,000 feet of the end of Prineville Airport runways should not create water impoundments accessible by waterfowl.

20. Commercial uses and other uses that result in concentrations of people should be prohibited within the clear zones of the runways at Prineville Airport, to avoid danger to the public safety by potential aircraft accidents.

B. Street System Policies:

Classification System and Basic Design Guidelines

1. The City should classify streets and highways within the Prineville urban area based on how they are to ultimately function within the overall system (see Street Functional Classification section), and should reserve right-of-way corridors for planned arterial and collector streets.

Multi-modal Street Design

2. The City of Prineville should design its streets to safely accommodate pedestrian, bicycle, and motor vehicle travel.

Multi-modal Intersection Design

3. Arterial and collector street intersections should be designed to promote safe and accessible crossings for pedestrians and bicyclists. Intersection design should incorporate measures to make pedestrian crossings convenient and less of a barrier to pedestrian mobility.

Arterial and Collector Street Intersections

4. Left-turn pockets should be incorporated into the design of all intersections of arterial streets with other arterial and collector streets, as well as collector streets with other arterial and collector streets.

Street Design Standards

5. The City of Prineville Design Standards should be the basis for all street design within the Prineville Urban Area.

Capacity Efficient Design and Mobility Standards

6. The City of Prineville should apply the street design standard that most safely and efficiently provides motor vehicle capacity respective to the functional classification of the street.

Streetscape Design and Aesthetics

7. Wherever possible the City of Prineville should incorporate safely designed, aesthetic features into the streetscape of its public rights-of-way. These features may include: planting of street trees, shrubs, and grasses; incorporation of planting strips; and, in some instances, the installation of street furniture, planters, special lighting or non-standard paving materials.

Physical Improvements to Existing City Streets

8. Existing streets that are to be widened or reconstructed should be designed to the adopted street design standards for the appropriate street classification. Adjustments to the design standards may be necessary to avoid existing topographical constraints, historic properties, schools, cemeteries, existing on-street parking, and significant cultural features. Whenever possible, the design of the street should be sensitive to the livability of the surrounding neighborhood.

Access Management

9. To maintain the utility of the public right-of-way for the mobility of all users, access location and spacing to arterial and collector streets should be controlled. (See Access Management Standards)

10. In order to recognize existing land use patterns, access management standards should be applied to new approaches only.

11. On State highways within the Prineville UGB, new direct access points should conform to *Division 51* of the *Oregon Administrative Rules*. Alternatives to direct access including, but not limited to, shared driveways, frontage roads, side street or alley access, should be utilized where possible.

Removal of Vision Hazards on Private Property

12. The City should work to increase traffic safety by requiring private property owners to maintain vision areas adjacent to intersections and driveways clear of fences, landscaping, and foliage that obstruct the necessary views of motorists, bicyclists, and pedestrians

Project Identification

13. The City should select City-funded, street improvement projects from those listed in the Prineville Transportation System Plan when making significant increases in system capacity or bringing arterial or collector streets up to urban standards. The selection of improvement projects should be prioritized based on consideration of improvements to safety, relief of existing congestion, response to near-term growth, system-wide benefits, geographic equity, and availability of funding.

Citizen Involvement in Project Design

14. The City should involve representatives of affected neighborhood associations and citizens in an advisory role in the design of street improvement projects. The purpose of citizen involvement in project design is to be a resource to project staff in the design process. The need for, and purpose of, the project are to be determined as part of the earlier planning process undertaken when including the project in the Prineville Transportation System Plan.

Traffic Impact Analysis Requirements

15. The City should require Traffic Impact Analyses as part of land use development proposals to assess the impact that a development will have on the existing and planned transportation system.

Exactions Required of Development

16. The City should require new development to make site-related, right-of-way dedication and street system improvements that are identified through the Traffic Impact Analysis process and other code requirements, and for planned arterial and collector streets.

Street Improvements Funded Through System Development Charges

17. The City should require new development to pay charges towards the mitigation of system-wide transportation impacts created by new growth in the community. These funds can be used towards improvements to the street system.

C. Transportation System Management Policies:

Improve the Efficiency of the Signal System

1. The City should work with ODOT and continue to modernize the signal system and improve its coordination and efficiency by ultimately connecting all of its signals to a centralized traffic control center. The City and ODOT should employ traffic signal timing plans that maximize the efficiency of the system given the particular travel demand during different months and time periods throughout the typical weekday and weekend day

Maintain Clear and Effective Signs and Pavement Markings

2. The City and ODOT should regularly maintain all of the traffic control devices (signs and markings) within their respective inventory so as to minimize congestion and driver delay due to confusion. While priority should always be given to regulatory and warning signs, informational (street name and directional) signs should also be given proper maintenance.

On-Street Parking Management

3. Where on-street parking is permitted on a congested arterial street, the City should give first priority to removing on-street parking as a means of enhancing the capacity of the facility. Depending upon the situation and proper analysis, the City may consider timed on-street parking prohibitions during peak travel periods in lieu of permanent removal.

Development and Adoption of Access Management Standards

4. The City should develop and adopt specific access management standards based on the following principles:

   a.) Properties with frontage along two streets should take primary access from the street with the lower classification.

   b.) Any one development along the arterial street system should be considered in its entirety, regardless of the number of individual parcels it contains. Individual driveways will not be considered for each parcel.

   c.) Access to the arterial street system should be primarily limited to one point provided adequate street frontage is available. Additional access may be permitted, provided adequate frontage and access spacing is available.

   d.) Signalized access for private streets and driveways onto the major street system should not be permitted within 1,320 feet (1/4 mile) of any existing or planned future signal.

   e.) Shared, mutual access easements should be designed and provided along arterial street frontage for both existing and future development.

   f.) The spacing of access points should be determined based on street classification (see Table 7-1). Generally, access spacing includes accesses along the same side of the street or on the opposite side of the street. Access points should be located directly across from existing or future access, provided adequate spacing results.

g.) All access to the public right-of-way should be located, designed, and constructed to the approval of the Public Works Director, or his designee. Likewise, variances to access management standards should be granted at the discretion of the Public Works Director, or his designees.

h.) All new access to State highways within the Prineville UGB should conform to Division 51 of the OAR.

D. Local Street Connectivity Policies:

Connectivity to the Street System

1. Applicants submitting preliminary subdivision plans should provide for local street connections toward existing or planned streets and neighborhood activity centers, located within one-half-mile of the development.

Connectivity of New Developments to Adjoining Undeveloped Land

2. Applicants submitting preliminary subdivision plans should provide for extension of local streets to adjoining undeveloped properties and eventual connection with the existing street system.

Sidewalks

3. All development should include sidewalk and walkway construction, as required by the *City of Prineville Land Development Ordinance.* All new road construction or reconstruction projects shall include sidewalks as specified in the Pedestrian Element of the *Prineville Transportation System Plan.*

Public Accessways

4. The City may require pedestrian and bicycle accessways to connect to cul-de-sac streets, to pass through long blocks, and to provide for networks of public paths creating non-motorized access to neighborhoods.

Street Width

5. In order to facilitate pedestrian crossing, discourage through traffic, and reduce speeds, local streets should not be excessive in width. However, public local streets must have sufficient width to allow for emergency access and provide parking on, at least, one side.

Discouraging Cut-through Traffic

6. Neighborhood Streets and Local Routes shall be designed to minimize cut-through traffic. Limiting street length, width, and the installation of traffic calming measures may be used to discourage through-traffic from using Neighborhood Streets and Local Routes.

Purpose of Cul-De-Sac Streets

7. The purpose of cul-de-sac streets should be to increase density by accessing land not otherwise accessible through a connected street pattern, due to topography or other constraints. Construction of cul-de-sac streets should be minimized to the extent practicable.

Cul-de-Sac Street Length

8. Cul-de-sac streets should not exceed 600 feet in length. However, no portion of the cul-de-sac street should be more than 400 feet from an intersecting street or public accessway unless physical constraints make it impracticable

Alleys

9. Alleys provide secondary access to residential properties where street frontages are narrow; where the street is designed with narrow width to provide limited on-street parking; or where alley access development is desired to increase residential densities. Alleys can provide several advantages over direct access from the street:

   - Alleys allow orientation of the residence, rather than the garage, to the street.
   - Use of alleys can reduce the number of driveway entrances onto the street, thereby improving the pedestrian environment.
   - Alleys provide greater flexibility in platting small lot subdivisions.
   - Alleys provide an alternative location for siting utilities and garbage collection services.

   Alleys should be paved surfaces with a width of 16 feet for two-way traffic. Alley shoulders should include graveled surfaces (minimum 2 feet), and fencing should be set back by a minimum of 2 feet behind the property line.

E. Bicycle System Policies:

1. The City of Prineville should recognize bicycle transportation as a necessary and viable component of the transportation system as an important transportation mode.

2. The City of Prineville should utilize where feasible opportunities to add bike lanes in conjunction with road reconstruction and re-striping projects on collector and arterial streets.

3. The City of Prineville should assure that, where appropriate, the design of streets and public improvement projects facilitates bicycling by providing proper paving, lane width, traffic control, storm drainage grates, striping, signage, lighting, etc.

4. The City of Prineville should actively work with ODOT to improve bicycling on State Highways within Prineville.

5. The City of Prineville should encourage bicycle recreation.

6. The City of Prineville should actively support and encourage local and state bicycle education and safety programs intended to improve bicycling skills, observance of laws, and overall safety for both children and adults by encouraging and support efforts by Prineville schools to develop and use a bicycle safety curriculum.

F. Pedestrian System Policies:

Inventory Existing System and Identify Future Needs

1. The City should continue to inventory and map new pedestrian facilities.

Establish Sidewalk Construction Program

2. To complete the pedestrian facility network, the City should consider establishing a Sidewalk Construction Program. Through this program, property owners would be required to build sidewalks on all lots abutting curbed City streets within the City limits, within a prescribed time period.

Ensuring Future Sidewalk Connections

3. All future development shall include sidewalk and walkway construction as required by the adopted *Street Design Standards.* All road construction or renovation projects shall include sidewalks, if appropriate.

Complete Connections with Crosswalks

4. All signalized intersections shall have marked crosswalks. Crosswalks at controlled intersections should be provided near schools, commercial areas, and other high volume pedestrian locations.

Compliance with ADA Standards

5. The City shall comply with the requirements set forth in the Americans with Disabilities Act regarding the location and design of new sidewalks.

Maintaining and Assuring the Quality of Facilities

6. The City should establish standards for the maintenance and safety of pedestrian facilities. These standards should include the removal of hazards and obstacles to pedestrian travel, as well as maintenance of benches and landscaping.

Education of Pedestrian Safety Needs

7. The City should encourage schools, safety organizations, and law enforcement agencies to provide information and instruction on pedestrian safety issues that focus on prevention of the most important accident problems. The programs should educate all roadway users of their privileges and responsibilities when driving, bicycling, and walking.

G. Freight Movement Policies:

Access to Streets and Highways

1. The City of Prineville shall create a street and highway system that provides direct and efficient access to, and between, Prineville Urban Area industrial and commercial centers and statewide transport corridors.

Accessibility to Railroads

2. The City should encourage the availability of railroad freight services to those industrial and commercial areas where utilization is economically viable.

Accessibility to Air Freight Services

3. The City should promote the utilization of air freight services by continuing to provide and maintain facilities at Prineville Airport that enable the operation of private air freight providers.

Regional Pipeline Systems

4. The City should promote accessibility to, protection of, and the appropriate location of, regional pipeline systems that service the Prineville Urban Area.

Adequate Street Design Standards for Trucks

5. The City shall develop adequate design standards that meet the weight and dimensional needs of trucks, particularly for those streets that serve industrial and commercial areas.

Transportation of Hazardous Materials

6. The City shall encourage responsible federal and state agencies to develop and enforce appropriate regulations regarding the safe transport of hazardous materials through the Prineville Urban Area.

H. Transportation Finance Policies:

General Obligation Bonds

1. The City should investigate the feasibility and public support for the sale of general obligation bonds to finance capital improvements to the transportation system. Projects shall be selected and authorized by a vote of the citizens of Prineville.

Transportation System Development Charges

2. As defined by Oregon Revised Statutes and City ordinances, transportation system development charges may be collected by the City to mitigate impacts placed on area-wide transportation facilities. The City should establish an SDC as an important and equitable funding source to pay for transportation capacity improvements.

Development Exactions

3. The City should require those responsible for new development to mitigate their development's impacts to the transportation system, as authorized in the *Oregon Revised Statutes*, concurrent with the development of the property.

Federal and State Funding Sources

4. The City shall seek federal and state funding for capital improvements through participation in the designated distribution process, as provided in currently-authorized federal and state transportation legislation.

Pursuing Federal and State Grants

5. The City shall pursue the awarding of federal, state, and private grants to augment operations activities, especially in the planning and engineering functions.

I. Plan Implementation Policies:

Policy Foundation for Decision-Making

1. The *Prineville Transportation System Plan* shall be used as the legal basis and policy foundation for all City decision-makers, advisory bodies, and citizens in issues related to transportation. The goals, objectives, policies, principles, maps, and recommended projects shall be considered in all decision-making processes that impact, or are impacted by, the transportation system.

Land Use Actions and Development Review

2. The goals, objectives, policies, standards, and maps contained in *Prineville Transportation System Plan* shall be considered and applied towards the review and approval of land use actions and development applications. Applications need to contain findings that show how the proposed land use action or development is in conformity with the adopted tenets of the Prineville Transportation System Plan.

Streets and Highways Element

Street Functional Classification

The Prineville Street Functional Classification system map and policies determine the intended use of each street in the City's street system in relation to adjacent land use. A street's functional classification determines what type of traffic should use the street - regional, intra-city, or neighborhood. The type of traffic, combined with expected traffic volumes, determine whether a street is an arterial, collector, local route or neighborhood street. Local topography may also be a factor in assigning a classification to a street. It is important to note that traffic volumes alone do not determine the functional classification of a street. All of the characteristics listed play a role in the determination. Once the street's function is determined, design characteristics are assigned – including the number of travel lanes, access controls, on-street parking, bicycle lanes, sidewalk width, and right-of-way width, consistent with its classification. While the right-of-way requirement is constant, the ultimate number of lanes and access controls may be phased-in over time, depending on the existing and projected travel demand on the facility.

The importance of the Street Functional Classification system cannot be overstated. The City of Prineville uses the Street Functional Classification system to reserve future rights-of-way, determine street design, and develop future street improvement projects. This system provides the "blueprint" of how the City wants its street system to develop and function over the next 20 years and beyond. The recommended street functional classifications within the Prineville UGB are described below:

> ***As part of the Prineville TSP update, careful consideration of the City's "Local Residential" street standard (as currently adopted) was conducted due to the levels of ambiguity concerning local street standards experience by communities across the state. The Prineville TSP Update includes recommendations for splitting the "Local Residential" standard into two standards - "Local Route" and "Neighborhood Street."***

Arterial Arterial streets form the primary roadway network within and through a region. They provide a continuous roadway system which distributes traffic between different neighborhoods and districts. They generally include State Highways and roadways over 10,000 vehicles per day.

Collector Collector streets are primarily intended to serve abutting lands and local access needs of neighborhoods. They are intended to carry from 3,000 to 10,000 vehicles per day, including some through traffic. The collector could serve either residential, commercial, industrial, or mixed land uses.

Local Route Local routes could serve residential, commercial, industrial, or mixed land uses. They are intended to carry between 1,200 and 3,000 vehicles per day. While through traffic connectivity is not a typical function, they may carry limited amounts.

Neighborhood Neighborhood streets are intended to serve the adjacent land without carrying through traffic. These streets are designed to carry less than 1,200 vehicles per day. To maintain low volumes, local residential streets should be designed to encourage low speed travel. Narrower streets generally improve the neighborhood aesthetics, and discourage speeding as well. They also reduce right-of-way needs, construction cost, storm water run-off, and vegetation clearance. If the forecast volume exceeds 1,200 vehicles per day, as determined in the design stage, the street system configuration should either be changed to reduce the forecast volume or the street shall be designed as a local route.

Cul-de-sac Cul-de-sac streets are a type of neighborhood street. They are intended to serve only the adjacent land in residential neighborhoods. These streets shall be short, serving a maximum of 20 single family houses. Because the streets are short and the traffic volumes relatively low, the street width can be narrow, allowing for the passage of two lanes of traffic when no vehicles are parked at the curb or one lane of traffic when vehicles are parked at the curb. To encourage local street circulation capability, the use of cul-de-sac streets shall be discouraged, and shall not be permitted if future connections to other streets are likely. Sidewalk connections from a new cul-de-sac shall be provided to other nearby streets and sidewalks.

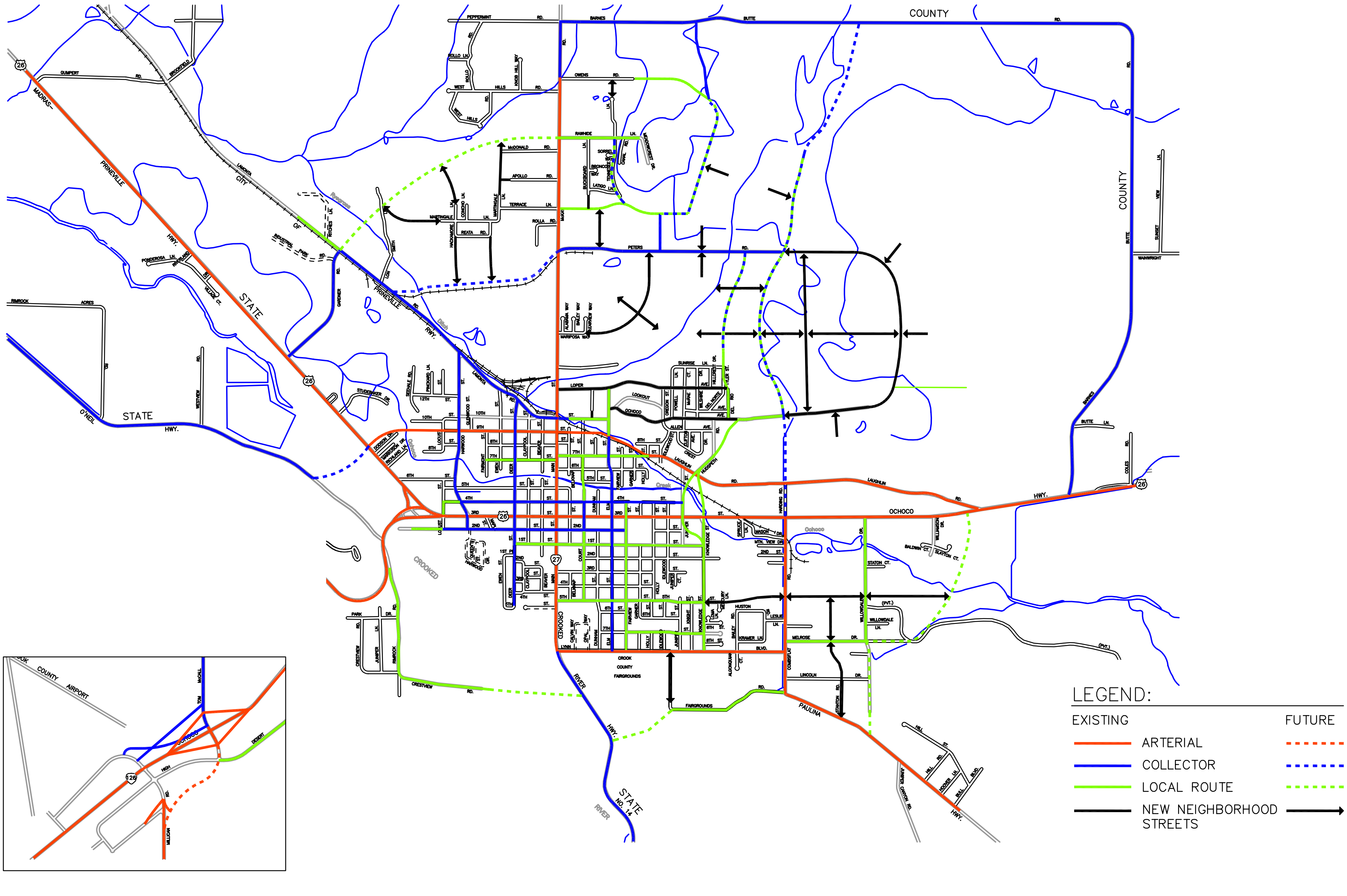
Alley Alley streets provide secondary access to residential properties where street frontages are narrow; where the street is designed with a narrow width to provide limited on-street parking; or where alley access development is desired to increase residential densities. Alleys are intended to provide rear access to individual properties and may provide alternative areas for utility placement.

Figure 7-1 identifies the recommended functional street classification and probable location of new neighborhood streets. **Table 7-1** describes the different characteristics that comprise each of the recommended street classifications in the Prineville Urban Area. The following attributes have been identified for each of the recommended classifications:

- assigned function or purpose;
- ultimate traffic design in number and configuration of lanes;
- allowance, or not, for on-street parking;
- bicycle and pedestrian facilities design;
- traffic management characteristics including ultimate design ADT (average daily traffic), traffic calming, managed speed, through-connectivity, and access control; and,
- required right-of-way widths.

These classifications are used to guide the development of new roads as they are brought into the system, as well as determining the types of improvements needed for existing streets.

Once a classification has been assigned to an individual street it needs to be designed in a manner that allows it to perform its function. Each street classification has a typical, or ideal, cross-section design. This design determines how a “typical” street of that classification should be built. For a variety of reasons, not every street with a given classification can be ultimately built to the ideal standard.



SOURCE: ODOT BASE MAP

CITY OF PRINEVILLE
TRANSPORTATION
SYSTEM PLAN

RECOMMENDED STREET FUNCTIONAL CLASSIFICATION

FIGURE 7-1

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Table 7-1: Street Functional Classification System

				Arterial	Collector	Local Route	Neigh. Street	Alley
Streetscape	Street Profile		Auto Amenities (lane widths) [1]	2 lanes (12 ft.)	2 lanes (11 ft.)	2 Lanes (11 ft)	2 Lanes (10 ft)	16 ft.
			Median / Center Turn Lane	14 ft.	12 ft.	None	None	None
		Bike	Bike Amenities [2]	[1] 2 Lanes (6 ft.)	2 Lanes (5 ft.)	Shared Surface	Shared Surface	None
			Curb-to-curb Street Width [5]					
			On-Street Parking					Not Apply
			Two Sides	66 ft.	60 ft.	38 ft.	36 ft.	
			One Side	na	na	30 ft.	28 ft.	
			None	50 ft.	44 ft.	22 ft.	20 ft.	
		Pedestrian (ADA requirements)	Pedestrian Amenities [3]					
			Sidewalks	(2) 5 ft. Res 8 ft. Com	(2) 5 ft. Res 8 ft. Com	2 (5 ft.)	2 (5 ft.)	None
			Planter Strips	6-10 ft.	6-10 ft.	4 ft. (optional)	4 ft. (optional)	None
			Preferred Adjacent Land Use - Intensity	High	High to Medium	Medium to Low	Low	Low
	Traffic Management		Ultimate Design ADT	10,000+	3 - 10,000	1,200 - 3,000	1,200 max	500 max
			Traffic Calming	Not Typical [6]	Permissible/ Not Typical	Permissible/ Not Typical	Typical	Not Typical
			Managed Speed [4]	35-55 mph	25-35 mph	25 mph	15-25 mph	10 mph
			Through-traffic Connectivity	Primary	Typical	Not Typical	Not Permissible	Not Permissible
			Access Control (*see Table 7-2*)	Yes	Some	No	No	No
			Maximum Grade	7%	7%	7%	10%	10%
			Right-of-Way:	85-105 ft.	75-100 ft.	50-60 ft.	48-58 ft.	24 ft.

Notes for Table 7-1

[1] Lane widths shown are the preferred construction standards that apply to existing routes adjacent to areas of new development, and to newly constructed routes. On arterial and collector roadways, an absolute minimum for safety concerns is 10 ft. Such minimums are expected to occur only in locations where existing development along an established sub-standard route or other severe physical constraints preclude construction of the preferred facility width.

[2] An absolute minimum width for safety concerns is 5 ft. on arterial and 4 ft. on collectors, local routes and neighborhood streets, which is expected to occur only in locations where existing development along an established sub-standard route or other severe physical constraints preclude construction of the preferred facility width. Parallel multi-use paths in lieu of bike lanes are not appropriate along the arterial-collector system due to the multiple conflicts created for bicycles at driveway and sidewalk intersections. In rare instances, separated (but not adjacent) facilities may provide a proper function.

[3] Sidewalks eight-feet in width are required in commercial areas unless otherwise provided for in the Prineville Land Development Ordinance. The *City of Prineville Downtown Enhancement Plan* (1997) recommends wider sidewalks in downtown Prineville in order to accommodate street trees and street furniture without compromising ADA requirements or business access. Designated Special Transportation Areas (STAs) in Prineville, including Third Street and a portion of Main Street, are to have 8-10 foot sidewalks, consistent with the Oregon Highway Plan.

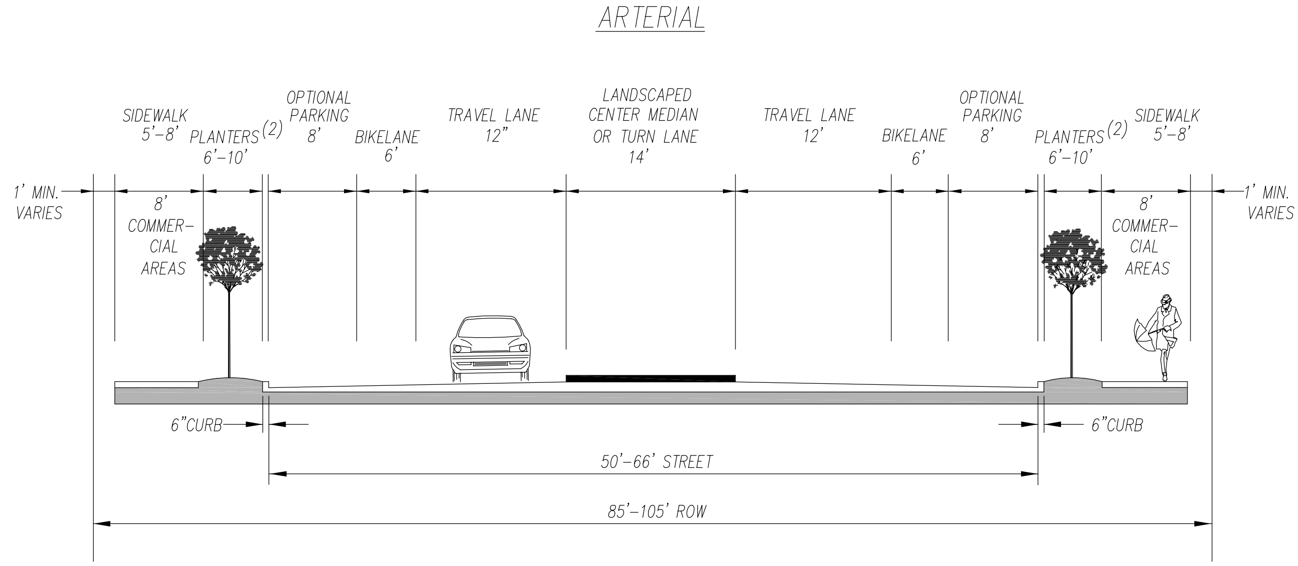
[4] Arterial speeds in the central business or other commercial districts in urban areas may be 20-25 mph. Traffic calming techniques, signal timing, and other efforts will be used to keep traffic within the desired managed speed ranges for each Functional Class. Design of a corridor's vertical and horizontal alignment will focus on providing an enhanced degree of safety for the managed speed.

[5] Street design for each development shall provide for emergency and fire vehicle access. Neighborhood street widths of less than 28 feet shall be applied as a development condition through the subdivision and/or planned development process. The condition may require the developer to make the choice between improving the street to the 28 ft. standard, or constructing the narrower streets with parking bays placed intermittently along the street length. The condition may require fire-suppressive sprinkler systems for any dwelling unit more than 150 feet from a secondary access point.

[6] Pursuant to the *City of Prineville Downtown Enhancement Plan* (1997) pedestrian flares (extensions) or half-flares are proposed at downtown intersections of arterial or collectors.

Topography, historic landmarks, business and residential districts, are just a few limiting factors. The typical cross-section design gives City staff the basis for requiring rights-of-way as part of development reviews, and the proper standards for how an existing street should be brought-up to urban standards.

Figure 7-2 illustrates the typical cross-section design for each street classification. **Figure 7-3** illustrates the typical streetscape improvements and sidewalk amenities for Third, Fourth and Second Streets as recommended in the Prineville Downtown Enhancement Plan. **Table 7-2** summarizes the street design guidelines, consistent with the street functional classification, including access management standards as discussed in the following section.



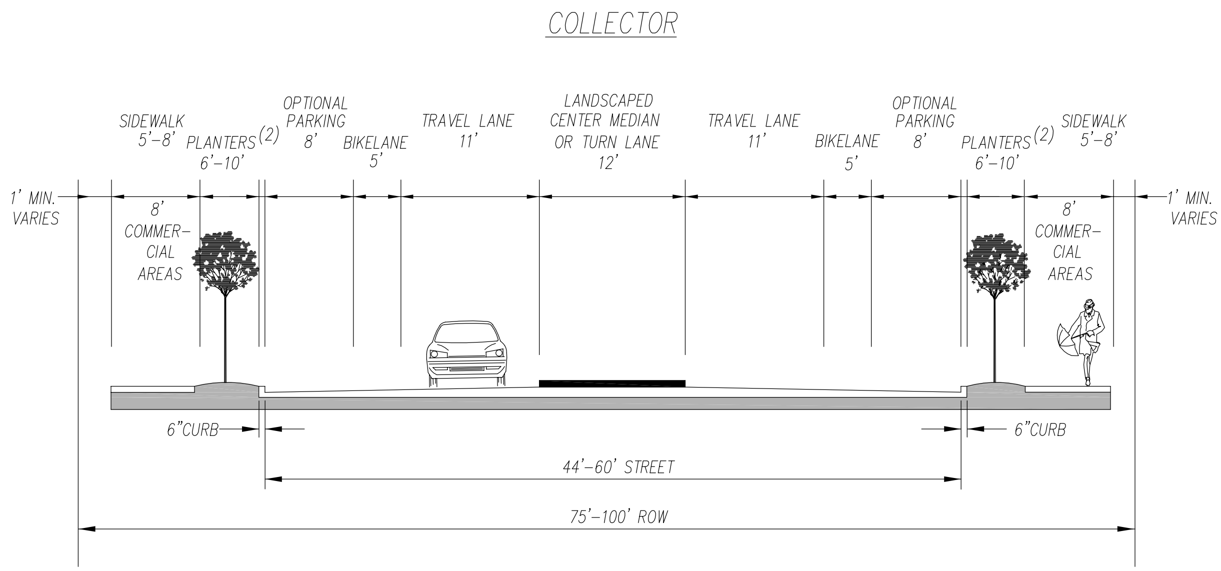


Figure 7-2
1 of 3

CITY OF PRINEVILLE TRANSPORTATION SYSTEM PLAN

TYPICAL STREET CROSS SECTIONS

The Transpo Group

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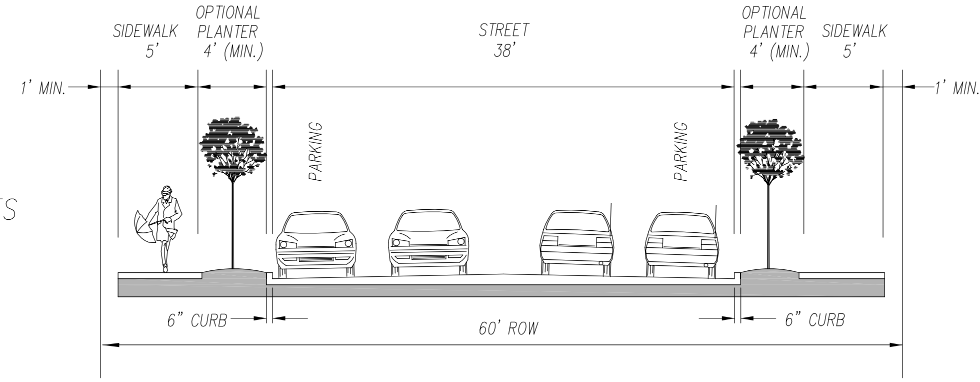
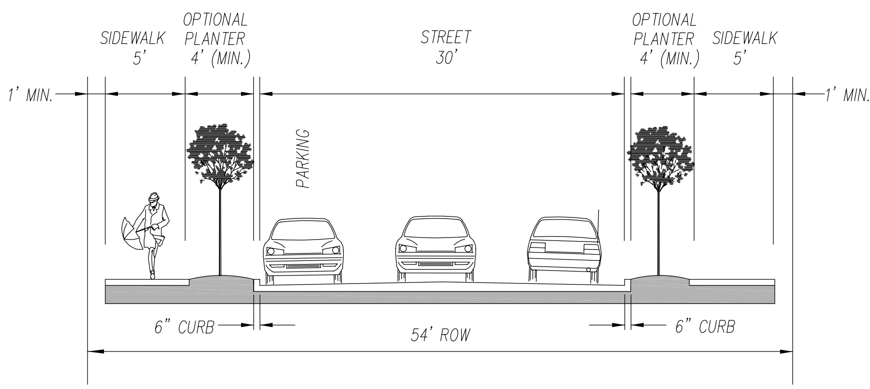
LOCAL ROUTE

ON-STREET PARKING

BOTH SIDES



ONE SIDE



NONE

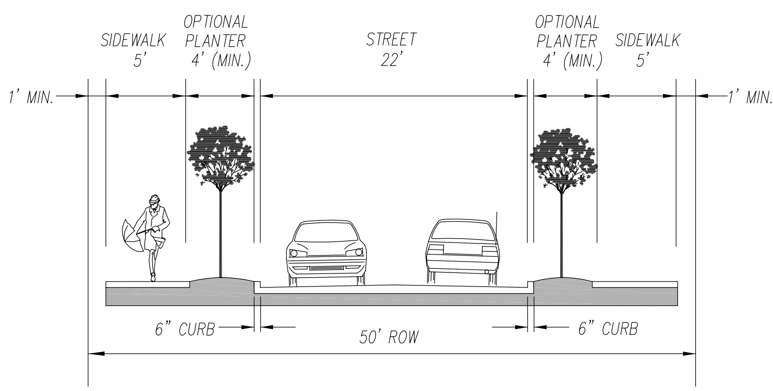


Figure 7-2
2 of 3

CITY OF PRINEVILLE TRANSPORTATION SYSTEM PLAN

TYPICAL STREET CROSS SECTIONS

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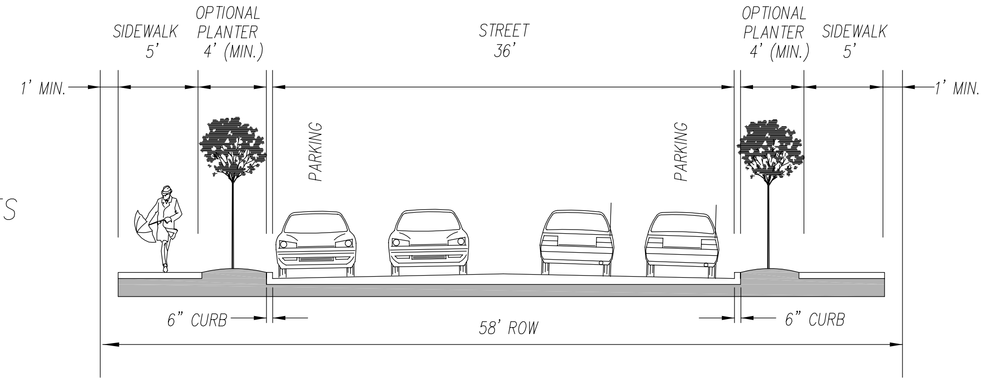
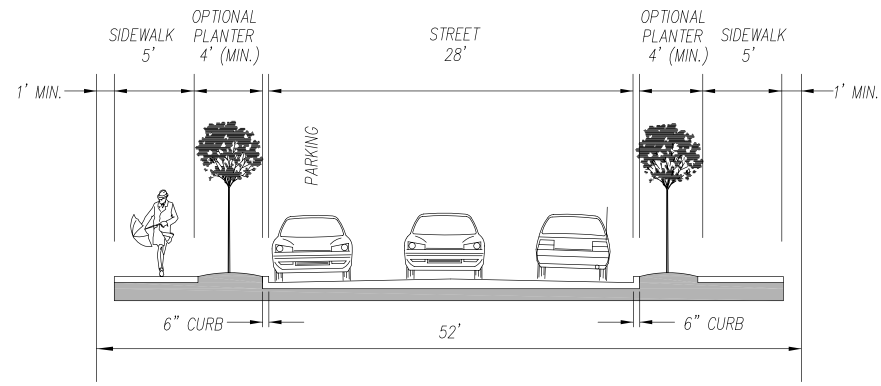
NEIGHBORHOOD STREET

ON-STREET PARKING

BOTH SIDES



ONE SIDE



ALLEY

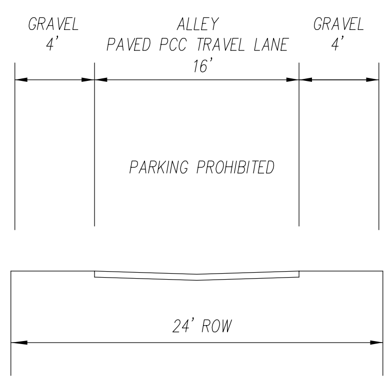


Figure 7-2
3 of 3

CITY OF PRINEVILLE TRANSPORTATION SYSTEM PLAN

TYPICAL STREET CROSS SECTIONS

The Transpo Group

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Figure 7-3

Typical Streetscape and Sidewalk Amenities - Prineville Downtown Enhancement Plan

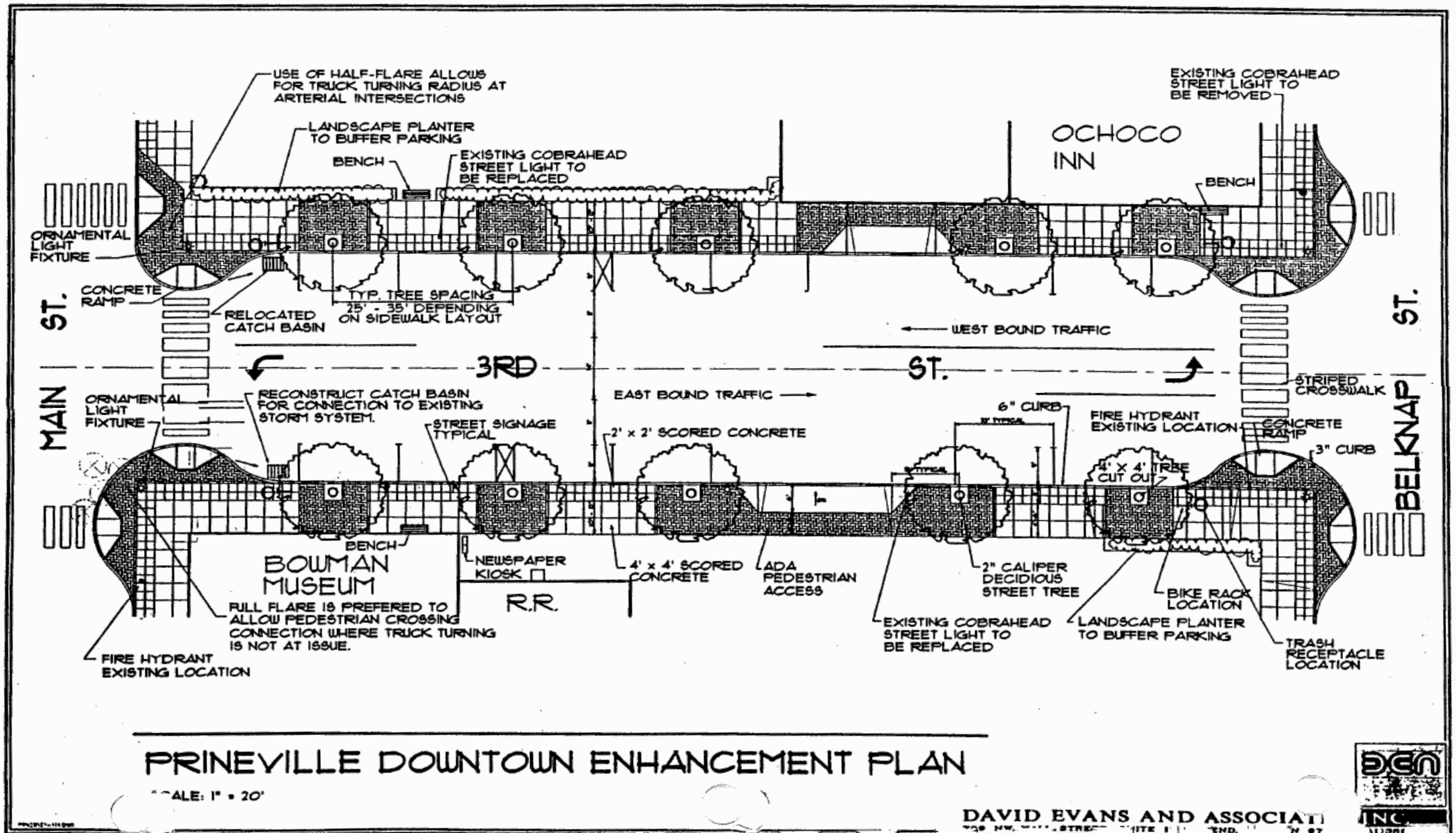


Table 7-2
Suggested Street Design Standards

Functional Classification	System Spacing	Design / Managed Speed (MPH)	Horizontal Alignment	Vertical Alignment	Traffic Control	Street Lighting	Access Management			
							Min. Spacing	Residential Use	Commercial Uses	Industrial Uses
St Highway	See Oregon Highway Design Manual						See Division 51, OAR			
Arterial	1 mi.	35-55\ 45-55	Minimum centerline radius: 650 ft	Maximum grade: 7% Minimum sight distance: 450 ft	1. Placement/ design of traffic control devices as warranted by MUTCD 2. Minimum signal spacing: 1/4 mile	1. Mounting height: 35-40 ft	300 ft	No direct access	1. Shared access driveways are encouraged 2. Left-hand turn lanes determined through review	1. Shared access driveways are encouraged 2. Left-hand turn lanes determined through review
Collector	1/4 mi.	35\ 25-35	Minimum centerline radius: 560 ft	Maximum grade: 7% Minimum sight distance: 300 ft	Placement/design of traffic control devices as warranted by MUTCD	1. Mounting height: 30-35 ft	100 ft	1. Shared access driveways are encouraged	1. Shared access driveways are encouraged 2. Left-hand turn lanes determined through review	1. Shared access driveways are encouraged 2. Left-hand turn lanes determined through review
Local Route	1/8 mi.	25\ 25	Minimum centerline radius: 300 ft	Maximum grade: 7% Minimum sight distance: 250 ft	Placement/design of traffic control devices as warranted by MUTCD	1. Mounting height: 25-30 ft	50 ft	1. Shared access driveways are encouraged	1. Shared access driveways are encouraged 2. Left-hand turn lanes determined through review	1. Shared access driveways are encouraged 2. Left-hand turn lanes determined through review
Neighborhood Street	Min. 400 ft. Max. 600 ft.	25\ 15-25	Minimum centerline radius: 150 ft	Maximum grade: 10% Minimum sight distance: 150 ft	Placement/design of traffic control devices as warranted by MUTCD	1. Mounting height: 20 ft	None	Curb cut minimum 45 ft. to curb return.	Curb cut minimum 50 ft. to curb return.	No direct access.

Transportation System Management Element

Transportation systems management (TSM) is a term used to describe a wide range of measures and techniques that help increase the efficiency, safety, capacity and level of service of the existing street system. TSM measures are typically low cost and easier to implement than new or reconstruction projects.

TSM measures provide for better traffic movement and increased safety by *managing* the existing street system. TSM measures will generally not require mid-block widening of the roadway system. Because they typically are low-cost and low-impact (to surrounding land uses and neighborhoods) improvements, TSM measures are a significant resource to the City of Prineville. This is particularly true when existing traffic congestion requires street improvements in highly developed areas of the community, or when finances dictate the need for an intermediate improvement (in lieu of major capital expenditures).

While the spectrum of TSM measures is wide, the measures that are applicable to Prineville will generally fall into one of four categories listed below:

- Traffic Management and Channelization;
- Intersection Modification and Widening;
- Access Management; and
- Improved Traffic Control Devices.

Intersection channelization and traffic control device improvements are recommended in a number of locations as part of the Prineville TSP. Traffic signal system enhancements are also recommended. All of these improvements have been included within the Street and Highways element of the Prineville TSP.

Access Management

Access management is an important key to balanced urban growth. As evidence, the lack of a prudent access management plan has led to miles of strip commercial development along the arterial streets of many urban areas. Business activities along arterial streets lead to increased traffic demands and the provision of roadway improvements to accommodate the increasing traffic demand. Roadway improvements stimulate more business activity and traffic demands. This often continues in a cyclical fashion, and requires extensive capital investments for roadway improvements and relocation. However, with the tightening of budgets by federal, state, and local governments, the financial resources to pay for such solutions are becoming increasingly scarce.

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

Traffic operations improvements and access provision are both important transportation objectives. However, the two are inversely related, and one can be achieved only by compromising on the other. Past research has shown a direct correlation between the number of access points and the accident rate for a specific class of roadway. Hence, it is important to strike a balance between traffic operations and access control through a prudent access management plan.

Access Management Techniques

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

- Restricting spacing between access points based on the type of development and the speed along the arterial
- Sharing of access points between adjacent properties
- Providing access via collector or local streets where possible
- Constructing frontage roads to separate local traffic from through traffic
- Providing service drives to prevent spill-over of vehicle queues onto the adjoining roadways

Traffic and facility improvements for access management include:

- Providing of acceleration, deceleration, and right turn only lanes
- Offsetting driveways to produce T-intersections to minimize the number of conflict points between traffic using the driveways and through traffic
- Installing median barriers to control conflicts associated with left turn movements
- Installing side barriers to the property along the arterial to restrict access width to a minimum

General Access Management Guidelines

Access management is hierarchical, ranging from complete access control on freeways to increasing use of streets for access purposes, parking and loading at the local and collector level. **Table 7-2** describes recommended general access management guidelines by roadway functional classification and appropriate adjacent land use type.

These access management restrictions are not intended to eliminate existing intersections or driveways. Rather, they shall be applied as new development occurs. Over time, as land is developed and redeveloped, the access to roadways will meet these guidelines.

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

Special Access Management Areas – State Highways

Special access management areas apply to several state highways in Prineville, particularly along Third Street in the downtown, commercial core. The state highways form an integral part of the Prineville transportation system and access management is important to promoting safe and efficient travel for both local and long distance users. The *1999 Oregon Highway Plan* specifies an access management classification system for state facilities. Although the City of Prineville and Crook County may designate state highways as arterial or collector roadways within their transportation systems, the access management categories for these facilities shall generally follow the guidelines of the OHP.

This section of the TSP describes the state highway access categories and specific roadway segments where special access areas may apply. **Table 7-3** summarizes these access management guidelines, which vary by state highway classification and posted speed limits.

TABLE 7-3

Urban Access Management Spacing Standards for State Highways[1]

(measurements in feet, center to center on same side of roadway)

Highway Category	Posted Speed	Expressway	Other	STA
Statewide	55+ mph	2640	1320	
	50 mph	2640	1100	
	40-45 mph	2640	990	
	30-35 mph		770	City Block[2]
	25 mph or less		550	City Block
Regional	55+ mph	2640	990	
	50 mph	2640	830	
	40-45 mph	2640	750	
	30-35 mph		600	City Block
	25 mph or less		450	City Block
District	55+ mph	2640	700	
	50 mph	2640	550	
	40-45 mph	2640	500	
	30-35 mph		400	City Block
	25 mph or less		400	City Block

[1] See *1999 Oregon Highway Plan* for specific access spacing criteria and definitions.

[2] Minimum spacing for public road approaches is either 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 STAs driveways are discouraged. However, where driveways are allowed and where land use permit, the minimum spacing for driveways is 175 feet or mid-block if the current city block spacing is less than 350 feet.

Highway Designation	Highway	From	To
Statewide / Expressway	OR 126	West UGB	O'Neil Hwy
Statewide / NHS	OR 126	O'Neil Hwy	Locust Street
Statewide / NHS / STA	OR 126	Locust Street	Knowledge Street
Statewide / NHS	OR 126	Knowledge Street	East UGB
Region	US 26	NW UGB	OR 126
District / STA	OR 27	OR 126	First Street
District	OR 27	First Street	South UGB
District	OR 370 (O'Neil)	NW UGB	OR 126
District	OR 380 (Paulina)	First Street	South UGB

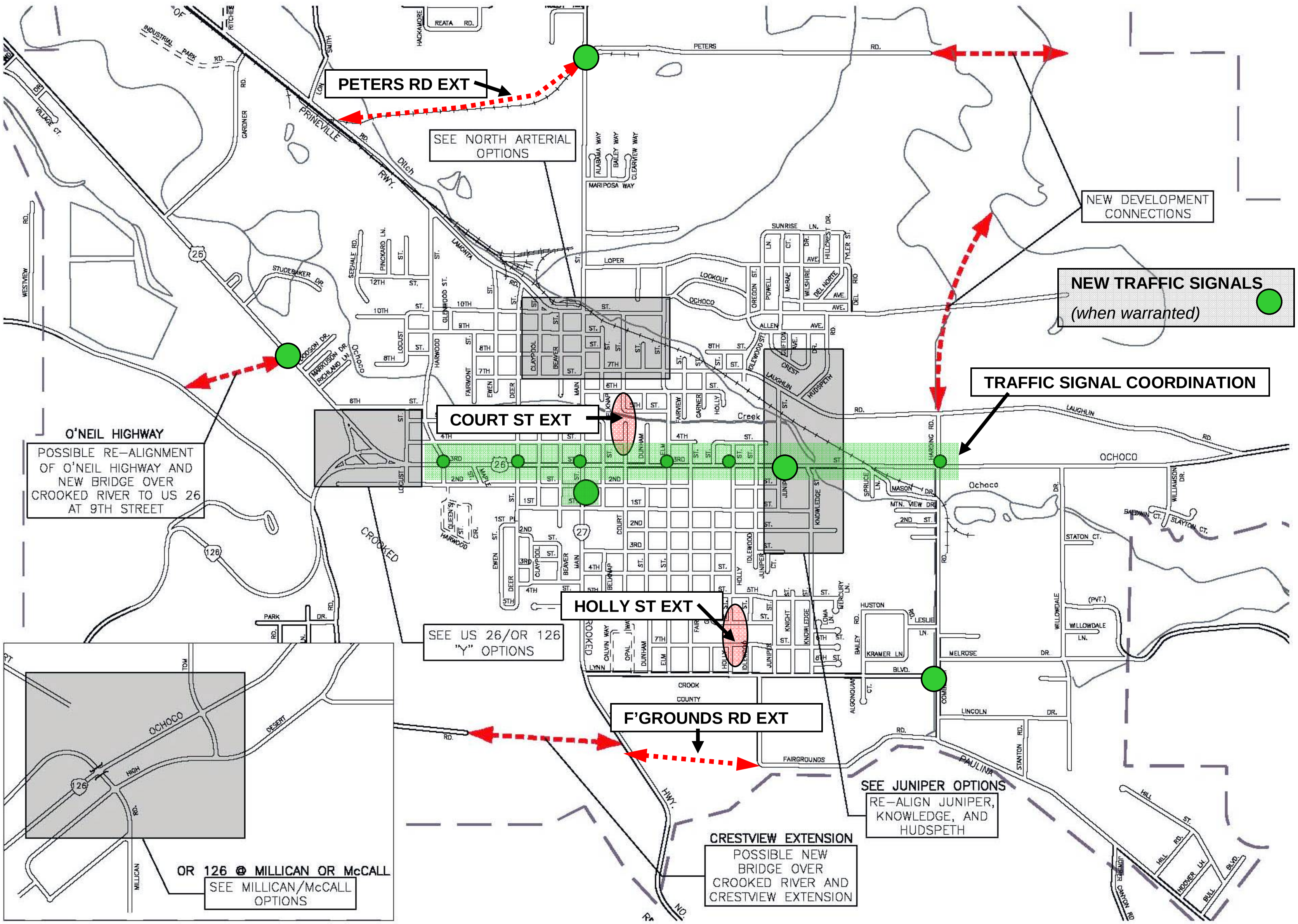
Street System Plan

The Street System Plan was developed based on the evaluation of existing and future traffic conditions, alternative solutions, and the recommended street functional classification standards. The Street System Plan addresses a twenty year planning horizon and assumes the Prineville urban growth boundary remains relatively unchanged. In **Figure 7-1**, functional street classifications and the probable location of traffic signals are identified for the improved street system. Recommended projects are described in the following section and summarized on **Figure 7-4.**

Street Improvements

The following improvements to the arterial and collector street system were included in the street system plan. The Implementation Plan summarized in **Table 7-5** provides a prioritized list of these improvements. Each is defined below as either "immediate," "short-term" or "long-term" needs.

