

**REPORT
TRANSPORTATION SYSTEM PLAN**

City of Lostine

JUNE 1997



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CITY OF LOSTINE

Transportation System Plan
Final Report

June 1997

Prepared for
The City of Lostine

Prepared by
David Evans and Associates, Inc.



Acknowledgment

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

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CHAPTER 1: INTRODUCTION

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

PLANNING AREA

The Lostine Transportation System Plan planning area includes the City of Lostine and the area within the city's Urban Growth Boundary (UGB). The planning area is shown on Figure 1-1. Roadways included in the TSP fall under several jurisdictions: Lostine, Wallowa County, and the State of Oregon.

Lostine is the smallest city in Wallowa County with a population of 235. Located in northeastern Oregon about 10 miles northwest of Enterprise, it is a self-contained community. Lostine provides a variety of residential, shopping, employment, and recreational opportunities within its UGB and the surrounding countryside.

Lostine, like many other smaller communities in Oregon, developed along the state highways serving the region. State Highway 82 (Wallowa Lake Highway) runs from the northwest to southeast through the center of town along Water and State Streets. The city consists of a small grid system of four east-west streets and four north-south streets. The Idaho Northern Pacific Railroad runs northeast of town.

PLANNING PROCESS

The Lostine TSP was prepared as part of an overall effort in Wallowa County to prepare TSPs for Wallowa County and the four municipalities: Enterprise, Joseph, Lostine, and Wallowa. Each plan was developed through a series of technical analyses combined with systematic input and review by the city, the combined management team, the Transportation Advisory Committee (TAC), ODOT, and the public. The TAC consisted of staff, elected and appointed officials, residents, and business people from Wallowa County, and the cities of Enterprise, Joseph, Lostine, and Wallowa. Key elements of the process include:

- Involving the Lostine community (Chapter 1).
- Defining goals and objectives (Chapter 2).
- Reviewing existing plans and transportation conditions (Chapters 3 and 4; Appendix A).
- Developing population, employment, and travel forecasts (Chapter 5; Appendix B).
- Developing and evaluating potential transportation system improvements (Chapter 6; Appendix C).
- Developing the Transportation System Plan (Chapter 7).
- Developing a capital improvement program (Chapter 8).
- Developing recommended policies and ordinances (Chapter 9).

Community Involvement

Community involvement is an integral component in the development of a TSP