Map No.	Recommended Improvement
[1]	*New Third Street Signal:* Install new traffic signals on Third Street at Harwood Street *[immediate]*.
[2]	*Re-align Knowledge to Juniper:* Re-align Knowledge Street to Juniper Street at Third Street, new signal on Third Street at Juniper, replace Ochoco Creek Bridge and re-align Juniper Street to Hudspeth Road at Laughlin Road. This project significantly improves Prineville's north-south collector street system, providing more direct linkages between north and south Prineville as a significant alternative to Main Street *[immediate]*.
[3]	*Third Street Signals:* replace antiquated signal equipment at existing intersections and install signal system interconnect from Harwood Street to Juniper Street *[immediate]*.
[4]	*Extend Ninth Street:* Extend Ninth Street east from Main Street to the railroad right-of-way, construct new arterial street along railroad right-of-way to intersection of Laughlin Road and Seventh Street. This project partially completes the Northern Arterial route, providing significant, parallel street capacity to Third Street (OR 126). The project includes the removal of the existing traffic signal on Main Street at Tenth Street. As part of the project Main Street can be re-striped with one travel lane in each direction, complimented by separate left- and right-turn lanes at major intersections *[immediate]*.
[5]	*Laughlin Road Upgrade:* Reconstruct Laughlin Road to arterial standards between Seventh Street and OR 126, including new bike lanes and sidewalks. This project completes the Northern arterial route and provides significant parallel street capacity to OR 126 *[immediate]*.



CITY OF PRINEVILLE TRANSPORTATION SYSTEM PLAN

MAJOR STREET IMPROVEMENTS UNDER STUDY

Figure 7-4

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[6] *Downtown Enhancement Plan:* Improve streetscape in Downtown Prineville, particularly on Second, Third and Fourth Streets - between Deer and Fairview Streets. Includes pavement resurfacing, sidewalk improvements, pedestrian flares, landscaping and trees, street furniture and street lighting *[short-term] (see Downtown Enhancement Plan and **Figure 7-2 (b)**).*

[7] *WYE Junction Roundabout:* Complete project engineering and construct roundabout at the junction of US 26 and OR 126. This project provides significant long-term highway capacity, serves as a “gateway” feature and entrance to downtown Prineville, and helps manage access to OR 126 while providing sufficient access enhancements to local businesses *[short-term]*.

[8] *OR 126/McCall Road Interchange Improvement*: Construct McCall Road interchange at OR 126 to improve access in the Prineville Airport Industrial Area. *[long-term]*.

[9] *Court Street Extension:* Improve City North/South Collector Street System by extending Court Street across Ochoco Creek and extending Knowledge Street to Laughlin Road *[long-term]*.

[10] *Holly and Elm Street Extensions:* Improve City North/South Collector Street System by extending Holly Street from Sixth Street to Seventh Street, and extending Elm Street from Fifth Street to Sixth Street *[long-term]*.

[11] *New Traffic Signal at Lynn Boulevard and Combs Flat Road:* When warranted, install new traffic signal at intersection of Lynn Boulevard and Combs Flat Road. This project will provide needed capacity to accommodate growth in traffic along both routes *[long-term]*.

[12] *O’Neil Highway Re-alignment:* Complete engineering and study then construct re-alignment of O’Neil Highway to intersect with US 26 at about Ninth Street. This project may require a minor re-alignment of Ninth Street to complete the major, four-legged intersection rather than an off-set of O’Neil Highway and Ninth Street (Northern Arterial) at US 26. This project provides significant relief to traffic congestion and enhances safety at the intersection of OR 126 and O’Neil Highway *[long-term]*.

[13] *Crestview Road Extension:* Extend Crestview Road east to the Crooked River Highway to provide a second access (collector street) route to the Crestview neighborhood *[long-term]*.

[14] *Fairgrounds Road Extension:* As part of new development, extend Fairgrounds Road to OR 27. This project provides the necessary connection for new development to the City’s arterial system *[long-term]*.

[15] *New Traffic Signal at US 26 at O’Neil Highway re-alignment and 9th Street:* When warranted, install new traffic signal at intersection of US 26 and 9th Street, likely at the same time as re-alignment of O’Neil Highway. This project will provide needed capacity to accommodate growth in traffic at the connecting point on US 26 between O’Neil Highway and the Northern Arterial (9th Street) *[long-term]*.

[16] *New Traffic Signal at OR 27 and Second Street:* When warranted, install new traffic signal at intersection of OR 27 (Main Street) and Second Street. This project will provide

needed capacity to accommodate growth in traffic in south Prineville, using Second Street as an alternate route to Third Street (US 26). The new signal will likely need to be integrated and coordinated with the Third Street signal system *[long-term]*.

[17] *New Traffic Signals on Main Street at Loper Street and Peters Road:* When warranted, install new traffic signals on north Main Street at the intersections of Lope Street and Peters Road. These projects will provide needed capacity to accommodate growth in traffic along Main Street as development occurs in north Prineville *[long-term]*.

[18] *Peters Road Extension:* As part of new development, extend Peters Road from Main Street to Lamonta Road adjacent to the railroad right-of-way. This project provides the necessary connection for new development to the City's arterial system *[long-term]*.

These street improvements address specific capacity deficiencies or safety needs. New development, particularly in the northeast, will result in a need for new roadways. The projections for this plan indicate that the existing system with the improvements specified previously can accommodate this growth. However, new developments will need to connect to the existing collector and arterial system.

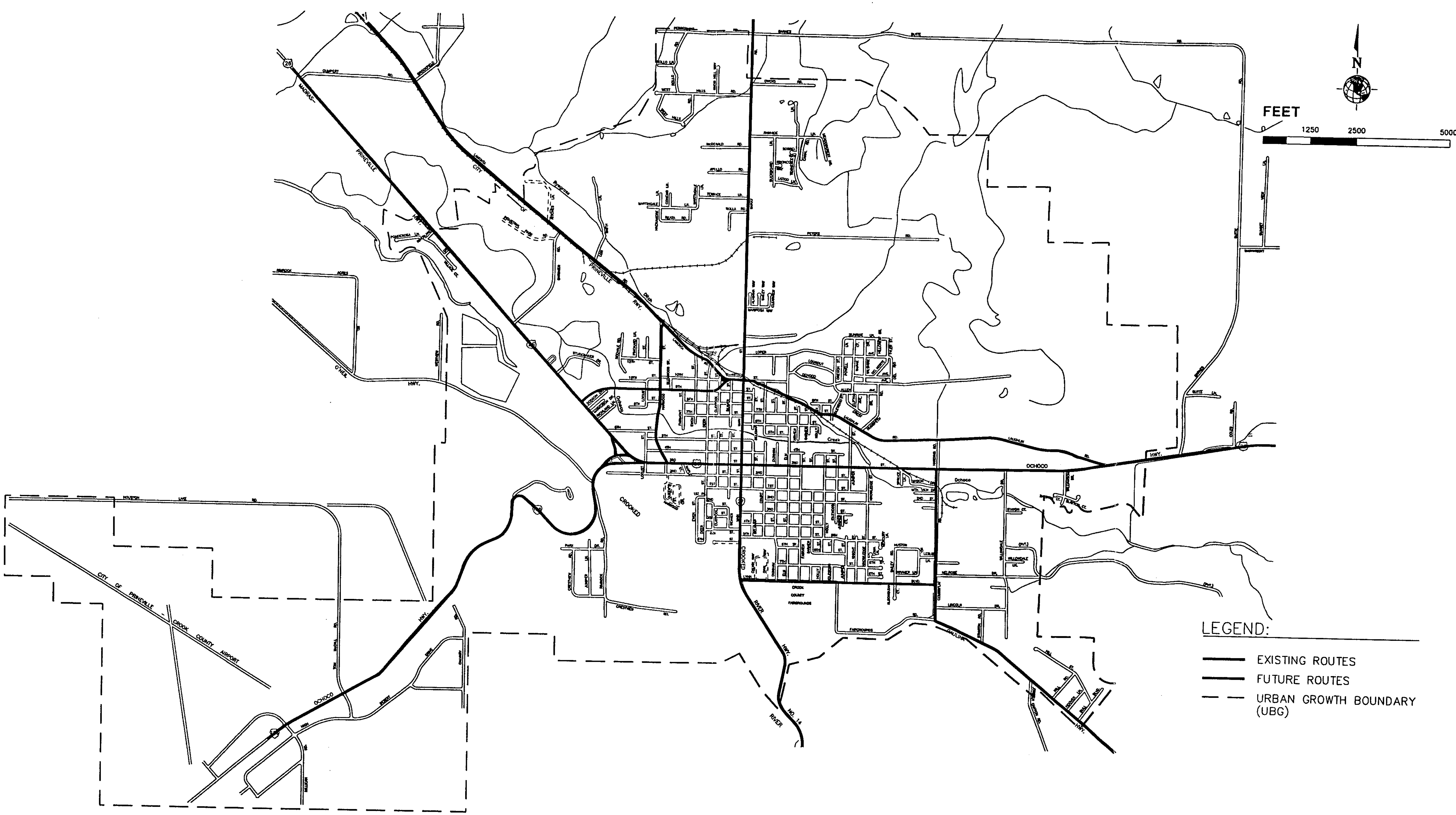
To serve this new growth and make these connections, some potential new collector and arterial roadways have been identified. The location of these roadways was selected to tie into existing collector and arterial roadways, and they reflect some of the limits imposed by topography. These potential roadways are also identified in **Figure 7-1**. However, the actual roads constructed will be dependent on the way the land develops. In general, these roads shall extend the existing grid of arterial and collector roadways.

Because these roadways are purely a function of new development, they shall be constructed as that development occurs. Funding for their construction will be provided by the developers. They have not been included in the capital improvement program.

Periodic reviews of this plan and population growth shall be used to track the future need for these potential arterial, collector and local route streets.

Freight Mobility Element

The state highway system provides the major freight link for the City of Prineville. The truck route plan is shown in **Figure 7-5**. With this plan, trucks have several alternate routes to Third Street and Main Street, which are currently the most frequently used routes. Some of these routes, such as the connection to US 26 via Laughlin and Ninth Street (Northern Arterial), are dependent on the implementation of the street system improvements. Currently traffic which is passing through Prineville on OR 126 toward US 26 must work its way through the existing city street grid, where tight turning radii, traffic congestion and pedestrian activity make driving difficult, particularly for large trucks. The extension of Laughlin Road to Main Street paralleling the Prineville RR could result in significant added relief to local traffic congestion on Third Street and Main Street.



SOURCE: ODOT BASE MAP

CITY OF PRINEVILLE
TRANSPORTATION
SYSTEM PLAN

TRUCK ROUTING PLAN

Figure
7-5

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Together with the extension of Ninth Street to US 26, the Laughlin Road extension provides alternative circulation and access for local auto and truck traffic. The Laughlin Road extension also provides immediate relief to Third Street and Main Street, and can help postpone the need or extensive State highway capacity improvements and provide access to industrial lands (job growth).

Bikeway Plan Element

Providing a safe and complete system of bicycle facilities encourages people to use alternative modes of travel and contributes to a small-town environment. From the standpoint of safety, bicycle facilities are most critical in areas of high traffic volume and in areas used by children. Bicycle paths can also provide alternative routes for cyclists, allowing them to simultaneously avoid conflict with automobiles and take advantage of recreational opportunities. The City of Prineville bikeway plan is shown on **Figure 7-6.** The map shows the existing bikeway system, bikeways currently under construction, future bikeways planned by Crook County, future bikeways associated with the street system improvements, and the future city bikeways designated on all arterial and collector streets.

In cases where a bikeway is proposed within the street right-of-way, the roadway pavement (*between curbs*) shall be widened to provide a five-foot bike lane (collector streets) or a six-foot bike lane (arterial streets) on each side of the street as described in **Table 7-1** and shown on the cross sections in **Figure 7-2**. The striping of bike lanes shall be done in conformance with the *Manual on Uniform Traffic Control Devices*. In cases where curb parking will exist with a bike lane, the bike lane will be located between the parking and travel lanes. In some situations, curb parking may have to be removed to permit a bike lane.

The bikeways on new streets or streets to be improved as part of the street system plan shall be added when the improvements are made. The Implementation Plan (see **Table 7-5**) program identifies an approximate schedule for these improvements.

In general, on arterial and collector streets which are not scheduled to be improved as part of the street system plan, improvements shall be implemented based on traffic volumes. When forecast traffic volumes exceed 2,500 to 3,000 vehicles per day, bike lanes shall be added to the existing roadway. The striping of bike lanes on streets which lead directly to schools shall be high priority. For Prineville, where most of the collector and arterial streets are 54 to 57 feet wide, adding bike lanes will not require widening streets or removing parking.

Bikeways on local routes and residential streets will only be signed as a route because the vehicular traffic volume is low on these streets and exclusive bike lanes are not necessary. Bicycles are legally classified as vehicles which may be ridden on most public roadways in Oregon. Because of this, bicycle facilities shall be designed to allow bicyclists to emulate motor vehicle drivers. Shared roadway facilities are common on city street systems. On a shared roadway facility, bicyclists share the normal vehicle lanes with motorists. Where bicycle travel is significant, these roadways shall be signed as bicycle routes.

However, the striping of bike lanes on streets which lead directly to schools and parks shall be high priority. Therefore, a list of specific bikeway projects shall be included in the capital improvement program. These improvements are listed below and estimated to cost $120,000:

1. *Juniper Street:* Until the completion of the Knowledge Street re-alignment, add bike lanes on Juniper Street from Laughlin Road to First Street. These lanes will connect neighborhoods to both the north and south with Ochoco Creek and the existing bike trail. The addition of bike lanes will require removing street parking on at least one side of Juniper Street between Laughlin Road and Ochoco Creek, where the paved surface is only 40 feet wide

2. *First Street:* Add bike lanes on First Street from Deer Street to Knowledge Street. These bike lanes will connect the residential neighborhoods in southeast Prineville with Crook County Schools on Knowledge Street.

4. *Second Street:* Add bike lanes on Second Street from Harwood Street to Fairview Street. These lanes will also connect residential neighborhoods with the Crooked River Elementary School and the park on the corner of Elm Street and Third Street.

5. *Elm Street:* Add bike lanes to Elm Street from Ochoco Avenue to First Street. These lanes will provide a valuable north-south route which will provide access to the hospital, the Ochoco Creek bike trail, and the elementary school, as well as connecting with other east-west bikeways. There is a 40-foot section from Tenth Street to Fourth Street which will require prohibiting parking on at least one side of the street to allow for bike lanes.

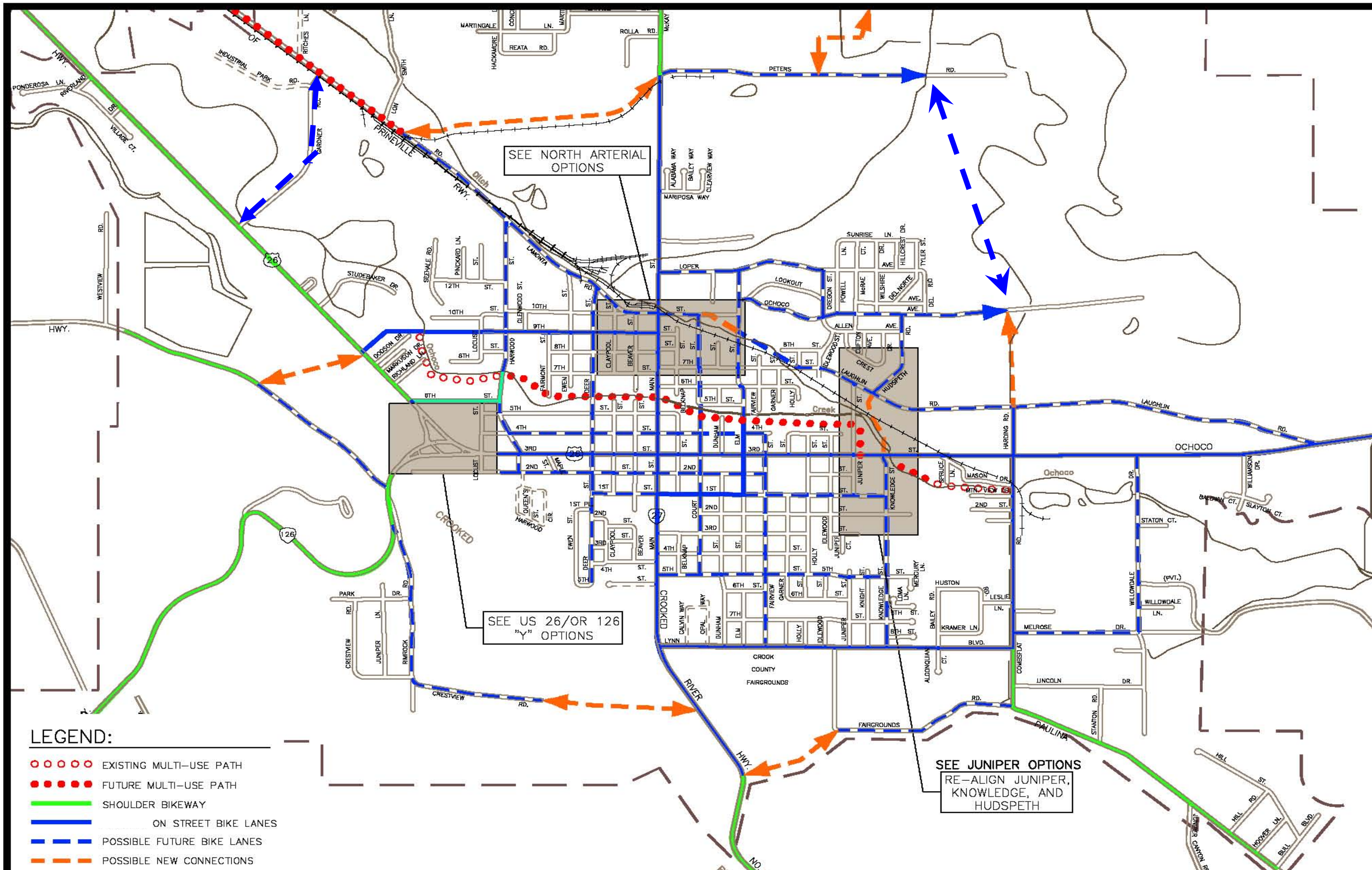
6. *Deer Street:* Add bike lanes to Deer Street from Tenth Street to First Street. These bike lanes will help connect residential areas to the south with the Ochoco Elementary School on Highway 26 and with the industrial areas to the north.

8. *Fairview Street:* Add bike lanes on Fairview Street from Fourth Street to Lynn Boulevard. These bike lanes will provide a connection between the residential neighborhoods to the south and Ochoco Creek Park.

9. *Main Street:* Add bike lanes on Main Street from Tenth Street to Second Street. These bike lanes will provide a direct connection between the bike lanes on McKay Road to the north and the bike lanes that are under construction south of Second Street. These improvements may require prohibiting parking on at least one side of the street.

10. *Court Street:* Add bike lanes to Court Street from Fifth Street to South Fifth Street. These lanes will provide another north-south connection for bicyclists.

11. *Fourth and Second Streets*: Add bike lanes as recommended by the Prineville Downtown Enhancement Plan.



CITY OF PRINEVILLE TRANSPORTATION SYSTEM PLAN

BIKEWAY PLAN

Figure 7-6

W&H PACIFIC
8405 SW NIMBUS AVE.
BEAVERTON, OR 97008
(503) 626-0455

C:\Documents and Settings\juliab\Desktop\Prineville (Andy)\CAD\PRN17F95-revised <8 x 11> juliab 03/08/05 15:38

Pedestrian System Element

Walking is our most basic transportation mode. Given the compact size of downtown Prineville, walking can provide a viable transportation alternative for many trips. Providing a safe, pedestrian-friendly environment is critical to retaining a vibrant and successful, small-town environment. Pedestrian safety on Third Street has been a concern in Prineville and pedestrian improvements within the downtown are addressed in detail in the *City of Prineville Downtown Enhancement Plan* (summarized in Appendix A).

Currently, the City of Prineville Land Development Ordinance (Ord. No. 1057, 1998) requires that sidewalks be provided unless alternative pedestrian routes are provided or residential densities are less than two dwelling units per acre. The City should continue to implement development of a complete pedestrian system as shown on **Figure 7-7**. Every paved street should have sidewalks on both sides of the roadway as described in **Table 7-1** and shown on the cross sections in **Figure 7-2**. Pedestrian access on walkways shall be provided between all buildings including shopping centers and abutting streets and adjacent neighborhoods.

Most of the existing roadways in Prineville do not have sidewalks except for the downtown core roadways. Even downtown, many of the streets either do not have sidewalks on both sides or are segmented and not continuous. Sidewalks should be added or improved as the improvements to the street system are made. The implementation program identifies an approximate schedule for these improvements.

Over time, sidewalks shall be added to streets which currently lack them and are not programmed for improvements. The priority streets shall be collector and arterial roadways where pedestrians feel most uncomfortable because of the higher traffic volumes these roadways carry. Streets such as First Street, Knowledge Street, Combs Flat Road, and Fairview Street are all arterial or collector roadways which lead to schools. Adding sidewalks to these streets and others which lead to schools and parks shall be the highest priority when evaluating sidewalk projects. Local Routes and Residential Streets shall also have sidewalks; however, because they are lower volume streets, they shall be lower priority for adding sidewalks.

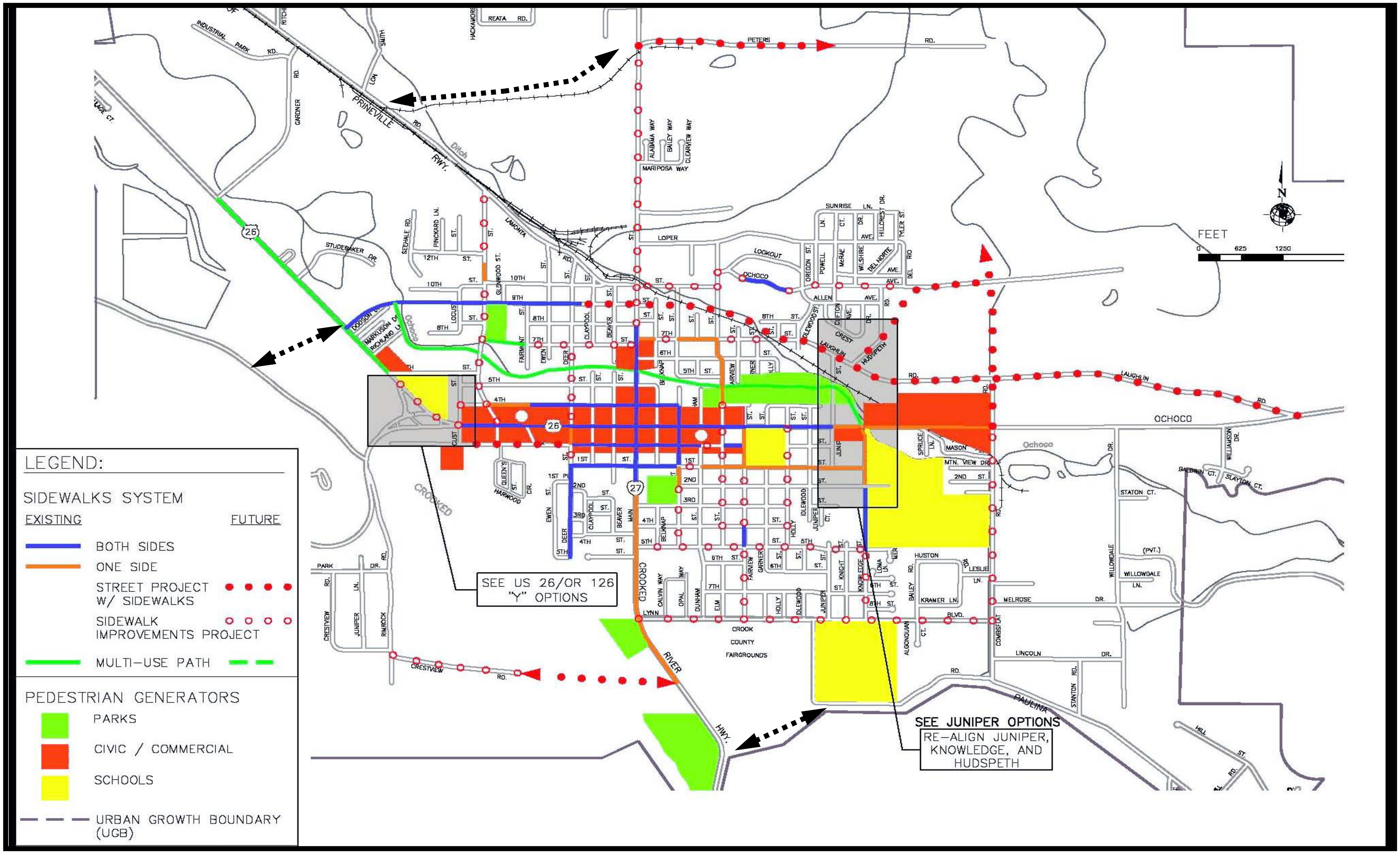
To address some of these high priority locations, a list of specific sidewalk improvements shall be included in the capital improvement program. These improvements include:

- *Harwood Street*: Construct new sidewalks on Harwood Street from Second Street to Tenth Street to improve pedestrian circulation and access *(from Chapter 6, Short-Term Improvements).*

- *Knowledge Street:* Add sidewalks to Knowledge Street from Fifth Street to Lynn Boulevard. Since this roadway provides direct access to the Crook County schools, good pedestrian access and safety is vital.

- *Elm Street:* Add sidewalks to Elm Street from Ochoco Avenue to South Seventh Street. Elm Street is an important north-south connector which passes the hospital and two parks as well as connecting residential neighborhoods.

Figure 7-7: Pedestrian Improvement Projects



- *First Street:* Add sidewalks to First Street from Court Street to Knowledge Street. This stretch of First Street currently has intermittent sidewalk segments. These segments need to be connected to provide good east-west access between residential neighborhoods and the Crook County schools.

- *Second Street:* Add sidewalks to Second Street from Locust Street to Deer Street and Court Street to Fairview Street. This stretch of Second Street currently has intermittent sidewalk segments. These segments need to be connected to provide good access between residential neighborhoods and the park on Elm Street and the Crooked River Elementary School on Fairview Street.

- *Main Street:* Add sidewalks to Main Street from Seventh Street to Tenth Street. Main Street has curbs but there are some critical missing sidewalk sections. As north Prineville grows, this section will become a more important pedestrian route.

- *Lynn Boulevard:* Add sidewalks to Lynn Boulevard from OR 27 to Combs Flat Road. Lynn Boulevard has no curb or sidewalks the entire length. This route is a critical walk-to-school route serving Crook County High School. New sidewalks are essential to establish better pedestrian access, circulation and safety.

- *Fourth Street:* Add sidewalks to Fourth Street from Harwood Street to Deer Street. Fourth Street is an important parallel route to Third Street, connecting western neighborhoods to downtown Prineville. New sidewalks are needed.

- *Deer Street*: Add sidewalks to Deer Street from First Street across Ochoco Creek to Ninth Street. Deer Street is an important pedestrian corridor linking north Prineville neighborhoods to Downtown Prineville. Only intermittent sidewalks existing in this corridor. Deer Street also provides a connection to the Ochoco Creek multi-use path.

Costs for adding sidewalks are relatively low if the addition is within the existing right-of-way. A 5-foot wide sidewalk with no curb, would cost about $15 per linear foot. Adding a curb as well as a 5-foot wide sidewalk would cost about $25 per linear foot. In commercial areas, an 8-foot wide sidewalk with a curb would cost about $28 per linear foot.

Table 7-4 summarizes the needed sidewalk improvements on Prineville's major collector/arterial street system, including costs and priority over the next twenty years. The total cost of all sidewalk improvements (excluding those sidewalks constructed as part of a street improvement) is almost $2.0 million.

Table 7-4: Sidewalk Improvement Projects

Map No.	Location	From	To	Length (ft)	Existing Features (Percent Existing) Curb	Sidewalks	Cost Estimate (to complete)	Priority	Cost/Year
	2nd St	Locust	Deer	1,950	90%	50%	$33,150	H	
	4th St	Harwood	Deer	1,250	100%	35%	$24,375	H	
	Deer St	1st St	9th St	2,600	60%	20%	$83,200	H	
	Elm St	7th St	Ochoco Ave	1,125	100%	0%	$33,750	H	
	Elm St	4th (N)	7th (N)	975	100%	50%	$14,625	H	
	Elm St	1st St	4th (N)	975	100%	80%	$5,850	H	
	Elm St	1st St	Lynn Blvd.	2,275	0%	0%	$113,750	H	
	Elm St	5th St (S)	7th St	975	100%	20%	$23,400	H	
	Harwood St	2nd St	4th St	650	100%	25%	$14,625	H	
	Harwood St	4th St	10th St	2,125	30%	0%	$93,500	H	
	Hwy 26	Locust	6th St	115	80%	0%	$3,910	H	
	Knowledge St	2nd St	US 26	300	100%	50%	$4,500	H	
	Knowledge St	Lynn Blvd	5th St	1,125	100%	0%	$33,750	H	
	Lynn Blvd	Hwy 27	Combs Flat	5,250	0%	0%	$262,500	H	
	Main St	7th St	10th St	875	100%	90%	$2,625	H	
HIGH Priority Total:							**$747,510**		**$149,502**
	1st St (S)	Court	Knowledge	2,750	100%	30%	$57,750	M	
	2nd St	Court	Fairview	875	100%	10%	$23,625	M	
	4th St	Locust	Harwood	375	100%	5%	$10,688	M	
	7th St	Fairmont	Main St	1,625	100%	0%	$48,750	M	
	7th St	Main St	Idlewood	2,375	100%	20%	$57,000	M	
	Court St	5th St (S)	1st St (S)	1,300	100%	30%	$27,300	M	
	Holly St	5th St	US 26	1,875	100%	0%	$56,250	M	
	Holly St	6th St	Lynn Blvd	975	0%	0%	$48,750	M	
	Hudspeth Rd	N. of Laughlin		350	0%	0%	$17,500	M	
	Main St.	3rd St (S)	Crestview	3,250	50%	50%	$81,250	M	
	Ochoco Ave/Elm/10th	Truck Rte.	Oregon St	2,625	100%	0%	$78,750	M	
	Peters Rd	Main St	end	2,400	0%	0%	$120,000	M	
	US 26	Knowledge	Combs Flat	2,000	50%	50%	$50,000	M	
MODERATE Priority Total:							**$677,613**		**$67,761**
	Combs Flat	Lynn Blvd	US 26	3,125	0%	0%	$156,250	L	
	Crestview Rd	Crooked River	Crossing	1,875	0%	0%	$93,750	L	
	Fairview St	Lynn Blvd	4th St	1,625	30%	30%	$56,875	L	
	Main St	10th St	Peters Rd	3,750	0%	0%	$187,500	L	
	Multi-use Path	Harwood	Fairmont	625	NA	0%	$18,750	L	
	Ochoco Cr. Path	Harwood	9th St	1,625	NA	0%	$48,750	L	
LOW Priority Total:							**$561,875**		**$112,375**
	TOTAL			**45,340**			**$1,986,998**		

Air Service Element

The Prineville Airport is part of the Oregon Aviation System Plan (OASP). It is owned and operated by Crook County and the City of Prineville to serve the aviation-related needs of the residents of the City of Prineville and Crook County. The Prineville Airport Layout Plan and Airport Layout Plan Report were prepared by Century West in 2003. The following concerns were addressed in the study: land use planning for the airport and surrounding areas; locating agricultural applicator aircraft operations; protection of Runway Protection Zones; encroachment of commercial enterprises onto airport environs; location of airport access road; location of terminal and FBO building; utilization of terminal and airport industrial area; location of additional aircraft hangar area; future location and type of aviation fuel storage facility; and, utilization of triangular area inside runways and taxiways.

Water Service

Prineville has no waterborne transportation.

Pipeline Service

Prineville is currently served by a major natural gas distribution line operated by Cascade Natural Gas. This distribution line extends eastward from the main line paralleling Highway 97.

Transportation Demand Management

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

Alternative Work Schedules

Alternative work schedules (*such as flex-time or staggered work hours*), especially with large employers, can help spread the peak period traffic volumes over a longer time period, thus providing greater service out of a fixed capacity roadway. The five largest employers in Prineville, employing more than 50 percent of the population, already have staggered work schedules. Each employer has staggered shifts for its employees, and these shifts differ from employer to employer. Staggered work schedules shall continue to be encouraged with new industries, and be coordinated to eliminate high surges of traffic. For example, if 5 percent of the employees which travel to or from work during the peak hour shift to another time period, 175 to 200 fewer vehicle trips would occur during the PM peak hour.

Carpooling and Vanpooling

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

The City can work with large employers, to establish a carpool and vanpool program. These programs, especially oriented to workers living in other neighboring cities, will help to reduce the travel and parking requirements, and to reduce air pollution. Employers can encourage ridesharing by providing matching services subsidizing vanpools, establishing preferential car and vanpool parking and convenient drop-off sites, and through other promotional incentives.

A very aggressive carpooling program could reduce result in a reduction of 175 to 200 peak vehicle trips. To achieve this reduction, current carpooling rates for journey to work trips would have to increase from 15 percent to 20 percent of the total trips.

Bicycle/Pedestrian Facilities

Bicycle/pedestrian use can be encouraged by implementing strategies discussed earlier in this plan. Providing bicycle parking, showers and locker facilities helps to encourage bicycle commuting and walking to work. An estimated reduction of 50 to 100 trips could be converted from motorized vehicles to other modes if these measures are implemented.

Telecommuting

The ability for people to work at home with the telecommuting technology is likely to continue to grow during the next two decades. During the past ten years, the percent of people working at home has more than doubled. If this trend continues, an additional 3 percent of the work force could stay home and work, thus reducing trips by 125 to 150 during the peak hour.

High Density Employment Areas

Transportation Demand Management programs work best in areas of high density employment and are most successful when applied to firms with more than 50 employees. Potential target areas for transportation demand management programs in the Prineville area include the central business district,

The City can work toward implementation of transportation demand management strategies through coordination with major employers, the Prineville Chamber of Commerce, employees and citizens. Successful implementation includes public support, industry involvement, quantifiable goals, and employer/employee incentives.

Implementation

The Prineville TSP implementation program is provided in the following time frames/priorities:

- 0 - 5 years (Short-Term)
- 6 - 10 years
- 11 - 15 years
- 16 - 20 years
- With Adjacent Development/When Warranted

These priorities are based on current need, the relationship between transportation service needs, and the expected growth of the City. However, some projects may not be needed until adjacent land develops, or for example, when traffic signal warrants are satisfied.

The implementation phasing also takes into account the time required for all the steps leading up to construction. These may include preparing a Corridor Environmental Impact Statement (EIS) pursuant to the requirements of the National Environmental Policy Act of 1969, as well as preliminary and final design.

Another consideration in developing the implementation program was funding. None of the projects which involve state facilities are currently included in the current State Transportation Improvement Program. Although lobbying for these improvements should begin as soon as possible, the projects themselves may not be implemented until later years.

The schedule, shown in **Table 7-5**, indicates priorities and should be modified to reflect changes in the availability of finances or the actual growth in population and employment. ***Based on the analysis of future traffic conditions and evaluation of improvement alternatives, the cumulative impact of the recommended improvements embodied in the Prineville TSP Update will accommodate the type and level of development identified in Prineville's Comprehensive Plan within acceptable standards.***

Table 7-5: Prineville TSP Update - Implementation Plan

Project		Program Schedule (years)				Benefit				Cost (millions)	Partnership				Estimated Cost Share (millions)			
No.	Description	0-5	6-10	11-15	16-20	Safety	Operations/ Capacity/ Circulation	Alt. Modes	Freight Mobility		State	City	County	Private	State	City	County	Private
1	**New Signal @ 3rd St / Harwood**					✳	✳	✳	✳	**$0.25**	100%				$0.25			
2	**Re-align Juniper, Knowledge and Hudspeth**					✳	✳	✳	✳	**$0.76**	30%	70%			$0.23	$0.53		
3	**3rd Street Signal Replacement & Interconnect**					✳	✳	✳	✳	**$0.85**	100%				$0.85			
4	**9th Street Extension - Main to 7th on RR ROW**					✳	✳	✳	✳	**$1.00**	50%	50%			$0.50	$0.50		
5	**Laughlin Road Upgrade - 7th to US 26**						✳	✳	✳	**$2.71**	25%	25%	25%	25%	$0.68	$0.68	$0.68	$0.68
6	**Downtown Enhancement Plan**					✳		✳		**$2.54**		50%		50%		$1.27		$1.27
7	**WYE Junction Roundabout**					✳	✳	✳	✳	**$1.90**	100%				$1.90			
8	**Hwy 126 / McCall Interchange**					✳	✳		✳	**$5.39**	50%	17%	17%	16%	$2.70	$0.92	$0.92	$0.86
9	**Court Street Extension to 5th Street**						✳	✳		**$1.40**		100%				$1.40		
10	**Holly St Ext (6th-7th) & Elm St Ext (5th-6th)**						✳	✳		**$0.80**		100%				$0.80		
11	**New Signal at Lynn Blvd / Combs Flat Rd**	or when warranted					✳	✳		**$0.25**				100%				$0.25
12	**O'Neil Highway Re-Alignment to US 26**					✳	✳		✳	**$2.32**	50%	50%			$1.16	$1.16		
13	**Crestview Extension**					✳	✳	✳	✳	**$9.72**		80%		20%		$7.78		$1.94
14	**Fairgrounds Rd Extension - Hwy 27 to End**	or as development occurs				✳	✳	✳		**$0.45**				100%				$0.45
15	**New Signal at US 26th & O'Neil Hwy/9th St**	or when warranted					✳	✳		**$0.25**	50%	50%			$0.13	$0.13		
16	**New Signal at Hwy 27 & 2nd St**	or when warranted				✳	✳	✳	✳	**$0.25**	50%	50%			$0.13	$0.13		
17	**New Signals on Main at Loper and Peters**	or when warranted				✳	✳	✳		**$0.50**				100%				$0.50
18	**Peters Road Extension - Main to Lamonta**					✳	✳	✳		**$1.03**		50%		50%		$0.52		$0.52
19	**Sidewalks Projects (priority)**	high	medium		low	✳	✳	✳		**$2.00**	5%	50%		45%	$0.10	$1.00		$0.90
20	**Bicycle Projects**					✳	✳	✳		**$0.12**		30%	70%			$0.04	$0.08	
	TOTAL									**$34.49**					$8.61	$16.83	$1.68	$7.37

Overview

The Prineville TSP includes a transportation financing plan that addresses:

- a discussion of existing and potential financing sources to fund the development of each transportation facility and major improvement (which can be described in terms of general guidelines or local policies)an analysis of historic street improvement funding sources;
- an analysis of historic street improvement funding;
- a list and general estimate of the timing for planned transportation facilities and major improvements; ; and,
- determination of planning level cost estimates for the transportation facilities and major investments identified in the TSP (intended to provide an estimate of the fiscal requirements to support the land uses in the acknowledged comprehensive plan(s) and allow jurisdictions to assess the adequacy of existing and possible alternative funding mechanisms).

The timing and financing provisions in the transportation financing program are not considered a land use decision as defined by the TPR and ORS 197.712(2)(e) and, therefore, cannot be the basis of appeal under State law. In addition, the transportation financing program is to implement the comprehensive plan policies which provide for phasing of major improvements to encourage infill and redevelopment of urban lands prior to facilities which would cause premature development of developable, urban areas or conversion of rural lands to urban uses.

This chapter summarizes the financing program defined for the Prineville TSP as required by the TPR. It summarizes the transportation improvement projects, identifies general timing and rough cost estimates of transportation system improvements, and summarizes the existing and potential future financial resources to pay for these improvements, as a general policy guideline.

Summary

The City of Prineville, like other cities in Oregon, is faced with the need to improve and expand its transportation system in order to alleviate existing safety and roadway capacity problems and to accommodate projected growth in the region. The Transportation System Plan identifies over $34 million (2005 dollars) in proposed transportation improvements over the next twenty years and beyond. While funding for a portion of the proposed improvements is expected to come from the Oregon Department of Transportation (ODOT), it is likely that residents of Prineville will be faced with the need to provide funding for the remaining share. **Table 8-1** indicates that state sources may provide funding for approximately $ 8.61 million of the proposed transportation improvements. An additional $1.68 million may be funded through Crook County.

Table 8-1: Prineville TSP Update - Implementation Plan

Project		Program Schedule (years)				Benefit				Cost (millions)	Partnership				Estimated Cost Share (millions)			
No.	Description	0-5	6-10	11-15	16-20	Safety	Operations/ Capacity/ Circulation	Alt. Modes	Freight Mobility		State	City	County	Private	State	City	County	Private
1	**New Signal @ 3rd St / Harwood**					✶	✶	✶	✶	**$0.25**	100%				$0.25			
2	**Re-align Juniper, Knowledge and Hudspeth**					✶	✶	✶	✶	**$0.76**	30%	70%			$0.23	$0.53		
3	**3rd Street Signal Replacement & Interconnect**					✶	✶	✶	✶	**$0.85**	100%				$0.85			
4	**9th Street Extension - Main to 7th on RR ROW**					✶	✶	✶	✶	**$1.00**	50%	50%			$0.50	$0.50		
5	**Laughlin Road Upgrade - 7th to US 26**						✶	✶	✶	**$2.71**	25%	25%	25%	25%	$0.68	$0.68	$0.68	$0.68
6	**Downtown Enhancement Plan**					✶		✶		**$2.54**		50%		50%		$1.27		$1.27
7	**WYE Junction Roundabout**					✶	✶	✶	✶	**$1.90**	100%				$1.90			
8	**Hwy 126 / McCall Interchange**					✶	✶		✶	**$5.39**	50%	17%	17%	16%	$2.70	$0.92	$0.92	$0.86
9	**Court Street Extension to 5th Street**						✶	✶		**$1.40**		100%				$1.40		
10	**Holly St Ext (6th-7th) & Elm St Ext (5th-6th)**						✶	✶		**$0.80**		100%				$0.80		
11	**New Signal at Lynn Blvd / Combs Flat Rd**	or when warranted					✶	✶		**$0.25**				100%				$0.25
12	**O'Neil Highway Re-Alignment to US 26**					✶	✶		✶	**$2.32**	50%	50%			$1.16	$1.16		
13	**Crestview Extension**					✶	✶	✶	✶	**$9.72**		80%		20%		$7.78		$1.94
14	**Fairgrounds Rd Extension - Hwy 27 to End**	or as development occurs				✶	✶	✶		**$0.45**				100%				$0.45
15	**New Signal at US 26th & O'Neil Hwy/9th St**	or when warranted					✶	✶		**$0.25**	50%	50%			$0.13	$0.13		
16	**New Signal at Hwy 27 & 2nd St**	or when warranted				✶	✶	✶	✶	**$0.25**	50%	50%			$0.13	$0.13		
17	**New Signals on Main at Loper and Peters**	or when warranted				✶	✶	✶		**$0.50**				100%				$0.50
18	**Peters Road Extension - Main to Lamonta**					✶	✶	✶		**$1.03**		50%		50%		$0.52		$0.52
19	**Sidewalks Projects (priority)**	high	medium		low	✶	✶	✶		**$2.00**	5%	50%		45%	$0.10	$1.00		$0.90
20	**Bicycle Projects**					✶	✶	✶		**$0.12**		30%	70%			$0.04	$0.08	
	TOTAL									**$34.49**					$8.61	$16.83	$1.68	$7.37

Further, private or new development is likely to pay for approximately $7.37 in direct transportation improvements listed in the TSP as a condition for development approval – costs not attributed to the City's Systems Development Charge (SDC) ordinance (#1111). This leaves the City with a local funding share of $16.83 million, or 49 percent of the total improvement costs.

Transportation Funding Sources

Under current Federal and State legislation, there are several methods of financing available to the City of Prineville for street system studies, capital improvements, programs, and maintenance:

Federal Surface Transportation Program (STP) Funds

These are Federal funds available through TEA-21 legislation that are available to the city of Prineville through the state of Oregon (Department of Transportation). These funds are flexible and can be used for different types of capital improvements and transportation programs.

Federal Enhancement Funds

Federal funds are available to complete capital improvements and programs related to pedestrian, bicycle, and other alternative travel modes to the automobile. This program can also be used for historic preservation of transportation facilities.

City Allocation of State Highway Fuel Tax Revenues

These revenues are used by the City of Prineville to operate and maintain the City's street and highway system. These funds are also used to provide transportation engineering and planning support.

State Transportation Program Grants

The State provides grant funds to local jurisdictions to conduct transportation studies, improve bicycle and pedestrian facilities, and participate in State-sponsored transportation activities.
State Transportation/Growth Management Grants These grant funds are jointly administered through the Oregon Department of Land Conservation and Development and the Oregon Department of Transportation. The City of Prineville may use these funds to conduct planning and transportation studies related to managing growth and reducing reliance on the SOV.

General Obligation Bonds (Property Tax Supported)

Bonds are a funding mechanism for constructing capital improvement projects in the City. Voter-approved bonds are sold to fund street improvement projects. Transportation projects are usually grouped in "bond packages" that go before the public for voter approval. General Obligation Bonds are supported through the City's property tax base.

Capital Funding Limitations

General Obligation Bonds are financed with property taxes. When these bonds are issued, the community pledges its "full faith and credit." This means that the local government has the unlimited power to levy property taxes to ensure that the principal and the interest on these bonds are paid. Because of this broad power, voter approval is required for each bond issue.

The revenues are collected by a special property tax levy called a "debt service levy." Subject to State limitations, the City has the unlimited power to levy property taxes to repay principal and interest for the term of the bonds. Because this is an unlimited pledge, the State imposes a legal debt ceiling which does not permit outstanding bonds of more than 3 percent of a City's true cash value.

Transportation System Development Charges

Recently adopted by the City of Prineville, these funds are collected from developers as new development occurs in the City. Charges (fee) are roughly based on trip generation rates by different types of land uses (i.e., single family residential, commercial, industrial, etc.). These funds may only be used to fund transportation improvements caused through the impacts of new growth and may not be used to fix existing capacity deficiencies.

Utility Franchise Fees

Public utilities that use the public right-of-way to convey their services can be charged a fee for that privilege. These funds are primarily used to recover the maintenance costs associated with utility work on city streets.

Development Exactions

To provide adequate infrastructure in response to site-specific growth, capital improvements can be exacted as conditions of approval for building permits, subdivisions, and zoning actions. Developers are usually required to complete frontage street improvements and other off-site transportation improvements to mitigate traffic impacts. The majority of the city's new neighborhood, local routes and some collector streets are created and improved as a result of development exactions.

Local Improvement Districts

This method allows neighboring property owners to group together to improve public facilities and then pay for them through individual assessments. These districts are generally used to complete local street improvements or improvements to business districts.

City General Funds

Though seldom available for transportation purposes, the City may choose to use general property tax revenues to build or operate transportation facilities. However, using general fund revenues places transportation system finance in direct competition with other City services which are already obligated, such as police, fire, libraries, and parks.

Local Transportation Funding History

Historically, the City of Prineville has accounted for street and transportation-related revenues and expenditures in two separate funds: the Street Fund and the Street Equipment Reserve Fund. The Street Fund is used for the operation, maintenance and improvement of city streets and roads. The Street Equipment Reserve Fund is used to acquire property and equipment. Summaries of the revenues and expenditures associated with these two funds over the past ten years are shown in **Tables 8-2** and **8-3**. The primary revenue source of the Street Fund is state gas tax revenues. Using fiscal year *(FY)* 1991-92 as an example, state gas tax revenues totaled $221,643, accounting for 32 percent of annual Street Fund revenues. As shown in **Table 8-2**, the 1991 Oregon State Legislature approval of a 2 cent per gallon increase in the state gas tax effective July 1, 1991, and an additional 2 cent per gallon increase effective July 1, 1992 resulted in increased revenues for Prineville. However, the 1993 Oregon State Legislature failed to approve a proposal to increase the gas tax by 3 cents per gallon in 1994 and another 3 cents in 1995. As a result, the City has not seen the increases state gas tax revenues continuing. In 1992 the City issued $150,000 of revenue bonds. The proceeds were used to finance street improvements within the City. The debt service was to be repaid with future state gas tax allocations to the City.

Table 8-2
City of Prineville Street Fund
Statement of Revenue and Expenditures

	1987-88	1988-89	1989-90	1990-91	1991-92
REVENUES:					
Local					
Taxes	$61,440	$61,223	$57,108	$61,769	$61,189
Interest	$14,599	$10,279	$11,109	$15,046	$17,007
Collection on Assessments	---	---	---	---	$32,724
Fees	$225	$160	$235	---	$445
Other	$858	$4,832	$2,047	$1,948	$3,462
Intergovernmental Sources					
State Gas Tax	$139,603	$166,277	$194,673	$220,781	$221,643
Other State	---	---	---	---	$6,489
County	$201,900	$203,200	$205,000	$205,000	$205,000
Bond Sale Proceeds	---	---	---	---	$147,000
Total Revenues	$418,625	$445,971	$470,172	$504,544	$694,959
Beginning Fund Balance	$120,247	$126,159	$82,775	$113,161	$133,673
Total Available	$538,872	$572,130	$552,947	$617,705	$828,632
EXPENDITURES:					
Personal Services	$105,826	$100,978	$108,275	$111,647	$121,723
Materials and Services	$226,807	$272,579	$243,018	$250,453	$309,762
Capital Outlay	$3,171	$860	$681	$544	$7,000
Transfers to Other Funds					
General Fund	$59,281	$103,220	$70,950	$74,200	$78,500
Bicycle Path Reserve Fund	$1,375	$1,718	$1,862	$2,188	$2,216
Street Equipment Reserve Fund	$13,253	$10,000	$15,000	$45,000	$35,500
Total Expenditures	$412,713	$489,355	$439,786	$484,032	$554,701
ENDING BALANCE	$126,159	$82,775	$113,161	$133,673	$273,931

Table 8-3
City of Prineville Street Equipment Reserve Fund
Statement of Revenues and Expenditures

	1987-88	1988-89	1989-90	1990-91	1991-92
REVENUES:					
Interest	$719	$843	$622	$1,330	$6,100
State Transfer	---	---	---	$18,020	$99,048
Transfer from Street Fund	$13,253	$10,000	$15,000	$45,000	$35,500
Beginning Fund Balance	$26,848	$17,139	$11,412	$7,835	$44,602
Total Available	$40,820	$27,982	$27,034	$72,185	$185,250
EXPENDITURES:					
Capital Outlay	$23,681	$16,570	$19,199	$27,583	$68,665
Materials and Services	---	---	---	---	$26,400
Total Expenditures	$23,681	$16,570	$19,199	$27,583	$95,065
UNAPPROPRIATED ENDING FUND BALANCE:	$17,139	$11,412	$7,835	$44,602	$90,185

The principal revenues of the Street Equipment Reserve Fund were transfers from the Street Fund and intergovernmental transfers from the State.

Potential Future Transportation Funding Sources

There are a variety of methods to generate revenue for transportation projects. Funding for transportation improvement projects are derived from three sources: federal, state and local governments. Appendix E provides a summary of federal, state and local highway, bridge, sidewalk, bicycle and transit funding programs that have typically been used in the past. Although property tax is listed as a possible revenue source, the impacts of Ballot Measure 47/50 are likely significant, but still vague.

Most Federal funding is passed through ODOT to the local jurisdictions. *A good working relationship with ODOT Region 4 planners and the Region Manager is important to have major transportation improvements included as part of the STIP when it is updated every two years.* ODOT maintains interstate and state highways - in Prineville this includes the Ochoco, the Madras-Prineville, Crooked River, O'Neil and Paulina Highways. State and federal funds administered through ODOT are the primary sources of funding for improvements to this facility.

ODOT's contribution towards transportation improvements in Prineville are needed within the next 10-20 years. Five significant projects include partnering with Prineville to:

(1) improve traffic control on Third Street,
(2) complete the Northern Arterial,
(3) construct the OR 126/US 26 roundabout,
(4) construct the OR 126/McCall interchange, and
(5) re-align O'Neil Highway to US 26.

The City of Prineville must look to local measures to fund future capacity projects. Potential funding sources are typically judged based on a number of criteria, including:

- legal authority
- financial capacity
- stability
- administrative feasibility
- equity
- political acceptability

The Prineville TSP includes a more focused evaluation of the following measures which could be used to fund Prineville's share of needed transportation system improvements:

- Local vehicle registration fees
- Local gasoline taxes
- Road improvement bonds
- System Development Charges (SDC)

Each of these measures was investigated to ascertain the 20-year level of revenue generated based on (assuming a revenue distribution based on future, year 2018 population).

Local Vehicle Registration Fee

Statewide vehicle registration fees are lowest in Oregon ($27/year) when compared to neighboring states, as shown in **Table 8-4**. As only counties can implement local vehicle registration fees in Oregon, Prineville would have to work with Crook County to initiate this measure. A summary of annual and 20-year revenues from a local vehicle registration fee in Prineville is provided in **Table 8-5**. Local revenues are listed with options for both a $10 and $20 local fee in addition to the current $27/year statewide fee. County-wide (including incorporated cities) revenues from a $10-$20 local vehicle registration fee ranges from $6.7 to $13.4 million over 20 years. Revenues allocated to Prineville are estimated at $3.9 million over 20 years based on a $10 per year local vehicle registration fee. Regardless of the option chosen, a local vehicle registration fee would require local voter approval.

Table 8-4
Comparison of Automobile-Related Taxes
(as of 2005)

Tax	Oregon	Washington	California	Idaho	Nevada
Gas Tax	$.24/gal	$.28/gal	$.19/gal*	$.26/gal*	$.257/gal
Registration Fee	$27/year	$33/year	$28/year	$29.25/year	$33/year
Ad Valorem Tax	$0	$172/year	$148/year	$0	$78/year
Auto Sales Tax**	$0	$191/year	$191/year	$123/year	$172/year

Source: ODOT, Funding the Oregon Transportation Plan, 2005.
* Idaho, California includes sales tax
** Prorated over eight years.

Table 8-5
Local Vehicle Registration Fee Option

	2005 ANNUAL REVENUE Local Vehicle Registration Options		**20-YEAR REVENUE** Local Vehicle Registration Options	
Jurisdiction	$10/yr	$20/yr	$10/yr	$20/yr
Prineville	$155,700	$311,400	$3,898,600	$7,797,200
Unincorporated Co.	$110,800	$221,600	$2,776,900	$5,553,800
TOTAL	**$266,500**	**$533,000**	**$6,675,500**	**$13,351,000**

Local Gasoline Tax

The State of Oregon collects gas taxes, vehicle registration fees, overweight/over height fines and weight/mile taxes and returns a portion of the revenue to cities and counties through an allocation formula. Based on 1992 conditions, cities received approximately 16 percent of the net revenues of the state highway fund; counties received 24 percent and the state kept 60 percent. The revenue share allocated to cities was then divided among all incorporated cities based upon population.

State gas tax revenues received by cities are mostly dedicated to road construction and maintenance. As previously mentioned, the City currently uses these funds primarily for ongoing maintenance and street support services. Prineville is one of only a few cities in Oregon that has recently issued revenue bonds secured by future gas tax receipts for specific road projects.

In addition to the state gas tax, some local governments (city of Woodburn and Washington and Multnomah counties) currently levy additional local gas taxes with such revenues being used to fund street-related improvements throughout the jurisdiction. A preliminary analysis (based on a 1992 profile) of the revenue that could be generated from a one cent gas tax levied throughout the City of Prineville is shown in **Table 8-6**.

Based on an approximation of gasoline sales in Crook County, a one cent per gallon local gas tax could produce revenues of about $35,000 per year. This revenue projection should be considered a very rough approximation only and should be explored in greater depth if the City views a local gas tax as an attractive option for funding its transportation need.

Table 8-6
Estimate of Revenue Generated from Hypothetical Crook County Gas Tax

Registered vehicles statewide	29,410,008
Registered vehicles Crook County	19,101
Crook County as a % of State	0.65%
Total Apportionment to counties	$108,101,496
Crook County apportionment	$690,171
Crook County as a % of State	0.64%
Estimate of Crook County Share of State total	0.64%
Estimated gallons sold statewide	1,447,400,000
Estimated gallons sold in Crook County	9,320,665
Estimated County revenues from 1 cent gas tax	$93,207
Crook County population	14,600
Prineville population	5,515
Prineville as a % of Crook County	37.8%
Prineville share of Crook County gas tax	
1 cent	$35,208
2 cent	$70,416
3 cent	$105,624

Road Bond Measure

Local property taxes could be used to fund transportation improvements. Roadway capital improvements are typically funded by a serial levy that implements property taxes for a set period of time, often for a specific set or list of projects. Voter approval is required for serial levies. Since passage of Measures 5 and 47/50, property tax levies are primarily used to support General Obligation bonds that finance transportation improvements, because levies for bonded indebtedness are exempt from property tax limitations.

Table 8-7 summarizes a range of road bond options based on the rate of added bond indebtedness ranging from $.25 to $.60 per $1,000 assessed property value. The estimated 20-year revenues from city-wide bond measure options ranges from $1.4 to $3.4 million.

Table 8-7
Road Bond Option

Prineville Total Assessed Valuation (2005 est.)	20-Year Revenues (in Millions) Rate per $1,000 Assessed Value							
	$.25	$.30	$.35	$.40	$.45	$.50	$.55	$.60
$281,983,000	$1.4	$1.7	$2.0	$2.3	$2.5	$2.8	$3.1	$3.4

System Development Charges

An increasingly common source of transportation funding is the collection of system development charges *(SDCs)* from new development. These charges are generally based on a measurement of the demand that a new development places on the street system and the capital cost of meeting that demand. These are one time fees collected as the development comes on line. Prineville recently adopted their own SDC for transportation by Ordinance #1111 (methodology) and Resolution # 962 (rate structure). It is anticipated that new development will pay approximately $10 million in transportation SDCs between 2005 and 2025. The SDC revenues will be spent towards future capacity improvement needs to serve growth.

Assessments

Local improvement districts *(LIDs)* may be formed under Oregon Statutes to construct public improvements such as streets, sidewalks and other improvements. Formation of an LID can be initiated by property owners or by the City, subject to remonstrance. Local improvement districts are appropriate for those kinds of improvements that provide primarily local benefits. When improvements are made within the district, the cost of the improvement is generally distributed according to benefit among the properties within the district. The cost becomes an assessment against the property which is a lien equivalent to a tax lien. The property owner may pay the assessment in cash or apply for assessment financing according to terms offered by the City.

Recommended Local Funding Sources

The range of alternative transportation funding mechanisms was reviewed to determine the most feasible methods available to meet the identified funding needs. A funding package combining State, County and City Road Funds, system development charges as well as general obligation bond financing and local vehicle registration fees appears to represent the most feasible funding strategy available to the City to meet expected capital and maintenance funding needs.

This funding plan was developed after carefully reviewing the feasibility of the other financing options. The effectiveness of the City adopting a local gas tax was considered; however, although this may produce significant revenues, the political feasibility of this option is questionable unless it is imposed by the three counties in the region. For example, if the three counties, Deschutes, Crook and Jefferson all decided to increase gas taxes by the same amount, the cities close to the borders of each county would not have to worry about losing business to the other counties. If the City wanted to pursue this funding option, the City would have to coordinate with all the other jurisdictions in the region.

A modest county-wide vehicle registration fee ($10 per year) would yield an estimated $6.68 million county-wide over the next 20 years. In lieu of statewide funding measures a local vehicle registration might be supported in Crook County for use on local transportation projects.

The Prineville TSP Financial Plan, summarized previously in **Table 8-1**, includes the proposed local revenue sources utilizing the recommended funding measures identified in **Table 8-8**.

Table 8-8
Recommended Funding Sources

Funding Source/Rate	ADDITIONAL REVENUE
Transportation SDC	*$10 million*
City-Wide Street Bond - 20 Years	*$2.8 million*
$0.50 per $1,000 assessed value	
Local Vehicle Registration Fee $10 per vehicle per year	*$3.9 million for Prineville UGB*

For the purposes of illustrating the impact of these new funding measures a simplified summary is provided based on a typical[1] household (dwelling) in Prineville. **Table 8-9** summarizes the added expenses for a "typical" dwelling to pay for needed transportation system improvements in the unincorporated areas of Prineville through these measures. Beginning in 2005, each typical dwelling would pay $20 per year in added vehicle registration fees. The Road Bond would add $2.8 million in local property tax over 20 years, totaling $90 in annual expense to the typical dwelling.

Table 8-9
Added Cost of New Transportation Funding Measures

New, City-Wide Transportation Revenue Measures	**Added Annual Expense for Typical Dwelling: in 2005**
Local Vehicle Registration Fee ($10/year)	$20
Road Bond ($.50 per $1,000 assessed value)	$90
TOTAL	$110

Additional evaluation of the economic impact of any new tax and bonding measures, particularly a local gasoline tax should be completed before a public vote and eventual implementation (assuming voter approval). Furthermore, the introduction of new local funding measures will require significant public support. Those measures adopted by the County will require definition of local programs to administer the fee and/or tax collection programs

Summary

Like other cities in the state and nation, Prineville faces challenges in providing a local transportation system able to meet the needs of its citizens. Having identified a total of over $35 million in needed transportation system improvements, the City must develop a strategy for funding its share of the need. The potential participation of the Oregon Department of Transportation in funding of $ 8.79 million in state highway and possible off-system improvements in the City is a significant step in meeting the overall need.

The City's TSP funding needs over the 20-year period are almost $17.3 million. The combination of revenues over the twenty year period (see **Table 8-8**) about match Prineville's funding needs.

The City of Prineville should coordinate with ODOT and the Governor's office to enhance the State's investment levels for OR 126, other state highways, and off-system City street improvements that support OR 126 in and through Prineville. Further State investment on these Prineville projects are consistent with the state policy to maintain

[1] Single-family dwelling assessed at $120,000, with 2 automobiles.

and enhance downtown areas a direct and effective growth management and livability policy.

A combined funding package including general obligation debt, local vehicle registration fees and system development charges represents the preferred funding strategy. The City of Prineville should immediately update their transportation SDC methodology ordinance to reflect the revised list of future capacity improvement projects and their costs.

APPENDIX A

SUMMARY OF EXISTING PLANS AND POLICIES

The following plans and reports are summarized in this appendix:

STATE OF OREGON

I. 1999 Oregon Highway Plan

CROOK COUNTY

II. The Crook County - Prineville Area Comprehensive Plan (1978)

III. Crook County Transportation System Plan (2005 Draft)

CITY OF PRINEVILLE

IV. Airport Master Plan (2003)

V. City of Prineville Downtown Enhancement Plan (1997)

VI. City of Prineville Draft Comprehensive Plan (2005)

VII. City of Prineville Traffic Impact Analysis (TIA) – Development Requirements

VIII. City of Prineville Transportation Systems Development Charge

IX. City of Prineville Land Development Ordinance No. 1057 (1998)

STATE OF OREGON

I. 1999 Oregon Highway Plan

The 1999 Oregon Highway Plan defines policies and investment strategies for Oregon's state highway system for the next 20 years. It further refines the goals and policies of the Oregon Transportation Plan and is part of Oregon's Statewide Transportation Plan. The Plan has four main elements:

- The **Vision** presents a vision for the future of the highway system, describes economic and demographic trends in Oregon and future transportation technologies, and summarizes the policy and legal context of the Highway Plan.
- The **Policy Element** comprises five goals, or policy areas: system definition, system management, access management, travel alternatives, and environmental and scenic resources.
- The **System Element** contains an evaluation of various ways to carry out the Policy Element, a description of the preferred investment strategy, and an implementation plan to address the Plan's goals.

Goal 1: System Definition

To maintain and improve the safe and efficient movement of people and goods and contribute to the health of Oregon's local, regional, and statewide economies and livability of its communities.

Of significance to the Prineville TSP is the OHP highway mobility standards policy, which establishes standards based on volume to capacity ratios that vary according to highway functional classification and urban and rural land use types. The OHP volume to capacity thresholds are summarized in Table A-1.

Goal 2: System Management

To work with local jurisdictions and federal agencies to create an increasingly seamless transportation system with respect to the development, operation and maintenance of the highway and road system that:

- Safeguards the state highway system by maintaining functionality and integrity;
- Ensures that local mobility and accessibility needs are met; and
- Enhances system efficiency and safety.

Goal 3: Access Management

To employ access management strategies to ensure safe and efficient highways consistent with their determined function, ensure the statewide movement of goods and services, enhance community livability and support planned development patterns, while recognizing the needs of motor vehicles, transit, pedestrians and bicyclists.

Table A-1 Mobility Standards for Prineville UGB Area – Volume-to-Capacity Ratios for State Highways[1] and Local Streets

Highway Route No.	From	To	Volume-to-Capacity Ratios			Highway Category
			STA2	Posted Travel Speed		
				< 45 mph	> = 45 mph	
US 26	Prineville UGB	OR 126 ("Y")		.80	.75	Region
OR 27	US 26	First St	.95			District
OR 27	First St	Prineville UGB		.85	.80	District
OR 126	Prineville UGB	O'Neil Hwy		.70	.70	State / Expressway
OR 126	O'Neil Hwy	US 26 ("Y")		.80	.75	State / NHS
OR 126	Locust St	Knowledge St	.90			State / NHS
OR 126	Knowledge St	Prineville UGB		.80	.75	State / NHS
OR 370 (O'Neil)	Prineville UGB	OR 126		.85	.80	District
OR 380 (Paulina)	US 26	Prineville UGB		.85	.80	District

1. Oregon Highway Plan, 1999.
2. Special Transportation Areas, adopted by Oregon Transportation Commission, 2004.
3. Traffic on non-state highway approaches that must either stop or yield shall not exceed the V/C for District highways.

Goal 4: Travel alternatives

To optimize the overall efficiency and utility of the state highway system through the use of alternative modes and travel demand management strategies.

Goal 5: Environmental and Scenic Resources

To protect and enhance the natural and built environment throughout the process of constructing, operating, and maintaining the state highway system.

OHP Appendix C: Access Management Standards

The OHP includes access management spacing standards for interchanges and highways, by functional classification. The most directly related standards are summarized in Table A-2. Other access management policies are included in the 1999 OHP, Appendix B, and in Division 51 of the Oregon Administrative Rules.

TABLE A-2

Urban Access Management Spacing Standards for State Highways[1]

(measurements in feet, center to center on same side of roadway)

Highway Category	Posted Speed	Expressway	Other	STA
Statewide	55+ mph	2640	1320	
	50 mph	2640	1100	
	40-45 mph	2640	990	
	30-35 mph		770	City Block[2]
	25 mph or less		550	City Block
Regional	55+ mph	2640	990	
	50 mph	2640	830	
	40-45 mph	2640	750	
	30-35 mph		600	City Block
	25 mph or less		450	City Block
District	55+ mph	2640	700	
	50 mph	2640	550	
	40-45 mph	2640	500	
	30-35 mph		400	City Block
	25 mph or less		400	City Block

1 See *1999 Oregon Highway Plan* for specific access spacing criteria and definitions.

2 Minimum spacing for public road approaches is either 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 STAs driveways are discouraged. However, where driveways are allowed and where land use permit, the minimum spacing fro driveways is 175 feet or mid-block if the current city block spacing is less than 350 feet.

Highway Designation	Highway	From	To
Statewide / Expressway	OR 126	West UGB	O’Neil Hwy
Statewide / NHS	OR 126	O’Neil Hwy	Locust Street
Statewide / NHS / STA	OR 126	Locust Street	Knowledge Street
Statewide / NHS	OR 126	Knowledge Street	East UGB
Region	US 26	NW UGB	OR 126
District / STA	OR 27	OR 126	First Street
District	OR 27	First Street	South UGB
District	OR 370 (O’Neil)	NW UGB	OR 126
District	OR 380 (Paulina)	First Street	South UGB

CROOK COUNTY

II. The Crook County - Prineville Area Comprehensive Plan (1978)

While Prineville's current comprehensive plan addresses many issues, only those sections pertaining to transportation planning were summarized. The 1978 comprehensive plan provides population projections for Prineville through the year 2000. Its transportation section of the report identifies traffic problems and recommends a series of improvements to be implemented. It also addresses other transportation facilities.

Traffic Problems and Recommend Solutions

The traffic problems identified in the comprehensive plan are located in the residential areas, in downtown core, and the "Y" intersection of US 26, OR 126, and Third Street. Recommended improvements are designed to address some of these problems.

Problems identified in the downtown core include:

- Third Street congestion;
- School, residential areas, and Ochoco Creek which dead-end many streets;
- No left turn facilities (since modified to current 3-lane traffic control);
- Insufficient loading facilities;
- Parking;
- Narrow lanes; and
- Heavy vehicle through traffic.

Problems identified in residential areas include:

- Wide streets which encourage high speeds;
- High maintenance costs of wide streets; and
- Traffic bypassing downtown congestion.

Problems identified at the "Y" intersection include:

- Hazardous design;
- Dangerous merge; and
- Narrow lanes.

The comprehensive plan provides a list of recommended improvements but does not provide any details about them. Many of these improvements do not address the problems described previously; however, they are all designed to improve traffic circulation within the city of Prineville. They include:

a. Extend NW Ninth Street to Madras Highway as a minor arterial.
b. Improve Laughlin Road to a minor arterial level.
c. Purchase right-of-ways for the extension of Lynn Boulevard to the "Y" intersection.
d. Construct a minor arterial from Laughlin Road to Tenth Street.
e. Improve the Lamonta Road/Main Street intersection
f. Improve Tenth street fro Main Street to Ninth Street at Locust Street
g. Designate and sign Laughlin road/Tenth Street as a truck route.
h. Bridge Court Street and Beaver Street across Ochoco Creek.
i. Improve McKay Road to Barnes Butte Road to principal arterial.
j. Improve Harwood Street to minor arterial.
k. Improve Lamonta Road to minor arterial.

Some of the arterial improvements were completed as part of the 10-year roadway resurfacing program began in 1983/1984. None of the extensions have been constructed.

Other Transportation Facilities

The plan also addresses other transportation facilities including the railroad, transit, pedestrian, and bicycle. It provides goals and guidelines rather than recommending specific improvements to these services.

The railroad service is an important part of Prineville industry. The goals of the City were to improve the safety of railroad crossings and to reduce time delays at crossings. It would also promote the advantages of rail service to potential new industry.

The Prineville transit service consists of taxis, out-of-town bus service, and a dial-a-ride senior citizen bus service. The City goals were to encourage transit usage and to encourage private efforts to supply additional shuttle services.

In 1978, pedestrian facilities were extremely limited outside of the downtown core and bicycle facilities were almost non-existent. Goals included preserving space on existing roadways for at least one bicycle/pedestrian path and insuring that activity centers have bicycle/pedestrian access. In the future, the City was supposed to require all subdivisions to provide pedestrian and bicycle access.

These goals cannot be easily evaluated for implementation. Railroad service continues to be an important part of the commercial transportation. Transit service has probably not changed considerably since the comprehensive plan was enacted. Some improvements may have been made to bicycle and pedestrian access. Main Street has a designated bike path and a second path runs along Ochoco Creek.

III. Crook County Transportation System Plan (Draft 2005)

The draft Crook County Transportation System Plan (TSP) was prepared to consider the County transportation planning needs for the next 20 years. The planning area does not officially include the Prineville urban area, but addresses many transportation issues and potential improvement projects within and around the Prineville UGB. The TSP found that the County's most heavily traveled roads are the State highways and that, with the exception of Highway 126, the highways are well below capacity and will continue to be below capacity by the year 2025. The highest growth is expected to occur on Highway 126 with traffic increases between 85 and 100%.

Several Prineville area projects are identified in the County TSP:

- **US 26/Harwood signal**
- **Crooked River Bridge (under design and construction)**
- **Millican Road Interchange with OR 126**
- **Crestview Road Extension Across Crooked River to OR 27**
- **Roundabout at Knowledge/high school entrance**
- **Add Bike lanes and sidewalks to Lynn Boulevard**

- **New Millican Road, alternative truck route, from OR 126 to US 20**

- **New Davis Road connection between Juniper Canyon and OR 27, south of Prineville**

CITY OF PRINEVILLE

IV. Prineville Airport Layout Plan and Airport Layout Plan Report (2003)

The Prineville Airport is part of the Oregon Aviation System Plan (OASP). It is owned and operated by Crook County and the City of Prineville to serve the aviation-related needs of the residents of the City of Prineville and Crook County. This Plan was prepared by Morrison Maierle, Inc. to update the 1986 Airport Layout Plan and the 1979 Master Plan. The following concerns were addressed in the study: locating agricultural applicator aircraft operations; protection of Runway Protection Zones; encroachment of commercial enterprises onto airport environs; location of airport access road; location of terminal and FBO building; utilization of terminal and airport industrial area; location of additional aircraft hangar area; future location and type of aviation fuel storage facility; and, utilization of triangular area inside runways and taxiways.

V. City of Prineville Downtown Enhancement Plan (1997)

The object of this Plan is to reinforce the downtown as an attractive center for community life, offering a diverse mix of shopping, business, entertainment, and recreation in an environment that is accessible for both residents and visitors. The Enhancement Plan focuses on Prineville's central business district: 3rd Street from Deer Street to Fairview Street. The study area encompasses 44 blocks with the boundaries extending from Deer Street to Fairview Street, and South 2nd Street north to Ochoco Creek. The Enhancement Plan includes an inventory and assessment of condition of existing sidewalks and bike lanes in the downtown.

The emphasis of the Enhancement Plan is on streetscape improvements. Including the following recommendations:

- Street and sidewalk improvements should include using a combination of several materials and forms with specific characteristics deemed important to the success of downtown streetscapes. The proposed sidewalk width of 10 to 12 feet allows the inclusion of trees and other street furniture without compromising ADA requirements or business access.
- Pedestrian flares (extensions) or half-flares are proposed at intersections of major arterials or collectors.
- Driveways should be designed to preserve sidewalk continuity.
- If a one-way couplet is developed, diagonal parking should be limited to the left side of the street, with parallel parking and a bike lane on the right side.
- On side streets that are collectors or local streets, it is recommended that improvements be made to clarify the marking and sizing of parking spaces.
- The City may wish to consider the restriction of the three parking lots it owns or leases to permit parking for downtown employees and other long-term users, freeing on-street parking for short-term (two hour) users.

The Enhancement Plan includes the following roadway dimensions as part of the conceptual alternative roadway improvements suggested for 2nd, 3rd, and 4th Streets.

Prineville Downtown Enhancement Plan
Conceptual Alternative Roadway Improvements

Street	**Lanes/Description**	**Pavement Width**	**Right-of-Way**
2nd St.	9' parallel parking, 6' bike lane, 12' eastbound lane, 13' westbound lane, 14' diagonal parking	54'	80'
3rd St.	9' parallel parking, 11' eastbound lane, 14' turn lane, 11' westbound lane, 9' parallel parking	54'	80'
4th St.	14' diagonal parking, 13' eastbound lane, 12' westbound lane, 6' bike lane, 10' parallel parking	54'	80'

VI. City of Prineville Comprehensive Plan (Draft 2005)

The City of Prineville's Draft Comprehensive Plan (January 2005) addresses a wide range of planning issues; this summary focuses on those related to transportation system planning.

Chapter 7 of the Comprehensive Plan is the Transportation and Circulation element and includes the following Goals:

Goal 1 - "To create a functional transportation system recognizing that vehicle use is the primary mode of travel overall and that incorporating alternate mode use into the transportation system will result in maximizing and extending the life of transportation facilities and improve livability throughout the Prineville community."

> *Under Goal 1 are a series of multi-modal policies and programs to address the Goal, including directives to Prineville's TSP effort, which have largely been addressed as part of the 2005 TSP Update.*

Goal 2 - "To create a functional transportation system that is designed to operate efficiently and effectively balanced against the need to preserve a high degree of community livability as growth occurs."

> *Under Goal 2 are a series of design values, policies and recommended programs addressing a Prineville vision of "livability" regarding multi system designs and operations; which have largely been addressed as part of the 2005 TSP Update.*

Goal 3 - "To create a reasonable method for determining and monitoring street capacity and service levels for providing an effective and efficient transportation system."

> *Under Goal 3 are a series of design values and policies addressing traffic operations which have been addressed as part of the 2005 TSP Update.*

Goal 4 - "To create a reasonable method for determining adequate and consistent transportation impact analyses, mitigation procedures and options."

Under Goal 4 are a set of values and policies addressing measurement standards and tools to evaluate impact of traffic growth. Some of the draft language acknowledging "subjectivity" in analytical methods or practices is at odds with professional standards and practices, and should be revised. The threshold by which traffic studies are to be conducted is set at "20 trips," and is unclear whether that is 20 new trips per day or per peak hour, but should be clarified consistent with the City's current policy and requirements.

Further, the City has adopted its own traffic analysis requirements (see below), which stipulate 200 trips per day and/or 20 trips per peak hour as the threshold for traffic studies.

Goal 5 - "To create a reasonable financing method for funding necessary transportation system master plan improvements over the life of the General Plan."

Under Goal 5 are a set of values and policies addressing transportation finance; largely addressed by both the 2005 TSP Update and SDC.

VII. City of Prineville Traffic Impact Analysis (TIA) – Development Requirements Policy (summarized in its entirety)

The City of Prineville recently adopted and now administers requirements for traffic studies.

City of Prineville
Traffic Impact Analysis (TIA) - Development Requirements Policy

1. ***Purpose and Intent***

The policy applies to new development, expansions to existing development and changes in use of existing development going through the City's land use approval process. The Traffic Impact Analysis (TIA) shall assist City staff in assessing the transportation system's ability to serve the development.

The transportation system, for purposes of this policy, is considered to be the system created by all individual elements that combine to move people and goods, including street rights of way, roadways, intersections, sidewalks, bike lanes, trails and transit system components within the City.

It shall be the responsibility of the developer to generate the TIA and submit it with the land use planning application. The TIA will be used by City staff to:

- *Evaluate site access and circulation,*
- *Evaluate the ability of the roadway system to support the proposed development,*
- *Determine specific on-site and off-site transportation system mitigation requirements, and*
- *Determine the development's share of future roadway improvements.*

2. ***Guidelines***

All Traffic Impact Analyses performed under this policy, within the City, shall be conducted under the direction of a registered professional engineer. The final report shall be stamped and signed by the registered Engineer responsible for the document. The Engineer's license shall be valid in the State of Oregon. Engineers performing each study shall discuss study requirements (trip generation, trip distribution, growth rates, e.g.) with the City to confirm each of these elements prior to completing the study.

2.1. Impact Analysis Study Area

The impact analysis study area shall include the frontage of the property and all access points. The area shall also include any intersection within 1000 feet of the site that would experience an increase of at least 200 vehicle trips per day.

2.1.1. Supplemental study issues may be identified by other affected jurisdictions (e.g., ODOT and Crook County) and will need to be addressed.

2.1.2. Projects that distribute trips to a residential local street and are projected to increase volumes on that street by 25% or more should propose traffic calming device designs and techniques that meet City approval. This traffic calming may be required through the land use decision and may take the form of cash payment for future installation of devices.

2.2. <u>Study Time of Day/Day of Week</u>

Analyses should be performed for the PM Peak hour of the transportation system. However, certain applications may also be required to study the peak hour of the proposed generator or the peak hour of a nearby major trip generator (school, e.g.) at the discretion of the City.

2.3. <u>Study Time Frames</u>

The analysis shall include the following study time frames:
- *Existing Traffic,*
- *Existing traffic plus project traffic at buildout, and at the end of each completed phase.*
  Five-year forecast after development of all phases of project. (Results of analyses performed for the 5-year projections are to be used by the City in development of the City's Capital Improvements Program.)

If a zone change that requires an amendment to the City's Comprehensive Plan/City's General Plan is an element of the land use proposal, then, an analysis shall be performed in keeping with Oregon's Transportation Planning Rule, Division 12.

Existing Traffic is a field count which reflects existing transportation system conditions and has been conducted within six (6) months of the land use planning application date. If major transportation system conditions have changed since the count, then a new field count should be performed. Field counts are to be a minimum of a 2-hour turning movement count (between 4:00 and 6:00 PM). Additional hour counts may be needed to justify traffic signal warrants or all-way stop warrants. Additional counts may also be required if hours other than the PM Peak are required to be analyzed. Counts may need to be seasonally adjusted.

Background Traffic is the calculated total of a field count (Existing Traffic) plus 100 percent of the traffic from other approved, but not as yet constructed developments, plus growth related trips. Growth related trips are to be calculated by the most accurate of the following methods and approved by the City:
- *based on historic counts for the area, or a minimum of three (5) percent per year.*
- *an interpolation between the Existing Traffic and either the City's 20 Year TSP projections or other longer term studies.*
- *ODOT's Transportation Planning Analysis Unit (TPAU) traffic projections for the roadway in question.*

2.4. <u>Transportation System Conditions</u>

For analysis purposes, engineers should consider existing transportation system conditions (control type and roadway geometry) to be field conditions. However, engineers may also consider committed transportation facilities as those which include a guaranteed financing mechanism:
- *City's one year Capital Improvement Program (CIP)*

- *County's one year Capital Improvement Program (CIP)*
- *ODOT's Statewide Transportation Improvement Program (STIP) (two years are committed)*
- *Private projects.*

Examples of private projects with guaranteed financing mechanisms include those for which a construction bond has been provided or for which a local improvement district has been fully formed by the City Council. The City shall make the final determination as to whether a private project may be considered as a "committed facility" for purposes of traffic impact analysis.

2.5. Trip Generation

Trip generation should coincide with the specific site use. If a specific site use is not identified and applied for at the time of the analysis, then the worse case trip generation for outright permitted uses within the zone shall be used.

Trip generation calculations are to be based on studies conducted by the Institute of Transportation Engineers (ITE) and summarized in the Trip Generation Manual, 6th Edition (or subsequent document updates). If trip rates other than those found in the Trip Generation Manual are desired to be used, the procedures in the ITE Trip Generation Handbook shall be followed and the results approved by the City.

2.6. Trip Distribution

Trips should be distributed based on current traffic turning movements and may be adjusted to reflect future, financially assured, transportation system connections. Trips should be distributed out one 1000 feet from the site, and down to 20 Peak Hour trips.

2.7. Safety/Crash Histories

Crash histories, when required, shall provide a three (3) year history of reported crashes. A reported crash is one with a report filed either with the Department of Motor Vehicles, Oregon State Police, Crook County Sheriff's Office, or the City Police Department. These shall be reported for all impacted intersections or at those locations requested by the City.

2.8. Traffic Impact Analysis Reports

Traffic Impact Analysis reports shall be prepared consistent with this policy, at the expense of the developer, meeting the requirements described herein. Trip generation letters may be provided in lieu of Traffic Impact Analysis reports for applications to demonstrate that they generate less than 200 trips per day, and verify that the site access driveways meets sight distance, operations and safety requirements.

3. Evaluation Measures & Intersection Operations

This section sets out and defines standards for intersection operations on the City's public road system. Operations should be assessed by the methods outlined in the Transportation Research Board's 2000 Highway Capacity Manual (or more current edition). In the case of roundabouts, the SIDRA model may also be used.

3.1. Operations Standards

The following standards define acceptable intersection operations. These standards shall apply for the entire peak hour.

3.1.1. Two-Way Stop Control (TWSC)

- *Delay for individual lane groups less than or equal to 50 seconds, and*

- *Volume to capacity ratio for individual lane groups less than or equal to 1.0, and*
- *95th percentile queuing less than or equal to storage length available.*

3.1.2. All-Way Stop Control (AWSC)

- *Delay for the intersection as a whole less than or equal to 80 seconds.*

3.1.3. Roundabout

- *Volume to capacity ratio for individual approaches less than or equal to 1.0.*

3.1.4. Signalized Intersection

- *Delay for the intersection as a whole less than or equal to 80 seconds, and*
- *Volume to capacity ratio for the intersection as a whole less than or equal to 1.0, and*
- *95th percentile queuing less than or equal to storage length available.*

3.2. Timing of Intersection Operations

As stated earlier, the transportation system should adequately serve the proposed additional trips as indicated by the above evaluation measures and operations criteria. This adequacy can be demonstrated by meeting the operations standards described above for the intersection at the time of final platting of the development or individual phases.

This concurrency requirement may be obtained by having any required mitigation constructed and in place or by creating a guaranteed funding mechanism for the mitigation to be constructed when it is shown to be physically needed in the field (Existing Traffic). This analysis may be performed on a semi-annual basis, at which time the intersection is shown to exceed the operations criteria, the improvements shall be constructed.

An intersection of higher order streets (arterials and collectors) shall be required to operate acceptably during the evaluation period. Intersections that are under the jurisdiction of the Oregon Department of Transportation shall also meet the applicable mobility standards from the Oregon Highway Plan. New development that will cause degradation below these levels shall be required to provide mitigating transportation system improvements that will restore the system, as is practical, as determined by the City.

For the operations of two-way stop controlled local streets, private streets or driveways (side streets) intersecting with a neighborhood, collector or arterial, the operations of the neighborhood, collector or arterial shall be given higher importance than the operations of the side street. If an intersection of a side street with a neighbirhood, collector or arterial is shown to fall below the acceptable operations standards defined above, the evaluation should also provide a discussion of system operations from a corridor point of view, including alternate routes to controlled intersections, corridor control spacing, pedestrian crossing ability, control warrants, and safety history. Mitigations can include addition of turn lanes or turn restrictions to the side street, pedestrian crossing improvements or status quo if safety is determined to be adequate.

Nothing in this policy diminishes the obligation of an applicant to contribute a proportional share toward the costs of the Master Plan improvement that will eventually be needed to increase the capacity of the affected facility(ies) to handle traffic volumes anticipated at build-out.

3.3. Mitigation

Incremental improvements may be considered for mitigation as long as the safety of an intersection is not compromised. Consecutive incremental improvements should build upon themselves, contributing to the ultimate intersection geometrics and operations. That is, improvements should be constructed from the centerline of the roadway out. Improvements must *bring the intersection back into acceptable operations as defined above. Any incremental transportation improvement must also accommodate bike and pedestrian movements.*

Improvements may include the following:
- *Left turn pockets*
- *Increased storage lengths*
- *Right turn lanes, slip lanes*
- *Conversion of Two Way Stop Control to All Way Stop Control if warrants are met*
- *Conversion of an All Way Stop Control to a roundabout or signal if warrants are met*
- *Improved signal progression (interconnect, master controller, retiming)*
- *Create phase overlaps*
- *Add through lanes.*

Any suggested changes to signal timing must evaluate the effects to the entire network of affected signals and not just the signalized intersection in question.

The Prineville policy should be updated to reflect more current documentation (ITE Trip Generation 7th edition (2003), and the TSP volume to capacity measures.

VIII. City of Prineville Transportation Systems Development Charge

Prineville recently adopted their own SDC for transportation by Ordinance #1111 (methodology) and Resolution # 962 (rate structure). It is anticipated that new development will pay approximately $10 million in transportation SDCs between 2005 and 2025. The SDC revenues will be spent towards future capacity improvement needs to serve growth. The City's SDC methodology and rate structure should be updated based on the 2005 TSP Update findings and project list.

IX. City of Prineville Land Development Ordinance No. 1057 (1998)

The Land Development Ordinance addresses a wide range of issues, this summary will focus on those specific to transportation only. Section 1.020 includes the following purpose statement, *"To lessen congestion by providing adequate transportation facilities for all modes of travel"*.

All of the residential, commercial and industrial Zones (except M-2) identified in the Ordinance permit the following transportation-related uses outright:

- Maintenance and repair of an existing transportation facility, including reconstruction, surfacing, minor widening or realignment of an existing road within an existing right-of-way, including the addition of turn refuges at existing street intersections, but not including the addition of "through" travel lanes.
- Replacement of bridges and other stream or canal crossing facilities.
- Bikeways, footpaths, and recreation trails.
- Construction of new streets and roads, that are included within locally adopted Transportation Systems Plans (as may be amended), the State Highway Transportation Improvement Plan, or as has been identified in a specific development review and approval process.

Other transportation-related uses are permitted conditionally in all residential, commercial and industrial Zones (unless specified otherwise).

- The addition of "through" travel lanes to an existing street within the existing right-of-way, and/or the extension of an existing street not previously planned. (Type I Conditional Use - except in C-1, C-2, C-3, C-4, C-5, M-1, M-2)
- Construction of a new street not set forth within a locally adopted Transportation System Plan, State Highway Transportation Improvement Plan, or previously approved development plan. (Type II Conditional Use - except in C-4, C-5, M-1, M-2)

Within the Airport Zones (AA, AO, AD, AC, AM), the following transportation uses are permitted outright with some variations in the specific Code language, except that within the A-R zone, transportation uses are permitted similarly to other residential uses described above.

- Uses of a public works, public service or public utility nature, including the maintenance or improvement of such, and including runway, taxiway, street or road construction or maintenance activities.

Within the Open Space-Park Reserve Zone (PR), the following transportation uses are permitted outright:

- Normal maintenance, replacement and improvement activities for existing parks, recreation, streets and roads, and other public works facilities.
- The development of parks, recreation areas and facilities, streets, roads, and other public works facilities that were adopted as part of a Plan element and/or a separate Plan document directly related thereto prior to the effective date of this Ordinance, or such development approved as part of an overall development plan in compliance with this Ordinance.

Other transportation-related uses are permitted conditionally in the Open Space-Park Preserve Zone.

- Bridge crossings and support structures therefore. (Type II Conditional Use)
- Public or private utility or public works facilities, including but not limited to, water systems, sewer systems, streets, roads, substations, pumping stations, sewer lift stations, etc. (Type II Conditional Use)

Within the Significant Resource Combining (SR) Zone, if uses permitted outright in the underlying zone are identified as "conflicting" they are become Type I Conditional Uses. The following Conflicting Uses and Activities relate specifically to transportation activities.

Wetlands, and within 100 feet of a "significant wetland"
- Fill for any purpose, usually but not necessarily in conjunction with building, road and roadway construction and siting.

Archaeological Resources
- Any activity requiring excavation.
- Construction activities.
- Activities resulting in permanent coverage of an identified resource or site.

Scenic Resources
- Any permanent use screening, inhibiting or detracting from public view of the subject resource
- Any activity directly altering the scenic value of the resource.
- Alteration of the scenic resource site.

Unique Resources

- Any use identified as having an adverse impact on such designated uses and the identified value(s) thereof.

Historic Resources

- Demolition or alteration

Mineral and Aggregate Resources

- Any permanent use which reasonably precludes the development and use of such resource for the use designated or intended.
- Wildlife habitat area or scenic waterway or highway

Fish and Wildlife Habitat

- Removal of habitat except when associated with habitat improvement.

Groundwater Resources

- Development in areas when the aquifer may be depleted.
- Development that may pollute groundwater.
- Development in areas of high groundwater tables.

Natural Areas

- Utility facilities, including overhead power lines and transmission towers, substations, etc.

Section 4.080 includes design and improvement standards for off-street parking and loading facilities, and other requirements relative to off-street parking and loading facilities. Minimum off-street parking space requirements are identified by use.

Section 4.100, Riparian Habitat, applies in addition to the standards of the SR Zone to areas within 25 feet of the ordinary highwater line or identified stream channel of Ochoco Creek, and 50 feet from the ordinary high water line or identified stream channel of the Crooked River. Within these designated Riparian areas, the following standards are applied to transportation-related uses.

Roadways and Structures shall not be located within said identified riparian areas unless:

- For an approved bridge or other stream crossing; or
- Roadway access is required for an otherwise approved use.

All trees, and at least 50 percent of the understory vegetation shall be retained within identified riparian habitat areas, with the following exceptions:

- Vegetation removal necessary to provide direct access for a water-dependent use, or for new bridge construction, or for routine repair, operation, or maintenance of bridges and highways, or for the necessary construction of a street or highway improvement within an existing right-of-way, or an otherwise approved use.
- Vegetation removal necessary for maintenance of clear vision areas and the removal of roadside hazards.

Section 5.090, Exception for Public Street and Highway Improvements, allows exceptions for some transportation-related projects pursuant to the following language:

> Excepting for those activities specifically regulated by this Ordinance, the following public street and highway improvement activities are permitted outright in all zones and are exempt from the permit requirements of this Ordinance.

(1) Installation of additional and/or passing lanes, including pedestrian and/or bike ways, within a street or highway right-of-way as of the effective date of this Ordinance, unless such adversely impacts on-street parking capacities and patterns.

(2) Reconstruction or modification of public roads and highways, not including the addition of travel lanes, where no removal or displacement of buildings would occur, and/or no new land parcels result.

(3) Temporary public roads and highway detours that will be abandoned and restored to original condition or use at such time as no longer needed.

(4) Minor betterment of existing public roads and highway related facilities such as maintenance yards, weight stations and rest areas, within a right-of-way existing as of the effective date of this Ordinance and contiguous public-owned property utilized to support the operation and maintenance of public roads and highways provided such is not located within a duly designated Residential Zone, or adjacent to or across the street from a lot or parcel within such a Zone, or in an Open Space-Park Reserve Zone or a Significant Resource Combining Zone.

(5) The construction, reconstruction or modification of a public street or highway that is identified as a priority project in a Transportation System Plan (TSP) or State Transportation Improvement Plan (STIP) that was duly adopted on or before the effective date of this Ordinance.

Section 5.100, Exception for Public Facilities Improvement or Reconstruction, allows additional exceptions for some transportation-related projects pursuant to the following language:

Minor betterment, improvements, replacement or reconstruction of existing public facilities such as sewer and water lines, storm-water drainage facilities, bikeways, and similar public facilities, sidewalks and other pedestrian ways or facilities, bikeways, and similar public facilities within rights-of-ways and easements for said purposes existing on or before the effective date of this Ordinance, or on contiguous publicly-owned property designated, intended or utilized to support such facilities, or such facilities that are set forth within an adopted Public Facilities Plan or other capital improvements plan duly adopted on or before the effective date of this Ordinance, are exempt from the permit requirements of this Ordinance unless specifically set forth otherwise.

Article 6, Conditional Uses, establishes General Criteria for determining whether or not a Conditional Use shall be approved or denied and General Conditions which may be found to be necessary to avoid a detrimental impact. The following general criteria and conditions could be of particular significance to transportation-related projects:

General Criteria

- The proposal is compatible with the City Comprehensive Plan and applicable Policies set forth thereby.
- That no approval be granted for any use which is or expected to be found to exceed resource or public facility carrying capacity.

General Conditions

- Increasing street width and/or requiring improvements to public streets and other public facilities serving the proposed use, even including those off-site but necessary to serve the subject proposal.
- Designating the size, number, improvements, location and nature of vehicle access points and routes, and requiring pedestrian and/or bicycle ways.

Article 7, Subdivisions and Partitionings, establishes minimum standards governing the approval of land divisions. A statement setting forth proposed types of housing and other uses to be accommodated, and a projection of traffic generation and population is required in a Outline Development Plan. Requirements for approval include the following transportation-related standards:

- The subdivision will not create an excessive demand on public facilities and services required to serve the proposed development, or that the developer has proposed adequate and equitable improvements and expansions to such facilities with corresponding approved financing therefore to bring such facilities and services up to an acceptable capacity level; and (GOAL 11)
- The streets and roads are laid out so as to conform to an adopted Transportation System Plan for the area, and to the plats of subdivisions and maps of major partitions already approved for adjoining property as to width, general direction and in all other respects unless the City determines it is in the public interest to modify the street or road pattern; and
- Streets and roads for public use are to be dedicated to the public without any reservation or restrictions; and Street and roads for private use are approved by the City as a variance to public access requirements.

Section 9.050, Streets and Other Public Facilities, establishes street design and improvement standards and requirements for new development. The proposed street location and pattern is required to be shown on the development plan, and the arrangement of streets must either: (a) provide for the continuation or appropriate projection of existing principal streets in surrounding areas; or (b) conform to a plan for the general area of the development approved by the Planning Commission to meet a particular situation where topographical or other conditions make continuance or conformance to existing streets impractical; and (c) conform to the adopted urban area Transportation System Plan as may be amended.

Section 9.050 also establishes minimum right-of-way and roadway widths for development plans as follows.

Minimum Right of Way and Roadway Widths
from the City of Prineville Land Development Ordinance

Street Classification	**Min. ROW Width (feet)**	**Min. Roadway Width (feet)**
One-Way Major Arterial (2 lanes w/parking & bike lanes)	70	46
Two-Way Major Arterial (5 lanes w/bike lanes)	80-100	74
Minor Arterial (3-5 lanes w/bike lanes)	80-100	50-74
Collector (2 lanes w/bike lanes)	60-70	40-50
Local Residential	40-50	32-40
Cul-de-sacs	50	45
Radius for cul-de-sac Turn-Around	40-50	40
Alleys	16	16
Sidewalks	6-12	4-12
Bikeways	4-8	4-8

Section 9.060, Access Management, sets standards for new development for access points to Arterials and Collectors and establishes both general access management guidelines and special access management guidelines (for selected streets) as follows.

General Access Management Guidelines (Desirable design spacing - existing spacing will vary)

Minimum spacing between driveways and/or streets:

Major Arterial	500 feet
Minor Arterial	300 feet
Collector	50 feet
Local Streets	Access to each lot

Minimum spacing between street intersections:

Major Arterial	1/4 mile
Minor Arterial	600 feet
Collector	300 feet
Local Streets	300 feet

The Special Access Management Guidelines are the same as those included in the Comprehensive Plan (see above).

APPENDIX B TPR COMPLIANCE TABLE

The following TPR Compliance Table was intended to begin dialogue between the City of Prineville, ODOT and DLCD regarding the status of Prineville's current TPR Compliance, and then make decisions about how to proceed with the TSP Update work program.

Background

The TPR was written with a great deal of ambiguity which can lead to confusion, particularly with the many cross-references between sections. The following table re-organizes and summarizes the TPR by packaging like requirements into a more easily understood summary with the following major sections:

- **I. TSP Elements** (what needs to go into a TSP)
- **1) TSP Preparation** (how a TSP should be prepared)
- **2) Protection of Transportation Street Facilities** (policies and regulations needed to protect land use/transportation systems)
- **3) Coordination of Land Use Reviews and Decisions/Land Use Amendments** (policies and regulations)
- **4) Determination of Transportation Needs**
- **5) Evaluation and Selection of Transportation System Alternatives**

In addition to the TPR summary, the Table summarizes the following: 1) whether and how Prineville's current Comprehensive Plan, Land Development Code and TSP addresses the TPR requirements; and, 2) a summary and recommendation for policy change(s) or actions need to be taken to achieve TPR compliance.

■ TSP Elements

TPR Requirements	Current Code/Policy Compliance (Yes, No, N/A or Update)	Summary of Current Policies/Situation (Comp Plan = 1997 Comprehensive Plan) (Code = 1998 Land Development Code) (TSP = 1998 Draft TSP)	Summary of Recommended Policy Change or Action
OAR 660-12-020 (2) (b)			
TSP shall include a road plan including a functional classification consistent with state, regional and local/county TSPs.	Update	Code and TSP define functional classification and basic design elements.	The Prineville TSP includes a functional classification policy and map. ***For roadways within the UGB, modifications may be necessary. This should be done in coordination with the County and County TSP to ensure consistency.***
Road standards for local streets to: 1) Address extensions of existing streets;	1) Yes/Update	1) Code and TSP discuss street extension requirements.	1) Prineville's local street network planning is referenced in TSP**.** ***Update maps and text as needed.***
2) Connections to existing/planned arterials and collectors;	2)Yes/Update	2) Code requires new streets to either provide for the continuation of existing principal streets, conform to a plan for the general area or conform to the TSP.	2) Prineville's local street network planning is referenced in TSP. ***Update maps and text as needed.***
3) Connections to neighborhood destinations.	3)Yes/Update	3) Code and TSP discuss general access requirements.	3) Prineville's local street network planning is referenced in TSP. ***Update maps and text as needed.***
OAR 660-12-020 (2) (C)			
TSP shall include a description of public transportation services for the disadvantaged including: 1) Identification of inadequacies;	1) Yes	1) Identified in the TSP.	1) None
2) Description of intercity bus and passenger	2) Yes	2) Bus routes are described in the TSP. Rail is described in the Comp Plan and TSP	2) None
3) Identification of both existing and planned trunk routes, major transit stops and park-and-ride locations.	3) Yes	3) The Comp Plan and TSP address existing public transportation facilities and existing and projected demand.	3) None

■ TSP Elements

TPR Requirements	Current Code/Policy Compliance (Yes, No, N/A, Update)	Summary of Current Policies/Situation (Comp Plan = 1997 Comprehensive Plan) (Code = 1998 Land Development Code) (TSP = Draft 1998 TSP)	Summary of Recommended Policy Change or Action
OAR 660-12-020 (2) (d)			
The TSP shall include a bicycle and pedestrian plan.	Yes/Update	Comp Plan and TSP include objectives for accommodation of cyclists and pedestrians. Code has requirements for construction of bike facilities and sidewalks.	Prineville TSP includes a Bikeway Plan and a Pedestrian Plan. ***Update maps and text as needed.***
OAR 660-12-045(6)			
Bicycle and pedestrian plans must include improvements that connect neighborhood activity centers (schools, shopping).	Yes/Update	General policies and requirements for connectivity are contained within the Comp Plan, TSP and Code.	Prineville TSP includes a Bikeway Plan and a Pedestrian Plan.

OAR 660-12-020 (2) (e) The TSP shall include air, rail, water and pipeline transportation plans...For airports, the planning area shall include all areas within airport imaginary surfaces and other areas covered by state or federal regulations.	Yes/Update	Both the Comp Plan and TSP address the provision of air, rail and water. The Code includes airport zoning.	Prineville TSP addresses air, rail, water and pipeline transportation modes.
OAR 660-12-020 (2) (f) The TSP shall include a plan for transportation system management (TSM) and demand management (TDM).	NA/Yes	Components of TSM and TDM strategies are contained within the Comp Plan, TSP and Code; however, these are not required by the TPR for urban areas less than 25,000 persons.	The TSP includes Transportation Demand Management Measures.
OAR 660-12-020 (2) (g) The TSP shall include a parking plan.	NA	Not required for non-MPO areas.	None.
OAR 660-12-020 (2) (I) The TSP shall include a transportation financing plan.	Update	The TSP contains a transportation financing plan for identified projects.	*The TSP Financing Plan should be updated in 2005.*

■ TSP Elements

TPR Requirements	Current Code/Policy Compliance (Yes, No, N/A or Update)	Summary of Current Policies/Situation (Comp Plan = 1997 Comprehensive Plan) (Code = 1998 Land Development Code) (TSP = Draft 1998 TSP)	Summary of Recommended Policy Change or Action
OAR 660-12-020 (3) 1) An inventory of existing and committed 2) A system of planned transportation facilities, services and major transportation improvements including location, capacity and level of service.	1) Update 2) Update	The TSP includes an inventory of existing and committed transportation facilities and services. This is included in the TSP.	***This should be updated to identify new transportation projects, changes to the UGB and forecasts.***

■ TSP Preparation

TPR Requirements	Current Code Compliance (Yes/No/NA/ Update)	Summary of Current Policies/Situation (Comp Plan = 1997 Comprehensive Plan) (Code = 1998 Land Development Code) (TSP = Draft 1998 TSP)	Summary of Recommended Policy Change or Action
OAR 660-12-015 (2) MPOs are required to prepare regional TSPs consistent with state plans.	NA	The City of Prineville is not within an MPO	None.
OAR 660-12-015 (3) Cities are required to prepare local TSPs consistent with state plans.	Yes/Update	The TSP is generally consistent with state plans.	***Some revisions to the TSP may be necessary for consistency with OHP and Crook County TSP.***
OAR 660-12-015 (4) The TSP prepared by the City must be adopted as part of the Comprehensive Plan.	Yes/Update	The City adopted the TSP as part of its Comp Plan.	***The revised TSP will have to be adopted as part of the Comp Plan, superseding the existing TSP, and other policies must be reviewed for consistency.***
OAR 660-12-015 (5) Preparation of the TSP will be coordinated with state and federal agencies and other jurisdictions.	Yes/Update	The existing TSP was developed in coordination with state and federal agencies and other jurisdictions.	***Revisions to the TSP will include coordination with local, state and federal agencies, particularly ODOT and Crook County.***
OAR 660-12-015 (6) Transportation airport and port districts must participate in preparation of the TSP and adopt plans for the transportation facilities they maintain consistent with the TSP.	Yes	See response to 660-12-015 (5), above.	See response to 660-12-015 (5), above.
OAR 660-12-015 (7) Conflicts between regional TSPs and local plans may be resolved by changing draft TSPs, amending local plans or petitioning of DLCD.	Update	The regional (Crook County) TSP has been prepared; however, it may need to be revised due to changes in the Prineville UGB and the Prineville TSP update.	Any conflicts with the Crook County TSP will be resolved through the approved courses of action.

Protection of Transportation Street Facilities/Improvements

TPR Requirements	Current Code Compliance (Yes/No/NA/ Update)	Summary of Current Policies/Situation (Comp Plan = 1997 Comprehensive Plan) (Code = 1998 Land Development Code) (TSP = Draft 1998 TSP)	Summary of Recommended Policy Change or Action
OAR 660-12-045(2) Local governments shall adopt regulations/policies to protect transportation facilities for the following topics:			
1) Access management standards;	1) Yes/Update	1) TSP and Comp Plan include access management policies. Code includes access management guidelines.	1) ***Spacing standards in the Code should be revisited in light of Oregon Highway Plan.***
2) Future operation of roads and transit corridors;	2) Yes/Update	2)General policies and requirements for future operations are contained within the Comp Plan, TSP and Code.	2) TSP should address Mobility Standards consistent with the OHP.
3) Control of land use around airports;	3) Yes	3) Prineville has an Airport Overlay Zone.	3) See response to OAR 660-12-020 (2) (e).
4) Coordinated review of transportation facility	4) No	4) Prineville currently notifies County and ODOT as appropriate, but Code does not require this.	4) ***Change Code to require County and ODOT notification on pertinent land use applications and work with the County to include similar language in their Code.***
5) Process to apply conditions to development	5) Yes/Update	5) Current review process provides opportunity for conditioning of development proposals.	5) ***Consider Codes changes to identify more specific standards for new development, including Mobility standards and consistent traffic impact analyses.***
6) Amendments to Land use, density shall be consistent with road classifications in TSP.	6) No	6) Street classification and land use/density are not specifically coordinated.	6) ***Change Comp Plan and Code to require review of Mobility Standards and TSP when land use designations are requested***.

■ Protection of Transportation Street Facilities/Improvements

TPR Requirements	Current Code Compliance (Yes/No/NA/ Update)	Summary of Current Policies/Situation (Comp Plan = 1997 Comprehensive Plan) (Code = 1998 Land Development Code) (TSP = Draft 1998 TSP)	Summary of Recommended Policy Change or Action
OAR 660-12-045(3) Local governments must amend land use or subdivision regulations in accordance with the following directions:			
1) Provide bike parking in new retail, office and institutional developments, transit facilities and multi-family developments 4 units or more;	1) No	1) TSP and Code do not address bicycle parking.	1) ***Include bicycle parking policy in TSP and implementing standards in Code.***
2) Provision of pedestrian and bicycle	2) Yes	2) Provided by Code requirements for sidewalks, direct pedestrian connections and bike lanes.	2) None.
3) Off-site road improvements must accommodate bicycle and pedestrian facilities on arterials and major collectors;	3) Yes	3) Provided for in both the Code and Comp Plan.	3) None.
4) Provision of internal pedestrian circulation	4) Yes	4) Provided within pedestrian connection requirements in Code.	4) None.
OAR 660-12-045 (4) To support transit in urban areas containing a population greater than 25,000 with public transit, local governments shall adopt land use and subdivision regulations which require/allow:			
1) Provision of facilities designed to support transit use;	1) NA	Prineville's urban area is less than 25,000 persons.	None.
2) Building placement and clustering with direct, lighted pedestrian connections between building entrances and site circulation systems to transit facilities;	2) NA		
3) Implementation of access to transit facilities may be accommodated through adoption of pedestrian districts;	3) NA		
4) Employee parking in new developments shall provide designated carpool and vanpool parking;	4) NA		
5) Existing parking areas to be redeveloped for transit oriented uses;	5) NA		
6) Road systems for new development to provide direct accessways to transit facilities;	6) NA		
7) Designation of types and densities of land uses along transit routes which will support	7) NA		

APPENDIX C

MAJOR TRANSPORTATION SYSTEM STREET INVENTORY

Appendix C
2005 MAJOR STREETS INVENTORY
Prineville Transportation System Plan

Street Segment	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	# of Travel Lanes	Curbs	On-Street Parking	Sidewalks	Bikeway (1)	Pavement Condition
1st Street											
Deer Street to Knowledge Street	City	Local Route	25	80	54	2	Yes	Yes	Intermittent	Shared	Fair
2nd Street											
West of Locust Street	City	Local Route	25	80	40	2	No	Yes	No	Shared	Poor
Locust Street to Deer Street	City	Collector	25	80	53	2	Yes	Yes	Intermittent	Shared	Good
Deer Street to Main Street	City	Collector	25	80	55	2	Diagonal	Yes	Yes	Shared	Good
Main Street to Fairview Street	City	Collector	25	80	53	4	Yes	Yes	Intermittent	Shared	Good
3rd Street (Highway 26)											
Locust Street to Juniper Street	State	Arterial	25-30	80	55	3	Yes	Yes	Yes	Shared	Fair
Juniper Street to Laughlin Road	State	Arterial	30-45	80	36	2	No	No	Intermittent	Shoulder	Fair
East of Laughlin Road	State	Arterial	55	80	36	2	No	No	No	Shoulder	Fair
4th Street											
Harwood Street to Deer Street	City	Collector	25	80	56	2	Yes	Yes	Yes	Shared	Fair
Deer Street to Main Street	City	Collector	25	80	56	2	Yes	Yes (S-Diag)	Yes	Shared	Fair
Main Street to Juniper Street	City	Collector	25	80	58	2	Yes	Yes (N-Diag)	Yes	Shared	Fair
7th Street											
Fairmont Street to Main Street	City	Local Route	25	80	56	2	Yes	Yes	No	Shared	Good
Main Street to Belknap Street	City	Local Route	25	60	35	2	Yes	Yes	Intermittent	Shared	Good
Belknap Street to Laughlin Road	City	Local Route	25	60	40	2	Yes	Yes	Intermittent	Shared	Good
9th Street											
US 26 to Main Street	City	Arterial	25	80	46	2	Yes	No	Yes	Lane	Good
10th Street											
Harwood Street to Fairmont Street	City	Arterial	25	80	56	2	Yes	Yes	Yes	Shared	Good
Fairmont Street to Lamonta Road	City	Arterial	25	80	48	2	Yes	Yes	No	Shared	Poor
Lamonta Road to Main Street	City	Arterial	25	80	24	2	No	No	No	Shared	Poor
Main Street to Court Street	City	Arterial	25	60	40	2	No	No	No	Lane	Good
Court Street to Elm Street	City	Arterial	25	60	40	2	Yes	Yes	No	Shared	Good
Barnes Butte Road											

Street Segment	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	# of Travel Lanes	Curbs	On-Street Parking	Sidewalks	Bikeway (1)	Pavement Condition
McKay Road to Highway 26	County	Collector									
Harding Road											
Laughlin Road to E 3rd St	City	Arterial	25	60	24	2	No	No	No	Shared	Fair
Harwood Street											
Lamonta Road to W 10th Street	City	Arterial	25	80	42	2	Yes	No	Yes - E	Shared	Fair
W 10th Street to W 6th Street	City	Arterial	25	80	24	2	No	No	No	Shared	Fair
W 6th Street to W 2nd Street	City	Arterial	25	80	54	2	Yes	Yes	No	Shared	Fair
Hudspeth Road											
Laughling Road to Ochoco Avenue	City	Collector	25	60	20	2	No	No	No	Shared	Good
Juniper Canyon Road											
South of Paulina Highway	County	Collector	25	60	24	2	No	No	No	Shared	Fair
Juniper Street											
Laughlin Road to Ochoco Creek	City	Arterial	25	80	40	2	No	Yes	No	Shared	Good
Ochoco Creek to E 1st Street	City	Arterial	25	80	56	2	Yes	Yes	No	Shared	Good
Knowledge Street											
3rd Street to 1st Street	City	Collector	25	80	54	2	Yes	Yes	No	Shared	Fair
1st Street to S 2nd Street	City	Collector	25	80	54	2	Yes	Yes	Yes - E	Shared	Fair
5th Street to Lynn Boulevard	City	Collector	25	80	54	2	Yes	Yes	No	Shared	Good
Lamonta Road											
10th Street to Northwest City Limi	City	Arterial	25-35	60	24	2	No	No	No	Shared	Poor
Northwest of City Limit	County	Arterial	40-55	60	30	2	No	No	No	Shared	Fair
Laughlin road											
US 26 to Harding Road	City	Arterial	25	60	24	2	No	No	No	Shared	Poor
Harding Road to E 7th Street	City	Arterial	35	70	24	2	No	No	No	Shared	Poor
Loper Avenue											
Main Street to Oregon Street	City	Collector	25	60	24	2	No	No	No	Shared	Good
Oregon Street to Powell Lane	City	Collector	25	60	48	2	No	Yes	No	Shared	Good
Powell Lane to Del Rio	City	Collector	25	60	30	2	Yes - N	Yes	No	Shared	Good
Rawhide lane											

Appendix C
2005 MAJOR STREETS INVENTORY
Prineville Transportation System Plan

Street Segment	Jurisdiction	Classification	Speed Limit (mph)	ROW Width (feet)	Street Width (feet)	# of Travel Lanes	Curbs	On-Street Parking	Sidewalks	Bikeway (1)	Pavement Condition
McKay Road to End	County	Collector	25	60	25	2	No	No	No	Shared	Good
Rimrock Road											
Highway 126 to Crestview Road	County	Collector	25	50	24	2	No	No	No	Shared	Fair
S 7th Street											
Fairview Street to Knowledge Stree	City	Collector	25	80	54	2	Yes	Yes	No	Shared	Good
S 5th Street											
Main Street to Fairview Street	City	Collector	25	80	38	2	No	Yes	No	Shared	Good
Fairview Street to Knowledge Stree	City	Collector	25	80	55	2	Yes	Yes	No	Shared	Good
Williamson Drive											
3rd Street to End	City	Collector	25	60	32	2	Yes - W	Yes	No	Shared	Good
Willowdale Drive											
3rd Street to End	County	Collector	25	60	20-24	2	No	No	No	Shared	Good

(1) Lane = A portion of a roadway that has been designated by striping, signing and pavement markings for the preferential or exclusive use by bicyclists.

Shared = A type of bikeway where bicyclists and motor vehicles share the same roadway.

Shoulder = A portion of a highway contiguous to the roadway that is primarily for use by pedestrians and bicyclists as well as vehicles stopped for emergency.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS & REPORTING UNIT

COMPARISON OF CRASH RATE DATA FOR STATE HIGHWAYS IN THE PRINEVILLE URBAN AREA
2002 - 2004

2002

Highway Identifier	Milepoint Range	Segment Length	Location	Functional Classification	AADT	Crashes	Deaths	Injuries	Crash Rate	State Avg Crash Rate
US 26, ORE 126, Hwy 41, Ochoco Hwy	14.81 - 20.75	5.92	Urban City	Urban Principal Arterial - Other	10,016	43	1	23	1.99	2.88
US 26, Hwy 360, Madras-Prineville Hwy	24.75 - 26.07	1.32	Suburban Area	Urban Minor Arterial	5,458	1	0	1	0.38	1.19
US 26, Hwy 360, Madras-Prineville Hwy	26.07 - 26.28	0.21	Urban Area	Urban Principal Arterial - Other	6,700	0	0	0	0.00	2.64
ORE 27, Hwy 14, Crooked River Hwy	0.00 - 1.02	1.02	Urban Area	Urban Minor Arterial	3,556	13	0	4	9.82	2.26
Hwy 370, O'Neil Hwy	15.53 - 17.67	2.14	Urban Area	Rural Minor Arterial	1,966	2	0	1	1.30	0.90
Hwy 380, Paulina Hwy	0.00 - 1.66	1.66	Suburban Area	Urban Minor Arterial	3,792	0	0	0	0.00	1.19

2003

Highway Identifier	Milepoint Range	Segment Length	Location	Functional Classification	AADT	Crashes	Deaths	Injuries	Crash Rate	State Avg Crash Rate
US 26, ORE 126, Hwy 41, Ochoco Hwy	14.81 - 20.75	5.92	Urban City	Urban Principal Arterial - Other	9,828	56	0	22	2.64	3.15
US 26, Hwy 360, Madras-Prineville Hwy	24.75 - 26.07	1.32	Suburban Area	Urban Minor Arterial	4,907	0	0	0	0.00	0.60
US 26, Hwy 360, Madras-Prineville Hwy	26.07 - 26.28	0.21	Urban Area	Urban Principal Arterial - Other	6,100	1	0	0	2.14	2.74
ORE 27, Hwy 14, Crooked River Hwy	0.00 - 1.02	1.02	Urban Area	Urban Minor Arterial	3,141	5	0	0	4.28	2.41
Hwy 370, O'Neil Hwy	15.53 - 17.67	2.14	Urban Area	Rural Minor Arterial	1,709	1	0	0	0.75	1.03
Hwy 380, Paulina Hwy	0.00 - 1.66	1.66	Suburban Area	Urban Minor Arterial	3,609	3	0	0	1.37	0.60

2004

Highway Identifier	Milepoint Range	Segment Length	Location	Functional Classification	AADT	Crashes	Deaths	Injuries	Crash Rate	State Avg Crash Rate
US 26, ORE 126, Hwy 41, Ochoco Hwy	14.81 - 20.75	5.92	Urban City	Urban Principal Arterial - Other	9,012	17	0	2	0.87	N/A
US 26, Hwy 360, Madras-Prineville Hwy	24.75 - 26.07	1.32	Suburban Area	Urban Minor Arterial	4,879	0	0	0	0.00	N/A
US 26, Hwy 360, Madras-Prineville Hwy	26.07 - 26.28	0.21	Urban Area	Urban Principal Arterial - Other	6,000	0	0	0	0.00	N/A
ORE 27, Hwy 14, Crooked River Hwy	0.00 - 1.02	1.02	Urban Area	Urban Minor Arterial	3,656	5	0	0	3.67	N/A
Hwy 370, O'Neil Hwy	15.53 - 17.67	2.14	Urban Area	Rural Minor Arterial	1,709	0	0	0	0.00	N/A
Hwy 380, Paulina Hwy	0.00 - 1.66	1.66	Suburban Area	Urban Minor Arterial	3,622	0	0	0	0.00	N/A

APPENDIX D TRAFFIC FORECASTS

BACKGROUND

The method used to estimate future traffic conditions for the Prineville TSP is based on procedures in the 2001 Transportation System Planning Guidelines prepared by the Oregon Department of Transportation. These guidelines identify three levels of transportation forecasting and analysis. Given the limited resources of the Prineville TSP Update and study, the City and ODOT agreed to develop future travel demand forecasts based on a Level 1 analysis. Two major factors influenced this decision:

- The time required to construct a travel demand model to ODOT Guidelines[1] for the Prineville UGB area would greatly extend the TSP development schedule; making a Level 3 methodology prohibitive to completing the TSP update in a timely manner.
- The time and resources required to conduct (a) origin-destination surveys in the Prineville UGB area and (b) detailed demographic forecasts were also found to exceed the study’s resources; making a Level 2 methodology impractical.

Level 1 - Trending Forecast

A trending forecast projects future traffic volumes from historical growth trends of vehicle traffic. This forecasting method requires 20 years of historical data and is sufficient to project 20 years into the future. Growth trends can be determined from traffic volume data on the nearest state highway since most communities do not have a program to count vehicles. Since this analysis assumes past growth trends will continue into the future, the existing land use zoning must support this analysis. The analysis needs to evaluate how well the transportation system presently functions. Intersections must be evaluated since they have a considerable effect on the traffic flow. The volume of traffic needs to be related to the capacity that the intersection can accommodate.

GROWTH FORECASTS

To the best degree, with available data for use in estimating traffic growth, state highway historic traffic data were assimilated for the five highways that serve the City of Prineville:

US 26	Madras-Prineville Highway
OR 27	Crooked River Highway

[1] *Travel Demand Model Development and Application Guidelines*, Oregon Department of Transportation 1995.

OR 126	Ochoco HIghway
OR 370	O'Neil Highway
OR 380	Paulina Highway

A series of data sources were used to establish the growth factors.

Historical Factors

Includes ODOT-based, 2003 annual growth rates (2003-2023) for all segments of state highways within Prineville. Historical growth factors were calculated for an area-wide average. Initial evaluation of the data revealed that Paulina Highway data skewed the overall average to a lower annual average growth rate (1.72%). Some of the original summary data was removed (rural periphery), resulting in an annual average growth rate of 1.82%.

ODOT Historical Traffic Growth Data

State Highway	ODOT Hwy #	M.P.	Location	2003	2023	RSQ	AVERAGE ANNUAL GROWTH RATE	
OR 27	14	0.25	.01 mi south of 3rd	5,400	8,300	0.7596	**2.17%**	
	14	0.58	.01 mi north of Lynn	3,900	6,100	0.7278	**2.26%**	
	14	0.6	.01 mi south of Lynn	1,000	1,600	0.874	**2.38%**	2.27%
OR126 / US 26 (east of "Y")	41	16.5	.01 mi west of Tom McCall	9,300	12,900	0.9058	**1.65%**	
		16.5	.01 mi east of Tom McCall	9,700	13,800	0.8925	**1.78%**	
		17.91	.01 mi west of O'Neil hwy	10,500	16,400	0.8522	**2.25%**	
		17.93	.01 mi east of O'Neil hwy	12,700	17,900	0.9073	**1.73%**	
		18.27	.01 mi east of Locust	13,900	20,400	0.723	**1.94%**	
		19.4	Ochoco Creek Br.	11,700	16,400	0.9178	**1.70%**	
		19.74	.01 mi west of Paulina hwy	10,000	12,400	0.8073	**1.08%**	
		19.76	.01 mi east of Paulina hwy	7,500	9,800	0.7244	**1.35%**	
		20.75	East of P'ville CL	4,500	6,700	0.7151	**2.01%**	1.72%
US 26 (east of "Y")	360	20.06	.01 mi NW of 6th Street	6,100	8,800	0.667	**1.85%**	
O'Neil Highway	370	17.66	.01 mi west of OR 126	2,200	3,000	0.8481	**1.56%**	
Paulina Highway	380	0.01	.01 mi south of US 26	4,500	6,000	0.8337	**1.45%**	
			AVERAGE ANNUAL GROWTH RATE (AAGR)				**1.81%**	

Source: ODOT Website, Last Updated 9/14/2004

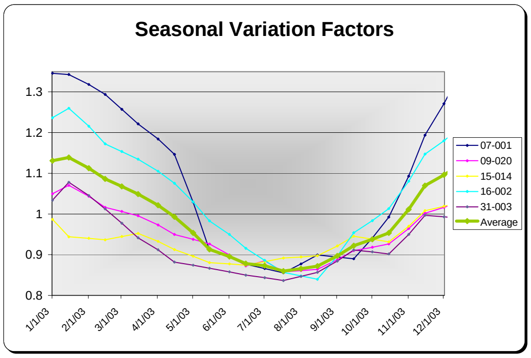
Use this Average Annual Growth Rate to adjust Historic Counts for 2004 Baseline in Prineville TSP (1.81%)

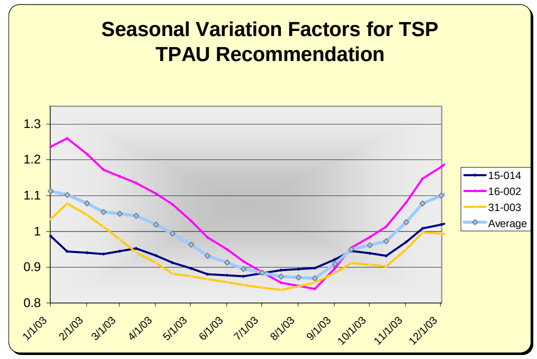
Seasonal Factors

A combination of 3-lane automatic traffic recorder (ATR) data from similar highways in Oregon (to OR 126 in Prineville) was used to calculate an "average" set of seasonal variation factors. These data were derived from ODOT's website. The peak month identified is **August**, and the design hour volume (DHV) is estimated to be **13.7%** of the average daily traffic (ADT). From this data a set of bi-monthly seasonal adjustment factors were developed for the Prineville TSP, to adjust base year counts.

2003 SEASONAL ADJUSTMENT FACTORS
Source: ODOT Website, November, 2004

			Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
ATR Sta.	ODOT Highway No.	Location	1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr	1-May	15-May	1-Jun	15-Jun	1-Jul	17-Jul	1-Aug	15-Aug	1-Sep	15-Sep	1-Oct	15-Oct	1-Nov	15-Nov	1-Dec	15-Dec
07-001	41	OR 126, east of Prineville CL	1.3462	1.3431	1.3185	1.2939	1.2577	1.2215	1.1842	1.1469	1.0293	0.9116	0.8943	0.8769	0.8663	0.8556	0.8775	0.8994	0.8947	0.89	0.9412	0.9924	1.0932	1.194	1.2716	1.3492
09-020	4	US 97 south of Redomnd	1.05	1.0706	1.0435	1.0163	1.0061	0.9959	0.9729	0.9498	0.938	0.9262	0.8992	0.8722	0.8849	0.8576	0.8611	0.8645	0.8872	0.9099	0.9182	0.9264	0.9644	1.0023	1.0163	1.0303
15-014	63	OR 99 south of Talent	0.9872	0.9441	0.9403	0.9365	0.9446	0.9526	0.9326	0.9125	0.8965	0.8805	0.8774	0.8743	0.883	0.8916	0.8946	0.8976	0.9216	0.9455	0.9387	0.9318	0.9701	1.0083	1.0193	1.0303
16-002	4	US 97 north of Madras Hwy Jct.	1.2366	1.26	1.2162	1.1723	1.1536	1.1349	1.1054	1.0759	1.0295	0.983	0.9495	0.9159	0.8862	0.8565	0.8481	0.8396	0.8968	0.9539	0.9837	1.0135	1.0805	1.1475	1.1803	1.2131
31-003	10	OR 82 west of Island City	1.0339	1.0781	1.0456	1.013	0.9774	0.9417	0.9118	0.8819	0.8742	0.8664	0.8581	0.8498	0.8432	0.8365	0.8466	0.8567	0.8841	0.9115	0.9069	0.9022	0.9497	0.9972	0.9935	0.9897
		Average	**1.1308**	**1.1392**	**1.1128**	**1.0864**	**1.0679**	**1.0493**	**1.0214**	**0.9934**	**0.9535**	**0.9135**	**0.8957**	**0.8778**	**0.8727**	**0.8596**	**0.8656**	**0.8716**	**0.8969**	**0.9222**	**0.9377**	**0.9533**	**1.0116**	**1.0699**	**1.0962**	**1.1225**





3-Lane, Intercity Commute Highways, < 17,000 ADT (TPAU recommendation): for use in the City of Prineville TSP

			Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
ATR Sta.	ODOT Highway No.	Location	1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr	1-May	15-May	1-Jun	15-Jun	1-Jul	17-Jul	1-Aug	15-Aug	1-Sep	15-Sep	1-Oct	15-Oct	1-Nov	15-Nov	1-Dec	15-Dec
15-014	63	OR 99 south of Talent	0.9872	0.9441	0.9403	0.9365	0.9446	0.9526	0.9326	0.9125	0.8965	0.8805	0.8774	0.8743	0.883	0.8916	0.8946	0.8976	0.9216	0.9455	0.9387	0.9318	0.9701	1.0083	1.0193	1.0303
16-002	4	US 97 north of Madras Hwy Jct.	1.2366	1.26	1.2162	1.1723	1.1536	1.1349	1.1054	1.0759	1.0295	0.983	0.9495	0.9159	0.8862	0.8565	0.8481	0.8396	0.8968	0.9539	0.9837	1.0135	1.0805	1.1475	1.1803	1.2131
31-003	10	OR 82 west of Island City	1.0339	1.0781	1.0456	1.013	0.9774	0.9417	0.9118	0.8819	0.8742	0.8664	0.8581	0.8498	0.8432	0.8365	0.8466	0.8567	0.8841	0.9115	0.9069	0.9022	0.9497	0.9972	0.9935	0.9897
		Average	**1.1119**	**1.1021**	**1.0783**	**1.0544**	**1.0491**	**1.0438**	**1.019**	**0.9942**	**0.963**	**0.9318**	**0.9135**	**0.8951**	**0.8846**	**0.8741**	**0.8714**	**0.8686**	**0.9092**	**0.9497**	**0.9612**	**0.9727**	**1.0253**	**1.0779**	**1.0998**	**1.1217**
																	0.8639									
																	PEAK MONTH									
		Traffic Count - Seasonal Adjustment Factors	1.2801	1.2688	1.2414	1.2139	1.2078	1.2017	1.1732	1.1446	1.1087	1.0728	1.0517	1.0305	1.0184	1.0063	1.0032	1	1.0467	1.0934	1.1066	1.1198	1.1804	1.241	1.2662	1.2914

Use these data and AVERAGE to develop Prineville adjustment factors

Peak Month = DHV (13.7% of ADT)

Use these seasonal adjustment factors for Prineville TSP raw count

= Count Period (n) / Peak Period (0.8686)

Vehicle Classification

A summary of variable vehicle classification data was developed for the state highways in Prineville. Heavy truck rate data were segregated intoeast and west Prineville – the WYE connection as the dividing line: (1) east Prineville (5.4%) and (2) west Prineville 8.75%.

In review of the various ODOT historical turn volume counts (2002) along OR 126 it was determined that the most consistent PM peak hour in Prineville is 4:30-5:30.

2003 VEHICLE CLASSIFICATION
Source: ODOT Website, November, 2004

ATR Sta.: Oregon Highway: Location	07-001 **OR 126** east of Prineville CL	09-020 **US 97** south of Redmond	16-002 **US 97** north of Madras Jct	**US 97 Combo**
Vehicle Classification				
Cars	24.70%	40.70%	39.90%	40.30%
Medium Trucks	69.90%	53.50%	48.40%	50.95%
Heavy Trucks	5.40%	5.80%	11.70%	8.75%

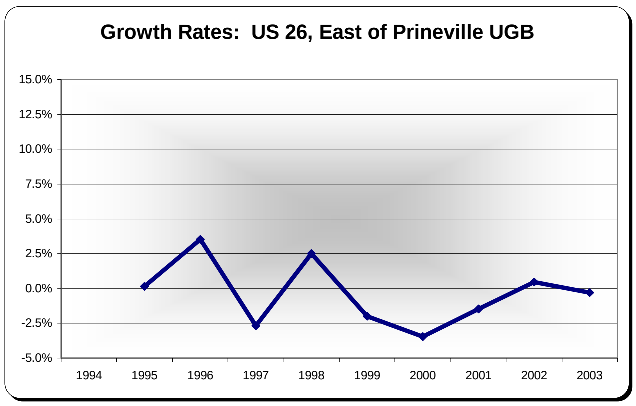
Use these vehicle classification data for state highway counts east of the "Y"

Use these vehicle classification data for state highway counts west of the "Y"

Traffic Forecasts

Historic traffic volume data along state highways within the Prineville urban area were summarized for the most recent 20-year trend (1982-2002). An average of these growth trends was calculated for the 20-year period beginning in 2003. As shown in **Table D-1**, the annual traffic growth trend, on average, is about 1.81 percent along state highways within Prineville. This average growth rate reflects the historic growth in traffic due to new land developments within the Prineville UGB and greater Crook County, but also growth in inter-city travel. It is important to note that the average growth rate also reflects years in which state highway traffic declined, primarily as a result to declining economic conditions within Central Oregon, but in some specific cases due to mill closings within Prineville (1997-2000, 2002). See **Figure D-1**. The closing of local mills likely resulted in fewer work-related trips in the Prineville area immediately following the mill closures.

Figure D-1

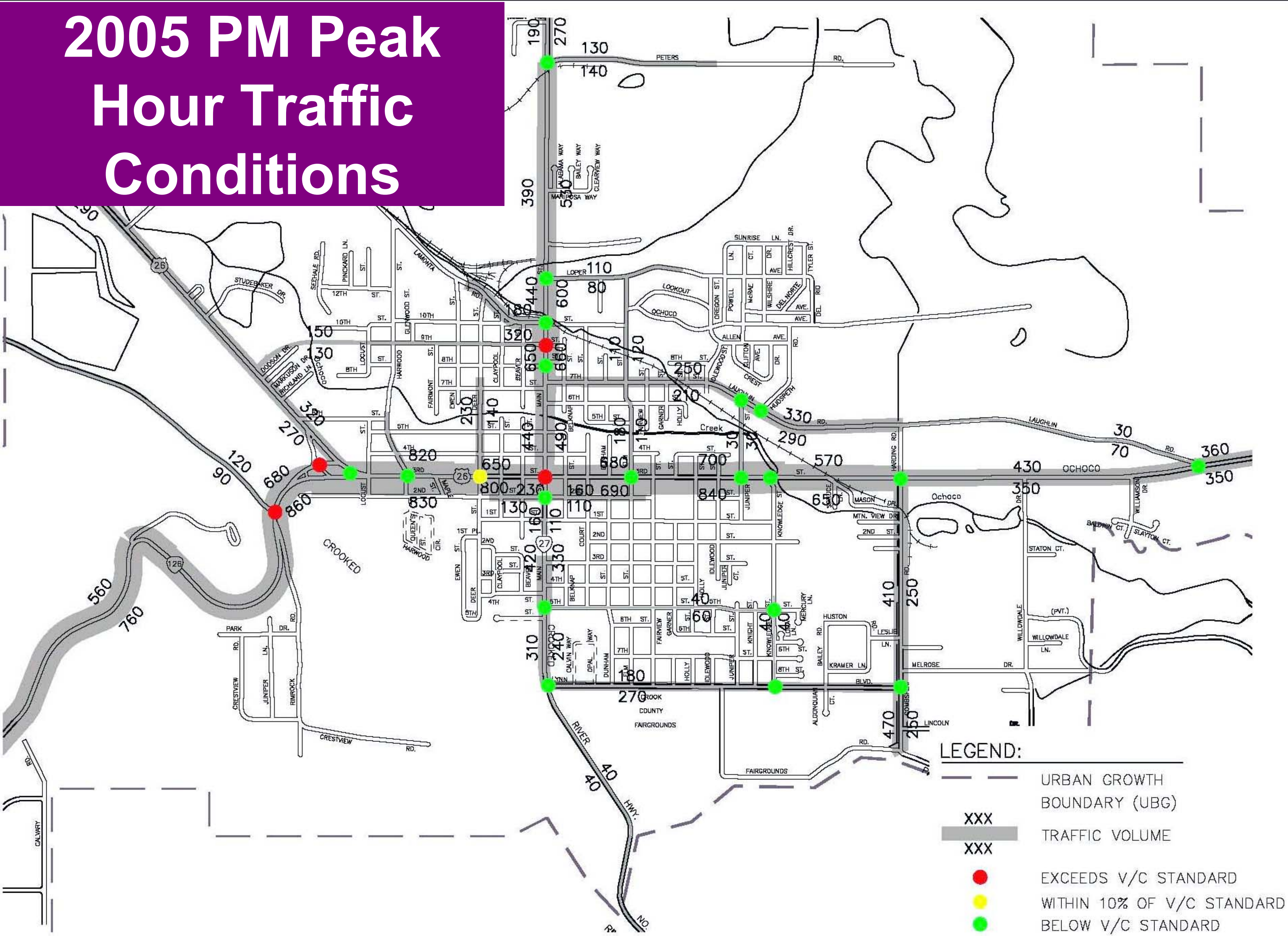


Base year, 2005 DHV traffic data were factored for a 2025 No-Build scenarios. The 2025 No-Build scenario was adjusted manually to reflect locational growth throughout Prineville and the impacts of proposed street improvements identified in the Build scenario. Figures for each volume sets are shown below.

Traffic operations analyses were calculated in Synchro for all options.

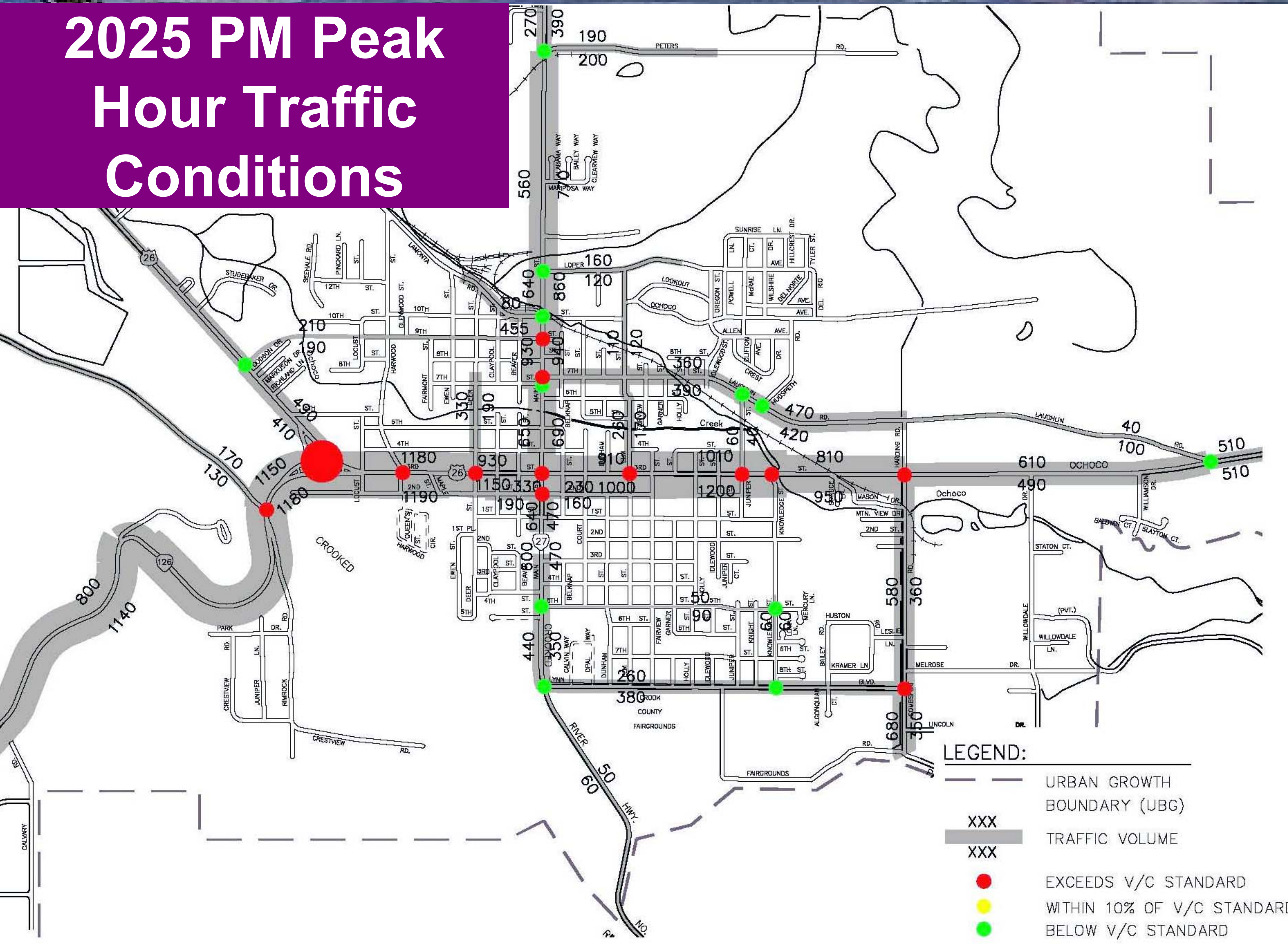
2005 Traffic Forecasts

2005 PM Peak Hour Traffic Conditions



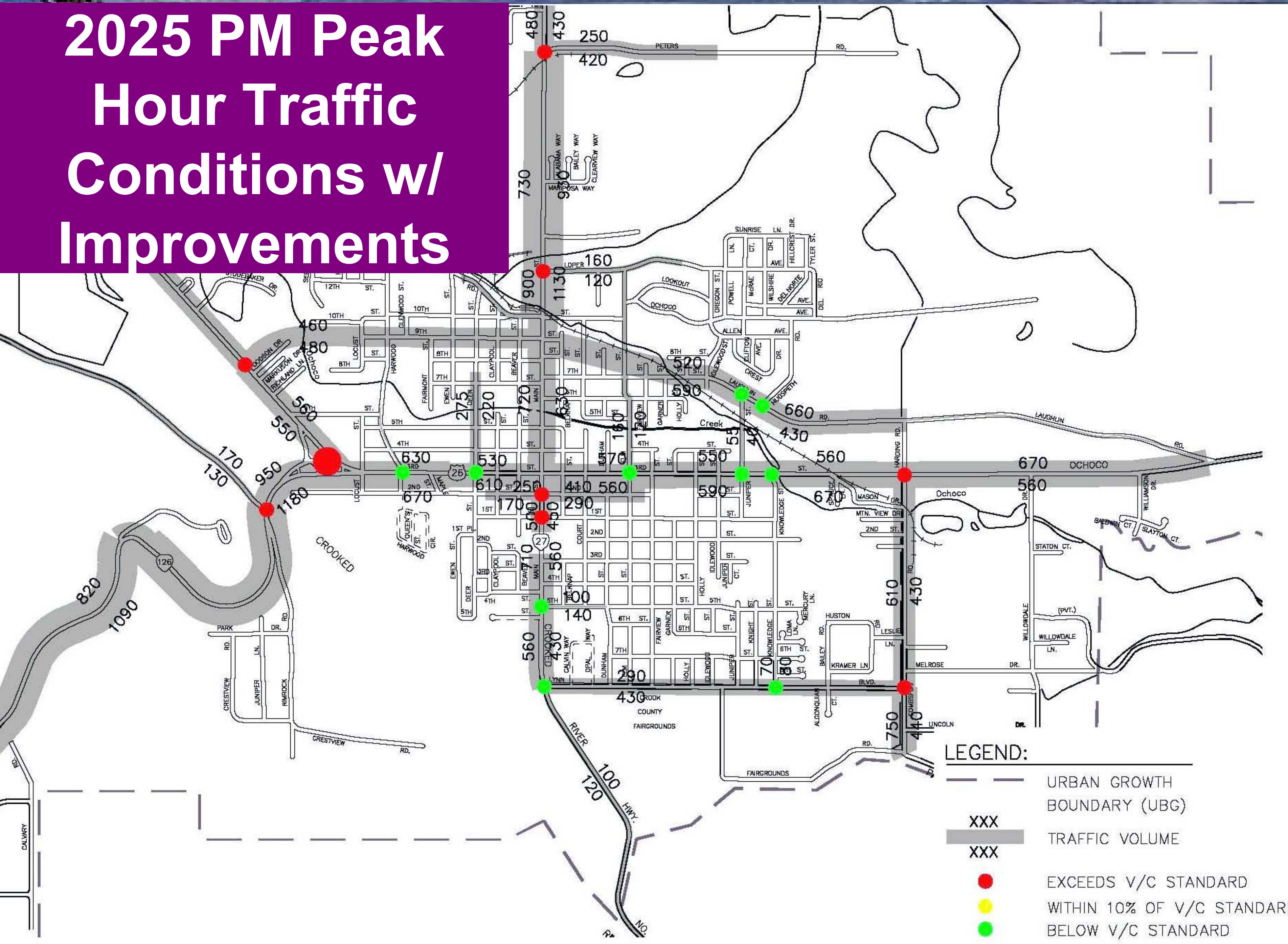
2025 No-Build Traffic Forecasts

2025 PM Peak Hour Traffic Conditions



2025 Build Traffic Forecasts

2025 PM Peak Hour Traffic Conditions w/ Improvements



2005 No Build Traffic

HCM Unsignalized Intersection Capacity Analysis
1: OR 126 & McMillan 6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	1	489	2	23	370	6	3	0	31	9	0	1
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	1	549	2	26	416	7	3	0	35	10	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	422			552			1020	1026	549	1054	1021	416
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	422			552			1020	1026	549	1054	1021	416
tC, single (s)	4.2			4.2			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			97			98	100	93	94	100	100
cM capacity (veh/h)	1100			984			204	222	522	181	223	622

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	1	549	2	26	416	7	38	11
Volume Left	1	0	0	26	0	0	3	10
Volume Right	0	0	2	0	0	7	35	1
cSH	1100	1700	1700	984	1700	1700	459	194
Volume to Capacity	0.00	0.32	0.00	0.03	0.24	0.00	0.08	0.06
Queue Length 95th (ft)	0	0	0	2	0	0	7	5
Control Delay (s)	8.3	0.0	0.0	8.8	0.0	0.0	13.6	24.6
Lane LOS	A			A			B	C
Approach Delay (s)	0.0			0.5			13.6	24.6
Approach LOS							B	C

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: OR 126 & Tom Mcall 6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	667	4	17	495	29	12	0	63	33	0	6
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	0	749	4	19	556	33	13	0	71	37	0	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	589			754			1353	1379	752	1417	1348	556
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	589			754			1353	1379	752	1417	1348	556
tC, single (s)	4.2			4.2			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			98			89	100	82	59	100	99
cM capacity (veh/h)	953			825			119	137	399	89	143	517

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	754	575	33	84	44
Volume Left	0	19	0	13	37
Volume Right	4	0	33	71	7
cSH	953	825	1700	290	102
Volume to Capacity	0.00	0.02	0.02	0.29	0.43
Queue Length 95th (ft)	0	2	0	29	45
Control Delay (s)	0.0	0.6	0.0	22.4	64.1
Lane LOS		A		C	F
Approach Delay (s)	0.0	0.6		22.4	64.1
Approach LOS				C	F

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: O'Neil Highway & OR 126

6/22/2005

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	73	15	17	746	554	101
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	92	19	22	944	701	128
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1753	765	829			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1753	765	829			
tC, single (s)	6.5	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.3			
p0 queue free %	0	95	97			
cM capacity (veh/h)	88	392	773			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	111	22	944	829
Volume Left	92	22	0	0
Volume Right	19	0	0	128
cSH	101	773	1700	1700
Volume to Capacity	1.10	0.03	0.56	0.49
Queue Length 95th (ft)	179	2	0	0
Control Delay (s)	198.7	9.8	0.0	0.0
Lane LOS	F	A		
Approach Delay (s)	198.7	0.2		0.0
Approach LOS	F			

Intersection Summary			
Average Delay	11.7		
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
4: US 26 & 9th Street

6/22/2005

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	76	210	246	55	92	58
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	87	241	283	63	106	67
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	346				730	314
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	346				730	314
tC, single (s)	4.2				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	93				70	91
cM capacity (veh/h)	1175				351	710

Direction, Lane #	SE 1	SE 2	NW 1	SW 1	SW 2
Volume Total	87	241	346	106	67
Volume Left	87	0	0	106	0
Volume Right	0	0	63	0	67
cSH	1175	1700	1700	351	710
Volume to Capacity	0.07	0.14	0.20	0.30	0.09
Queue Length 95th (ft)	6	0	0	31	8
Control Delay (s)	8.3	0.0	0.0	19.6	10.6
Lane LOS	A			C	B
Approach Delay (s)	2.2		0.0	16.1	
Approach LOS				C	

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	37.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations					↑						↑	
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	226	0	0	0	0	0	630	0
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	0	0	0	0	279	0	0	0	0	0	778	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	917	778	0	778	778	778	778			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	917	778	0	778	778	778	778			0		
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.3	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	100	100	100	100	13	100	100			100		
cM capacity (veh/h)	63	320	1065	305	320	386	808			1578		

Direction, Lane #	SB 1	SW 1
Volume Total	279	778
Volume Left	0	0
Volume Right	0	0
cSH	320	1700
Volume to Capacity	0.87	0.46
Queue Length 95th (ft)	200	0
Control Delay (s)	60.1	0.0
Lane LOS	F	
Approach Delay (s)	60.1	0.0
Approach LOS	F	

Intersection Summary			
Average Delay	15.9		
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations	↰					↑
Sign Control	Stop		Stop			Free
Grade	0%		0%			0%
Volume (veh/h)	94	0	0	0	0	800
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	106	0	0	0	0	899
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	899	0	53	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	899	0	53	0	0	
tC, single (s)	6.6	6.3	7.2	6.6	4.2	
tC, 2 stage (s)						
tF (s)	4.1	3.4	3.6	4.1	2.3	
p0 queue free %	61	100	100	100	100	
cM capacity (veh/h)	271	1065	647	882	1578	

Direction, Lane #	NB 1	NW 1
Volume Total	106	899
Volume Left	0	0
Volume Right	0	899
cSH	271	1700
Volume to Capacity	0.39	0.53
Queue Length 95th (ft)	44	0
Control Delay (s)	26.5	0.0
Lane LOS	D	
Approach Delay (s)	26.5	0.0
Approach LOS	D	

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	56.6%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
7: OR 126 & Harwood

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.97	1.00
Satd. Flow (prot)	1319	1380		1319	1377			1383	1227		1397	1227
Flt Permitted	0.29	1.00		0.27	1.00			0.83	1.00		0.84	1.00
Satd. Flow (perm)	405	1380		377	1377			1197	1227		1213	1227
Volume (vph)	89	767	32	37	716	41	6	1	38	14	7	73
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	99	852	36	41	796	46	7	1	42	16	8	81
RTOR Reduction (vph)	0	1	0	0	1	0	0	0	37	0	0	72
Lane Group Flow (vph)	99	887	0	41	841	0	0	8	5	0	24	9
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	1%	1%	1%	1%	1%	1%
Parking (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8		8	4		4
Actuated Green, G (s)	71.9	71.9		71.9	71.9			10.1	10.1		10.1	10.1
Effective Green, g (s)	71.9	71.9		71.9	71.9			10.1	10.1		10.1	10.1
Actuated g/C Ratio	0.80	0.80		0.80	0.80			0.11	0.11		0.11	0.11
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	324	1102		301	1100			134	138		136	138
v/s Ratio Prot		c0.64			0.61							
v/s Ratio Perm	0.24			0.11				0.01	0.00		c0.02	0.01
v/c Ratio	0.31	0.80		0.14	0.76			0.06	0.03		0.18	0.07
Uniform Delay, d1	2.4	5.1		2.0	4.7			35.7	35.6		36.2	35.7
Progression Factor	1.00	1.00		1.23	0.90			1.00	1.00		1.00	1.00
Incremental Delay, d2	2.4	6.3		0.7	3.9			0.2	0.1		0.6	0.2
Delay (s)	4.8	11.4		3.2	8.1			35.9	35.7		36.8	35.9
Level of Service	A	B		A	A			D	D		D	D
Approach Delay (s)		10.7			7.9			35.7			36.1	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM Average Control Delay	11.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: OR 126 & Deer Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.98			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	
Satd. Flow (prot)	1466	1370		1466	1380			2753			2711	
Flt Permitted	0.35	1.00		0.26	1.00			0.67			0.71	
Satd. Flow (perm)	536	1370		395	1380			1896			1955	
Volume (vph)	44	726	69	13	602	26	176	68	36	70	82	74
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	46	764	73	14	634	27	185	72	38	74	86	78
RTOR Reduction (vph)	0	3	0	0	1	0	0	14	0	0	63	0
Lane Group Flow (vph)	46	834	0	14	660	0	0	281	0	0	175	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		0			0			0			0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	65.1	65.1		65.1	65.1			16.9			16.9	
Effective Green, g (s)	65.1	65.1		65.1	65.1			16.9			16.9	
Actuated g/C Ratio	0.72	0.72		0.72	0.72			0.19			0.19	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.5	3.5		3.5	3.5			2.5			2.5	
Lane Grp Cap (vph)	388	991		286	998			356			367	
v/s Ratio Prot		c0.61			0.48							
v/s Ratio Perm	0.09			0.04				c0.15			0.09	
v/c Ratio	0.12	0.84		0.05	0.66			1.10dl			0.48	
Uniform Delay, d1	3.8	8.8		3.6	6.6			34.9			32.6	
Progression Factor	1.17	0.90		0.62	1.41			1.00			1.00	
Incremental Delay, d2	0.4	5.6		0.2	1.8			10.7			0.7	
Delay (s)	4.8	13.5		2.4	11.1			45.6			33.3	
Level of Service	A	B		A	B			D			C	
Approach Delay (s)		13.1			10.9			45.6			33.3	
Approach LOS		B			B			D			C	

Intersection Summary			
HCM Average Control Delay	19.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.0%	ICU Level of Service	D
Analysis Period (min)	15		
dl Defacto Left Lane. Recode with 1 though lane as a left lane.			
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
9: OR 126 & Main Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1319	1346		1466	1361		1466	1499		1319	1480	
Flt Permitted	0.23	1.00		0.37	1.00		0.23	1.00		0.40	1.00	
Satd. Flow (perm)	326	1346		570	1361		350	1499		556	1480	
Volume (vph)	131	512	131	34	503	76	48	215	50	90	273	102
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	138	539	138	36	529	80	51	226	53	95	287	107
RTOR Reduction (vph)	0	10	0	0	5	0	0	10	0	0	16	0
Lane Group Flow (vph)	138	667	0	36	604	0	51	269	0	95	378	0
Parking (#/hr)	0	0			0	0				0		0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	57.1	57.1		45.5	45.5		24.9	24.9		24.9	24.9	
Effective Green, g (s)	57.1	57.1		45.5	45.5		24.9	24.9		24.9	24.9	
Actuated g/C Ratio	0.63	0.63		0.51	0.51		0.28	0.28		0.28	0.28	
Clearance Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	2.0		2.0	2.0		3.0	3.0		1.5	1.5	
Lane Grp Cap (vph)	291	854		288	688		97	415		154	409	
v/s Ratio Prot	0.04	c0.50			c0.44			0.18			c0.26	
v/s Ratio Perm	0.26			0.06			0.15			0.17		
v/c Ratio	0.47	0.78		0.12	0.88		0.53	0.65		0.62	0.92	
Uniform Delay, d1	10.4	11.9		11.7	19.8		27.6	28.7		28.4	31.6	
Progression Factor	0.67	0.79		0.77	0.90		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	4.2		0.7	12.5		5.1	3.5		5.1	26.1	
Delay (s)	7.7	13.6		9.8	30.3		32.6	32.2		33.5	57.7	
Level of Service	A	B		A	C		C	C		C	E	
Approach Delay (s)		12.6			29.2			32.2			53.0	
Approach LOS		B			C			C			D	

Intersection Summary			
HCM Average Control Delay	28.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	95.1%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: OR 126 & Elm Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	1.00		1.00	1.00			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1466	1382		1466	1383			2754			2730	
Flt Permitted	0.36	1.00		0.34	1.00			0.78			0.74	
Satd. Flow (perm)	558	1382		525	1383			2188			2070	
Volume (vph)	24	689	23	15	652	17	51	73	35	109	38	35
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	24	703	23	15	665	17	52	74	36	111	39	36
RTOR Reduction (vph)	0	1	0	0	1	0	0	32	0	0	29	0
Lane Group Flow (vph)	24	725	0	15	681	0	0	130	0	0	157	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		0			0			0			0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	70.8	70.8		70.8	70.8			11.2			11.2	
Effective Green, g (s)	70.8	70.8		70.8	70.8			11.2			11.2	
Actuated g/C Ratio	0.79	0.79		0.79	0.79			0.12			0.12	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.5	3.5		3.5	3.5			2.5			2.5	
Lane Grp Cap (vph)	439	1087		413	1088			272			258	
v/s Ratio Prot		c0.52			0.49							
v/s Ratio Perm	0.04			0.03				0.06			c0.08	
v/c Ratio	0.05	0.67		0.04	0.63			0.48			0.61	
Uniform Delay, d1	2.1	4.3		2.1	4.0			36.7			37.3	
Progression Factor	1.40	1.80		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	2.4		0.2	2.7			1.0			3.4	
Delay (s)	3.2	10.2		2.3	6.8			37.7			40.7	
Level of Service	A	B		A	A			D			D	
Approach Delay (s)		10.0			6.7			37.7			40.7	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	64.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	19	826	6	8	700	4	8	6	8	6	9	15
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	23	983	7	10	833	5	10	7	10	7	11	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	838			990			1908	1889	987	1896	1890	836
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	838			990			1908	1889	987	1896	1890	836
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			77	89	97	84	84	95
cM capacity (veh/h)	784			686			42	68	302	46	68	369

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	23	990	10	838	26	36
Volume Left	23	0	10	0	10	7
Volume Right	0	7	0	5	10	18
cSH	784	1700	686	1700	72	98
Volume to Capacity	0.03	0.58	0.01	0.49	0.36	0.36
Queue Length 95th (ft)	2	0	1	0	34	36
Control Delay (s)	9.7	0.0	10.3	0.0	80.8	61.1
Lane LOS	A		B		F	F
Approach Delay (s)	0.2		0.1		80.8	61.1
Approach LOS					F	F

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	717	26	59	525	51	44
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	779	28	64	571	55	48
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			808		1492	793
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			808		1492	793
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		55	88
cM capacity (veh/h)			805		123	384

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	808	64	571	103
Volume Left	0	64	0	55
Volume Right	28	0	0	48
cSH	1700	805	1700	180
Volume to Capacity	0.48	0.08	0.34	0.58
Queue Length 95th (ft)	0	6	0	77
Control Delay (s)	0.0	9.9	0.0	49.2
Lane LOS		A		E
Approach Delay (s)	0.0	1.0		49.2
Approach LOS				E

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
13: OR 126 & Paulina Hwy (Combs Flat Rd) 6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.95		1.00	0.99			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1629	1631		1629	1696			1690			1715	
Flt Permitted	0.35	1.00		0.29	1.00			0.82			0.91	
Satd. Flow (perm)	606	1631		491	1696			1415			1572	
Volume (vph)	31	347	166	104	419	31	93	87	59	42	142	51
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	35	390	187	117	471	35	104	98	66	47	160	57
RTOR Reduction (vph)	0	34	0	0	6	0	0	25	0	0	21	0
Lane Group Flow (vph)	35	543	0	117	500	0	0	243	0	0	243	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	1%	1%	1%	1%	1%	1%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	17.9	17.9		17.9	17.9			14.1			14.1	
Effective Green, g (s)	17.9	17.9		17.9	17.9			14.1			14.1	
Actuated g/C Ratio	0.45	0.45		0.45	0.45			0.35			0.35	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Grp Cap (vph)	271	730		220	759			499			554	
v/s Ratio Prot		c0.33			0.30							
v/s Ratio Perm	0.06			0.24				c0.17			0.15	
v/c Ratio	0.13	0.74		0.53	0.66			0.49			0.44	
Uniform Delay, d1	6.5	9.1		8.0	8.7			10.1			9.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.5	4.9		4.5	2.8			1.6			1.2	
Delay (s)	6.9	14.1		12.5	11.5			11.7			11.1	
Level of Service	A	B		B	B			B			B	
Approach Delay (s)		13.7			11.6			11.7			11.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	12.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	75.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
14: OR 126 & Laughlin Road 6/22/2005

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	285	332	24	65	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	0	324	377	27	74	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	405				715	391
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	405				715	391
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				81	100
cM capacity (veh/h)	1138				393	651

Direction, Lane #	EB 1	WB 1	SE 1
Volume Total	324	405	74
Volume Left	0	0	74
Volume Right	0	27	0
cSH	1700	1700	393
Volume to Capacity	0.19	0.24	0.19
Queue Length 95th (ft)	0	0	17
Control Delay (s)	0.0	0.0	16.3
Lane LOS			C
Approach Delay (s)	0.0	0.0	16.3
Approach LOS			C

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	30.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	114	15	258	136	5	186
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	127	17	287	151	6	207
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	504	287			287	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	504	287			287	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	76	98			100	
cM capacity (veh/h)	525	752			1275	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	127	17	287	151	6	207
Volume Left	127	0	0	0	6	0
Volume Right	0	17	0	151	0	0
cSH	525	752	1700	1700	1275	1700
Volume to Capacity	0.24	0.02	0.17	0.09	0.00	0.12
Queue Length 95th (ft)	23	2	0	0	0	0
Control Delay (s)	14.0	9.9	0.0	0.0	7.8	0.0
Lane LOS	B	A			A	
Approach Delay (s)	13.5		0.0		0.2	
Approach LOS	B					

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	27.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	52	59	614	59	20	453
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	57	65	675	65	22	498
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)			650			
pX, platoon unblocked						
vC, conflicting volume	1000	370			740	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1000	370			740	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	76	90			97	
cM capacity (veh/h)	234	627			863	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	122	450	290	188	332
Volume Left	57	0	0	22	0
Volume Right	65	0	65	0	0
cSH	351	1700	1700	863	1700
Volume to Capacity	0.35	0.26	0.17	0.03	0.20
Queue Length 95th (ft)	38	0	0	2	0
Control Delay (s)	20.6	0.0	0.0	1.3	0.0
Lane LOS	C			A	
Approach Delay (s)	20.6	0.0		0.5	
Approach LOS	C				

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	42.3%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
17: 10th Street & Main Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0	4.0		4.0			4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frt		1.00	0.85		0.99			0.99			0.98	
Flt Protected		0.96	1.00		0.97			0.99			1.00	
Satd. Flow (prot)		1710	1515		1719			3292			3273	
Flt Permitted		0.70	1.00		0.77			0.81			0.95	
Satd. Flow (perm)		1255	1515		1371			2682			3121	
Volume (vph)	143	27	147	43	26	4	99	374	28	2	321	60
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	159	30	163	48	29	4	110	416	31	2	357	67
RTOR Reduction (vph)	0	0	118	0	3	0	0	6	0	0	19	0
Lane Group Flow (vph)	0	189	45	0	78	0	0	551	0	0	407	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		4			4			2			2	
Permitted Phases	4		4	4			2			2		
Actuated Green, G (s)		12.1	12.1		12.1			23.3			23.3	
Effective Green, g (s)		12.1	12.1		12.1			23.3			23.3	
Actuated g/C Ratio		0.28	0.28		0.28			0.54			0.54	
Clearance Time (s)		4.0	4.0		4.0			4.0			4.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		350	422		382			1440			1676	
v/s Ratio Prot												
v/s Ratio Perm		c0.15	0.03		0.06			c0.21			0.13	
v/c Ratio		0.54	0.11		0.20			0.38			0.24	
Uniform Delay, d1		13.3	11.6		12.0			5.9			5.4	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		1.7	0.1		0.3			0.2			0.1	
Delay (s)		15.0	11.7		12.2			6.0			5.4	
Level of Service		B	B		B			A			A	
Approach Delay (s)		13.5			12.2			6.0			5.4	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM Average Control Delay	8.1	HCM Level of Service	A
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	43.4	Sum of lost time (s)	8.0
Intersection Capacity Utilization	50.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
18: 9th Street & Main Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	55	0	173	0	0	0	110	536	0	0	539	91
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	67	0	211	0	0	0	134	654	0	0	657	111
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)											318	
pX, platoon unblocked	0.94	0.94	0.94	0.94	0.94		0.94					
vC, conflicting volume	1579	1579	657	1790	1690	654	768			654		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1614	1614	637	1837	1731	654	754			654		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	2	100	53	100	100	100	83			100		
cM capacity (veh/h)	68	81	449	25	69	465	808			933		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	278	0	134	654	0	657	111
Volume Left	67	0	134	0	0	0	0
Volume Right	211	0	0	0	0	0	111
cSH	192	1700	808	1700	1700	1700	1700
Volume to Capacity	1.45	0.00	0.17	0.38	0.00	0.39	0.07
Queue Length 95th (ft)	424	0	15	0	0	0	0
Control Delay (s)	275.0	0.0	10.3	0.0	0.0	0.0	0.0
Lane LOS	F	A	B				
Approach Delay (s)	275.0	0.0	1.8		0.0		
Approach LOS	F	A					

Intersection Summary			
Average Delay	42.4		
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	44	179	490	49	184	403
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	54	221	605	60	227	498
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						860
pX, platoon unblocked						
vC, conflicting volume	1587	635			665	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1587	635			665	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	39	54			75	
cM capacity (veh/h)	90	478			924	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	275	665	227	498
Volume Left	54	0	227	0
Volume Right	221	60	0	0
cSH	258	1700	924	1700
Volume to Capacity	1.07	0.39	0.25	0.29
Queue Length 95th (ft)	283	0	24	0
Control Delay (s)	117.7	0.0	10.2	0.0
Lane LOS	F		B	
Approach Delay (s)	117.7	0.0	3.2	
Approach LOS	F			

Intersection Summary			
Average Delay	20.8		
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	13	10	10	539	398	5
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	15	11	11	612	452	6
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				1300	960	
pX, platoon unblocked						
vC, conflicting volume	1090	455	458			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1090	455	458			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	98	99			
cM capacity (veh/h)	236	605	1103			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	26	11	612	458
Volume Left	15	11	0	0
Volume Right	11	0	0	6
cSH	321	1103	1700	1700
Volume to Capacity	0.08	0.01	0.36	0.27
Queue Length 95th (ft)	7	1	0	0
Control Delay (s)	17.2	8.3	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	17.2	0.2		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
21: 2nd Street & Main Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	23	37	70	14	60	83	119	239	12	59	338	52
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	40	76	15	65	90	129	260	13	64	367	57
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)											302	
pX, platoon unblocked												
vC, conflicting volume	1165	1055	396	1117	1077	266	424			273		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1165	1055	396	1117	1077	266	424			273		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	74	79	88	87	65	88	88			95		
cM capacity (veh/h)	97	190	656	121	185	775	1119			1273		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	141	171	129	273	64	424
Volume Left	25	15	129	0	64	0
Volume Right	76	90	0	13	0	57
cSH	242	287	1119	1700	1273	1700
Volume to Capacity	0.58	0.60	0.12	0.16	0.05	0.25
Queue Length 95th (ft)	83	89	10	0	4	0
Control Delay (s)	38.8	34.5	8.6	0.0	8.0	0.0
Lane LOS	E	D	A		A	
Approach Delay (s)	38.8	34.5	2.8		1.0	
Approach LOS	E	D				

Intersection Summary			
Average Delay	10.8		
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
22: 5th Street & Main Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	3	0	5	1	0	46	1	242	6	87	321	4
Peak Hour Factor	0.90	0.90	0.90	0.88	0.90	0.88	0.90	0.88	0.88	0.88	0.88	0.90
Hourly flow rate (vph)	3	0	6	1	0	52	1	275	7	99	365	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	898	849	367	851	848	278	369			282		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	898	849	367	851	848	278	369			282		
tC, single (s)	7.2	6.6	6.2	7.2	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	99	100	100	93	100			92		
cM capacity (veh/h)	225	271	672	258	272	753	1173			1264		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	9	53	283	468
Volume Left	3	1	1	99
Volume Right	6	52	7	4
cSH	385	724	1173	1264
Volume to Capacity	0.02	0.07	0.00	0.08
Queue Length 95th (ft)	2	6	0	6
Control Delay (s)	14.6	10.4	0.0	2.3
Lane LOS	B	B	A	A
Approach Delay (s)	14.6	10.4	0.0	2.3
Approach LOS	B	B		

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
23: Lynn Street & Main Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	13	10	4	6	5	196	0	28	8	246	31	10
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	17	13	5	8	7	261	0	37	11	328	41	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1006	752	48	752	753	43	55			48		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1006	752	48	752	753	43	55			48		
tC, single (s)	7.2	6.6	6.2	7.2	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	87	95	99	97	97	74	100			79		
cM capacity (veh/h)	132	264	1012	259	264	1019	1531			1540		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	36	276	0	48	328	55
Volume Left	17	8	0	0	328	0
Volume Right	5	261	0	11	0	13
cSH	193	883	1700	1700	1540	1700
Volume to Capacity	0.19	0.31	0.00	0.03	0.21	0.03
Queue Length 95th (ft)	17	34	0	0	20	0
Control Delay (s)	27.9	10.9	0.0	0.0	8.0	0.0
Lane LOS	D	B			A	
Approach Delay (s)	27.9	10.9	0.0		6.8	
Approach LOS	D	B				

Intersection Summary			
Average Delay	8.9		
Intersection Capacity Utilization	41.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
24: 7th Street & Juniper Street

6/22/2005

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	279	27	14	252	24	28
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	358	35	18	323	31	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			392		734	375
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			392		734	375
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		92	95
cM capacity (veh/h)			1161		380	669

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	392	341	67
Volume Left	0	18	31
Volume Right	35	0	36
cSH	1700	1161	495
Volume to Capacity	0.23	0.02	0.13
Queue Length 95th (ft)	0	1	12
Control Delay (s)	0.0	0.6	13.4
Lane LOS		A	B
Approach Delay (s)	0.0	0.6	13.4
Approach LOS			B

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
25: 7th Street & Hudspeth Road

6/22/2005

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	40	283	316	12	8	23
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	51	358	400	15	10	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	415				867	408
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	415				867	408
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				97	95
cM capacity (veh/h)	1138				308	641

Direction, Lane #	EB 1	WB 1	SW 1
Volume Total	409	415	39
Volume Left	51	0	10
Volume Right	0	15	29
cSH	1138	1700	501
Volume to Capacity	0.04	0.24	0.08
Queue Length 95th (ft)	3	0	6
Control Delay (s)	1.4	0.0	12.8
Lane LOS	A		B
Approach Delay (s)	1.4	0.0	12.8
Approach LOS			B

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	49.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
26: 5th Street & Knowledge Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	8	10	0	3	1	13	22	1	1	32	8
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	17	9	11	0	3	1	15	25	1	1	36	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	4			20			79	53	15	66	58	4
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	4			20			79	53	15	66	58	4
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			98	97	100	100	96	99
cM capacity (veh/h)	1624			1602			867	832	1068	901	826	1083

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	37	4	40	46
Volume Left	17	0	15	1
Volume Right	11	1	1	9
cSH	1624	1602	849	868
Volume to Capacity	0.01	0.00	0.05	0.05
Queue Length 95th (ft)	1	0	4	4
Control Delay (s)	3.3	0.0	9.4	9.4
Lane LOS	A		A	A
Approach Delay (s)	3.3	0.0	9.4	9.4
Approach LOS			A	A

Intersection Summary			
Average Delay	7.3		
Intersection Capacity Utilization	24.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	15	229	28	12	123	20	28	8	18	23	9	6
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	17	260	32	14	140	23	32	9	20	26	10	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	162			292			489	500	276	498	505	151
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	162			292			489	500	276	498	505	151
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			93	98	97	94	98	99
cM capacity (veh/h)	1422			1275			471	463	765	457	461	898

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	17	292	14	162	61	43
Volume Left	17	0	14	0	32	26
Volume Right	0	32	0	23	20	7
cSH	1422	1700	1275	1700	538	496
Volume to Capacity	0.01	0.17	0.01	0.10	0.11	0.09
Queue Length 95th (ft)	1	0	1	0	10	7
Control Delay (s)	7.6	0.0	7.9	0.0	12.5	12.9
Lane LOS	A		A		B	B
Approach Delay (s)	0.4		0.6		12.5	12.9
Approach LOS					B	B

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	24.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	115	152	96	151	317	81
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86
Hourly flow rate (vph)	134	177	112	176	369	94
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	815	416	463			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	815	416	463			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	57	72	90			
cM capacity (veh/h)	313	639	1104			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	310	287	463
Volume Left	134	112	0
Volume Right	177	0	94
cSH	441	1104	1700
Volume to Capacity	0.70	0.10	0.27
Queue Length 95th (ft)	134	8	0
Control Delay (s)	30.3	3.9	0.0
Lane LOS	D	A	
Approach Delay (s)	30.3	3.9	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	9.9		
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	6	248	287	0	0	10
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	7	282	326	0	0	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	326				622	326
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	326				622	326
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	98
cM capacity (veh/h)	1217				443	708

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	7	282	326	11
Volume Left	7	0	0	0
Volume Right	0	0	0	11
cSH	1217	1700	1700	708
Volume to Capacity	0.01	0.17	0.19	0.02
Queue Length 95th (ft)	0	0	0	1
Control Delay (s)	8.0	0.0	0.0	10.2
Lane LOS	A			B
Approach Delay (s)	0.2		0.0	10.2
Approach LOS				B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	25.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	57	10	0	21	6	0
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	65	11	0	24	7	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			76		94	70
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			76		94	70
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1516		903	989

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	76	24	7
Volume Left	0	0	7
Volume Right	11	0	0
cSH	1700	1700	903
Volume to Capacity	0.04	0.01	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.0	9.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.0
Approach LOS			A

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	13.8%	ICU Level of Service	A
Analysis Period (min)	15		

2025 No-Build Traffic Operations Analysis – Synchro

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	700	5	35	530	10	5	0	45	15	0	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	737	5	37	558	11	5	0	47	16	0	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	568			742			1384	1389	737	1426	1384	558
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	568			742			1384	1389	737	1426	1384	558
tC, single (s)	4.2			4.2			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	99			96			95	100	88	83	100	99
cM capacity (veh/h)	970			834			111	131	407	93	132	516

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	5	737	5	37	558	11	53	21
Volume Left	5	0	0	37	0	0	5	16
Volume Right	0	0	5	0	0	11	47	5
cSH	970	1700	1700	834	1700	1700	321	117
Volume to Capacity	0.01	0.43	0.00	0.04	0.33	0.01	0.16	0.18
Queue Length 95th (ft)	0	0	0	3	0	0	14	16
Control Delay (s)	8.7	0.0	0.0	9.5	0.0	0.0	18.4	42.6
Lane LOS	A			A			C	E
Approach Delay (s)	0.1			0.6			18.4	42.6
Approach LOS							C	E

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	955	5	25	710	40	15	0	90	50	0	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1005	5	26	747	42	16	0	95	53	0	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	789			1011			1818	1850	1008	1903	1811	747
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	789			1011			1818	1850	1008	1903	1811	747
tC, single (s)	4.2			4.2			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			96			71	100	67	0	100	97
cM capacity (veh/h)	800			659			54	68	283	32	73	401

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	1011	774	42	111	63
Volume Left	0	26	0	16	53
Volume Right	5	0	42	95	11
cSH	800	659	1700	177	38
Volume to Capacity	0.00	0.04	0.02	0.63	1.65
Queue Length 95th (ft)	0	3	0	88	167
Control Delay (s)	0.0	1.1	0.0	54.4	549.6
Lane LOS		A		F	F
Approach Delay (s)	0.0	1.0		54.4	549.6
Approach LOS				F	F

Intersection Summary			
Average Delay	20.8		
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	105	20	25	1070	795	145
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	111	21	26	1126	837	153
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2092	913	989			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2092	913	989			
tC, single (s)	6.5	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.3			
p0 queue free %	0	93	96			
cM capacity (veh/h)	53	322	672			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	132	26	1126	989
Volume Left	111	26	0	0
Volume Right	21	0	0	153
cSH	61	672	1700	1700
Volume to Capacity	2.16	0.04	0.66	0.58
Queue Length 95th (ft)	318	3	0	0
Control Delay (s)	677.7	10.6	0.0	0.0
Lane LOS	F	B		
Approach Delay (s)	677.7	0.2		0.0
Approach LOS	F			

Intersection Summary			
Average Delay	39.3		
Intersection Capacity Utilization	73.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	110	300	350	80	130	80
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	116	316	368	84	137	84
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	453				958	411
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	453				958	411
tC, single (s)	4.2				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	89				45	87
cM capacity (veh/h)	1072				247	626

Direction, Lane #	SE 1	SE 2	NW 1	SW 1	SW 2
Volume Total	116	316	453	137	84
Volume Left	116	0	0	137	0
Volume Right	0	0	84	0	84
cSH	1072	1700	1700	247	626
Volume to Capacity	0.11	0.19	0.27	0.55	0.13
Queue Length 95th (ft)	9	0	0	76	12
Control Delay (s)	8.8	0.0	0.0	36.2	11.6
Lane LOS	A			E	B
Approach Delay (s)	2.4		0.0	26.8	
Approach LOS				D	

Intersection Summary			
Average Delay	6.3		
Intersection Capacity Utilization	48.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	325	0	0	0	0	0	900	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	0	0	342	0	0	0	0	0	947	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1118	947	0	947	947	947	947			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1118	947	0	947	947	947	947			0		
tC, single (s)	7.2	6.6	6.3	7.2	6.6	6.3	4.2			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.1	3.4	3.6	4.1	3.4	2.3			2.3		
p0 queue free %	0	100	100	100	0	100	100			100		
cM capacity (veh/h)	0	254	1065	234	254	307	697			1578		

Direction, Lane #	SB 1	SW 1
Volume Total	342	947
Volume Left	0	0
Volume Right	0	0
cSH	254	1700
Volume to Capacity	1.35	0.56
Queue Length 95th (ft)	452	0
Control Delay (s)	218.3	0.0
Lane LOS	F	
Approach Delay (s)	218.3	0.0
Approach LOS	F	

Intersection Summary			
Average Delay	57.9		
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	NBL	NBR	SET	SER	NWL	NWT
Lane Configurations						
Sign Control	Stop		Stop			Free
Grade	0%		0%			0%
Volume (veh/h)	135	0	0	0	0	1145
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	142	0	0	0	0	1205
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1205	0	71	0	0	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1205	0	71	0	0	
tC, single (s)	6.6	6.3	7.2	6.6	4.2	
tC, 2 stage (s)						
tF (s)	4.1	3.4	3.6	4.1	2.3	
p0 queue free %	20	100	100	100	100	
cM capacity (veh/h)	178	1065	306	882	1578	

Direction, Lane #	NB 1	NW 1
Volume Total	142	1205
Volume Left	0	0
Volume Right	0	1205
cSH	178	1700
Volume to Capacity	0.80	0.71
Queue Length 95th (ft)	135	0
Control Delay (s)	76.3	0.0
Lane LOS	F	
Approach Delay (s)	76.3	0.0
Approach LOS	F	

Intersection Summary			
Average Delay	8.0		
Intersection Capacity Utilization	78.2%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
7: OR 126 & Harwood

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.97	1.00		0.97	1.00
Satd. Flow (prot)	1319	1380		1319	1377			1396	1227		1398	1227
Flt Permitted	0.16	1.00		0.13	1.00			0.84	1.00		0.83	1.00
Satd. Flow (perm)	223	1380		184	1377			1215	1227		1198	1227
Volume (vph)	125	1100	45	50	1025	60	10	5	55	20	10	105
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	132	1158	47	53	1079	63	11	5	58	21	11	111
RTOR Reduction (vph)	0	1	0	0	2	0	0	0	51	0	0	98
Lane Group Flow (vph)	132	1204	0	53	1140	0	0	16	7	0	32	13
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	1%	1%	1%	1%	1%	1%
Parking (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8		8	4		4
Actuated Green, G (s)	71.6	71.6		71.6	71.6			10.4	10.4		10.4	10.4
Effective Green, g (s)	71.6	71.6		71.6	71.6			10.4	10.4		10.4	10.4
Actuated g/C Ratio	0.80	0.80		0.80	0.80			0.12	0.12		0.12	0.12
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	177	1098		146	1095			140	142		138	142
v/s Ratio Prot		c0.87			0.83							
v/s Ratio Perm	0.59			0.29				0.01	0.01		c0.03	0.01
v/c Ratio	0.75	1.10		0.36	1.04			0.11	0.05		0.23	0.09
Uniform Delay, d1	4.6	9.2		2.6	9.2			35.7	35.4		36.2	35.6
Progression Factor	1.00	1.00		1.07	1.08			1.00	1.00		1.00	1.00
Incremental Delay, d2	24.6	57.5		1.8	26.3			0.4	0.1		0.9	0.3
Delay (s)	29.2	66.7		4.6	36.2			36.0	35.5		37.0	35.8
Level of Service	C	E		A	D			D	D		D	D
Approach Delay (s)		63.0			34.8			35.6			36.1	
Approach LOS		E			C			D			D	

Intersection Summary			
HCM Average Control Delay	48.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	98.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: OR 126 & Deer Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.99		1.00	0.99			0.98			0.95	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.98	
Satd. Flow (prot)	1466	1370		1466	1380			2753			2713	
Flt Permitted	0.17	1.00		0.07	1.00			0.61			0.63	
Satd. Flow (perm)	267	1370		101	1380			1731			1748	
Volume (vph)	65	1040	100	20	860	35	255	95	50	100	120	105
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	68	1095	105	21	905	37	268	100	53	105	126	111
RTOR Reduction (vph)	0	4	0	0	2	0	0	12	0	0	64	0
Lane Group Flow (vph)	68	1196	0	21	940	0	0	409	0	0	278	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		0			0			0			0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	61.0	61.0		61.0	61.0			21.0			21.0	
Effective Green, g (s)	61.0	61.0		61.0	61.0			21.0			21.0	
Actuated g/C Ratio	0.68	0.68		0.68	0.68			0.23			0.23	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.5	3.5		3.5	3.5			2.5			2.5	
Lane Grp Cap (vph)	181	929		68	935			404			408	
v/s Ratio Prot		c0.87			0.68							
v/s Ratio Perm	0.25			0.21				c0.24			0.16	
v/c Ratio	0.38	1.29		0.31	1.01			1.63dl			0.68	
Uniform Delay, d1	6.3	14.5		5.9	14.5			34.5			31.4	
Progression Factor	1.22	0.94		1.04	1.23			1.00			1.00	
Incremental Delay, d2	0.5	130.2		1.1	10.2			47.8			4.2	
Delay (s)	8.2	143.9		7.2	28.1			82.3			35.7	
Level of Service	A	F		A	C			F			D	
Approach Delay (s)		136.6			27.7			82.3			35.7	
Approach LOS		F			C			F			D	

Intersection Summary			
HCM Average Control Delay	82.4	HCM Level of Service	F
HCM Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	109.1%	ICU Level of Service	H
Analysis Period (min)	15		
dl Defacto Left Lane. Recode with 1 though lane as a left lane.			
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
9: OR 126 & Main Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.97		1.00	0.98		1.00	0.97		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1319	1347		1466	1361		1466	1500		1319	1480	
Flt Permitted	0.09	1.00		0.12	1.00		0.14	1.00		0.28	1.00	
Satd. Flow (perm)	121	1347		183	1361		220	1500		382	1480	
Volume (vph)	185	735	185	50	720	110	70	305	70	130	390	145
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	195	774	195	53	758	116	74	321	74	137	411	153
RTOR Reduction (vph)	0	10	0	0	6	0	0	9	0	0	15	0
Lane Group Flow (vph)	195	959	0	53	868	0	74	386	0	137	549	0
Parking (#/hr)	0	0			0	0				0		0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	54.0	54.0		42.0	42.0		28.0	28.0		28.0	28.0	
Effective Green, g (s)	54.0	54.0		42.0	42.0		28.0	28.0		28.0	28.0	
Actuated g/C Ratio	0.60	0.60		0.47	0.47		0.31	0.31		0.31	0.31	
Clearance Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	2.0		2.0	2.0		3.0	3.0		1.5	1.5	
Lane Grp Cap (vph)	179	808		85	635		68	467		119	460	
v/s Ratio Prot	0.10	c0.71			c0.64			0.26			c0.37	
v/s Ratio Perm	0.56			0.29			0.34			0.36		
v/c Ratio	1.09	1.19		0.62	1.37		1.09	0.83		1.15	1.19	
Uniform Delay, d1	27.1	18.0		18.1	24.0		31.0	28.7		31.0	31.0	
Progression Factor	1.07	0.81		0.73	0.81		1.00	1.00		1.00	1.00	
Incremental Delay, d2	49.2	85.4		12.3	169.1		135.4	11.4		128.9	106.6	
Delay (s)	78.2	99.9		25.5	188.5		166.4	40.2		159.9	137.6	
Level of Service	E	F		C	F		F	D		F	F	
Approach Delay (s)		96.3			179.2			60.1			142.0	
Approach LOS		F			F			E			F	

Intersection Summary			
HCM Average Control Delay	124.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.31		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	123.0%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: OR 126 & Elm Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.99		1.00	1.00			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1466	1381		1466	1383			2756			2730	
Flt Permitted	0.18	1.00		0.15	1.00			0.71			0.67	
Satd. Flow (perm)	278	1381		230	1383			1982			1878	
Volume (vph)	35	985	35	20	935	25	75	105	50	155	55	50
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	37	1037	37	21	984	26	79	111	53	163	58	53
RTOR Reduction (vph)	0	1	0	0	1	0	0	33	0	0	27	0
Lane Group Flow (vph)	37	1073	0	21	1009	0	0	210	0	0	247	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		0			0			0			0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	66.3	66.3		66.3	66.3			15.7			15.7	
Effective Green, g (s)	66.3	66.3		66.3	66.3			15.7			15.7	
Actuated g/C Ratio	0.74	0.74		0.74	0.74			0.17			0.17	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.5	3.5		3.5	3.5			2.5			2.5	
Lane Grp Cap (vph)	205	1017		169	1019			346			328	
v/s Ratio Prot		c0.78			0.73							
v/s Ratio Perm	0.13			0.09				0.11			c0.13	
v/c Ratio	0.18	1.06		0.12	0.99			0.61			0.94dl	
Uniform Delay, d1	3.6	11.9		3.4	11.5			34.3			35.3	
Progression Factor	1.44	1.54		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	27.5		1.5	26.0			2.5			8.9	
Delay (s)	5.4	45.8		4.9	37.5			36.8			44.3	
Level of Service	A	D		A	D			D			D	
Approach Delay (s)		44.4			36.9			36.8			44.3	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	40.8	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	91.2%	ICU Level of Service	F
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	25	1180	10	10	1000	5	10	10	10	10	15	20
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	26	1242	11	11	1053	5	11	11	11	11	16	21
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1058			1253			2403	2379	1247	2387	2382	1055
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1058			1253			2403	2379	1247	2387	2382	1055
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			98			17	68	95	35	51	92
cM capacity (veh/h)	647			545			13	33	213	16	32	275

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	26	1253	11	1058	32	47
Volume Left	26	0	11	0	11	11
Volume Right	0	11	0	5	11	21
cSH	647	1700	545	1700	26	39
Volume to Capacity	0.04	0.74	0.02	0.62	1.20	1.21
Queue Length 95th (ft)	3	0	1	0	95	119
Control Delay (s)	10.8	0.0	11.7	0.0	464.9	374.4
Lane LOS	B		B		F	F
Approach Delay (s)	0.2		0.1		464.9	374.4
Approach LOS					F	F

Intersection Summary			
Average Delay	13.5		
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	1025	35	85	750	75	60
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1079	37	89	789	79	63
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			1116		2066	1097
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1116		2066	1097
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			85		0	75
cM capacity (veh/h)			615		50	255

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	1116	89	789	142
Volume Left	0	89	0	79
Volume Right	37	0	0	63
cSH	1700	615	1700	78
Volume to Capacity	0.66	0.15	0.46	1.82
Queue Length 95th (ft)	0	13	0	308
Control Delay (s)	0.0	11.8	0.0	504.3
Lane LOS		B		F
Approach Delay (s)	0.0	1.2		504.3
Approach LOS				F

Intersection Summary			
Average Delay	34.0		
Intersection Capacity Utilization	82.4%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
13: OR 126 & Paulina Hwy (Combs Flat Rd)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.95		1.00	0.99			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.99	
Satd. Flow (prot)	1629	1630		1629	1696			1690			1714	
Flt Permitted	0.20	1.00		0.18	1.00			0.72			0.90	
Satd. Flow (perm)	346	1630		310	1696			1237			1560	
Volume (vph)	45	495	240	150	600	45	135	125	85	60	205	75
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	47	521	253	158	632	47	142	132	89	63	216	79
RTOR Reduction (vph)	0	33	0	0	5	0	0	25	0	0	22	0
Lane Group Flow (vph)	47	741	0	158	674	0	0	338	0	0	336	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	1%	1%	1%	1%	1%	1%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	22.1	22.1		22.1	22.1			17.0			17.0	
Effective Green, g (s)	22.1	22.1		22.1	22.1			17.0			17.0	
Actuated g/C Ratio	0.47	0.47		0.47	0.47			0.36			0.36	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	5.0	5.0		5.0	5.0			5.0			5.0	
Lane Grp Cap (vph)	162	765		145	796			446			563	
v/s Ratio Prot		0.45			0.40							
v/s Ratio Perm	0.14			c0.51				c0.27			0.22	
v/c Ratio	0.29	0.97		1.09	0.85			0.76			0.60	
Uniform Delay, d1	7.7	12.2		12.5	11.0			13.2			12.3	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	2.1	25.1		100.8	9.1			8.6			2.6	
Delay (s)	9.8	37.3		113.3	20.1			21.8			14.8	
Level of Service	A	D		F	C			C			B	
Approach Delay (s)		35.7			37.7			21.8			14.8	
Approach LOS		D			D			C			B	

Intersection Summary			
HCM Average Control Delay	31.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	47.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	101.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
14: OR 126 & Laughlin Road

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	410	475	35	95	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	432	500	37	100	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	537				950	518
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	537				950	518
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				65	100
cM capacity (veh/h)	1016				285	551

Direction, Lane #	EB 1	WB 1	SE 1
Volume Total	432	537	100
Volume Left	0	0	100
Volume Right	0	37	0
cSH	1700	1700	285
Volume to Capacity	0.25	0.32	0.35
Queue Length 95th (ft)	0	0	38
Control Delay (s)	0.0	0.0	24.3
Lane LOS			C
Approach Delay (s)	0.0	0.0	24.3
Approach LOS			C

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	40.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	165	20	370	195	5	265
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	174	21	389	205	5	279
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	679	389			389	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	679	389			389	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	58	97			100	
cM capacity (veh/h)	415	659			1169	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	174	21	389	205	5	279
Volume Left	174	0	0	0	5	0
Volume Right	0	21	0	205	0	0
cSH	415	659	1700	1700	1169	1700
Volume to Capacity	0.42	0.03	0.23	0.12	0.00	0.16
Queue Length 95th (ft)	51	2	0	0	0	0
Control Delay (s)	19.8	10.6	0.0	0.0	8.1	0.0
Lane LOS	C	B			A	
Approach Delay (s)	18.8		0.0		0.1	
Approach LOS	C					

Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	75	85	880	85	30	650
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	79	89	926	89	32	684
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)			650			
pX, platoon unblocked						
vC, conflicting volume	1376	508			1016	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1376	508			1016	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	39	82			95	
cM capacity (veh/h)	130	510			679	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	168	618	398	260	456
Volume Left	79	0	0	32	0
Volume Right	89	0	89	0	0
cSH	215	1700	1700	679	1700
Volume to Capacity	0.78	0.36	0.23	0.05	0.27
Queue Length 95th (ft)	139	0	0	4	0
Control Delay (s)	64.0	0.0	0.0	1.8	0.0
Lane LOS	F			A	
Approach Delay (s)	64.0	0.0		0.6	
Approach LOS	F				

Intersection Summary			
Average Delay	5.9		
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
17: 10th Street & Main Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)		4.0	4.0		4.0			4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00			0.95			0.95	
Frt		1.00	0.85		0.99			0.99			0.98	
Flt Protected		0.96	1.00		0.97			0.99			1.00	
Satd. Flow (prot)		1711	1515		1719			3293			3274	
Flt Permitted		0.69	1.00		0.74			0.75			0.95	
Satd. Flow (perm)		1229	1515		1318			2495			3111	
Volume (vph)	205	40	210	60	35	5	140	535	40	5	460	85
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	216	42	221	63	37	5	147	563	42	5	484	89
RTOR Reduction (vph)	0	0	138	0	3	0	0	6	0	0	21	0
Lane Group Flow (vph)	0	258	83	0	102	0	0	746	0	0	557	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		4			4			2			2	
Permitted Phases	4		4	4			2			2		
Actuated Green, G (s)		15.2	15.2		15.2			21.8			21.8	
Effective Green, g (s)		15.2	15.2		15.2			21.8			21.8	
Actuated g/C Ratio		0.34	0.34		0.34			0.48			0.48	
Clearance Time (s)		4.0	4.0		4.0			4.0			4.0	
Vehicle Extension (s)		3.0	3.0		3.0			3.0			3.0	
Lane Grp Cap (vph)		415	512		445			1209			1507	
v/s Ratio Prot												
v/s Ratio Perm		c0.21	0.05		0.08			c0.30			0.18	
v/c Ratio		0.62	0.16		0.23			0.62			0.37	
Uniform Delay, d1		12.5	10.4		10.7			8.5			7.3	
Progression Factor		1.00	1.00		1.00			1.00			1.00	
Incremental Delay, d2		2.9	0.1		0.3			0.9			0.2	
Delay (s)		15.4	10.6		11.0			9.5			7.4	
Level of Service		B	B		B			A			A	
Approach Delay (s)		13.2			11.0			9.5			7.4	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM Average Control Delay	9.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.2%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
18: 9th Street & Main Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	80	0	245	0	0	0	160	770	0	0	770	130
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	84	0	258	0	0	0	168	811	0	0	811	137
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)											318	
pX, platoon unblocked	0.87	0.87	0.87	0.87	0.87		0.87					
vC, conflicting volume	1958	1958	811	2216	2095	811	947			811		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2104	2104	782	2402	2262	811	939			811		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	24	100	100	100	73			100		
cM capacity (veh/h)	26	33	341	4	26	378	633			815		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	342	0	168	811	0	811	137
Volume Left	84	0	168	0	0	0	0
Volume Right	258	0	0	0	0	0	137
cSH	85	1700	633	1700	1700	1700	1700
Volume to Capacity	4.03	0.00	0.27	0.48	0.00	0.48	0.08
Queue Length 95th (ft)	Err	0	27	0	0	0	0
Control Delay (s)	Err	0.0	12.7	0.0	0.0	0.0	0.0
Lane LOS	F	A	B				
Approach Delay (s)	Err	0.0	2.2		0.0		
Approach LOS	F	A					

Intersection Summary			
Average Delay	1508.9		
Intersection Capacity Utilization	82.7%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
19: NE 7th Street & Main Street

6/22/2005

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	60	255	700	70	265	575
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	63	268	737	74	279	605
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						860
pX, platoon unblocked						
vC, conflicting volume	1937	774			811	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1937	774			811	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	0	33			66	
cM capacity (veh/h)	47	399			815	

Direction, Lane #	WB 1	NB 1	SB 1	SB 2
Volume Total	332	811	279	605
Volume Left	63	0	279	0
Volume Right	268	74	0	0
cSH	165	1700	815	1700
Volume to Capacity	2.00	0.48	0.34	0.36
Queue Length 95th (ft)	641	0	38	0
Control Delay (s)	518.8	0.0	11.7	0.0
Lane LOS	F		B	
Approach Delay (s)	518.8	0.0	3.7	
Approach LOS	F			

Intersection Summary			
Average Delay	86.5		
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
20: NW 7th Street & Main Street

6/22/2005

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	20	15	15	770	570	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	16	16	811	600	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				1300	960	
pX, platoon unblocked						
vC, conflicting volume	1445	603	605			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1445	603	605			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	85	97	98			
cM capacity (veh/h)	143	499	973			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	37	16	811	605
Volume Left	21	16	0	0
Volume Right	16	0	0	5
cSH	206	973	1700	1700
Volume to Capacity	0.18	0.02	0.48	0.36
Queue Length 95th (ft)	16	1	0	0
Control Delay (s)	26.3	8.8	0.0	0.0
Lane LOS	D	A		
Approach Delay (s)	26.3	0.2		0.0
Approach LOS	D			

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
21: 2nd Street & Main Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	35	55	100	20	85	120	170	345	15	85	485	75
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	37	58	105	21	89	126	179	363	16	89	511	79
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)											302	
pX, platoon unblocked	0.76	0.76	0.76	0.76	0.76		0.76					
vC, conflicting volume	1621	1466	550	1553	1497	371	589			379		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1816	1612	409	1726	1654	371	460			379		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	79	0	0	81	78			92		
cM capacity (veh/h)	0	58	491	0	54	677	825			1163		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	200	237	179	379	89	589
Volume Left	37	21	179	0	89	0
Volume Right	105	126	0	16	0	79
cSH	0	0	825	1700	1163	1700
Volume to Capacity	Err	Err	0.22	0.22	0.08	0.35
Queue Length 95th (ft)	Err	Err	21	0	6	0
Control Delay (s)	Err	Err	10.6	0.0	8.4	0.0
Lane LOS	F	F	B		A	
Approach Delay (s)	Err	Err	3.4		1.1	
Approach LOS	F	F				

Intersection Summary			
Average Delay	Err		
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
22: 5th Street & Main Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	0	5	5	0	65	5	345	10	125	460	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	0	5	5	0	68	5	363	11	132	484	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1197	1134	487	1134	1132	368	489			374		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1197	1134	487	1134	1132	368	489			374		
tC, single (s)	7.2	6.6	6.2	7.2	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	96	100	99	97	100	90	100			89		
cM capacity (veh/h)	131	177	575	160	177	670	1058			1168		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	11	74	379	621
Volume Left	5	5	5	132
Volume Right	5	68	11	5
cSH	213	546	1058	1168
Volume to Capacity	0.05	0.13	0.00	0.11
Queue Length 95th (ft)	4	12	0	9
Control Delay (s)	22.7	12.6	0.2	2.9
Lane LOS	C	B	A	A
Approach Delay (s)	22.7	12.6	0.2	2.9
Approach LOS	C	B		

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	20	15	5	10	5	280	0	40	10	350	45	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	16	5	11	5	295	0	42	11	368	47	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1132	845	55	845	847	47	63			53		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1132	845	55	845	847	47	63			53		
tC, single (s)	7.2	6.6	6.2	7.2	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	79	93	99	95	98	71	100			76		
cM capacity (veh/h)	101	225	1003	215	224	1013	1521			1534		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	42	311	0	53	368	63
Volume Left	21	11	0	0	368	0
Volume Right	5	295	0	11	0	16
cSH	148	855	1700	1700	1534	1700
Volume to Capacity	0.28	0.36	0.00	0.03	0.24	0.04
Queue Length 95th (ft)	27	42	0	0	24	0
Control Delay (s)	38.6	11.6	0.0	0.0	8.1	0.0
Lane LOS	E	B			A	
Approach Delay (s)	38.6	11.6	0.0		6.9	
Approach LOS	E	B				

Intersection Summary			
Average Delay	9.8		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	400	40	20	360	35	40
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	421	42	21	379	37	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			463		863	442
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			463		863	442
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		88	93
cM capacity (veh/h)			1093		317	613

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	463	400	79
Volume Left	0	21	37
Volume Right	42	0	42
cSH	1700	1093	427
Volume to Capacity	0.27	0.02	0.18
Queue Length 95th (ft)	0	1	17
Control Delay (s)	0.0	0.6	15.3
Lane LOS		A	C
Approach Delay (s)	0.0	0.6	15.3
Approach LOS			C

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	48.5%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
25: 7th Street & Hudspeth Road

6/22/2005

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	55	405	455	15	10	35
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	58	426	479	16	11	37
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	495				1029	487
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	495				1029	487
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				96	94
cM capacity (veh/h)	1064				244	579

Direction, Lane #	EB 1	WB 1	SW 1
Volume Total	484	495	47
Volume Left	58	0	11
Volume Right	0	16	37
cSH	1064	1700	443
Volume to Capacity	0.05	0.29	0.11
Queue Length 95th (ft)	4	0	9
Control Delay (s)	1.6	0.0	14.1
Lane LOS	A		B
Approach Delay (s)	1.6	0.0	14.1
Approach LOS			B

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
26: 5th Street & Knowledge Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	20	10	15	0	5	5	20	30	5	5	45	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	11	16	0	5	5	21	32	5	5	47	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	11			26			103	71	18	89	76	8
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	11			26			103	71	18	89	76	8
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			97	96	100	99	94	99
cM capacity (veh/h)	1615			1594			824	811	1063	858	805	1077

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	47	11	58	63
Volume Left	21	0	21	5
Volume Right	16	5	5	11
cSH	1615	1594	834	845
Volume to Capacity	0.01	0.00	0.07	0.07
Queue Length 95th (ft)	1	0	6	6
Control Delay (s)	3.3	0.0	9.6	9.6
Lane LOS	A		A	A
Approach Delay (s)	3.3	0.0	9.6	9.6
Approach LOS			A	A

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	24.7%	ICU Level of Service	A
Analysis Period (min)	15		

27: Lynn Street & Knowledge Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	20	330	40	15	175	30	40	10	25	35	15	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	347	42	16	184	32	42	11	26	37	16	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	216			389			645	658	368	653	663	200
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	216			389			645	658	368	653	663	200
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			88	97	96	90	96	99
cM capacity (veh/h)	1360			1175			362	374	679	352	372	843

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	21	389	16	216	79	63
Volume Left	21	0	16	0	42	37
Volume Right	0	42	0	32	26	11
cSH	1360	1700	1175	1700	431	395
Volume to Capacity	0.02	0.23	0.01	0.13	0.18	0.16
Queue Length 95th (ft)	1	0	1	0	17	14
Control Delay (s)	7.7	0.0	8.1	0.0	15.2	15.8
Lane LOS	A		A		C	C
Approach Delay (s)	0.4		0.6		15.2	15.8
Approach LOS					C	C

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	32.9%	ICU Level of Service	A
Analysis Period (min)	15		

28: Lynn Street & Paulina Hwy (Combs Flat Rd)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	165	220	135	215	455	115
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	174	232	142	226	479	121
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1050	539	600			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1050	539	600			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	20	57	86			
cM capacity (veh/h)	216	544	982			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	405	368	600
Volume Left	174	142	0
Volume Right	232	0	121
cSH	330	982	1700
Volume to Capacity	1.23	0.14	0.35
Queue Length 95th (ft)	448	13	0
Control Delay (s)	160.8	4.5	0.0
Lane LOS	F	A	
Approach Delay (s)	160.8	4.5	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	48.6		
Intersection Capacity Utilization	86.4%	ICU Level of Service	E
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
29: OR 126 & OR 126 Bypass

6/22/2005

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	10	355	410	0	0	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	374	432	0	0	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	432				826	432
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	432				826	432
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	97
cM capacity (veh/h)	1112				334	618

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	11	374	432	16
Volume Left	11	0	0	0
Volume Right	0	0	0	16
cSH	1112	1700	1700	618
Volume to Capacity	0.01	0.22	0.25	0.03
Queue Length 95th (ft)	1	0	0	2
Control Delay (s)	8.3	0.0	0.0	11.0
Lane LOS	A			B
Approach Delay (s)	0.2		0.0	11.0
Approach LOS				B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
30: Laughlin Road & OR 126 Bypass

6/22/2005

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	80	15	0	30	10	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	84	16	0	32	11	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			100		124	92
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			100		124	92
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1486		869	962

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	100	32	11
Volume Left	0	0	11
Volume Right	16	0	0
cSH	1700	1700	869
Volume to Capacity	0.06	0.02	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.0	9.2
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.2
Approach LOS			A

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	15.4%	ICU Level of Service	A
Analysis Period (min)	15		

2025 Build Traffic Operations Analysis – Synchro

HCM Unsignalized Intersection Capacity Analysis
1: OR 126 & McMillan

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	700	5	35	530	10	5	0	45	15	0	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	737	5	37	558	11	5	0	47	16	0	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	568			742			1384	1389	737	1426	1384	558
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	568			742			1384	1389	737	1426	1384	558
tC, single (s)	4.2			4.2			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	99			96			95	100	88	83	100	99
cM capacity (veh/h)	970			834			111	131	407	93	132	516

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SB 1
Volume Total	5	737	5	37	558	11	53	21
Volume Left	5	0	0	37	0	0	5	16
Volume Right	0	0	5	0	0	11	47	5
cSH	970	1700	1700	834	1700	1700	321	117
Volume to Capacity	0.01	0.43	0.00	0.04	0.33	0.01	0.16	0.18
Queue Length 95th (ft)	0	0	0	3	0	0	14	16
Control Delay (s)	8.7	0.0	0.0	9.5	0.0	0.0	18.4	42.6
Lane LOS	A			A			C	E
Approach Delay (s)	0.1			0.6			18.4	42.6
Approach LOS							C	E

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	51.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
2: OR 126 & Tom Mcall

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	955	5	25	710	40	15	0	90	50	0	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	1005	5	26	747	42	16	0	95	53	0	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	789			1011			1818	1850	1008	1903	1811	747
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	789			1011			1818	1850	1008	1903	1811	747
tC, single (s)	4.2			4.2			7.2	6.6	6.3	7.2	6.6	6.3
tC, 2 stage (s)												
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1	3.4
p0 queue free %	100			96			71	100	67	0	100	97
cM capacity (veh/h)	800			659			54	68	283	32	73	401

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	1011	774	42	111	63
Volume Left	0	26	0	16	53
Volume Right	5	0	42	95	11
cSH	800	659	1700	177	38
Volume to Capacity	0.00	0.04	0.02	0.63	1.65
Queue Length 95th (ft)	0	3	0	88	167
Control Delay (s)	0.0	1.1	0.0	54.4	549.6
Lane LOS		A		F	F
Approach Delay (s)	0.0	1.0		54.4	549.6
Approach LOS				F	F

Intersection Summary			
Average Delay	20.8		
Intersection Capacity Utilization	77.7%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
3: O'Neil Highway & OR 126

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	110	20	20	1070	800	145
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	116	21	21	1126	842	153
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)					1311	
pX, platoon unblocked	0.82	0.82	0.82			
vC, conflicting volume	2087	918	995			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2329	900	994			
tC, single (s)	6.5	6.3	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.4	2.3			
p0 queue free %	0	92	96			
cM capacity (veh/h)	30	268	547			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	137	21	1126	995
Volume Left	116	21	0	0
Volume Right	21	0	0	153
cSH	35	547	1700	1700
Volume to Capacity	3.88	0.04	0.66	0.59
Queue Length 95th (ft)	Err	3	0	0
Control Delay (s)	Err	11.8	0.0	0.0
Lane LOS	F	B		
Approach Delay (s)	Err	0.2		0.0
Approach LOS	F			

Intersection Summary			
Average Delay	600.5		
Intersection Capacity Utilization	73.8%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
4: US 26 & 9th Street

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.93		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1569	1651	1539		1569	1404
Flt Permitted	0.33	1.00	1.00		0.95	1.00
Satd. Flow (perm)	537	1651	1539		1569	1404
Volume (vph)	180	230	295	300	315	140
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	189	242	311	316	332	147
RTOR Reduction (vph)	0	0	55	0	0	110
Lane Group Flow (vph)	189	242	572	0	332	37
Heavy Vehicles (%)	9%	9%	9%	9%	9%	9%
Turn Type	Perm					Perm
Protected Phases		6	2		8	
Permitted Phases	6					8
Actuated Green, G (s)	27.8	27.8	27.8		11.9	11.9
Effective Green, g (s)	27.8	27.8	27.8		11.9	11.9
Actuated g/C Ratio	0.58	0.58	0.58		0.25	0.25
Clearance Time (s)	4.0	4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	313	962	897		391	350
v/s Ratio Prot		0.15	c0.37		c0.21	
v/s Ratio Perm	0.35					0.03
v/c Ratio	0.60	0.25	0.64		0.85	0.10
Uniform Delay, d1	6.4	4.9	6.6		17.0	13.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.3	0.1	1.5		15.7	0.1
Delay (s)	9.7	5.0	8.1		32.7	13.9
Level of Service	A	A	A		C	B
Approach Delay (s)		7.1	8.1		26.9	
Approach LOS		A	A		C	

Intersection Summary			
HCM Average Control Delay	13.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	47.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: OR 126 & US 26

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1629	1714	1714	1457	1629	1457
Flt Permitted	0.33	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	566	1714	1714	1457	1629	1457
Volume (vph)	345	830	570	170	160	385
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	363	874	600	179	168	405
RTOR Reduction (vph)	0	0	0	70	0	247
Lane Group Flow (vph)	363	874	600	109	168	158
Turn Type	Perm			Perm		Perm
Protected Phases		4	8		6	
Permitted Phases	4			8		6
Actuated Green, G (s)	55.0	55.0	55.0	55.0	27.0	27.0
Effective Green, g (s)	55.0	55.0	55.0	55.0	27.0	27.0
Actuated g/C Ratio	0.61	0.61	0.61	0.61	0.30	0.30
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	346	1047	1047	890	489	437
v/s Ratio Prot		0.51	0.35		0.10	
v/s Ratio Perm	c0.64			0.08		c0.11
v/c Ratio	1.05	0.83	0.57	0.12	0.34	0.36
Uniform Delay, d1	17.5	13.9	10.5	7.4	24.6	24.7
Progression Factor	1.00	1.00	0.93	0.83	1.00	1.00
Incremental Delay, d2	61.8	5.9	0.7	0.1	1.9	2.3
Delay (s)	79.3	19.8	10.4	6.1	26.5	27.0
Level of Service	E	B	B	A	C	C
Approach Delay (s)		37.2	9.4		26.9	
Approach LOS		D	A		C	

Intersection Summary			
HCM Average Control Delay	26.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
7: OR 126 & Harwood

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	0.97		1.00	0.98			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.95	1.00		0.96	1.00
Satd. Flow (prot)	1319	1350		1319	1363			1378	1227		1381	1227
Flt Permitted	0.43	1.00		0.33	1.00			0.70	1.00		0.71	1.00
Satd. Flow (perm)	601	1350		461	1363			1006	1227		1019	1227
Volume (vph)	130	545	125	50	435	60	105	5	65	45	5	130
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	137	574	132	53	458	63	111	5	68	47	5	137
RTOR Reduction (vph)	0	8	0	0	5	0	0	0	57	0	0	114
Lane Group Flow (vph)	137	698	0	53	516	0	0	116	11	0	52	23
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	1%	1%	1%	1%	1%	1%
Parking (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Turn Type	Perm			Perm			Perm		Perm	Perm		Perm
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8		8	4		4
Actuated Green, G (s)	66.9	66.9		66.9	66.9			15.1	15.1		15.1	15.1
Effective Green, g (s)	66.9	66.9		66.9	66.9			15.1	15.1		15.1	15.1
Actuated g/C Ratio	0.74	0.74		0.74	0.74			0.17	0.17		0.17	0.17
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	447	1004		343	1013			169	206		171	206
v/s Ratio Prot		c0.52			0.38							
v/s Ratio Perm	0.23			0.11				c0.12	0.01		0.05	0.02
v/c Ratio	0.31	0.70		0.15	0.51			0.69	0.06		0.30	0.11
Uniform Delay, d1	3.8	6.1		3.3	4.8			35.2	31.5		32.8	31.8
Progression Factor	0.57	0.48		0.91	0.68			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.3	2.9		0.8	1.5			11.0	0.1		1.0	0.2
Delay (s)	3.5	5.9		3.8	4.8			46.2	31.6		33.9	32.0
Level of Service	A	A		A	A			D	C		C	C
Approach Delay (s)		5.5			4.7			40.8			32.5	
Approach LOS		A			A			D			C	

Intersection Summary			
HCM Average Control Delay	11.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
8: OR 126 & Deer Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.98		1.00	0.99			0.97			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.97			0.99	
Satd. Flow (prot)	1466	1367		1466	1374			2751			2732	
Flt Permitted	0.41	1.00		0.37	1.00			0.65			0.71	
Satd. Flow (perm)	639	1367		569	1374			1847			1954	
Volume (vph)	90	525	60	20	475	35	155	95	50	75	120	80
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	553	63	21	500	37	163	100	53	79	126	84
RTOR Reduction (vph)	0	4	0	0	3	0	0	19	0	0	51	0
Lane Group Flow (vph)	95	612	0	21	534	0	0	297	0	0	238	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		0			0			0			0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	64.4	64.4		64.4	64.4			17.6			17.6	
Effective Green, g (s)	64.4	64.4		64.4	64.4			17.6			17.6	
Actuated g/C Ratio	0.72	0.72		0.72	0.72			0.20			0.20	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.5	3.5		3.5	3.5			2.5			2.5	
Lane Grp Cap (vph)	457	978		407	983			361			382	
v/s Ratio Prot		c0.45			0.39							
v/s Ratio Perm	0.15			0.04				c0.16			0.12	
v/c Ratio	0.21	0.63		0.05	0.54			1.00dl			0.62	
Uniform Delay, d1	4.3	6.6		3.8	6.0			34.7			33.2	
Progression Factor	1.26	1.14		0.65	1.31			1.00			1.00	
Incremental Delay, d2	0.8	2.4		0.1	1.1			13.7			2.7	
Delay (s)	6.2	9.9		2.6	8.9			48.4			35.9	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		9.4			8.7			48.4			35.9	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	19.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	78.0%	ICU Level of Service	D
Analysis Period (min)	15		

dl Defacto Left Lane. Recode with 1 though lane as a left lane.
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
9: OR 126 & Main Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1319	1356		1466	1345		1466	1500		1319	1502	
Flt Permitted	0.26	1.00		0.48	1.00		0.14	1.00		0.28	1.00	
Satd. Flow (perm)	361	1356		741	1345		220	1500		382	1502	
Volume (vph)	90	400	75	50	420	110	30	305	70	130	390	85
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	421	79	53	442	116	32	321	74	137	411	89
RTOR Reduction (vph)	0	8	0	0	10	0	0	9	0	0	9	0
Lane Group Flow (vph)	95	492	0	53	548	0	32	386	0	137	491	0
Parking (#/hr)	0	0			0	0				0		0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	54.0	54.0		44.1	44.1		28.0	28.0		28.0	28.0	
Effective Green, g (s)	54.0	54.0		44.1	44.1		28.0	28.0		28.0	28.0	
Actuated g/C Ratio	0.60	0.60		0.49	0.49		0.31	0.31		0.31	0.31	
Clearance Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	2.0		2.0	2.0		3.0	3.0		1.5	1.5	
Lane Grp Cap (vph)	279	814		363	659		68	467		119	467	
v/s Ratio Prot	0.02	c0.36			c0.41			0.26			0.33	
v/s Ratio Perm	0.18			0.07			0.15			c0.36		
v/c Ratio	0.34	0.60		0.15	0.83		0.47	0.83		1.15	1.05	
Uniform Delay, d1	10.5	11.3		12.6	19.7		25.0	28.7		31.0	31.0	
Progression Factor	0.87	0.93		0.64	0.67		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	2.6		0.8	11.0		5.1	11.4		128.9	55.8	
Delay (s)	9.8	13.1		8.8	24.1		30.1	40.2		159.9	86.8	
Level of Service	A	B		A	C		C	D		F	F	
Approach Delay (s)		12.6			22.8			39.4			102.5	
Approach LOS		B			C			D			F	

Intersection Summary			
HCM Average Control Delay	45.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: OR 126 & Elm Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.99		1.00	1.00			0.97			0.97	
Flt Protected	0.95	1.00		0.95	1.00			0.98			0.97	
Satd. Flow (prot)	1466	1378		1466	1382			2757			2727	
Flt Permitted	0.46	1.00		0.45	1.00			0.81			0.75	
Satd. Flow (perm)	706	1378		698	1382			2255			2087	
Volume (vph)	25	465	25	15	465	15	50	75	35	85	40	35
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	26	489	26	16	489	16	53	79	37	89	42	37
RTOR Reduction (vph)	0	1	0	0	1	0	0	33	0	0	33	0
Lane Group Flow (vph)	26	514	0	16	504	0	0	136	0	0	135	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	1%	1%	1%	1%	1%	1%
Parking (#/hr)		0			0			0			0	
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	71.9	71.9		71.9	71.9			10.1			10.1	
Effective Green, g (s)	71.9	71.9		71.9	71.9			10.1			10.1	
Actuated g/C Ratio	0.80	0.80		0.80	0.80			0.11			0.11	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.5	3.5		3.5	3.5			2.5			2.5	
Lane Grp Cap (vph)	564	1101		558	1104			253			234	
v/s Ratio Prot		c0.37			0.36							
v/s Ratio Perm	0.04			0.02				0.06			c0.06	
v/c Ratio	0.05	0.47		0.03	0.46			0.54			0.58	
Uniform Delay, d1	1.9	2.9		1.9	2.9			37.7			37.9	
Progression Factor	1.52	1.65		0.45	0.45			1.00			1.00	
Incremental Delay, d2	0.1	0.9		0.1	1.3			1.7			2.8	
Delay (s)	3.0	5.7		0.9	2.5			39.5			40.7	
Level of Service	A	A		A	A			D			D	
Approach Delay (s)		5.6			2.5			39.5			40.7	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	12.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	49.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
11: OR 126 & Juniper Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00		1.00	0.92		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1629	1712		1629	1712		1693	1649		1693	1693	
Flt Permitted	0.30	1.00		0.21	1.00		0.73	1.00		0.74	1.00	
Satd. Flow (perm)	508	1712		357	1712		1293	1649		1324	1693	
Volume (vph)	20	570	5	35	475	5	50	10	10	10	30	15
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	21	600	5	37	500	5	53	11	11	11	32	16
RTOR Reduction (vph)	0	1	0	0	1	0	0	6	0	0	9	0
Lane Group Flow (vph)	21	604	0	37	504	0	53	16	0	11	39	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	1%	1%	1%	1%	1%	1%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	40.4	40.4		40.4	40.4		41.6	41.6		41.6	41.6	
Effective Green, g (s)	40.4	40.4		40.4	40.4		41.6	41.6		41.6	41.6	
Actuated g/C Ratio	0.45	0.45		0.45	0.45		0.46	0.46		0.46	0.46	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	228	768		160	768		598	762		612	783	
v/s Ratio Prot		c0.35			0.29			0.01			0.02	
v/s Ratio Perm	0.04			0.10			c0.04			0.01		
v/c Ratio	0.09	0.79		0.23	0.66		0.09	0.02		0.02	0.05	
Uniform Delay, d1	14.3	21.1		15.3	19.4		13.6	13.1		13.1	13.3	
Progression Factor	1.31	1.25		1.00	1.00		1.00	1.00		1.01	0.99	
Incremental Delay, d2	0.2	5.0		0.7	2.0		0.3	0.1		0.1	0.1	
Delay (s)	18.8	31.5		16.0	21.4		13.9	13.2		13.3	13.3	
Level of Service	B	C		B	C		B	B		B	B	
Approach Delay (s)		31.0			21.0			13.7			13.3	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	25.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.43		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	48.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM Unsignalized Intersection Capacity Analysis
12: OR 126 & Knowledge Street

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	615	5	25	415	10	45
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	647	5	26	437	11	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)	432					
pX, platoon unblocked			0.69		0.69	0.69
vC, conflicting volume			653		1139	650
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			499		1201	496
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		92	88
cM capacity (veh/h)			728		135	394

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	653	26	437	58
Volume Left	0	26	0	11
Volume Right	5	0	0	47
cSH	1700	728	1700	292
Volume to Capacity	0.38	0.04	0.26	0.20
Queue Length 95th (ft)	0	3	0	18
Control Delay (s)	0.0	10.1	0.0	20.4
Lane LOS		B		C
Approach Delay (s)	0.0	0.6		20.4
Approach LOS				C

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	44.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
13: OR 126 & Paulina Hwy (Combs Flat Rd)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.94		1.00	0.99		1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1629	1617		1629	1692		1693	1680		1693	1714	
Flt Permitted	0.35	1.00		0.23	1.00		0.48	1.00		0.51	1.00	
Satd. Flow (perm)	599	1617		401	1692		860	1680		912	1714	
Volume (vph)	45	395	240	160	460	45	135	170	105	60	220	75
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	47	416	253	168	484	47	142	179	111	63	232	79
RTOR Reduction (vph)	0	40	0	0	6	0	0	50	0	0	27	0
Lane Group Flow (vph)	47	629	0	168	525	0	142	240	0	63	284	0
Heavy Vehicles (%)	5%	5%	5%	5%	5%	5%	1%	1%	1%	1%	1%	1%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	22.2	22.2		22.2	22.2		14.9	14.9		14.9	14.9	
Effective Green, g (s)	22.2	22.2		22.2	22.2		14.9	14.9		14.9	14.9	
Actuated g/C Ratio	0.49	0.49		0.49	0.49		0.33	0.33		0.33	0.33	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Grp Cap (vph)	295	796		197	833		284	555		301	566	
v/s Ratio Prot		0.39			0.31			0.14			c0.17	
v/s Ratio Perm	0.08			c0.42			0.17			0.07		
v/c Ratio	0.16	0.79		0.85	0.63		0.50	0.43		0.21	0.50	
Uniform Delay, d1	6.3	9.5		10.0	8.4		12.1	11.8		10.9	12.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	6.2		30.5	2.2		2.9	1.1		0.7	1.5	
Delay (s)	6.8	15.7		40.5	10.6		15.0	12.9		11.6	13.6	
Level of Service	A	B		D	B		B	B		B	B	
Approach Delay (s)		15.1			17.8			13.6			13.2	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	15.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	45.1	Sum of lost time (s)	8.0
Intersection Capacity Utilization	85.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
14: OR 126 & Laughlin Road

6/22/2005

Movement	EBL	EBT	WBT	WBR	SEL	SER
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	0	430	485	175	95	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	453	511	184	100	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	695				1055	603
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	695				1055	603
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				59	100
cM capacity (veh/h)	887				247	494

Direction, Lane #	EB 1	WB 1	SE 1
Volume Total	453	695	100
Volume Left	0	0	100
Volume Right	0	184	0
cSH	1700	1700	247
Volume to Capacity	0.27	0.41	0.41
Queue Length 95th (ft)	0	0	46
Control Delay (s)	0.0	0.0	29.2
Lane LOS			D
Approach Delay (s)	0.0	0.0	29.2
Approach LOS			D

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
15: Peters Street & Main Street

6/22/2005

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1676	1500	1765	1500	1676	1765
Flt Permitted	0.95	1.00	1.00	1.00	0.48	1.00
Satd. Flow (perm)	1676	1500	1765	1500	852	1765
Volume (vph)	230	20	410	315	100	375
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	242	21	432	332	105	395
RTOR Reduction (vph)	0	17	0	122	0	0
Lane Group Flow (vph)	242	4	432	210	105	395
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%
Turn Type		Perm		Perm	Perm	
Protected Phases	8		2			6
Permitted Phases		8		2	6	
Actuated Green, G (s)	10.3	10.3	31.7	31.7	31.7	31.7
Effective Green, g (s)	10.3	10.3	31.7	31.7	31.7	31.7
Actuated g/C Ratio	0.21	0.21	0.63	0.63	0.63	0.63
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	345	309	1119	951	540	1119
v/s Ratio Prot	c0.14		c0.24			0.22
v/s Ratio Perm		0.00		0.14	0.12	
v/c Ratio	0.70	0.01	0.39	0.22	0.19	0.35
Uniform Delay, d1	18.4	15.8	4.4	3.9	3.8	4.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.3	0.0	1.0	0.5	0.8	0.9
Delay (s)	24.7	15.8	5.4	4.4	4.6	5.2
Level of Service	C	B	A	A	A	A
Approach Delay (s)	24.0		5.0			5.1
Approach LOS	C		A			A

Intersection Summary			
HCM Average Control Delay	8.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	54.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
16: Loper Avenue & Main Street

6/22/2005

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	75	85	1040	85	30	825
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	79	89	1095	89	32	868
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)			968			
pX, platoon unblocked						
vC, conflicting volume	1637	592			1184	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1637	592			1184	
tC, single (s)	6.8	6.9			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	9	80			95	
cM capacity (veh/h)	87	449			585	

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	168	730	454	321	579
Volume Left	79	0	0	32	0
Volume Right	89	0	89	0	0
cSH	152	1700	1700	585	1700
Volume to Capacity	1.11	0.43	0.27	0.05	0.34
Queue Length 95th (ft)	227	0	0	4	0
Control Delay (s)	165.7	0.0	0.0	1.8	0.0
Lane LOS	F			A	
Approach Delay (s)	165.7	0.0		0.6	
Approach LOS	F				

Intersection Summary			
Average Delay	12.6		
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
17: 10th Street & Main Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	20	120	10	25	5	40	845	20	5	655	65
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	21	126	11	26	5	42	889	21	5	689	68
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								318				
pX, platoon unblocked	0.73	0.73		0.73	0.73	0.73				0.73		
vC, conflicting volume	1692	1695	689	1811	1742	889	758			911		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1942	1946	689	2104	2010	850	758			878		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	37	53	72	13	36	98	95			99		
cM capacity (veh/h)	17	45	447	12	41	266	853			565		

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	11	21	126	11	26	5	42	889	21	5	689	68
Volume Left	11	0	0	11	0	0	42	0	0	5	0	0
Volume Right	0	0	126	0	0	5	0	0	21	0	0	68
cSH	17	45	447	12	41	266	853	1700	1700	565	1700	1700
Volume to Capacity	0.63	0.47	0.28	0.87	0.64	0.02	0.05	0.52	0.01	0.01	0.41	0.04
Queue Length 95th (ft)	41	42	29	47	59	2	4	0	0	1	0	0
Control Delay (s)	401.5	141.6	16.2	613.3	190.3	18.8	9.4	0.0	0.0	11.4	0.0	0.0
Lane LOS	F	F	C	F	F	C	A			B		
Approach Delay (s)	58.6			274.6			0.4			0.1		
Approach LOS	F			F								

Intersection Summary			
Average Delay	11.1		
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
18: 9th Street & Main Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1660	1748	1485	1660	1748	1485	1676	1765	1500	1676	1765	1500
Flt Permitted	0.64	1.00	1.00	0.59	1.00	1.00	0.35	1.00	1.00	0.33	1.00	1.00
Satd. Flow (perm)	1119	1748	1485	1032	1748	1485	617	1765	1500	590	1765	1500
Volume (vph)	285	190	230	60	160	205	160	550	50	220	530	215
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	300	200	242	63	168	216	168	579	53	232	558	226
RTOR Reduction (vph)	0	0	168	0	0	150	0	0	23	0	0	99
Lane Group Flow (vph)	300	200	74	63	168	66	168	579	30	232	558	127
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	Perm		Prot	Perm		Prot	Perm		Prot	Perm		Prot
Protected Phases		4	4		8	8		2	2		6	6
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	18.3	18.3	18.3	18.3	18.3	18.3	33.7	33.7	33.7	33.7	33.7	33.7
Effective Green, g (s)	18.3	18.3	18.3	18.3	18.3	18.3	33.7	33.7	33.7	33.7	33.7	33.7
Actuated g/C Ratio	0.30	0.30	0.30	0.30	0.30	0.30	0.56	0.56	0.56	0.56	0.56	0.56
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	341	533	453	315	533	453	347	991	843	331	991	843
v/s Ratio Prot		0.11	0.05		0.10	0.04		0.33	0.02		0.32	0.08
v/s Ratio Perm	c0.27			0.06			0.27			c0.39		
v/c Ratio	0.88	0.38	0.16	0.20	0.32	0.15	0.48	0.58	0.04	0.70	0.56	0.15
Uniform Delay, d1	19.8	16.4	15.2	15.4	16.0	15.2	7.9	8.6	5.9	9.5	8.4	6.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	21.8	0.4	0.2	0.3	0.3	0.1	4.8	2.5	0.1	11.7	2.3	0.4
Delay (s)	41.6	16.8	15.4	15.7	16.4	15.3	12.7	11.1	6.0	21.2	10.7	6.7
Level of Service	D	B	B	B	B	B	B	B	A	C	B	A
Approach Delay (s)		26.4			15.8			11.1			12.2	
Approach LOS		C			B			B			B	

Intersection Summary			
HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
19: NE 7th Street & Main Street

6/22/2005

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Volume (veh/h)	30	55	730	40	40	605
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	32	58	768	42	42	637
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)						542
pX, platoon unblocked	0.92					
vC, conflicting volume	1489	768			811	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1535	768			811	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	72	86			95	
cM capacity (veh/h)	111	401			815	

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	32	58	768	42	42	637
Volume Left	32	0	0	0	42	0
Volume Right	0	58	0	42	0	0
cSH	111	401	1700	1700	815	1700
Volume to Capacity	0.28	0.14	0.45	0.02	0.05	0.37
Queue Length 95th (ft)	27	12	0	0	4	0
Control Delay (s)	49.8	15.5	0.0	0.0	9.7	0.0
Lane LOS	E	C			A	
Approach Delay (s)	27.6		0.0		0.6	
Approach LOS	D					

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
20: NW 7th Street & Main Street

6/22/2005

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Volume (veh/h)	20	15	15	570	570	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	16	16	600	600	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None					
Median storage veh)						
Upstream signal (ft)				1300	642	
pX, platoon unblocked						
vC, conflicting volume	1232	600	605			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1232	600	605			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	89	97	98			
cM capacity (veh/h)	193	501	973			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	21	16	16	600	600	5
Volume Left	21	0	16	0	0	0
Volume Right	0	16	0	0	0	5
cSH	193	501	973	1700	1700	1700
Volume to Capacity	0.11	0.03	0.02	0.35	0.35	0.00
Queue Length 95th (ft)	9	2	1	0	0	0
Control Delay (s)	26.0	12.4	8.8	0.0	0.0	0.0
Lane LOS	D	B	A			
Approach Delay (s)	20.2		0.2		0.0	
Approach LOS	C					

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
21: 2nd Street & Main Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.91		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1693	1583		1693	1630		1629	1703		1629	1680	
Flt Permitted	0.43	1.00		0.35	1.00		0.39	1.00		0.52	1.00	
Satd. Flow (perm)	770	1583		620	1630		666	1703		896	1680	
Volume (vph)	35	65	190	35	90	120	245	345	15	85	485	75
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	37	68	200	37	95	126	258	363	16	89	511	79
RTOR Reduction (vph)	0	165	0	0	87	0	0	2	0	0	6	0
Lane Group Flow (vph)	37	103	0	37	134	0	258	377	0	89	584	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	5%	5%	5%	5%	5%	5%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.5	11.5		11.5	11.5		45.5	45.5		45.5	45.5	
Effective Green, g (s)	11.5	11.5		11.5	11.5		45.5	45.5		45.5	45.5	
Actuated g/C Ratio	0.18	0.18		0.18	0.18		0.70	0.70		0.70	0.70	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	136	280		110	288		466	1192		627	1176	
v/s Ratio Prot		0.07			c0.08			0.22			0.35	
v/s Ratio Perm	0.05			0.06			c0.39			0.10		
v/c Ratio	0.27	0.37		0.34	0.46		0.55	0.32		0.14	0.50	
Uniform Delay, d1	23.1	23.6		23.4	24.0		4.8	3.8		3.2	4.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.8		1.8	1.2		4.7	0.7		0.5	1.5	
Delay (s)	24.2	24.4		25.2	25.2		9.5	4.5		3.7	6.0	
Level of Service	C	C		C	C		A	A		A	A	
Approach Delay (s)		24.4			25.2			6.5			5.7	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM Average Control Delay	11.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.54		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	83.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
22: 5th Street & Main Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	5	0	5	5	0	95	5	420	10	125	585	5
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	0	5	5	0	100	5	442	11	132	616	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1439	1345	618	1345	1342	447	621			453		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1439	1345	618	1345	1342	447	621			453		
tC, single (s)	7.2	6.6	6.2	7.2	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	99	95	100	83	99			88		
cM capacity (veh/h)	82	131	484	113	131	605	945			1092		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	11	105	458	753
Volume Left	5	5	5	132
Volume Right	5	100	11	5
cSH	140	497	945	1092
Volume to Capacity	0.07	0.21	0.01	0.12
Queue Length 95th (ft)	6	20	0	10
Control Delay (s)	32.7	14.2	0.2	2.9
Lane LOS	D	B	A	A
Approach Delay (s)	32.7	14.2	0.2	2.9
Approach LOS	D	B		

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		

HCM Unsignalized Intersection Capacity Analysis
23: Lynn Street & Main Street

6/22/2005

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	20	15	5	10	5	305	0	90	10	400	100	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	16	5	11	5	321	0	95	11	421	105	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1374	1061	113	1061	1063	100	121			105		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1374	1061	113	1061	1063	100	121			105		
tC, single (s)	7.2	6.6	6.2	7.2	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	65	90	99	93	97	66	100			71		
cM capacity (veh/h)	61	158	932	143	157	947	1448			1467		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	42	337	0	105	421	121
Volume Left	21	11	0	0	421	0
Volume Right	5	321	0	11	0	16
cSH	93	755	1700	1700	1467	1700
Volume to Capacity	0.45	0.45	0.00	0.06	0.29	0.07
Queue Length 95th (ft)	48	58	0	0	30	0
Control Delay (s)	72.3	13.5	0.0	0.0	8.4	0.0
Lane LOS	F	B			A	
Approach Delay (s)	72.3	13.5	0.0		6.6	
Approach LOS	F	B				

Intersection Summary			
Average Delay	10.9		
Intersection Capacity Utilization	57.5%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	530	55	20	485	35	40
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	558	58	21	511	37	42
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			616		1139	587
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			616		1139	587
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		83	92
cM capacity (veh/h)			959		217	508

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	616	532	79
Volume Left	0	21	37
Volume Right	58	0	42
cSH	1700	959	312
Volume to Capacity	0.36	0.02	0.25
Queue Length 95th (ft)	0	2	25
Control Delay (s)	0.0	0.6	20.4
Lane LOS		A	C
Approach Delay (s)	0.0	0.6	20.4
Approach LOS			C

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	EBL	EBT	WBT	WBR	SWL	SWR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	170	420	580	75	10	70
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	179	442	611	79	11	74
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	689				1450	650
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	689				1450	650
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	80				91	84
cM capacity (veh/h)	900				115	467

Direction, Lane #	EB 1	WB 1	SW 1
Volume Total	621	689	84
Volume Left	179	0	11
Volume Right	0	79	74
cSH	900	1700	338
Volume to Capacity	0.20	0.41	0.25
Queue Length 95th (ft)	18	0	24
Control Delay (s)	4.8	0.0	19.2
Lane LOS	A		C
Approach Delay (s)	4.8	0.0	19.2
Approach LOS			C

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		

26: 5th Street & Knowledge Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	20	10	15	0	5	5	20	30	5	5	45	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	11	16	0	5	5	21	32	5	5	47	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	11			26			103	71	18	89	76	8
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	11			26			103	71	18	89	76	8
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			97	96	100	99	94	99
cM capacity (veh/h)	1615			1594			824	811	1063	858	805	1077

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	47	11	58	63
Volume Left	21	0	21	5
Volume Right	16	5	5	11
cSH	1615	1594	834	845
Volume to Capacity	0.01	0.00	0.07	0.07
Queue Length 95th (ft)	1	0	6	6
Control Delay (s)	3.3	0.0	9.6	9.6
Lane LOS	A		A	A
Approach Delay (s)	3.3	0.0	9.6	9.6
Approach LOS			A	A

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	24.7%	ICU Level of Service	A
Analysis Period (min)	15		

27: Lynn Street & Knowledge Street

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	20	383	40	15	200	30	40	10	25	35	15	10
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	21	403	42	16	211	32	42	11	26	37	16	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	242			445			727	740	424	735	745	226
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	242			445			727	740	424	735	745	226
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			87	97	96	88	95	99
cM capacity (veh/h)	1330			1120			317	336	632	308	333	816

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	21	445	16	242	79	63
Volume Left	21	0	16	0	42	37
Volume Right	0	42	0	32	26	11
cSH	1330	1700	1120	1700	383	351
Volume to Capacity	0.02	0.26	0.01	0.14	0.21	0.18
Queue Length 95th (ft)	1	0	1	0	19	16
Control Delay (s)	7.7	0.0	8.3	0.0	16.8	17.5
Lane LOS	A		A		C	C
Approach Delay (s)	0.3		0.5		16.8	17.5
Approach LOS					C	C

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
28: Lynn Street & Paulina Hwy (Combs Flat Rd)

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1693	1515	1693	1782	1782	1515
Flt Permitted	0.95	1.00	0.41	1.00	1.00	1.00
Satd. Flow (perm)	1693	1515	738	1782	1782	1515
Volume (vph)	165	270	160	280	480	115
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	174	284	168	295	505	121
RTOR Reduction (vph)	0	214	0	0	0	56
Lane Group Flow (vph)	174	70	168	295	505	65
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Turn Type		Perm	Perm			Perm
Protected Phases	4			2	6	
Permitted Phases		4	2			6
Actuated Green, G (s)	9.0	9.0	19.6	19.6	19.6	19.6
Effective Green, g (s)	9.0	9.0	19.6	19.6	19.6	19.6
Actuated g/C Ratio	0.25	0.25	0.54	0.54	0.54	0.54
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	416	373	395	954	954	811
v/s Ratio Prot	c0.10			0.17	c0.28	
v/s Ratio Perm		0.05	0.23			0.04
v/c Ratio	0.42	0.19	0.43	0.31	0.53	0.08
Uniform Delay, d1	11.6	10.9	5.1	4.7	5.5	4.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.2	0.7	0.2	0.5	0.0
Delay (s)	12.3	11.2	5.9	4.9	6.0	4.2
Level of Service	B	B	A	A	A	A
Approach Delay (s)	11.6			5.3	5.7	
Approach LOS	B			A	A	

Intersection Summary			
HCM Average Control Delay	7.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	36.6	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
29: OR 126 & OR 126 Bypass

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	10	375	420	0	0	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	395	442	0	0	16
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	442				858	442
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	442				858	442
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	97
cM capacity (veh/h)	1102				320	609

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	11	395	442	16
Volume Left	11	0	0	0
Volume Right	0	0	0	16
cSH	1102	1700	1700	609
Volume to Capacity	0.01	0.23	0.26	0.03
Queue Length 95th (ft)	1	0	0	2
Control Delay (s)	8.3	0.0	0.0	11.1
Lane LOS	A			B
Approach Delay (s)	0.2		0.0	11.1
Approach LOS				B

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	33.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	80	15	0	170	10	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	84	16	0	179	11	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			100		271	92
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			100		271	92
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			1486		716	962

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	100	179	11
Volume Left	0	0	11
Volume Right	16	0	0
cSH	1700	1700	716
Volume to Capacity	0.06	0.11	0.01
Queue Length 95th (ft)	0	0	1
Control Delay (s)	0.0	0.0	10.1
Lane LOS			B
Approach Delay (s)	0.0	0.0	10.1
Approach LOS			B

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	19.4%	ICU Level of Service	A
Analysis Period (min)	15		

2025 Build & TDM Traffic Operations Analysis – Synchro

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1319	1356		1466	1345		1466	1500		1319	1501	
Flt Permitted	0.27	1.00		0.49	1.00		0.16	1.00		0.29	1.00	
Satd. Flow (perm)	379	1356		750	1345		243	1500		401	1501	
Volume (vph)	87	389	73	49	408	107	29	297	68	126	379	83
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	92	409	77	52	429	113	31	313	72	133	399	87
RTOR Reduction (vph)	0	8	0	0	10	0	0	9	0	0	9	0
Lane Group Flow (vph)	92	478	0	52	532	0	31	376	0	133	477	0
Parking (#/hr)	0	0			0	0				0		0
Turn Type	pm+pt			Perm			Perm			Perm		
Protected Phases	5	2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	54.0	54.0		44.2	44.2		28.0	28.0		28.0	28.0	
Effective Green, g (s)	54.0	54.0		44.2	44.2		28.0	28.0		28.0	28.0	
Actuated g/C Ratio	0.60	0.60		0.49	0.49		0.31	0.31		0.31	0.31	
Clearance Time (s)	3.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	2.0		2.0	2.0		3.0	3.0		1.5	1.5	
Lane Grp Cap (vph)	288	814		368	661		76	467		125	467	
v/s Ratio Prot	0.02	c0.35			c0.40			0.25			0.32	
v/s Ratio Perm	0.17			0.07			0.13			c0.33		
v/c Ratio	0.32	0.59		0.14	0.80		0.41	0.81		1.06	1.02	
Uniform Delay, d1	10.3	11.1		12.5	19.3		24.5	28.5		31.0	31.0	
Progression Factor	0.87	0.93		0.63	0.65		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	2.4		0.7	9.4		3.5	9.8		98.7	47.2	
Delay (s)	9.5	12.7		8.6	22.0		28.0	38.2		129.7	78.2	
Level of Service	A	B		A	C		C	D		F	E	
Approach Delay (s)		12.2			20.8			37.5			89.3	
Approach LOS		B			C			D			F	

Intersection Summary			
HCM Average Control Delay	40.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX E
TRANSPORTATION SYSTEMS FUNDING SOURCES

Table 1: Summary of Road-Related Transportation Funding Programs: Federal Sources

Table 2: Summary of Road-Related Transportation Funding Programs: State Sources

Table 3: Summary of Road-Related Transportation Funding Programs: Local Sources

Table 1
Transportation Systems Plan
Summary of Road-Related Transportation Funding Programs: Federal Sources

Program Name	Description
Intermodal Surface Transportation Efficiency Act (ISTEA)	ISTEA is designed to provide flexibility in federal funding of transportation projects. ISTEA established several funding programs including the 1) National Highway System; 2) Interstate Program; 3) Surface Transportation Program; 4) Congestion Management and Air Quality Improvements Program; and 5) National Scenic Byways Program.
Surface Transportation Program (STP) (Bridge Program)	The Surface Transportation Program was authorized by Title I of the ISTEA. The STP funds are allocated to the State and suballocated to cities and counties on a formula basis by the Oregon Transportation Commission. STP funds may be used for any road that is not functionally classified as a local or rural minor collector and must be included in the Transportation Improvement Program to receive STP funds.
Transportation Enhancement Program (Part of STP)	The ISTEA includes provisions that require the State to set aside a portion of its Surface Transportation Program (STP) funds for projects that will enhance the cultural and environmental value of the State's transportation system. Eligible transportation enhancement projects must be directly related to the intermodal transportation system. This program funds enhancements including pedestrian and bicycle facilities; preservation of abandoned railway corridors; landscaping and other scenic beautification; control and removal of outdoor advertising; acquisition of scenic easements and scenic or historic sites; scenic or historic highway programs; historic preservation; rehabilitation and operation of historic transportation buildings, structures or facilities; archaeological planning and research; and mitigation of water pollution due to highway runoff.
Highway Enhancement System (HES)	The FHWA Highway Enhancement System Program provides funding for safety improvement projects on public roads. Safety improvement projects may occur on any public road and must be sponsored by a county or city. To be eligible for Federal aid, a project should be part of either the annual element of a Regional Transportation Plan or the annual listing of rural projects by ODOT, although they do not have to be part of the approved State Highway Improvement Program to receive HES funding.
Timber Receipts (USFS)	The United States Forest Service shares 25 percent of national forest receipts with counties. By Oregon law (ORS 294.060), the County then allocates 75 percent of the national forest receipts to the road fund

	and 25 percent to local school districts.
Community Development Block Grants (CDBG)	Community Development Block Grants (CDBG) are administered by the Department of Housing and Urban Development (HUD) and could potentially be used for transportation improvements in eligible areas.
Forest Highway Program	Support all public lands (including BLM), not just forest

Table 2
Transportation Systems Plan
Summary of Road-Related Transportation Funding Programs: State Level

Program Name	Description
State Highway Fund	The State Highway Fund composed of gas taxes, vehicle registration fees, and weight-mile taxes assessed on freight carrier. In 1994, the state gas tax was $0.24 per gallon. Vehicle registration fees were $15 annually. Revenues are divided as follows: 15.57 percent to cities, 24.38 percent to counties, and 60.05 percent to ODOT. The County share of the State Highway Fund is allocated based on population and vehicle registration. ORS 366.514 requires at least one percent of the State Highway Fund received by ODOT, counties and cities be expended for the development of footpaths and bikeways. ODOT administers the bicycle funds, handles bikeway planning, design, engineering and construction, and provides technical assistance and advice to local governments concerning bikeways.
Special Public Works Fund (SPWF)	The State of Oregon allocates a portion of revenues from the state lottery for economic development. The Oregon Economic Development Department provides grants and loans through the SPWF program to construct, improve and repair infrastructure to support local economic development and create new jobs. The SPWF provides a maximum grant of $500,000 for projects that will help create a minimum of 50 jobs.
Transportation Access Charges	The most familiar form of a transportation access charge is a bridge or highway toll. Transportation access charges are most appropriate for high-speed, limited access corridors; service in high-demand corridors; and bypass facilities to avoid congested areas. Congestion pricing, where drivers are charged electronically for the trips they make based on location and time of day, is the most efficient policy for dealing with urban congestion. It not only generates revenue for maintenance and improvements; but also decreases congestion and the need for capital improvements by increasing the cost of trips during peak periods.

	The Oregon Revised Statutes allow ODOT to construct toll bridges to connect state highways and improve safety and capacity. The Statues also allow private development of toll bridges. Recent actions by the Oregon legislature provide authority for developing toll roads. State authority for congestion pricing does not exist; new legislation would be required.
Immediate Opportunity Fund (IOF)	Financed at a level of $5 million per year to a maximum of $40 million through FY96. The fund is to support specific economic developments in Oregon through the construction and improvement of roads and is restricted for use in situations that require a quick response and commitment of funds. It is anticipated that the maximum amount available for a single project is $500,000 or 10 percent of the annual program level. This fund may be used only when other sources of financial support are unavailable or insufficient and are not a replacement or substitute for other funding sources.

OR Transportation Infrastructure Bank	As a pilot program for the USDOT, the Oregon Transportation Commission has made $10 million available from projects that will not be contracted in FY 1996. The OTIB will make loans for transportation projects and will offer a variety of credit enhancements. Initial loans must be for improvements on federal aid highways, repayments go into an account that will be made available for any mode. Ability to repay will be a key factor in all loans.
Traffic Control Projects	The State maintains a policy of sharing installation, maintenance, and operational costs for traffic signals and luminaire units at intersections between State highway and city streets (or county roads). Intersections involving a State highway and a city street (or county road) which are included on the state-wide priority list are eligible to participate in the cost sharing policy. ODOT establishes a statewide priority list for traffic signal installations on the State Highway System. The priority system is based on warrants outlined in the Manual for Uniform Traffic Control Devices. Local agencies are responsible for coordinating the statewide signal priority list with local road requirements.

Table 3
Transportation Systems Plan
Summary of Road-Related Transportation Funding Programs: Local Sources

Program Name	Description
Special Assessments/Local Improvements Districts	Special assessments are charges levied on property owners for neighborhood public facilities and services, with each property assessed a portion of total project cost. They are commonly used for such public works projects as street paving, drainage, parking facilities and sewer lines. The justification for such levies is that many of these public works activities provide services to or directly enhance the value of nearby land, thereby providing direct and/or financial benefit to its owners. Local Improvement Districts (LIDs) are legal entities established by the City to levy special assessments designed to fund improvements that have local benefits. Through a local improvement district (LID), streets or other transportation improvements are constructed and a fee is assessed to adjacent property owners.
Systems Development Charges (Impact Fees)	Systems Development Charges (SDCs) are fees paid by land developers intended to reflect the increased capital costs incurred by a municipality or utility as a result of a development. Development charges are calculated to include the costs of impacts on adjacent areas or services, such as increased school enrollment, parks and recreation use, or traffic congestion. Numerous Oregon cities and counties presently use SDCs to fund transportation capacity improvements. SDCs are authorized and limited by ORS 223.297 - 223.314.
Local Gas Tax	A local gas tax is assessed at the pump and added to existing state and federal taxes. Tillamook, The Dalles and Woodburn are Oregon cities that have a local gas tax. Multnomah and Washington Counties also have gas taxes.
Local Parking Fees	Parking fees are a common means of generating revenue for public parking maintenance and development. Most cities have some public parking and many charge nominal fees for use of public parking. Cities also generate revenues from parking citations. These fees are generally used for parking-related maintenance and improvements.

Program Name	Description
Street Utility Fee	Most city residents pay water and sewer utility fees. Street user fees apply the same concept to city streets. A fee would be assessed to all businesses and households in the city for use of streets based on the amount of use typically generated by a particular use. For example, a single-family residence might, on average, generate 10 vehicle trips per day compared to 130 trips per 1,000 square feet of floor area for retail uses. Therefore, the retail use would be assessed a higher fee based on higher use. Street services fees differ from water and sewer fees because usage cannot be easily monitored. Street user fees are typically used to pay for maintenance more than for capital projects.
Vehicle Registration Fees	Counties can implement a local vehicle registration fee. The fee would operate similar to the state vehicle registration fee. A portion of the County fee would be allocated to the City.
Property Taxes	Local property taxes could be used to fund transportation, although this is limited by Ballot Measure 5 and 47.
Revenue Bonds	Revenue Bonds are bonds whose debt service is financed by user charges, such as service charges, tolls, admissions fees, and rents. If revenues from user charges are not sufficient to meet the debt service payments, the issuer generally is not legally obligated to levy taxes to avoid default, unless they are also based by the full faith and credit of the insuring governmental unit. In that case, they are called indirect general obligation bonds. Revenue bonds could be secured by a local gas tax, street utility fee, or other transportation-related stable revenue stream.

APPENDIX F

PUBLIC MEETING NOTICES, AGENDA & COMMENTS

MEMORANDUM

To:	Prineville TSP, Technical Advisory Committee (TAC)	Date:	December 10, 2004
From:	Andy Mortensen, The Transpo Group	TG:	04206.00
Subject:	City of Prineville TSP – TAC Meeting #1 Summary		

Technical Advisory Committee Meeting #1

December 9, 2004 – 1:00 – 3:00 p.m.

AGENDA

I. Introduction – General introduction of members, summary of hand-out materials and project schedule.
II. Goals & Objectives
III. Street Standards
IV. Next Steps

ATTENDANCE

TAC	***Organization***	***Phone Number / e-mail***
Gordon Gillespie	Prineville City Council	447-3715 ggillespie@crestviewcable.com
Dale Keller	Les Schwab	480-0403 Kellerbiz@crestviewcable.com
Peter Russell	ODOT – Region #4	388-6046 Peter.l.russell@odot.state.or.us
Howard Becker	City of Prineville Police	447-8332 hbecker@prinevillepd.org
James H. Mole Sr.	City of Prineville Public Works	408-5472 J.Mole@cityofprineville.com
Penny L. Keller	Crook County Road	447-4644 Penny.Keller@co.crook.or.us
Bill Zelenka	Crook County Planning	447-8156 Bill.Zelenka@co.crook.or.us
Michael Cerbone	City of Prineville Planning	447-8326 mcerbone@cityofprineville.com
Mark Radabaugh	DLCD	388-6157

DISCUSSION

The TAC's discussion of various issues are summarized below. We categorized the discussion by topic rather than chronological order.

> ***Follow-up action items are noted in italics.***

TSP Coordination

Coordination with the Draft Crook County TSP was needed, in particular regarding overlap with the Prineville UGB related to (1) state/county growth estimates (see below) and (2) planned "projects" (e.g. Millican Road interchange at OR 126 & Bremer Road connection).

Prineville is in-process developing its Comprehensive Plan, which the TSP should coordinate with.

> ***Andy to contact and coordinate with Debra McMahon, of DMC Consulting, and integrate the CP working Draft Map and Framework.***

Growth

Most recent 20-year population forecasts, coordinated and agreed upon by Crook County and DLCD, should be used as baseline for Prineville TSP update. Discussion ensued that the forecasts may not necessarily reflect recent trends of new, affordable housing and inter-city work commute regional dynamics.

21,000 population forecast for Prineville by 2025. City needs to have one consistent forecast for all public facility plans.

Transpo has already established design hour traffic volume adjustments factors (seasonalization and growth) with concurrence by ODOT TPAU unit.

> ***Michael to forward to Transpo summary documentation.***

Goals & Objectives

There will be refinement and additions to the draft Goals & Objectives (hand-out). Citizen issues are being integrated into the 2005 Draft TSP, focusing in growth management to retain a small town atmosphere. How the City addresses these issues needs to be integrated into a pro-active public involvement effort (see Public Involvement below), **with particular emphasis on street width and livability**.

Multi-Modal Plan and Program Development

There were a variety of issues raised and discussed, including:

(1) *Truck route connectivity* - through town, changing truck travel patterns, and an immediate need for the completion of the planned, northern arterial truck route. There is some community sensitivity to the use and term – "Truck Route" and the need to re-label as something like "Northern Arterial" (general consensus of the TAC), in part due to the closure of mills and concern of cut-through truck traffic. Conceptual engineering of the final phase completing the Northern Arterial to address these issues.
(2) *Poor street connectivity* - there are a number of Prineville streets that lack full connectivity, are "dog-legged" or dead-end in critical areas.
(3) *City Railroad* – there are 7 at-grade crossings. Whether or not to keep the City's rail spur is a question that is very likely to continue beyond the Draft TSP development process and adoption in 2005. Issue will, in part, be addressed as part of the conceptual engineering of Phase II – Northern Arterial.
(4) *Juniper Canyon/Bremmer Road impacts* – the 2005 TSP needs to assess its impact within the 20-year planning horizon, as there will be a number of new homes in the area.
(5) *Sidewalks* – are really important, from both a connectivity/safety issue but also to address ADA requirements. Need to identify missing links and prioritize improvements. TSP scope includes hand-held GPS data collection to fully address ADA requirements for Self-Examination, TSP outcome will serve as ADA Transition Plan.
(6) *The "Y"* – conceptual engineering of a possible round-about at the OR 126 / US 26 (Third Street) connection should evaluate and consider (a) O'Neil Highway connection and Ochoco River Bridge design; (b) possible connection to Second Street (as an alternative east-west route to Third Street, with connections to OR 27 and South Prineville); and, (c) truck

Consultant Team to consider (1) Bend's Juniper Ridge Roundabout as part of the planning for the "Y." and (2) City's Railroad and crossings as part of Phase II/Northern Arterial (analysis may provide City with further information (e.g. cost) in on-going assessment for the railroad.

City Staff to discuss Sidewalk Inventory Staffing, Transpo to train staffing (coordination already taken with School District and Crook County GIS Staff). Otherwise Transpo to contact City Police (Quelar) and/or Crook County Christian school to find volunteer staffing for data collection.

Transportation Demand Management

Consultant has already coordinated with *Commute Options for Central Oregon* (full summary will be included in Stakeholder Interview Summary, distributed to TAC later in December). Expansion of carpool/vanpool program, inter-city bus and additional park-and-ride facilities to be explored.

City is assessing possible park-and-ride facility on the Ochoco Rim, with possible multi-use trail connections. There is a need to identify other park-and-ride facilities in Prineville.

Policies & Ordinance(s)

DLCD would like to see a *street connectivity* ordinance, draft 1998 TSP included some work on street functional classification and design that specifies street spacing.

IFC and Dept of Forestry have fire planning policies, and City should assess need for fire safety/traffic circulation projects, especially on the Ochoco benches (not necessarily down in the river valley).

Traffic Impact Analysis – need to identify a TIA "trigger." Draft 1998 TSP has trigger for state highways, need to add language to TIA requirements for "trigger" on city streets.

New school location is a growing concern. Impacts to busing and sidewalk system development becomes critical. Possibility of re-locating two schools along OR 126 may have implications of TSP (e.g. new street extensions, re-prioritization of TSP recommended improvements).

Drainage issues and designs do have implications of TSP, with regards to recommended street standards.

Coordinated parks planning is important to identify where park system enhancements can dove-tail with good pedestrian system planning (which affects and supports efficient and safe street design).

Public Involvement

Public involvement effort to focus on public education of:

(a) *street design* (minimum widths) - need to emphasize that extremely wide streets are (1) more expensive to build, (2) more expensive to maintain, and (3) reduces pedestrian crossing lengths (exposure) and improves safety by helping reduce excessive auto speeds.
(b) *sidewalk design* – to enhance pedestrian safety and address ADA legal requirements.

Need to initiate Public Involvement effort in January, to include coordinated workshop setting with Comp Plan effort to provide education on street and sidewalk design.

Transpo to (1) assimilate sidewalk and street design material for January Workshop and (2) brainstorm development of PI packet of materials for PI process, including 1-2 page flyer (for "counter" hand-outs in public buildings and some businesses).

These materials need to illustrate that the designs help Prineville meet their goals and objectives and address Prineville citizen concerns:

Managing growth to retain Prineville's small town atmosphere, through effective and efficient management of tax revenues in support of public works priorities.

MEMORANDUM

To:	Prineville TSP, Technical Advisory Committee (TAC)	Date:	February 15, 2005
From:	Andy Mortensen, The Transpo Group	TG:	04206.00
Subject:	City of Prineville TSP – TAC Meeting #2 Summary		

Technical Advisory Committee Meeting #2

February 15, 2005 – 1:00 – 3:00 p.m.

AGENDA

I. Summary of Existing Conditions – Draft TSP Chapter 4 (sent by e-mail prior to meeting)
II. "Y" Intersection Improvement Options – *handout memo*
III. Draft Recommendations to Revise Street Standards – *handout memo*
IV. Public Meeting Schedule & Strategy
V. Next Steps

ATTENDANCE

TAC	*Organization*	*Phone Number / e-mail*
Gordon Gillespie	Prineville City Council	447-3715 ggillespie@crestviewcable.com
Peter Russell	ODOT – Region #4	388-6046 Peter.l.russell@odot.state.or.us
Howard Becker	City of Prineville Police	447-8332 hbecker@prinevillepd.org
James H. Mole Sr.	City of Prineville Public Works	408-5472 J.Mole@cityofprineville.com
Bill Zelenka	Crook County Planning	447-8156 Bill.Zelenka@co.crook.or.us
Michael Cerbone	City of Prineville Planning	447-8326 mcerbone@cityofprineville.com
Barry Johnson	W&H Pacific	388-4255 BJohnson@whpacific.com
Andy Mortensen	The Transpo Group	(503) 472-3099 andym@thetranspogroup.com

DISCUSSION

The TAC's discussion of various issues is summarized below. We categorized the discussion by topic.

Existing Conditions – Draft TSP Chapter #4

Overview of Existing Conditions, including inventory update of transportation system elements was discussed. Highlights included:

(1) Revised Oregon Highway Plan (1999) Mobility Standards
(2) Establishment of base, 2005 P.M. Peak hour traffic conditions
(3) Consistent measures of traffic operations for state and city facilities using Highway Capacity Manual calculation of volume-to-capacity rather than delay-based methods.
(4) Testing a new city policy threshold of V/C=.90 for Existing Conditions, further evaluation of Future conditions to determine final policy recommendation, and recommendations to city to possible revise traffic impact analysis policy requirement if a new standard is developed.
(5) Summary of traffic operations -existing deficiencies at:
   - US 26 / OR 126 ("Y) – stop controlled approaches
   - 3rd(US 26) & Main
   - 9th & Main
   - 7th & Main
   - OR 126 & O'Neil

No surprises, as measured conditions mostly confirm common occurrences of traffic sore points. TSP Update scope of work was defined with these hot spots already in mind. Bottom line, as was the focus in the 1998 TSP Update – **further define options that provide alternatives to 3rd Street**. Recent projects that help this are the 9th Street extension to US 26, 4th Street between Court & Elm, new signal onus 26 at Combs Flat and new signal on 3rd Street (US 26) at Harwood.

Future alternative improvements will need to address issue of dis-connectivity along major City routes.

Other issues to address in evaluation of future, multi-modal plan components:

(1) ADA accessibility (will be addressed as part of the ped inventory, TSP plan element)
(2) Safe Routes to School (same)
(3) Downtown revitalization/urban renewal
(4) 3rd Street (US 26) traffic signal system (possible replacement of old equipment and upgrade to better manage variable traffic demand
(5) Peters Road intersection with Main Street

(6) Juniper Canyon Development
(7) Need to double-check functional classification for some local streets (e.g. Lynn Blvd., Combs Flat).

"Y" INTERSECTION

The concept of a roundabout (RAB) was discussed in detail. In general, the ROW for a 1- or 2-lane RAB easily fits in the current "Y" area. Prineville Bridge replacement project also identifies additional ROW acquisition for free right turn from US 26 to OR 126 westbound, across Les Schwab property. The following highlights issues needing to be addressed as part of RAB option:

- 1-lane vs 2-lane RAB, considering large truck maneuverability and impacts to small vehicle operations (safety and operations)
- Possibility of slip ramps that significantly reduce traffic volume through RAB
- RAB placement with respect to adjacent land use (south side of 3rd Street) and possible 4th leg connection to 2nd Street
- Access control along state highway ROW, particularly the south side of current "Y," including the need to either provide some form of frontage access or relocation of some existing uses
- Need to specific individual traffic movements, by vehicle class – especially larger truck/trailer combo's
- Relationship to O'Neil Highway and Locust intersection circulation
- Relationship to new Crooked River bridge, with possible slip-ramp to 2nd Street as an interim access solution
- Relationship to adjacent school (will the school eventually re-locate?)

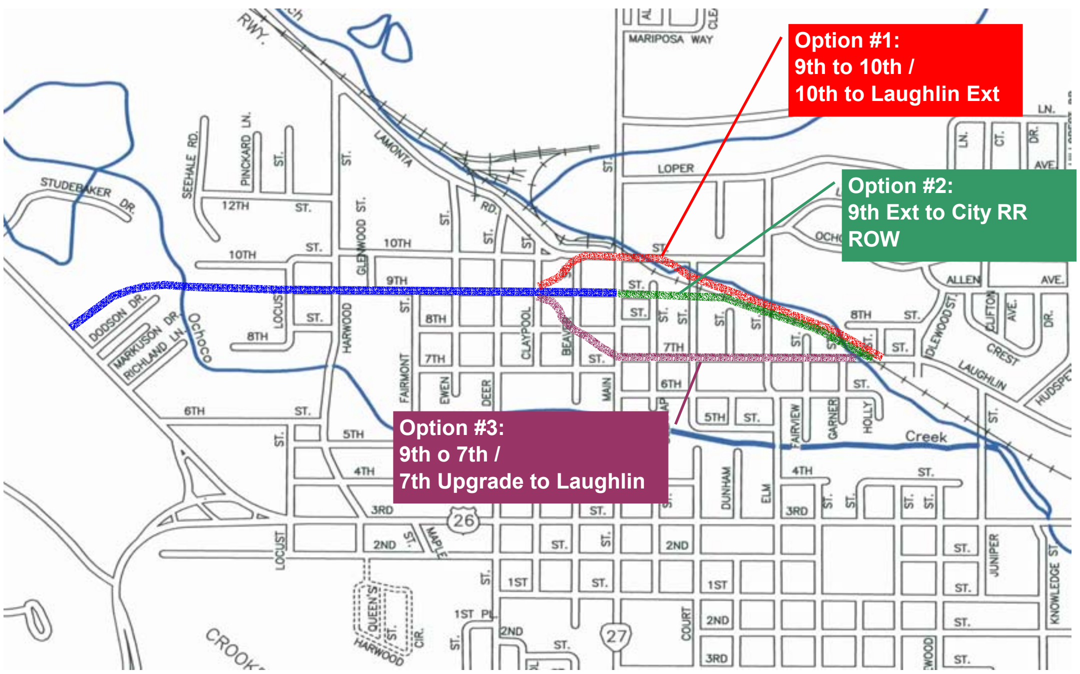
Other possible solutions might include a single intersection controlled by a new traffic signal, with or without possible slip lanes (e.g. westbound US 26 to north US 26 and/or southbound US 26 to west OR 126)

For all options, the issue of how best to connect 2nd Street as a viable alternative to 3rd needs to be identified.

NORTHERN ARTERIAL

Three distinctively different options need to be evaluated that link the new 9th Street alignment, through and across Main Street to Laughlin at 7th Street:

(1) 9th to 10th via Claypool/Beaver transition, 10th to Laughlin Extension via new ROW paralleling railroad;
(2) 9th Extension through and across Main Street (impacting existing supermarket – Price Slasher) to City RR ROW and then to Laughlin at 7th Street; (this option would require abandonment of rail operation, need to investigate possibility of joint ROW use for street and rail operations); and,
(3) 9th Street re-alignment to 7th Street (via Claypool/Beaver transition), upgrade 7th Street between Main and Laughlin



In all options, need to evaluate:

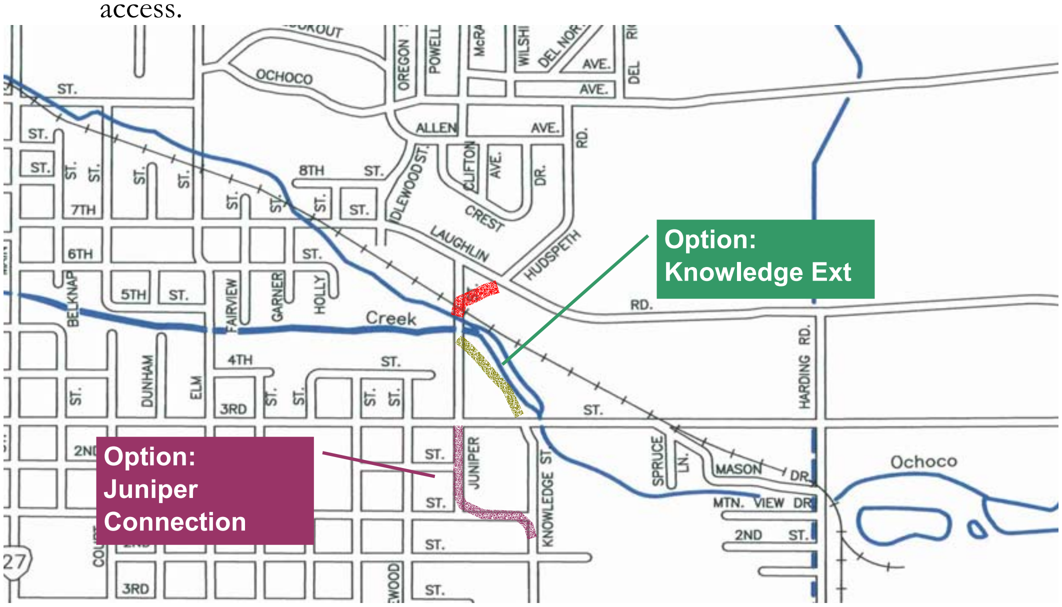
- truck mobility/access (e.g. curb radii)
- bicycle lanes and pedestrian facilities (type of curb extension and crossing facilities, including refuge islands where appropriate) to match new 9th Street connector
- revisions to North Main Street lane configuration and traffic control (e.g. 3-lane instead of 4-lane, modifications to on-street parking, need for separate turn lanes at critical intersections, posted speed, bicycle lanes, etc.)
- impacts to alleviate 3rd Street congestion

Again, because this improvement is essentially one of the two (the "Y" being the other) most important, long-term improvements in Prineville, the communication of these options with the public and policy makers needs to emphasize *community-wide needs* in balance with *individual property ownership* – long-term.

OTHER IMPROVEMENT OPTIONS

Other possible solutions that need to be evaluated include:

(1) Harwood signal (new) / 3rd Street Crossing – possibility of closing School Crossing at Meadowlake / Locust – relationship with "Y" improvement options.
(2) O'Neil Highway intersection at Or 126 – possibility of consolidating with Rimrock Road at OR 126 as an interim solution for 20-year TSP.
(3) Knowledge St. / Juniper Street consolidated intersection/crossing of US 26 (3rd St) and Juniper / Hudspeth consolidated intersection of Laughlin Road – continuous connection between north and south Prineville and linkage to High School, integrating multi-use path connection for ped and bicycle access.



(4) New Crooked River Bridge to improve long-term, local circulation and access. Identify long-term solution, which may or may not fall within 20-year TSP planning horizon, including one or a combination of the following options:
   - Sister structure next to existing OR 126 bridge (to be reconstructed) – consolidating (if possible) O'Neil Highway and Rimrock Road connection across river to 2nd Street; may retail right-in and right-out access to /from O'Neil Highway at OR 126

- Re-align O'Neil Highway with new bridge across Crooked River to US 26 at 9th Street, then disconnect O'Neil Highway at OR 126
- Construct new Crestview Extension bridge across Crooked River with connection to OR 27; may retain right-in/right-out access on OR 126 at Rimrock Road and full access at O'Neil Highway (option is already part of 1998 Draft TSP)

(5) New interchange on OR 126 at either Tom McCall/Millican (as already shown in Draft 1998 TSP and current draft of Crook County TSP)

DRAFT STREET DESIGN STANDARDS

Out of time to discuss, postponed until next TAC meeting.

TAC and PUBLIC MEETINGS

The schedule for upcoming meetings is:

March 1, 2005 TAC Meeting #3 (1:00-3:00 pm) / Public Meeting #1 (time TBA)

- Future LOS / Need
- Draft Improvement Options

March 10, 2005 TAC Meeting #4 (1:00-3:00 pm) / Public Meeting #2 (time TBA)

- Draft TSP

March 24, 2005 TAC Meeting #5 (1:00-3:00 pm) / Public Meeting #3 (time TBA)

- Final TSP
- Implementation Policies

MEMORANDUM

To:	Prineville TSP, Technical Advisory Committee (TAC)	Date:	March 9, 2005
From:	Andy Mortensen, The Transpo Group	TG:	04206.00
Subject:	City of Prineville TSP – TAC Meeting #3 Agenda		

Technical Advisory Committee Meeting #3

Thursday, March 10, 2005

1:00 – 3:00 p.m.

Location: Prineville City Hall

AGENDA

I. Summary of Future Traffic Conditions (presentation & discussion)

II. Draft Recommendations to Revise City Street Standards (further discussion)

III. Transportation Improvement Options (presentation & discussion)
   - Streets, Pedestrian and Bicycle System Improvements

IV. Public Meeting Schedule
   - *March 10, 2005* – Future conditions, Improvement Needs and Options
   - March 24, 2005 – Draft Plan Findings & Recommendations

V. Next Meeting: **Thurs., March 24, 2005 – 1:00-3:00 pm**

MEMORANDUM

To:	Prineville TSP, Technical Advisory Committee (TAC)	Date:	May 11, 2005
From:	Andy Mortensen, The Transpo Group	TG:	04206.00
Subject:	City of Prineville TSP – TAC Meeting #4 Agenda		

Technical Advisory Committee Meeting #4

Thursday, May 11, 2005

1:00 – 3:00 p.m.

Location: Meadow Lakes Country Club

AGENDA

I. Transportation Improvement Options (presentation & discussion)
   - Streets, Pedestrian and Bicycle System Improvements

II. Northern Arterial Options - Refinement

III. Stakeholder Meeting Findings (discussion)

IV. Public Meeting Schedule

May 11, 2005 – Future conditions, Improvement Needs and Options
May 25, 2005 – Draft Plan Refinement

V. Next Meeting: **May 25, 2005 – 1:00-3:00 pm**

MEMORANDUM

To:	Prineville TSP, Technical Advisory Committee (TAC)	Date:	May 25, 2005
From:	Andy Mortensen, The Transpo Group	TG:	04206.00
Subject:	City of Prineville TSP – TAC Meeting #5 Agenda		

Technical Advisory Committee Meeting #5

Thursday, May 25, 2005

1:00 – 3:00 p.m.

Location: City Hall

AGENDA

I. Transportation Improvement Options (presentation & discussion)
   - Streets, Pedestrian and Bicycle System Improvements

II. Northern Arterial Options - Refinement

III. Implementation Plan (discussion)

IV. Public Meeting Schedule

May 25, 2005 – Draft Plan Refinement

V. Next Steps: Draft TSP Documentation and Council/Planning Commission Meeting(s)

PRINEVILLE TRANSPORTATION SYSTEM PLAN –PRESS RELEASE

On Thursday, March 10, 2005 from 6:00-8:00 pm, the city of Prineville will be hosting the first of three Public Open House Meetings to discuss its Transportation System Plan. The Public Open House Meeting will be held at Meadowlakes Golf Course, 300 SW Meadow Lakes Drive, Prineville Oregon 97754 (phone – 541-447-7113).

The City's Transportation system Plan was last adopted in 1994 and is in need of updating. Some of the transportation improvement options that the City is exploring are: completion of the Northern Arterial (9th Street to Laughlin Road), reconfiguration of the "Y" intersection (US 26 and Highway 126); and new traffic signals, sidewalks and bike lanes where needed in critical locations. Improvement options will be displayed and discussed at the Open House Meeting. The public is encouraged to attend and provide comment and input.

The Transportation System Plan is expected to be completed by the end of April, 2005. Future Public Open House meetings will be held later in March and early April, 2005 to discuss the draft Plan recommendations.

-----Original Message-----
From: Andy Mortensen [mailto:AndyM@thetranspogroup.com]
Sent: Friday, May 20, 2005 2:20 PM
To: co@eaglenewspapers.com
Cc: Michael Cerbone; Johnson, Barry; mbertalot@eaglenewspapers.com; cindym@cityofprineville.com
Subject: Prineville Transportation System Plan Open House - May 25, 2005 - Press Release

Please consider publishing the following in your Tuesday, May 24th edition of the Central Oregonian.

PRESS RELEASE: PRINEVILLE TRANSPORTATION SYSTEM PLAN UPDATE

The public is invited to attend and participate in the third and final public open house meeting to be held:

When? Wednesday, May 25, 2005 – 6:00-7:30 p.m.

Where? Meadow Lakes Golf Club, **300 SW Meadow Lakes Drive, Prineville Oregon, 97754, (541) 447-7113**

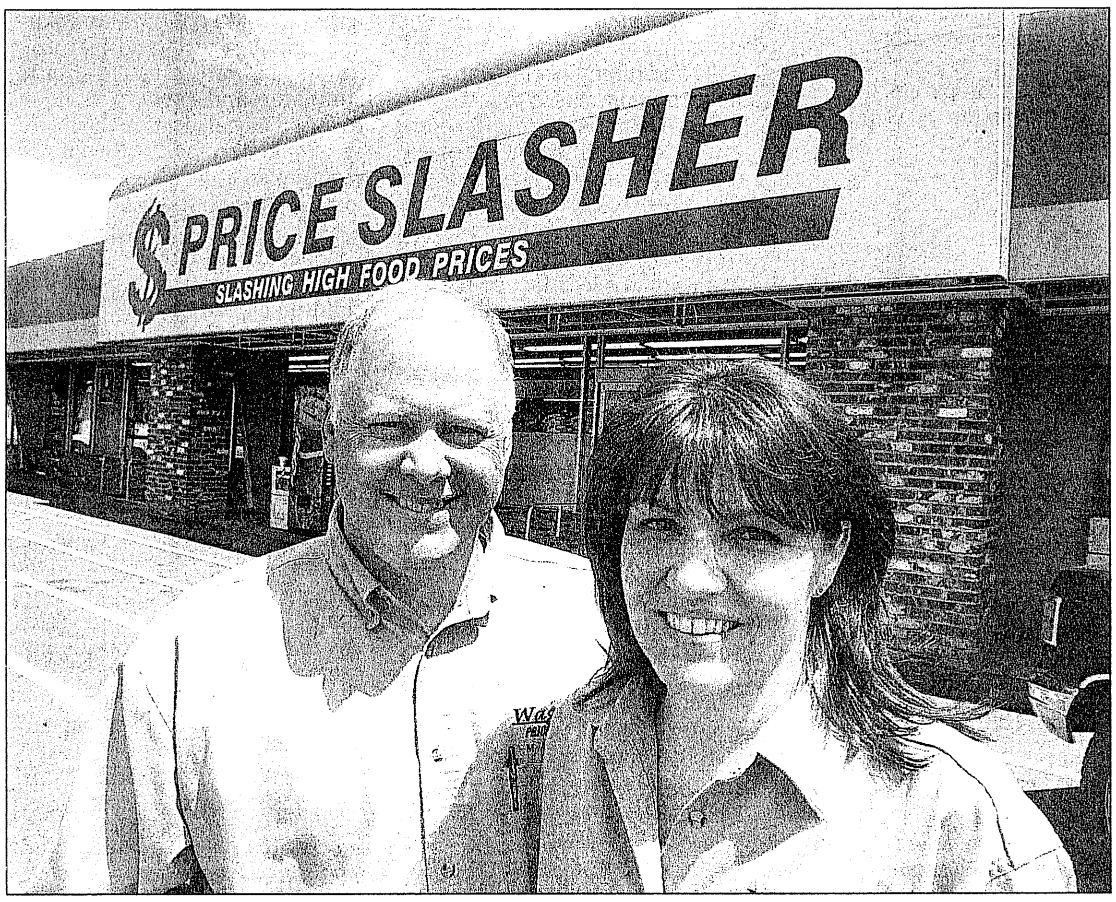
The consultant team will present and discuss their recommendations for:

- Major Highway and Street Improvements
  1. US 26 / Hwy 126 Junction
  2. North Arterial
  3. Knowledge Street / Juniper Street / Hudspeth Road
  4. OR 126 at McCall Road
- Pedestrian and Bicycle system improvement plans and projects throughout the city

Over the next several months the City of Prineville Planning Commission and City Council will consider the consultants findings and recommendations and public input. Advanced notification of future Planning Commission and City Council meetings considering the Draft TSP will be posted once meeting dates have been set.

If you have any questions please call Michael Cerbone, City Planning Director, at 447-8326.

Independent grocery caters to its customers



Rob Kerr / The Bulletin

Terry Harper and his wife, Deb, stand in front of their Prineville store, Wagner's Price Slasher, on Thursday. With 18 years of grocery-chain experience under Terry's belt, the Harpers have been operators of the grocery store since 1996.

Wagner's Price Slasher has no-frills approach to grocery shopping

By Ernestine Bousquet
The Bulletin

PRINEVILLE — *Terry Harper spent 18 years with Albertsons grocery chain, working his way up from checker to store manager.*

But he always wanted to own a grocery store.

Harper, 49, and his wife, Deb, 48, finally got that chance three years ago when they decided to buy Wagner's Price Slasher, a low-price, independently owned grocery store on Main Street.

Opened in 1991, the Prineville store was one of four Wagner's in Central Oregon owned by John and Tom Overbay. The Overbays sold the Bend and Redmond stores to Albertsons in the mid-1990s, but kept the Prineville store open.

At John Overbay's beckoning in 1996, Terry Harper quit his job as store manager at the Albertsons in Redmond to run the Wagner's in Prineville. Deb Harper came a year later to work as the bookkeeper and office manager.

Overbay offered the Harpers the chance to buy Wagner's after the couple's deal to buy a big-box grocery store in Mount Angel fell through. They negotiated a phase-in deal, where the Harpers would buy stock in increments until they own the store outright in June 2007.

Since taking over Wagner's, the Harpers have kept the name and the low prices. They have also retained the no-frills approach, offering basic amenities, such as a deli and a bakery, while forgoing a pharmacy or photo developing department.

THE BASICS

Wagner's Price Slasher

Address: 930 N. Main St., Prineville

Hours: 6 a.m. to 10 p.m., daily

Number of employees: An average of 31 employees year-round

Phone: 541-447-2600

What kind of niche do you fill?

Terry: Well, I think independent grocery stores, they have the ability to tailor their stores in the particular neighborhood that they are in. It's something that the corporate stores cannot do. Corporate stores have a one-size-fits-all mentality. We have the ability to carry the products that the customers need, and we have the flexibility to order and fill special requests.

What is an example of an item that someone can special order?

Deb: There is a gal who gets a specific brand of soy milk and flavor that we don't keep on the shelf because it doesn't have a high enough volume. But we order it for her at any point in time that she comes in.

How have you had to adapt to the market in Prineville?

Terry: Well, the Prineville market is pretty basic meat-and-potatoes people, and so we don't emphasize a lot on organics or ... gourmet foods. It's just your basic items.

Have you seen more demand for those kinds of items?

Terry: There is. Prineville is growing so rapidly that the customers are changing, and so we'll have to find out what they want and change with them.

Deb: But I think it's a lot easier for us. As we hear customers want something, it only takes us maybe a week to respond and research and try to find a product. Where, with a corporation, there is a lot of hierarchy to go through.

What are the challenges of being an independently owned grocery store?

Terry: The banking fees and the insurance and the overhead. We don't have the negotiating power of larger stores to get our costs down in that respect, and so that is a big challenge.

See **Harpers** */ B5*

La Pine's chamber head steps down in order to travel, write

By Lily Raff
The Bulletin

After two years at the helm of the La Pine Chamber of Commerce, Paul Cathcart is packing up and heading, well, everywhere.

The chamber's board of directors announced Thursday that the executive director is stepping down June 30.

"It's been a fun whirlwind, but he continued. "It's just going to be an ongoing process for years. And life is too short."

Beginning this July, Cathcart said he plans to travel around the Northwest, then the rest of the country. He will also try to sell a couple of screenplays he has written.

He said he will continue to volunteer and serve as a board member for the La Pine Commu-

ed on a slogan: The Outdoors at Your Front Door.

The slogan is now posted on signs at the north and south ends of La Pine, along Highway 97. It is also part of a map and business brochure Cathcart published last year.

Cathcart also kicked off a radio advertising campaign for the community. The chamber's membership increased by about

ALSO INSIDE

Getting away — together

What we (and our parents) did at summer camp, **see Page B2.**

Stocks report

For a complete listing of stocks, including mutual funds, **see Pages B4-B5.**

BUSINESS BRIEFS

Online survey deadline extended to Friday

The deadline to complete an online survey of the area's accredited investors has been extended to Friday to attract more participants, according to Mike Osborn, a management, financial and start-up consultant in Bend who is one of several local volunteers from Economic Development for Central Oregon and the Central Oregon Entrepreneurs Forum who are launching the survey.

The survey is online at: www.surveywave.com/script/en-us/takesurvey.asp?guid=7246ED9D.

The purpose of the survey is to gauge Central Oregon angel investors' interest in making seed and early-stage investments.

— Cathy Carroll

Microsoft gets deadline from EU

BRUSSELS, Belgium — Microsoft has until the middle of next week to comply with the European Commission's antitrust ruling, or face daily fines of up to $5 million, Europe's competition monitor said Monday. The commission ruled in March 2004 that Microsoft had abused its dominant position in the European software market. The company paid a 497 million euro fine last summer, but has not acted on two orders to change its business practices.

Online sales to grow this year

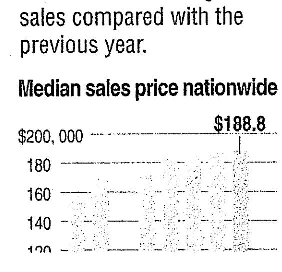
CHICAGO — Online retail sales are expected to grow 23 percent this year, cracking the $100 billion mark for the first time and garnering a bigger share of shopping dollars, despite Internet security threats. Online sales, however, accounted for 4.6 percent of the retail business in 2004 and will grow to 5.5 percent in 2005, the study predicted.

— From wire reports

Soaring property sales

44 states showed higher sales compared with the previous year.

Median sales price nationwide



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Whereas earnings of young people without a college degree declined by 0.8 percent from 2000 to 2004, to $13.38 an hour, on average, wages of young college graduates fell 2.8 percent, to $22.41.

Now, as the job market starts warming up across the country, demand for new college graduates is picking up, too. At Purdue University, the number of employers visiting campus has increased by 12 percent to 15 percent this year, said Timothy B. Luzader, director of the center for career opportunities.

At the University of Dayton, Greg Hayes, the executive director of career services, expects a 7 percent increase in the hiring of graduates this year. Marcia B. Harris, director of career services at the University of North Carolina, said that this year about 35 percent of graduating seniors had jobs awaiting them, up from 30 percent last year and about 15 percent in 2003.

The Department of Labor does not break out statistics on the job status of young college graduates. But it does show that the unemployment rate of workers ages of 20 to 24, the typical age at graduation, dropped 1.2 percentage points over the last two years, to 8.9 percent, even as the total unemployment rate declined 0.8 percentage points, to 5.2 percent.

Some professions are hotter than others. Accounting majors are benefiting after the passage of the Sarbanes-Oxley Act, which forced company executives to take responsibility for the accuracy of their accounting. Hayes added that majors in security-related fields, from computer science to engineering, are also having a good year.

Even manufacturing companies, which for years have done nothing but shed workers, are picking up graduates.

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some costs for the company, too. The city's street policy specifies that traffic-field counts in an application be less than six months old. The field counts the company used in its original, incomplete application are dated Jan. 18. The company will therefore have to conduct a new field count and update its analysis for an August submission.

For opponents of the project, the new deadline changes little.

"We're committed to staying the course in terms of what our organization plans to do: continuing to build community education and opposition to a Supercenter," said Michael Funke, a founder of Our Community First, a group organized to oppose the Supercenter. "From the very beginning, we always thought the solution to the traffic problem up there was going to be a major factor."

The Supercenter would be the largest individual retailer in Bend at 204,000 square feet. Supercenters sell the types of merchandise available at a typical Wal-Mart and also have a full grocery store.

Christian Trejbal *can be reached at 541-617-7837 or at ctrejbal@bendbulletin.com.*

Harpers

Owners belong to Associated Grocers group in Seattle

Continued from B1

What about buying merchandise?

Terry: We belong to Associated Grocers in Seattle, and we get our groceries there. They are a co-op, meaning that the independent grocery stores own stock in Associated. So we're also owners of our own warehouse. And they have over 400 stores that buy from them and they service Washington, Oregon, Hawaii, Alaska and Guam.

What are some other challenges?

Terry: It's always your people, trying to retain people and the training. Training is an ongoing thing, and we don't have a lot of resources.

Deb: We are the personnel department.

Terry: We are it. We are the maintenance, the personnel, the administration, the legal — you name it.

What are some of the hurdles to lining up financing as an independent grocery store?

Deb: We applied for a small-business loan. The paperwork and the information that they required was excessive.

Terry: I think (it's hard) especially for the grocery stores because your profit margin in a grocery store is very small. You make 25 (percent) or 30 percent on a can of beans, but by the time you pay your overhead — the electricity, the building cost, the insurance, all the finance charges — you're making about 1 percent on every dollar that you put through the till in a grocery store. So the banker looks at that profit margin and says, 'You guys are crazy.'

How did you get around those hurdles?

Terry: Mr. John Overbay. I suppose we could call him Dad.

Deb: He has been a tremendous help to us. ... We found a seller that was willing to work with us and loan us the money.

What advice would you have for fellow entrepreneurs, such as yourselves, who are either looking to get into the grocery business or trying to start their own businesses?

Terry: If they have many years of experience in the field, in whichever field they want to pursue in business, then that works to their advantage.

Deb: Persistence. Don't get discouraged because you're going to run into hurdles.

Terry: You have to do a lot of homework on the neighborhood you want to go into, what the growth patterns are, who else is coming in, what the particular town needs or does not need.

As you take over the store, what do you see on the horizon?

Terry: Payments. No, I hope we can continue to do business like we have in the past and retain our business.

Deb: For this store, there are some plans and some upgrades we would like to do. ... There is always something that needs to be replaced. And we want to keep it running smooth and doing things that benefit the employees, so it's a good place to work and therefore it benefits the community.

Ernestine Bousquet *can be reached at 541-504-2336 or at ebousquet@bendbulletin.com.*

Your Crook County newspaper since 1882

Central Oregonian

THE FUTURE OF PRINEVILLE TRAFFIC?

Business, property owners comment against four proposed truck routes

W & H PACIFIC/VANCE W. TONG/CENTRAL OREGONIAN

The City of Prineville is considering these four options as a means of developing an alternative east-west route through the city.

City officials have discussed putting in an alternate route for residents to travel east to west in town since 1998, but the issue came to a boiling point with property owners yesterday.

Thursday afternoon, property owners met in a "stakeholder's meeting" in the city council meeting room with officials to discuss the effects of the four proposed routes.

"This plan goes through my shop," one Prineville resident said.

"Well this other one goes through my house," another responded.

In 2003, city officials and transportation engineers introduced four route possibilities to accomplish the project.

At the stakeholder's meeting, residents questioned city officials and discussed the impacts the four conceptual routes may have on their businesses or homes.

"Currently on Third Street, during peak hours in the morning and evening there are significant delays," said Barry Johnson, a transportation engineer with W & H Pacific.

About 25 bodies packed into the small meeting room. Every seat in the room was taken.

All four of the proposed routes would affect at least one property owner and possibly result in their home or business being condemned.

"There are certainly impacts with each option," said Johnson.

Two of the proposed routes run through property where Price Slasher is located.

An attendant pointed out that in a survey the city conducted late last year, the number one priority for residents was jobs.

According to Terry Harper, owner of Price Slasher, if the store had to close down, 33 employees would be displaced.

"We get over 1,000 customers a day. Those customers would have to go down Third Street to Erickson's or Ray's," explained Harper.

"There are no easy answers. You're talking about peoples homes or peoples jobs," said Becky Moore. She and her husband own the property Price Slasher is located on.

She explained to the crowd that historically, Prineville has always had three grocery stores.

"There's been a grocery store there since August 1948. It was owned by Scotty and Eilinor McLean and was called Scotty's Grocery. They added onto it twice and then moved across the street," Moore continued. "This is history to us."

Price Slasher has occupied their current building since October 1991.

City officials are updating their comprehensive plan, which plans for the anticipated growth within the next 20 years. A plan dealing with transportation is a piece of the comprehensive plan.

"The goal is to create a plan to make the city viable as a whole and spread the traffic throughout town," explained Johnson.

"We've all driven downtown. We all know what that's like. These are options to alleviate the traffic on

Third Street," explained Jim Mole, City of Prineville Public Works director.

All four routes start on Deer and Ninth Street and eventually connect with Laughlin Road.

City officials welcomed suggestions of alternate routes, and one Prineville resident suggested moving the "blue route" (see map). His suggestion was to start the particular route at an intersection further west, rather than on Deer and Ninth Street.

At the stakeholder's meeting, residents questioned when a route would be picked and by whom.

"It just depends how fast the community grows and where that growth is," explained Michael Cerbone, city planning director. He added that if the homes on the Hudspeth and Pahlisch Homes property on the north side of town build quickly, the need would need to be addressed sooner.

Cerbone estimated that these changes may take place within the next five to 10 years.

"These options will go to the planning commission," explained Jim Mole, City of Prineville Public Works director. "They will make a recommendation to the City Council who will ultimately make the decision."

"The guys before you now are not the ones making the decision," Mole continued.

Residents also voiced concerns about developing their property, if in the end, the city is going to have to condemn it.

Cerbone said he did not know how property value would be affected.

"All we're trying to do is accommodate growth, so we can grow logically," said Cerbone.

Prineville resident Ruth Cox was concerned about the time the meeting was taking place. She mentioned people with children are picking up their students at 3:30 p.m., the time of the meeting, and suggested a different time for the meetings be considered.

There will be two more open houses to discuss the conceptual transportation plans before plans are presented to the city planning commission. Dates have not been set yet.

Doing nothing is the worst choice

It's taken about seven years for plans to be developed by the city for a route that would bypass downtown.

In 1998, city officials explored the idea of an alternate route to Third Street to take drivers from the west side of town to the east.

City officials have presented four options to the community and all four would impact homes, businesses, or in some cases, both.

We first reported on those four route options in November 2003.

In the last year and a half, the subject of the west-east downtown bypass has remained pretty quiet.

Until yesterday.

Thursday afternoon, city officials held a "stakeholder's meeting" for property owners who may be affected by one of the four proposed routes.

Although the meeting was not a public meeting, every seat in the room was taken.

Public hearings, meetings, and even open houses have been held to gather input from the community on the city's development of the transportation system plan (of which a piece includes this bypass), but attendance has been lacking.

At the last open house on March 10 at Meadow Lakes, Michael Cerbone, city planning director guessed that 12 people attended. However, most were elected officials or department heads. Cerbone estimated five people were community members.

The City of Prineville has practically been begging for community input. That's exactly what they got Thursday.

It's safe to say that the four proposed routes weren't popular. When you look at the map, each of the routes goes over the top of either a business or a house - or a multiple thereof. Needless to say, the people in those houses or businesses weren't pleased with the proposed options.

Consider the case of Price Slasher. Only one of the routes bypasses their property. One literally goes right over the top of the building, while another narrowly misses the northeast corner.

As more meetings take place in the coming months, there is going to be an untold amount of debate on how to solve this problem.

We think the need for an alternate route to Third Street is undeniable. Unfortunately, there does not seem to be a way to construct one without impacting one or more homes or businesses. At this point, it would seem that the southernmost route would impact the least number of people and would make use of an

existing city street.
The reality of the situation is whichever route is ultimately chosen, someone is going be impacted and quite possibly have their home or business condemned by the city.
However, with the anticipated growth of Prineville, perhaps doing nothing is the worst choice of all.

Michelle Bertalot
for the editorial board

Roundabout is our best choice for the 'Y'

Almost everyone has driven through the "Y" heading out of town, and most have driven through it during peak times - around 8 a.m. and 5 p.m.
It's not fun.
Drivers sit and wait as the semi-trucks try to make that awkward turn onto Madras Highway.
Pedestrians play "chicken," waiting for a gap in the stream of heavy traffic to make their dash and cross the busy road.
It's dangerous and as Prineville continues to grow, it's just going to get worse.
We believe the best option presented so far is the roundabout.
It's important to keep in mind, this is a Prineville-sized roundabout, not like ones in Bend.
It's estimated the roundabout would be 220 feet in diameter, which is about 40 feet in diameter larger than the biggest roundabout in Bend.
The size will allow trucks to travel through it relatively easily and would give a focal point for visitors entering Prineville.
Also, the slip lanes, or bypass lanes, will allow drivers to bypass the roundabout altogether if they need to.
The second option presented was putting a signal by Gee's Chinese Restaurant at the bottom of the grade.
We are not in support of this option.
The current configuration of the "Y" already results in drivers having to stop when a semi-truck has to turn onto Madras Highway.
A T-intersection would continue to stop traffic flows, just as the "Y" intersection is doing now.
Also, in the winter when the grade has packed snow (with an exception of this year of course), coming to a stop at the bottom seems dangerous.
Whether Prineville residents like it or not, the Bend-Redmond-Prineville area is quickly becoming the booming tri-cities area of Oregon.
It's not uncommon in this area for people to live in one city and commute for work to another - Prineville residents included.
State departments like the Oregon Department of Transportation have been completing road projects like the east and west Powell Butte passing lanes to help accommodate for the central Oregon growth.
We believe Prineville needs to also do our part and accommodate for it as well.

Michelle Bertalot
for the editorial board

Roundabout being considered for west 'Y'

Roundabout, signaled intersection are two options being explored

In as little as six years, Prineville may be getting it's first roundabout.
City officials are updating the city's transportation system plan. The plan includes options for reconfiguring the "Y" where Highway 126 and 26 intersect.
Michael Cerbone, city planning director, listed several problems with the current "Y" including

pedestrian safety and traffic back-up during peak hours.
"It's difficult for people coming off the grade to head out Madras Highway," Cerbone said.
He identified that with Ochoco Elementary relatively close to the intersection, it is also difficult for pedestrians to cross.
"When it was a low volume intersection, I'm sure it functioned fine. Now that the volume has been increasing, it's starting to show some problems," explained Barry Johnson, project manager for the Bend-based engineering company W&H Pacific.
Employees with the city's public works department counted vehicles at the beginning of the year during peak hours for the transportation system plan.
According to Jim Mole, public works director, on the O'Neil junction on a weekday from 4:30 to 5:30 p.m., there were 1,241 trips. On Tom McCall Road during the same time, employees counted 1,183 vehicles and passing the intersection of Ninth and Madras Highway they counted 1,098 trips.
"Compared to the '98 TSP (transportation system plan), it's not quite double," said Mole. "It's almost doubled, but not quite, with the growth in the city and county."
City officials are primarily considering two options for improving the "Y."
"We looked at two different roundabout options and a signalized T-intersection," said Johnson. "It's at a very conceptual stage at this point in terms of the transportation system plan," he continued.
The first roundabout option was approximately 170 feet in diameter. City officials asked that the diameter be increased to deal with truck traffic, so the conceptual diameter of the roundabout is about 220 feet.
"The roundabout is relatively large," Cerbone said. "We have a couple of truck freight companies in town like Schwab that have to be able to navigate their vehicles through," he continued.
Cerbone added that in the summer, Prineville has increased recreational traffic coming through the "Y."
"Be it horse trailers or fifth-wheels, they need to be able to navigate," said Cerbone.
The second, larger roundabout option also has slip lanes, an option that the first proposed roundabout lacked. Slip lanes are lanes that bypass the roundabout for drivers who do not need to use the roundabout to reach their destination.
"The only movements having to enter the roundabout are those essentially making left turns," Johnson said.
If plans go through for the roundabout, at this point, it would be the largest roundabout in central Oregon.
"Size wise, there have certainly been roundabouts of this size built before. The ones here in Bend are typically more compact because they are in much more dense urban areas where they have been built," said Johnson.
The largest roundabout in Bend is on Colorado Avenue and Century drive and is about 180 feet in diameter.
Other roundabout sizes in Bend range between 120 and 140 feet in diameter - about half the size of the proposed roundabout for the "Y" intersection.
"I think folks who may not like the roundabout are used to the ones in Bend, which kind of get small," said Cerbone.
The second option city officials are looking at is a signalized T-intersection at the NE corner of Gee's Chinese Restaurant parking lot.
"The T-intersection is kind of the standard that's been used for decades and decades, when we have three major lanes coming together like this," explained Johnson.
Cerbone said at this time, he doesn't have a preference to either of the projects.
"Aesthetically, the roundabout would give more of a gateway treatment to town than a T-intersection," Cerbone added.
From an air quality standpoint, Johnson explained that a T-intersection would call for more drivers to stop and idle their vehicles and produce more pollution.
"The roundabout adjusts for traffic flow, if there is very little traffic, someone doesn't have to be idling at all, where at a signal they may have to come in and wait for the light to change," he added.
The cost of either projects is unknown because the projects are still in the conceptual design phase.
Because the project involves two intersecting state highways, the Oregon Department of Transportation would also most likely be involved, especially with funding.
Cerbone identified that the project may be eligible for STIP (State Transportation Improvement Project) funding, because of Highway 126 and 26.
"We hope to get funding from the state to complete the project," Cerbone said.
There are multiple steps the project still has to go through.

The project is still in the beginning stages.
"This would be at least six years, maybe even 10 years," Cerbone said.

City identifies three projects to ease traffic

City officials are exploring multiple options for three future transportation projects.
The three projects involve improving access from Tom McCall Road and Millican Road onto Highway 126, constructing an alternative route to travel from north of Prineville to the south without using Main Street and alleviating congestion where O'Neil Highway (Highway 360) and Highway 126 meet.
Citizens can view the plans at a transportation system plan open house on May 25 from 6 to 7:30 p.m. at Meadow Lakes.
W&H Pacific, a Bend-based engineering company, has proposed four options to improve traffic flow at the top of the grade.
"It's relatively difficult to make a left off of Tom McCall and Millican," said Michael Cerbone, city planning director. "Especially if you hit peak traffic times."
City officials have met with the Prineville airport commission to discuss possible complications improvements may bring.
Two of the options involve an underpass at either Tom McCall or Millican Road.
The preferred option is constructing an overpass at Tom McCall Road.
"It's typical of what's seen on (Highway) 97 and I-5," Cerbone added.
A fourth option is a split diamond at Millican Road and at Tom McCall Road.
Cerbone said one of these options may come into effect five to 10 years from now.
Another project is to create an alternative route for drivers to travel from the north to south side of town.
There are two routes city officials are considering. The preferred route extends from Hudspeth Street, aligning it with Juniper Street, and would require widening Juniper and part of Second Street. Also, a traffic signal would be installed at Third and Juniper Streets.
If Juniper and Hudspeth were aligned, the two roads would essentially be the same road, in which case it would probably have the same name. Johnson was not sure if the streets would have to be renamed to either Juniper or Hudspeth.
The second option is to again align Hudspeth with Juniper Street, but to then create a new road that would connect with Knowledge.
"It has some conflicts at Third Street with the creek crossing. Plus there is a lot of properties impacted on the north side of Third Street," said Johnson.
The new road in the second option would affect the tennis courts, a church on Third Street, and would cross in front of Crook County Middle School.
Main Street has the highest volume of drivers traveling north and south.
"It has some capacity problems, which is one of the reasons we're trying to improve this- to relieve some of the pressure on Main Street," said Johnson.
The third project is to construct a route that would connect O'Neil Highway with Ninth Street.
"It's really difficult for people to make left hand turns onto (Highway) 126," said Cerbone.
The conceptual plans show the route extending over a sewer lagoon off of O'Neil Highway.
"It's very conceptual at this point," said Cerbone.
"What we're looking at is rerouting people who are going to make those left hand turns," he continued. "This is 10 to 20 years out. It will need a lot of refinement.

Last meeting, not last chance

In today's issue of the Central Oregonian we feature three additional projects outlined in the city's updated transportation system plan (TSP).

The three projects involve improving access from Tom McCall Road and Millican Road onto Highway 126, constructing an alternative route to travel from north of Prineville to the south without using Main Street, and alleviating congestion where O'Neil Highway (Highway 360) and Highway 126 meet.

Other projects, higher on city officials' priority lists, are to improve the West "Y" area with possibly a roundabout, and create a route for drivers to travel from the east to west side of town.

These projects may occur sometime between five to 20 years from now.

The last TSP open house meeting will be held on Wednesday, May 25 from 6 to 7:30 p.m. at Meadow Lakes.

This open house meeting is an opportunity for citizens to bring up concerns and alternatives to proposed conceptual plans. It's also an opportunity to view maps of the various options each project has.

While it's the last open house meeting, it's important to note, this isn't the public's last chance to comment.

First, a more in-depth design of any one of these plans is needed before a project could be started.

That plan would then have to be approved by the planning committee, and then by the city council. Both of these entities have a visitors/public comment section scheduled in each public meeting where citizens can bring up questions or concerns.

Without direction from the public, how are these committees to know what is best for Prineville?

This is your town and we implore citizens to attend these meetings and tell city officials what you think.

Michelle Bertalot
for the editorial board

Final open house for the city's Transportation System Plan held on Wednesday evening

The public is invited to attend and participate in the third and final public open house meeting to be held on Wednesday, May 25, from 6 to 7:30 p.m. at the Meadow Lakes Golf Club.

The consultant team will present and discuss their recommendations for major highway and street improvements which include US 26/Hwy 126 Junction, North Arterial, Knowledge Street/Juniper Street/Hudspeth Road, and Highway 126 at McCall Road.

The plan also includes pedestrian and bicycle system improvement plans and projects throughout the city.

Over the next several months the City of Prineville Planning Commission and City Council will consider the consultants findings and recommendations and public input. Advanced notification of future Planning Commission and City Council meetings considering the Draft TSP will be posted once meeting dates have been set.

If you have any questions please call Michael Cerbone, City Planning Director, at 447-8326.

Recommended traffic route would go through Price Slasher

City would be forced to compensate store's owners

A plan to improve east-west Prineville traffic may result in the closure or relocation of Wagner's Price Slasher, a grocery store on North Main Street.

Wednesday night was the last open house TSP meeting and about 26 property, business, and homeowners attended to ask questions and express concerns about the conceptual plans.

One of those projects is the "northern arterial," a project that would give drivers an alternate route to travel east-west without using Main Street.

The City of Prineville is updating the transportation system plan (TSP) which identifies various projects which would improve Prineville traffic and be capable of handling projected population growth.

"The whole goal is to improve connectivity other than Third Street," explained Barry Johnson, project manager for Bend-based engineering company W&H Pacific. Johnson and Andy Mortensen, regional transportation planning manager for the Transpo Group, Inc., are the two engineers city officials have worked with to identify traffic problems.

Johnson and Mortensen recommended Ninth Street as the preferred route to improve east-west connectivity.

The Ninth Street route follows the existing street, would extend through Price Slasher, and connect with the railroad right of way.

"It didn't come with any surprise. We kind of knew that was their first option," said Terry Harper.

Harper and his wife, Deb, are co-owners of Price Slasher. They are purchasing the Prineville business from John and Tom Overbay.

"From a construction standpoint, this is the lower cost option," said Johnson.

Although construction costs may be lower, the city of Prineville would have to acquire the property, most likely by purchasing the property - that cost is unknown.

"It's difficult to place a dollar amount on that specifically," said Mortensen.

"It's been made very clear to us, they want to continue to operate a business in that area and I suspect that in order for them to want to participate in something like that, would be looking to the public to help fund the cost of a new structure," said Robb Corbett, Prineville city manager.

After the public meeting, the owner of Price Slasher, Harper, and the property owners met privately with the transportation engineers.

"We sat down with our views and what we would like to see. We want to work with the city. Realistically, it's a necessity in the future and we're working on a plan to try and relocate and get us a new building," said Harper.

"Moving a grocery store is an enormous project. We just want to help them understand this is what happens to move a grocery store, the time frame involved in the moving, and so on and so forth," he continued.

The Price Slasher building has been at that location for about 45 years and employs about 35 people.

"The thought of having a new building is great. We would love to have a new building, but from the landlord's perspective, they are taking some prime real estate that's really valuable. It splits their property. They also own the computer store (TLC Computers) and Perfect For U. They own this whole block, and it would split it right in half," said Harper.

The property of the grocery store is owned by Becky Moore of West Linn, Ore.

"Nobody wants (to fight). It's not a win-win situation, but we're looking for a win-win situation. If it's not in the budget to help us relocate, their second option would be to realign 10th Street," said Harper.

Realigning 10th Street is a second option engineers and city officials have looked at. There are three different routes that could be used. All routes affect a homeowner or business.

Irene and Jack Duckett have owned and operated Duckett Welding, LLC in Prineville for more than 40 years.

The business is located on the corner of Beaver and Ninth Streets and if the decision was made to go with a 10th Street alignment, which would bypass Price Slasher, it is possible their business would be affected.

"We've been doing well with all this building. I don't know who doesn't come to us," said Irene.

The couple has lived in Prineville for more than 45 years.

The Ducketts would move their business, if they had to.

"We have to do something to make a living," Irene said.

Although last Wednesday was the last TSP open house meeting, before any plan is finalized, final design plans would have to be completed and approved by the city planning commission and city council.

Mortensen made it clear to attendants at Wednesday's meeting this was the beginning of the process and the beginning of public hearings.

"We don't want people to feel like, 'Gosh this is a done deal,'" said Mortensen.

APPENDIX G

DRAFT TSP REVIEW COMMENTS

Oregon

Theodore R. Kulongoski, Governor

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February 23, 2004

Andy Mortensen
Regional Transportation Planning Manager
The Transpo Group, Inc.
309 NE 3rd St., Suite 5
McMinnville, OR 97128

RE: ODOT comments on draft Chapter 4 of Prineville TSP

Dear Andy,

Thanks for giving us the opportunity to comment upon the draft Chapter 4 of the Prineville TSP, which deals with existing conditions. Overall, the chapter looks good. I have identified some areas where the text cited the incorrect *Oregon Highway Plan (OHP)* designations or mobility standards or highway names.

Highway Designations

Table 4-3 on page 10 needs one modification and one addition. The addition is OR 126, which as the highway enters Prineville by Millican Road and descends the grade, is classified as an Expressway. The addition to Table 4-3 should be a row that reads "OR 126 from UGB to MP 17.92 (O'Neil Hwy), 0.70 V/C for <45mph and 0.70 V/C for >=45mph, State/Expressway." This means the current row six of the table needs to be modified as follows "OR 126 from MP 17.92 (O'Neil Hwy) to U.S. 26 'Y'" while the remaining information in row six is correct.

The text in the second paragraph on page 10 ("Within Prineville, the mobility standards…") will need to be modified as well to include the mobility standards for Expressways.

Mobility Standards

David Boyd has pointed out the TSP should reference the *OHP* at page 75, second bullet that states intersections where traffic on the non-highway approach that must either stop or yield shall not exceed the V/C for District/Local Interest Roads. The City is free to determine its own standards for intersections where all of the approaches are under City jurisdiction.

Table 4-4 needs several corrections regarding the correct V/C standard. These are provided below:

U.S. 26 & Combs Flat Road - .75 (also text has highway misidentified as OR 126)
OR 126 & Millican - .70 for the highway, .80 for the side street. (also text has road incorrectly as "McMillian")
OR 126 & Tom McCall - .70 for the highway, .80 for the sidestreet
U.S. 26 & 9th St. - .80 for the highway, .85 for the sidestreet

In terms of why the differences above, U.S. 26 and Combs Flat Road is a signalized intersection; OR 126 is a Statewide Expressway with a posted speed greater than 45mph and sidestreets controlled by stop signs; U.S. 26 is a Regional Highway posted at less than 45mph and the sidestreet controlled by a stop sign.

Highway Names
This is always a confusing section in every planning document as there are route numbers, which is how the public knows most roads, then highway numbers, which is how ODOT stores its data, and then highway names. The only mistake in Table 4-1 is how it references the route number.

Ochoco Highway No. 41 begins as OR 126 in Redmond and passes through the "Y" at the west end of Prineville. There the OR 126 route ends as Ochoco Highway changes its route number to U.S. 26 which passes all the way through town along Third Street. The portion of the highway from Redmond until the intersection with O'Neil Highway at MP 17.92 is a Statewide Highway and an Expressway. From there eastward, it's a Statewide.

Madras-Prineville Highway No. 360 begins in Madras as U.S. 26 and terminates at the west "Y."

Crooked River Highway No. 14 begins in Prineville at the intersection of Third and Main as OR 27 and goes south to U.S. 20 just west of Brothers.

O'Neil Highway No. 370 starts at the junction with U.S. 97.

Paulina Highway No. 380 originates at the intersection of Third Street and Combs Flat Road in the eastern portion of Prineville. (The text on Page 2, second paragraph "In Prineville, the arterial network…" incorrectly labels Combs Flat Road as a Crook County facility. Combs Flat Road is in fact the route used by Paulina Highway.)

Map corrections
Figure 4-1 misidentifies Combs Flat Road as a Crook County facility when in fact it is the Paulina Highway No. 380. It would also be helpful if this map were relabeled "Existing Street Classifications, Signals, and Jurisdiction."

Currently, there's no map which depicts the Special Transportation Area (STA) on U.S. 26 (Third Street) and OR 27 (Main Street).

Text calls the Existing Bikeway Map Figure 4-4, but the map label has it incorrectly as Figure 4-3. Similarly, Existing Sidewalk Map is called Figure 4-5 in the text, but labeled 4-4.

In general, all of the maps are display a large area in an small space and are difficult to read. A better presentation might be 11X17 maps which are then folded in half into the document.

Table Corrections
Table 4-4 on page 12 lists a series of existing signalized highways, but misidentifies the highway. All of the signalized intersections in Prineville are on U.S. 26, not OR 126.

Miscellany
A better title for Table 4-3 on page 10 would be "Mobility Standards for Prineville UGB Area – Volume/Capacity Ratios for State Highways and Local Streets"

On page 11 the text discusses a future signal at U.S. 26/Knowledge. The future signal under discussion will actually be at U.S. 26/Harwood.

The text does not existing safety problems in any detail. There are Safety Priority Index System (SPIS) sites within the Prineville UGB. The Safety Investment Program (SIP) also classifies much of U.S. 26 through Prineville as a Category 3 (3-5 fatal or severe injury crashes). The text should identify and discuss these safety issues as well as any on the local system, albeit the source for those will likely be more anecdotal, but still valuable.

The bikeways section only discusses bikeways and whether they are on or off the street. It might be helpful to identify barriers to bicyclists or identify which highways/arterials/collectors/local streets are friendly or unfriendly to bicyclists.

I recognize the chapter will be revised once the sidewalk inventory information is available. As downtown Prineville is an STA, identifying substandard sidewalks or crossings or ramps will be critically important.

Again, on balance the TSP does a thorough job of presenting existing conditions. If you have any questions, feel free to contact me at (541) 388-6046.

Peter Russell
Senior Planner

cc: David Boyd, Region 4 Access Management Engineer
Jim Bryant, Program & Planning Unit Interim Manager
Joel McCarroll, Region 4 Traffic Operations

APPENDIX H

RECOMMENDED UPDATES TO COMPREHENSIVE PLAN AND LAND DEVELOPMENT ORDINANCE TO IMPLEMENT THE TRANSPORTATION SYSTEM PLAN

INTRODUCTION

The following report, prepared originally by W&H Pacific, Inc. (1998) for the City of Prineville, and updated as part of the 2005 Draft TSP, is intended to help guide the City of Prineville in updating their Comprehensive Plan and implementing ordinances in order to comply with the Transportation Planning Rule (TPR). It includes proposed revisions to the following documents:

- Comprehensive Plan (July, 1997).
- Land Development Ordinance No. 1057, hereafter referred to as the "Development Ordinance" (March, 1998).

The proposed code amendments are organized around the following TPR compliance issues:

A. Approval Process for Transportation Facilities
B. Assure Amendments are Consistent with the Transportation System Plan (TSP)
C. Recommended Regulations to Provide Notice to Public Agencies
D. Street Standards
E. Safe and Convenient Pedestrian and Bicycle Circulation
F. Bicycle Parking
G. Protecting Existing and Future Operation of Facilities

A brief discussion of the TPR compliance issues rationale for the proposed code changes introduces each subsection. A table identifying the proposed language and its suggested location(s) within the adopted Prineville ordinances follows.

For both the comprehensive plan and development ordinance, proposed new code language is *italicized*, and existing code language remains in a regular font format. Those sections of the existing code proposed for deletion are distinguished with a ~~strikethrough~~, and proposed replacement language immediately follows.

The Transportation Planning Rule (TPR)

In 1991, the Oregon Transportation Planning Rule (TPR) was adopted to implement State Planning Goal 12–Transportation (amended in May and September 1995). The Transportation Planning Rule requires all jurisdictions to revise their land use regulations to implement a Transportation System Plan that addresses the following elements of the TPR:

> *Amend land use regulations to reflect and implement the Transportation System Plan.*

Clearly identify which transportation facilities, services, and improvements are allowed outright, and which will be conditionally permitted or permitted through other procedures.

Adopt land use or subdivision ordinance measures, consistent with applicable federal and state requirements, to protect transportation facilities, corridors and sites for their identified functions, to include the following topics:

- *access management and control;*
- *protection of public use airports;*
- *coordinated review of land use decisions potentially affecting transportation facilities;*
- *conditions to minimize development impacts to transportation facilities;*
- *regulations to provide notice to public agencies providing transportation facilities and services of land use applications that potentially affect transportation facilities;*
- *regulations assuring that amendments to land use applications, densities, and design standards are consistent with the Transportation System Plan.*

Adopt land use or subdivision regulations for urban areas and rural communities to provide safe and convenient pedestrian and bicycle circulation and 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.

In addition to the development of a Transportation System Plan, local jurisdictions are required to create policies and ordinances that implement the Plan.

PROPOSED AMENDMENTS TO THE COMPREHENSIVE PLAN AND IMPLEMENTING ORDINANCES

A. APPROVAL PROCESS FOR TRANSPORTATION FACILITIES

Pursuant to the TPR, projects that are specifically identified in the Prineville Transportation System Plan (TSP), which the City has made all the required land use and goal compliance findings, are permitted outright and subject only to the standards established by the TSP. A city only may allow outright an improvement that complies with the TSP. Therefore, it is recommended that the City of Prineville use the conditional use permit process to review those transportation projects not allowed outright within the Urban Growth Boundary. Adoption of the proposed code language will meet the requirements of OAR 660-12-045 (1).

Comprehensive Plan

Suggested Location	Proposed Language Change
Amend Transportation Element, Goals and Objectives, Section 2. New language is a subset to the existing Goal 2.	*A. The city shall coordinate with the Oregon Department of Transportation (ODOT) to implement the highway improvements listed in the Statewide Transportation Improvement Program (STIP) that are consistent with the Transportation System Plan and comprehensive plan.* *B. The city shall consider the findings of ODOT's draft Environmental Impact Statements and Environmental Assessments (if any) 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.*

Implementing Ordinances

The Development Code currently permits transportation projects as either a permitted or conditional use, in accordance with OAR 660-12-045 (1).

B. ASSURE AMENDMENTS ARE CONSISTENT WITH THE TRANSPORTATION SYSTEM PLAN (TSP)

The Transportation Planning Rule requires that jurisdictions develop regulations to assure that all development proposals, plan amendments, or zone changes conform to the Transportation System Plan. Adoption of the proposed code language will meet the requirements of OAR 660-12-045(2)(g).

Comprehensive Plan

Suggested Location	**Proposed Language Change**
Amend Transportation Element, Goals and Objectives, Section 2. New language is a subset to the existing Goal 7.	*A. All development proposals, plan amendments, or zone changes shall conform with the adopted Transportation System Plan.*

Implementing Ordinances

Suggested Location	**Proposed Language Change**
Insert in Development Ordinance, Amendments, Article 11	***Section 11.080 Conformance with the TSP*** *A. A plan or land use regulation amendment significantly affects a transportation facility if it:* *1. Changes the functional classification of an existing or planned transportation facility;* *2. Changes standards implementing a functional classification system;* *3. Allows types or levels of land use that would result in levels of travel or access that are inconsistent with the functional classification of a transportation facility; or* *4. Would reduce the level of service (mobility standard) of the facility below the minimum acceptable level identified in the Transportation System Plan.* *B. Amendments to the comprehensive plan and land use regulations which significantly affect a transportation facility shall assure that allowed land uses are consistent with the function, capacity, and level of service of the facility identified in the Transportation System Plan. This shall be accomplished by one of the following:* *1. Limiting allowed land uses to be consistent with the planned function of the transportation facility;* *2. Amending the Transportation System Plan to ensure that existing, improved, or new transportation facilities are adequate to support the proposed land uses consistent with the requirement of the Transportation Planning Rule; or,* *3. Altering land use designations, densities, or design requirements to reduce demand for automobile travel and meet travel needs through other modes.* *C. A Traffic Impact Study, prepared pursuant to Section 9.005 of the Development Ordinance, may be required.*

C. RECOMMENDED REGULATIONS TO PROVIDE NOTICE TO PUBLIC AGENCIES

Review of land use actions is typically initiated by a Notice. A Procedures Ordinance or Notification Policy usually defines this process. The TPR requires a city to provide notice to ODOT regarding any land use action on or adjacent to a State facility. All actions by the city potentially affecting another jurisdiction's road should include notification of that jurisdiction's public works department. In addition, the notification policy should be to notify providers of public transit and recognized special interest transportation groups such as truckers, railroad, bicyclists, pedestrians, and the disabled on any roadway or other transportation project. Adoption of the proposed code language will meet the requirements of OAR 660-12-045(2).

Comprehensive Plan

Suggested Location	Proposed Language Change
Amend Transportation Element, Goals and Objectives, Section 2. New language is a subset to the existing Goal 2.	C. *The city shall coordinate plan amendments, zone changes, and other land use decisions that affect transportation facilities and services with other providers of these services including ODOT and Crook County.*

Implementing Ordinances

Suggested Location	Proposed Language Change
Insert in the Development Ordinance, Amendments, Article 11	**Section 11.040 Public Notice Requirements** *(6) Any application that involves access to the State Highway System shall be provided to Oregon Department of Transportation for their review and comment regarding conformance with state access management standards and requirements.*
Insert in the Development Ordinance, Administration and Enforcement, Article 12	**Section 12.070 Public Hearings and Notice** (5) Contents of Public Notices (c) Set forth the street address or other easily understood geographical reference to the subject property, *including the location of project access point(s)*

D. STREET STANDARDS

The Transportation Planning Rule requires that cities balance mobility, access, and livability when specifying street standards. Historically, cities have tended to establish street dimensions based on highway standards. Many cities have found it increasingly expensive to construct and maintain very wide streets. In many cases, livability has been diminished because excessively wide streets make it difficult to walk, and community aesthetics decline as the landscape is dominated by roads and motor vehicles. As understanding of roadway function has increased, local governments have established standards for local streets and accessways that minimize pavement width and total right-of-way, while maintaining the operational needs of the facility. This reduces the costs of new construction and maintenance, and provides for more efficient use of urban land. The goal is to allow for emergency vehicle access while discouraging inappropriate traffic volumes and speeds, along with accommodating pedestrians and bicyclists. Adoption of the proposed code language will meet the requirements of Section 660-12-045(7).

Comprehensive Plan

Suggested Location	**Proposed Language Change**
Amend Transportation Element, Goals and Objectives, Section 2. New language is a subset to the existing Goal 6.	A. *Design standards for local streets and accessways should minimize pavement width and total right-of-way, while maintaining the operational needs of the facility to reduce the costs of new construction and maintenance, and provide for more efficient use of urban land.* B. *Existing streets that are to be widened or reconstructed should be designed to the adopted street design standards for the appropriate street classification. Adjustments to the design standards may be necessary to avoid existing topographical constraints, historic properties, schools, cemeteries, existing on-street parking, and significant cultural features. Whenever possible, the design of the street should be sensitive to the livability of the surrounding neighborhood.*

Implementing Ordinances

Suggested Location	**Proposed Language Change**

Insert in the Development Ordinance, Design and Improvement Standards and Requirements, Article 9	**Section 9.020 Lots and Blocks** (1) Blocks. ~~(a) No block shall be more than 1,000 feet in length between street corner lines unless it is adjacent to an arterial street, or unless topography or the location of adjoining streets justifies an exception, and is so approved by the reviewing authority.(b) The recommended minimum length of a block along an arterial is 1,800 feet.~~ *(a) Limit block length to 600 feet in length, except for 800 feet on arterials.* ~~(c)~~ *(b)* A block shall ….
Ibid.	**Section 9.0303 Easements** (3) Pedestrian Ways. When desirable for public convenience, a pedestrian and/or bicycle way of not less than four (4) feet in width may be required connect to a cul-de-sac or to pass through ~~an unusually long or oddly shaped block~~ *a block over six hundred feet in length*, or to otherwise provide …
Ibid.	**Section 9.050 Streets and Other Public Facilities** (11) Cul-de-sacs. *Limit the use of cul-de-sac designs and closed street systems to situations where topography, pre-existing development or environmental constraints prevent full street extensions. If cul-de-sacs are used, they shall be as short as possible and shall have maximum lengths of six hundred feet.* A cul-de-sac shall terminate with a circular turn-a-round with a minimum radius of 45 feet of paved driving surface and a 50 – 60 feet right-of-way.
Ibid.	**Section 9.050 Streets and Other Public Facilities** (6) Minimum Right-of-Way and Roadway Widths. Unless otherwise approved in the tentative development plan, street, sidewalk and bike right-of-ways and surfacing … *Supersede existing table with the following table*

Street Functional Classification System

				Arterial	Collector	Local Route	Neigh. Street	Alley
Streetscape	Street Profile		Auto Amenities (lane widths) [1]	2 lanes (12 ft.)	2 lanes (11 ft.)	2 Lanes (11 ft)	2 Lanes (10 ft)	16 ft.
			Median / Center Turn Lane	14 ft.	12 ft.	None	None	None
		Bike	Bike Amenities [2]	2 Lanes (6 ft.)	2 Lanes (5 ft.)	Shared Surface	Shared Surface	None
			Curb-to-curb Street Width [5] On-Street Parking Two Sides One Side None	 66 ft. na 50 ft.	 60 ft. na 44 ft.	 38 ft. 30 ft. 22 ft.	 36 ft. 28 ft.	Not Apply
	To meet ADA Standards	Pedestrian	Pedestrian Amenities [3] Sidewalks Planter Strips	 (2) 5 ft. Res 8 ft. Com	 (2) 5 ft. Res 8 ft. Com 6-10 ft.	 2 (5 ft.) 4 ft. (optional)	 2 (5 ft.) 4 ft. (optional)	 None None
			Preferred Adjacent Land Use (Intensity)	High	High to Medium	Medium to Low	Low	Low
See Mobility & Access Diagram		Traffic Management	Ultimate Design ADT	10,000+	3 - 10,000	1,200 - 3,000	1,200 max	500 max
			Traffic Calming	Not Typical [6]	Permissible/ Not Typical	Permissible/ Not Typical	Typical	Not Typical
			Managed Speed [4]	35-55 mph	25-35 mph	25 mph	15-25 mph	10 mph
			Through-traffic Connectivity	Primary	Typical	Not Typical	Not Permissible	Not Permissible
			Access Control	Yes	Some	No	No	No
			Maximum Grade	7%	7%	7%	10%	10%
			Right-of-Way (feet)	85-105 ft.	75-100 ft.	50-60 ft.	48-58 ft.	24 ft.

Notes:

[1] Lane widths shown are the preferred construction standards that apply to existing routes adjacent to areas of new development, and to newly constructed routes. On arterial and collector roadways, an absolute minimum for safety concerns is 10 ft. Such minimums are expected to occur only in locations where existing development along an established sub-standard route or other severe physical constraints preclude construction of the preferred facility width.

[2] An absolute minimum width for safety concerns is 5 ft. on arterial and 4 ft. on collectors, local routes and neighborhood streets, which is expected to occur only in locations where existing development along an established sub-standard route or other severe physical constraints preclude construction of the preferred facility width. On 4ft sidewalks a minimum 4 ft. "clear width" should be constructed and maintained, to best meet the requirements of the Americans With Disabilities Act. Parallel multi-use paths in lieu of bike lanes are not appropriate along the arterial-collector system due to the multiple conflicts created for bicycles at driveway and sidewalk intersections. In rare instances, separated (but not adjacent) facilities may provide a proper function.

[3] Sidewalks eight-feet in width are required in commercial areas unless otherwise provided for in the Prineville Land Development Ordinance. The *City of Prineville Downtown Enhancement Plan* (1997) recommends wider sidewalks in downtown Prineville in order to accommodate street trees and street furniture without compromising ADA requirements or business access. Designated Special Transportation Areas (STAs) in Prineville, including Third Street and a portion of Main Street, are to have 8-10 foot sidewalks, consistent with the Oregon Highway Plan.

[4] Arterial speeds in the central business or other commercial districts in urban areas may be 20-25 mph. Traffic calming techniques, signal timing, and other efforts will be used to keep traffic within the desired managed speed ranges for each Functional Class. Design of a corridor's vertical and horizontal alignment will focus on providing an enhanced degree of safety for the managed speed.

[5] Street design for each development shall provide for emergency and fire vehicle access. Neighborhood street widths of less than 28 feet shall be applied as a development condition through the subdivision and/or planned development process. The condition may require the developer to make the choice between improving the street to the 28 ft. standard, or constructing the narrower streets with parking bays placed intermittently along the street length. The condition may require fire-suppressive sprinkler systems for any dwelling unit more than 150 feet from a secondary access point.

[6] Pursuant to the *City of Prineville Downtown Enhancement Plan* (1997) pedestrian flares (extensions) or half-flares are proposed at downtown intersections of arterial or collectors.

E. SAFE AND CONVENIENT PEDESTRIAN AND BICYCLE CIRCULATION

Bicycling and walking are often the most appropriate mode for short trips. In smaller cities where the downtown area is compact, walking and bicycling can replace short auto trips, and thus reduce the need for construction and maintenance of new roads. However, the lack of safe and convenient bikeways and walkways can discourage pedestrian and bicycle travel. The Transportation Planning Rule (660-12-045(3)) requires that urban areas and rural communities plan for bicycling and walking as part of the overall transportation system.

In order for walking and bicycling to be viable forms of transportation, the proper facilities must be supplied. In addition, certain development patterns, such as orienting commercial uses to the street and placing parking behind the building, make a commercial district more accessible to non-motorized transportation and to existing or future transit. The Transportation Planning Rule specifies that, at a minimum, sidewalks and bikeways be provided along arterials and collectors in urban areas. Separate bicycle and pedestrian facilities should be provided, as they provide a "short cut" and could safely minimize trips distances. Adoption of the proposed code language will meet the requirements of OAR 660-12-045(3)(b), (c), and (d).

<u>Comprehensive Plan</u>

Suggested Location	**Proposed Language Change**
Amend <u>Transportation Element</u>, Goals and Objectives, Section 2. Proposed language is a new goal – Goal 8. Additional language is a subset to the new goal.	*8. Develop a network of streets, accessways, and other improvements, including bikeways, sidewalks, and safe street crossings to promote safe and convenient bicycle and pedestrian circulation within the community. This shall be done through the implementation of the TSP and review of new development proposals.*
Subset to Goal 8.	*A) Require streets and, where appropriate, accessways to provide direct and convenient access to major activity centers, including downtown, schools, shopping areas, and community centers.*
Ibid.	*B) In areas of new development, the city should investigate the existing and future opportunities for pedestrian and bicycle accessways. Many existing accessways such as user trails established by school children distinguish areas of need and should be incorporated into the transportation system.*
Ibid.	*C) Maintenance and repair of pedestrian accessways (including sidewalks) and existing bikeways should be given equal priority to the maintenance and repair of motor vehicle facilities.*
Ibid.	*D) Bikeways and pedestrian accessways shall connect to local and regional travel routes. Design and construction of such facilities should follow the guidelines established by the Oregon Bicycle and Pedestrian Plan.*
Ibid.	*E) Bike lanes shall be included on all new arterials and collectors within the Urban Growth Boundary .*
Ibid.	*F)Arterial and collector streets shall include bike lanes except as otherwise specifically provided for in the TSP.*

	Local routes/neighborhood streets will accommodate bicycles by allowing for shared use of travel lanes or shoulder bikeways.

Implementing Ordinances

Suggested Location	Proposed Language Change
Insert in the Development Ordinance, General Provisions, Article 1, Section 1.040	*Accessway. A walkway that provides pedestrian and bicycle passage either between streets or from a street to a building or other destination such as a school, park, or transit stops. Accessways generally include a walkway and additional land on either side of the walkway, often in the form of an easement or right-of-way, to provide clearance and separation between the walkway and adjacent uses. Accessways through parking lots are generally physically separated from adjacent vehicle parking or parallel vehicle traffic by curbs or similar devices and include landscaping, trees, and lighting. Where accessways cross driveways, they are generally raised, paved, or marked in a manner that provides convenient access for pedestrians.* *Bicycle Facilities. A general term denoting improvements and provisions made to accommodate or encourage bicycling, including parking facilities and all bikeways.* *Neighborhood Activity Center. An attractor or destination for residents of surrounding residential areas. Includes, but is not limited to existing or planned schools, parks, shopping areas, transit stops, employment areas.* *Reasonably direct. A route that does not deviate unnecessarily from a straight line or a route that does not involve a significant amount of out-of-direction travel for likely users.* *Safe and convenient bicycle and pedestrian routes are:* *a. Reasonably free from hazards, and* *b. Provides a reasonably direct route of travel between destinations, considering that the optimum travel distance is one-half mile for pedestrians and three miles for bicyclists.* *Walkway. A hard-surfaced area intended and suitable for pedestrians, including sidewalks and the surfaced portions of accessways.*
Insert in the Development Ordinance, Central Commercial, C-1 Zone, Section 3.050	**Section 3.050 C-1 Zone** (6) Use Limitations. *(f) New commercial buildings, particularly retail shopping and offices, shall be oriented to the street, near or at the setback line. A main entrance shall be oriented to the street.*
Ibid.	(7) Off-Street Parking and Loading *(e) Where feasible, off-street motor vehicle parking for new commercial developments shall be located at the side or behi the building(s).*

Suggested Location	**Proposed Language Change**
Amend the Development Ordinance, Streets and Other Public Facilities, Section 9.0505	(23) Sidewalks *Sidewalks shall be required along arterials, collectors, connectors, local routes and neighborhood streets as specified in the TSP.*
Ibid.	(24) Bike Lanes *Bikeways and bike lanes shall be provided along arterial and collector streets as specified in the TSP*

F. BICYCLE PARKING

The lack of safe and convenient bicycle parking can discourage bicycling as a transportation mode. The following are recommended to comply with Section 660-12-045 (3) of the TPR.

Comprehensive Plan

Suggested Location	Proposed Language Change
Amend Transportation Element, Goals and Objectives, Section 2. Proposed language is a subset to new Goal 8.	*G) Bicycle parking facilities shall be provided at all new residential multifamily developments of four units or more, commercial, industrial, recreational, and institutional facilities.*

Implementing Ordinances

Suggested Location	Proposed Language Change
Insert in the Development Ordinance, General Provisions: Off-Street Parking and Loading, Section 4.060	*(5) The number of vehicular spaces required in Section 4.070may be reduced by up to 10% if one of the following is demonstrated to the satisfaction of the Planning Director or Planning Commission:* *(a) Residential densities greater than units per gross acre (parking shall be no less than one space per unit for multi-family structures).* *(b) The Planning Director or the Planning Commission conclude that the proposed development is pedestrian oriented by virtue of a location which is in convenient walking distance of existing or planned neighborhood activities (such as schools, parks, shopping etc.) and the development provides additional pedestrian amenities not required by the code which when taken together significantly contribute to making walking convenient (e.g. wider sidewalks, pedestrian plazas, pedestrian scale lighting, benches, etc.)*

Insert in the Development Ordinance, Supplementary Provisions, Article 4.	*4.075 Bicycle Parking Requirements* *(1) General Standard:* *A minimum of 2 bicycle parking spaces (one sheltered and one unsheltered) per use shall be required.* *(2) Specific Uses:* *A. Residential:* *Multi-family dwellings: every multi-family development of four (4) or more dwelling units shall provide at least one sheltered bicycle parking space for each unit. Sheltered bicycle parking spaces may be located within a garage, storage shed, basement, utility room or similar area. In those instances in which the multi-family development has no garage or other easily accessible storage unit, the required bicycle parking spaces shall be sheltered under an eave, overhang, an independent structure, or similar cover.* *B. Place of Public Assembly* *1. Elementary or junior high schools: one bicycle parking space for every 10 students and employees. All spaces shall be sheltered under an eave, overhang, independent structure, or similar cover.* *2. High school: one bicycle parking space for every 5 students and employees. All spaces shall be sheltered under an eave, overhang, independent structure, or similar cover.* *3. Colleges. one bicycle parking space for every 10 motor vehicle spaces plus one space for every dormitory unit. Fifty percent of the bicycle parking spaces shall be sheltered under an eave, independent structure, or similar cover.* *C. Commercial* *1. Parking Lots. All public and commercial parking lots and parking structures shall provide a minimum of one bicycle parking space for every 10 motor vehicle parking spaces.* *2. Downtown Areas. In downtown areas with on-street parking, bicycle parking for customers shall be provided along the street at a rate of at least one space per use. Spaces may be clustered to serve up to six (6) bicycles; at least one cluster per block shall be provided. Bicycle parking spaces shall be located in front of the stores along the street, either on the sidewalks in specially constructed areas such as pedestrian curb extensions. Inverted "U" style racks are recommended. Bicycle parking shall not interfere with pedestrian passage, leaving a clear area of at least 5 feet. Customer spaces are not required to be sheltered. Sheltered parking (within a building, or under an eave, overhang, or similar structure) shall be provided at a rate of one space per 10 employees, with a minimum of one space per store.*
Insert in the Development Ordinance, Design/Improvement Standards - Off-Street Parking and Loading, Section	(14) Parking Lot Plans Required *(h) Location and number of bicycle parking stalls*

4.080	

G. PROTECTING EXISTING AND FUTURE OPERATIONS OF FACILITIES

The Transportation Planning Rule requires that jurisdictions protect the future operation of transportation corridors. For example, an important arterial for through traffic should be protected from incompatible land uses in order to meet the community's identified needs. Other future transportation facilities that small jurisdictions may wish to address include rights-of-way or other easements for accessways, paths, and trails. Additionally, space and building orientation necessary to support future transit may also be an important issue.

Protection of existing and planned transportation systems can be provided by ongoing coordination with other agencies, adhering to the road standards, and to the access management policies and ordinances suggested below. Adoption of the proposed code language will meet the requirements of OAR 660-12-045(2).

Comprehensive Plan

Suggested Location	**Proposed Language Change**
Amend Transportation Element, Goals and Objectives, Section 2. New language is a subset to the existing Goal 6.	C) *The city should protect the function of existing and planned roadways as identified in the Transportation System Plan.*
Amend Transportation Element, Goals and Objectives, Section 2. New language is a subset to the existing Goal 7.	B) *The city should include consideration of the impact on existing or planned transportation facilities in all land use decisions.*

Ibid.	*C) The city should protect the function of existing or planned roadways or roadway corridors through the application of appropriate land use regulations.*
Ibid.	*D) The city should consider the potential to establish or maintain accessways, paths, or trails prior to the vacation of any public easement or right-of-way.*
Ibid.	*E) The city should preserve right-of-way for planned transportation facilities through exactions, voluntary dedication, or setbacks.*

Suggested Location	Proposed Language Change
Insert in the Development Ordinance, Definitions, Section 1.040	Access. *A way or means of approach to provide pedestrian, bicycle, or motor vehicular entrance or exit to a property.* Access Connection. *Any driveway, street, turnout or other means of providing for the movement of vehicles to or from the public roadway system.* Access Management. *The process of providing and managing access to land development while preserving the regional flow of traffic in terms of safety, capacity, and speed.* Cross Access. *A service drive providing vehicular access between two or more contiguous sites so the driver need not enter the public street system.* Joint Access *(or Shared Access). A driveway connecting two or more contiguous sites to the public street system.* Lot Frontage. *That portion of a lot extending along a street right-of-way line.* Nonconforming Access Features. *Features of the property access that existed prior to the date of ordinance adoption and do not conform with the requirements of this ordinance.* Reasonable Access. *The minimum number of access connections, direct or indirect, necessary to provide safe access to and from the roadway, as consistent with the purpose and intent of this ordinance and any applicable plans and policies of the (city/county).* Stub-out *(Stub-street). A portion of a street or cross access drive used as an extension to an abutting property that may be developed in the future.*
Amend the Development Ordinance, Site Plan and Review, Section 4.240	(D) Site Development Plan 7. Parking and circulation areas, including their dimensions*; and the number and type of bicycle parking facilities required in Section 4.075.*
Amend the Development Ordinance, Site Plan and Review, Section 4.240	(D) Site Development Plan 13. Pedestrian and bicycle circulation. *Internal pedestrian circulation shall be provided in new commercial, office, and multi-family residential developments through the clustering of buildings, construction of hard surface walkways, landscaping, accessways, or similar techniques. Pedestrian circulation through parking lots shall be provided in the form of accessways.*

Suggested Location	**Proposed Language Change**
Ibid.	(D) <u>Site Development Plan</u> *20. On-site facilities shall be provided to accommodate safe and convenient pedestrian and bicycle access within new subdivisions, multi-family developments, planned development, shopping centers, and commercial districts, and connecting to adjacent residential areas and neighborhood activity centers. Residential developments shall include streets with sidewalks and accessways.* *21. For new office parks and commercial developments:* *(a) At least one walkway connection between the proposed development and each abutting property shall be provided.* *(b) walkways shall be provided to the street for every 300 feet of developed frontage.* *(c) walkways shall be direct and driveway crossings minimized.* *(d) walkways shall be linked to the internal circulation of the building.* *(e) walkways shall be at least five feet wide and shall be raised, have curbing, or have different paving material when crossing driveways.* *22. Access management requirements per 9.060 where applicable*
Amend the <u>Development Ordinance</u>, Access Management, Section 9.060	(3) <u>General Access Management Guidelines</u>. ~~In the review and approval of new developments, the reviewing authority shall consider the following guidelines.~~ *In the interest of promoting unified access and circulation systems, the number of access points permitted shall be the minimum number necessary to provide reasonable access to these properties, not the maximum available for that frontage. All necessary easements, agreements, and stipulations shall be met. This shall also apply to phased development plans. The owner and all lessees within the affected area are responsible for compliance with the requirements of this ordinance and both shall be cited for any violation.* *For any new development, the following information shall be shown on the site plan.* *A. Driveways shall meet the following standards:* *1. If the driveway is a one-way in or one-way out drive, then the driveway shall be a minimum width of 12 feet and shall have appropriate signage designating the driveway as a one way connection.* *2. For two-way access, each lane shall have a minimum width of 12 feet.* *B. Driveway approaches must be designed and located to provide an exiting vehicle with an unobstructed view. Construction of driveways along acceleration or deceleration lanes and tapers shall be avoided due to the potential for vehicular weaving conflicts.* *C. The length of driveways shall be designed in accordance with the anticipated storage length for entering and exiting vehicles to prevent vehicles from backing into the flow of traffic on the public street or causing unsafe conflicts with on-site circulation.* D. The number and spacing of accesses to City Streets shall be as specified in the table below (see Table H-1 for State

	Highways):

City of Prineville

Access Management Guidelines and Suggested Design Standards for City Streets

Functional Classification	System Spacing	Design / Managed Speed (MPH)	Horizontal Alignment	Vertical Alignment	Traffic Control	Street Lighting	Access Management			
							Min. Spacing	Residential Use	Commercial Uses	Industrial Uses
Arterial	1 mi.	35-55\ 45-55	Minimum centerline radius: 650 ft	Maximum grade: 7% Minimum sight distance: 450 ft	1. Placement/ design of traffic control devices as warranted by MUTCD 2. Minimum signal spacing: 1/4 mile	1. Mounting height: 35-40 ft	300 ft	No direct access	1. Shared access driveways are encouraged 2. Left-hand turn lanes determined through review	1. Shared access driveways are encouraged 2. Left-hand turn lanes determined through review
Collector	1/4 mi.	35\ 25-35	Minimum centerline radius: 560 ft	Maximum grade: 7% Minimum sight distance: 300 ft	Placement/design of traffic control devices as warranted by MUTCD	1. Mounting height: 30-35 ft	100 ft	1. Shared access driveways are encouraged	1. Shared access driveways are encouraged 2. Left-hand turn lanes determined through review	1. Shared access driveways are encouraged 2. Left-hand turn lanes determined through review
Local Route	1/8 mi.	25\ 25	Minimum centerline radius: 300 ft	Maximum grade: 7% Minimum sight distance: 250 ft	Placement/design of traffic control devices as warranted by MUTCD	1. Mounting height: 25-30 ft	50 ft	1. Shared access driveways are encouraged	1. Shared access driveways are encouraged 2. Left-hand turn lanes determined through review	1. Shared access driveways are encouraged 2. Left-hand turn lanes determined through review

Neighborhood Street	Min. 400 ft. Max. 600 ft.	25\ 15-25	Minimum centerline radius: 150 ft	Maximum grade: 10% Minimum sight distance: 150 ft	Placement/design of traffic control devices as warranted by MUTCD	1. Mounting height: 20 ft	None	Curb cut minimum 45 ft. to curb return.	Curb cut minimum 50 ft. to curb return.	No direct access.

Suggested Location	Proposed Language Change
Insert in the Development Ordinance, Access Management, Section 9.060	*(5) Joint and Cross Access Guidelines.* *Any developments requiring site plan review that do not meet access spacing requirements are subject to these requirements. In these cases, the following information shall be shown on the site plan:* *A. Adjacent commercial or office properties classified as major traffic generators (e.g. shopping plazas, office parks), shall provide a cross access drive and pedestrian access to allow circulation between sites.* *B. A system of joint use driveways and cross access easements shall be established wherever feasible and shall incorporate the following:* *1. A continuous service drive or cross access corridor extending the entire length of each block served to provide for driveway separation consistent with the access management classification system and standards.* *2. A design speed of 10 mph and a minimum width of 20 feet to accommodate tw -way travel aisles designated to accommodate automobiles, service vehicles, and loading vehicles;* *3. Stub-outs and other design features to make it visually obvious that the abutting properties may be tied in to provide cross-access via a service drive;* *4. A unified access and circulation system plan for coordinated or shared parking areas is encouraged.* *5. Subdivisions with frontage on the state highway system shall be designed into shared access points to and from the highway. Normally, a maximum of two accesses shall be allowed regardless of the number of lots or businesses served. If access off of a secondary street is possible, then access should not be allowed onto the state highway. If access off of a secondary street becomes available, then conversion to that access is encouraged, along with closing the state highway access* *C. Shared parking areas may be permitted a reduction in required parking spaces if peak demands do not occur at the same time periods.* *D. Pursuant to this section, property owners shall:* *1. Record an easement with the deed allowing cross access to and from other properties served by the joint use driveways and cross access or service drive;* *2. Record an agreement with the deed that remaining access rights along the roadway will be dedicated to the city and pre-existing driveways will be closed and eliminated after construction of the joint-use driveway;* *3. Record a joint maintenance agreement with the deed defining maintenance responsibilities of property owners.* *E. The city may reduce required separation distance of access points where they prove impractical, provided all of the following requirements are met:* *1. Joint access driveways and cross access easements are provided in accordance with this section.* *2. The site plan incorporates a unified access and circulation system in accordance with this section.* *3. The property owner enters into a written agreement with the city, recorded with the deed, that pre-existing connections on the site will be closed and eliminated after construction of each side of the joint use driveway.* *F. The Planning Department may modify or waive the requirements of this section where the characteristics or layout of abutting properties would make a development of a unified or shared access and circulation system impractical.*

Suggested Location	**Proposed Language Change**
Insert in the Development Ordinance, Access Management, Section 9.060	*(6) Standards for State Highways In the review and approval of new developments, the reviewing authority shall consider the following guidelines.* *(1)Future developments abutting state highways (zone changes, comprehensive plan amendments, redevelopment, and/or new development) will be required to meet the 1999 Oregon Highway Plan Access Management policies and standards.* *(a)* ***Special Access Management Guidelines*** *- See Table H-1 at the end of this Appendix.*
	(2) Proposed land use actions that do not comply with the designated access spacing policy will be required to apply for an access variance from the City of Prineville and ODOT. Cases within the 1999 OHP Minor Deviation Limits require approval of the City and ODOT Region Access Management Engineer. Deviation beyond these limits will be permitted only if no other reasonable option (such as joint access) exists, and requires approval of the City Council and the ODOT Region Manager. *(3) The 1999 Oregon Highway Plan also establishes Mobility Standards for all State Highways, including those within the Prineville Area. The transportation impact from proposed developments must be appropriately mitigated where necessary to meet these Mobility Standards.* (4) The existing legal driveway connections, intersection spacings and other accesses to the state highway system are not required to meet the spacing standards of the assigned category immediately upon adoption of this access management plan. However, existing permitted connections not conforming to the design goals and objectives of the roadway classification will be upgraded as circumstances permit and during redevelopment. At any time, an approach road may need to be modified due to a safety problem or a capacity issue that exists or becomes apparent. By statute, ODOT is required to ensure that all safety and capacity issues are addressed.
Ibid.	*(5) If a property is landlocked (no reasonable alternative access exists), if an approach road cannot be safely constructed and operated, and if all other alternatives are explored and rejected, ODOT must purchase the property. (Note, if a hardship is self-inflicted, such as by partitioning or subdividing a property, ODOT has no responsibility for purchasing the property.)* *(6) New direct accesses to individual one and two family dwellings shall be prohibited on all but District-level State Highways, unless doing so would deny reasonable access to an existing legal lot of record.*
Insert in the Development Ordinance, Access Management, Section 9.060	*(8) Nonconforming Access Features* *Legal access connections in place as of (date of adoption) that do not conform with the standards herein are considered nonconforming features and shall be brought into compliance with applicable standards under the following conditions:* *a. When new access connection permits are requested;* *b. Change in use or enlargements or improvements that will significantly increase trip generation.*
Ibid.	*(9) Exception Standards for City Facilities*

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

<table>
<tr><td>Insert in the <u>Development Ordinance</u>, Design and Improvement Standards and Requirements, Article 9</td><td>Section 9.055 <u>Traffic Impact Study</u> Any new development shall not impose an undue burden on the public transportation system. For developments that are likely to impact the existing transportation system, the applicant shall provide adequate information, such as a traffic impact study, to demonstrate the level of impact to the surrounding street system..
(1) Proposed land use actions, new developments, and/or redevelopment will need to provide traffic impact studies to the respective local reviewing jurisdiction(s) and ODOT(where appropriate) if the proposed use:
(a) Directly accesses a state highway; or
(b) Requires a comprehensive plan amendment; or
(c) There is a recognized traffic safety or operations deficiency in the vicinity of the proposed land use action;
<u>and</u> the proposed use exceeds the thresholds defined as:

(d) Generation Threshold: 50 newly generated vehicle trips (inbound and outbound) during the adjacent street peak hour; or
(e) Mitigation Threshold: installation of any traffic control device and/or construction of geometric improvements that will affect the progression or operation of traffic traveling on, entering, or exiting the (state) highway; or
(f) Heavy Vehicle Trip Generation Threshold: 20 newly generated heavy vehicle trips (inbound and outbound) during the day.
(2) A traffic study will not be required if a proposed land use action is allowed outright or a conditional use and it does not exceed the thresholds defined above.
(3) Traffic Impact Studies will be prepared in accordance with the City of Prineville’s Traffic Impact Analysis (TIA) - Development Requirements Policyy.
(4) Dedication of land for streets, transit facilities, sidewalks, bikeways, paths, or accessways shall be required where the existing transportation system will be impacted by or is inadequate to handle the additional burden caused by the proposed use.
(5) Improvements such as paving, curbing, installation or contribution to traffic signals, construction of sidewalks, bikeways, accessways, paths, or streets that serve the proposed use where the existing transportation system, may be burdened by the proposed use.</td></tr>
<tr><td>Insert in the <u>Development Ordinance</u>, Streets and Other Public Facilities, Section 9.050</td><td><u>Section 9.050</u> <u>Streets and Other Public Facilities</u>
(1) It shall be the responsibility of the developer …
a. If any lot abuts a street right-of-way that does not conform to the design specifications of this ordinance, the may be required to dedicate up to one-half of the total right-of-way width required by this ordinance.
b. Dedication of land for streets, transit facilities, sidewalks, bikeways, paths, or accessways shall be required the existing transportation system will be impacted by or is inadequate to handle the additional burden cau the proposed use.</td></tr>
<tr><td>Ibid.</td><td>(28) <u>Connectivity</u> The street system of proposed subdivisions shall be designed to connect with existing, proposed, and planned streets outside of the subdivision as provided in this Section.</td></tr>
</table>

	(a) Wherever a proposed development abuts unplatted land or a future development phase of the same development, street stubs shall be provided to provide access to abutting properties or to logically extend the street system into the surrounding area. All street stubs shall be provided with a temporary turn-around unless specifically exempted by the Public Works Director, and the restoration and extension of the street shall be the responsibility of any future developer of the abutting land. *(e) Minor collector and local residential access streets shall connect with surrounding streets to permit the convenient movement of traffic between residential neighborhoods or facilitate emergency access and evacuation. Connections shall be designed to avoid or minimize through traffic on local streets. Appropriate design and traffic control such as four-way stops and traffic calming measures are the preferred means of discouraging through traffic.* *(c) All access must be internalized using the shared circulation system of the principal development or retail center. Driveways shall be designed to avoid queuing across surrounding parking and driving aisles.*
Insert in the <u>Development Ordinance</u>, Lots and Blocks, Section 9.020	*(2) <u>Lots</u>* *A. The resulting or proposed size, width, shape and orientation …* *B. To provide for proper site design and prevent the creation of irregularly shaped parcels, the depth of any lot or parcel shall not exceed 3 times its width (or 4 times its width in rural areas) unless there is a topographical or environmental constraint or an existing man-made feature such as a railroad line.* *C. Flag Lots or Panhandle-shaped Lots:* *a. Flag lots shall not be permitted when the result would be to increase the number of properties requiring direct and individual access connections to the State Highway System or other arterials.* *b. Flag lots may be permitted for residential development when necessary to achieve planning objectives, such as reducing direct access to roadways, providing one legal connection to a residential street, or preserving natural or historic resources, under the following conditions:* *i. The flag lot driveway shall have a minimum width of 10 feet and maximum width of 20 feet.* *ii. The lot area occupied by the flag driveway shall not be counted as part of the required minimum lot area of that zoning district.*
Ibid.	*(3) <u>Access</u> Each resulting or proposed lot or parcel shall abut upon a public street, …* *Lots that front on more than one street shall be required to locate motor vehicle accesses on the street with the lower functional classification.*
Amend the <u>Development Ordinance</u>, Site Plan and Review, Section 4.240	*(D) <u>Site Development Plan</u>* *23. Distances to neighboring constructed access points, median openings (where applicable), traffic signals (where applicable), intersections, and other transportation features on both sides of the property;* *24. Number and direction of lanes to be constructed on the driveway plus striping plans;* *25. All planned transportation features (such as sidewalks, bikeways, auxiliary lanes, signals, etc.);*

Table H-1: Urban Access Management Spacing Standards for State Highways[1]

(measurements in feet, center to center on same side of roadway)

Highway Category	Posted Speed	Expressway	Other	STA
Statewide	55+ mph	2640	1320	
	50 mph	2640	1100	
	40-45 mph	2640	990	
	30-35 mph		770	City Block[2]
	25 mph or less		550	City Block
Regional	55+ mph	2640	990	
	50 mph	2640	830	
	40-45 mph	2640	750	
	30-35 mph		600	City Block
	25 mph or less		450	City Block
District	55+ mph	2640	700	
	50 mph	2640	550	
	40-45 mph	2640	500	
	30-35 mph		400	City Block
	25 mph or less		400	City Block

1 See *1999 Oregon Highway Plan* for specific access spacing criteria and definitions.

2 Minimum spacing for public road approaches is either 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 STAs driveways are discouraged. However, where driveways are allowed and where land use permit, the minimum spacing for driveways is 175 feet or mid-block if the current city block spacing is less than 350 feet.

Table H-1: Continued

Highway Designation	Highway	From	To
Statewide / Expressway	OR 126	West UGB	O'Neil Hwy
Statewide / NHS	OR 126	O'Neil Hwy	Locust Street
Statewide / NHS / STA	OR 126	Locust Street	Knowledge Street
Statewide / NHS	OR 126	Knowledge Street	East UGB
Region	US 26	NW UGB	OR 126
District / STA	OR 27	OR 126	First Street
District	OR 27	First Street	South UGB
District	OR 370 (O'Neil)	NW UGB	OR 126
District	OR 380 (Paulina)	First Street	South UGB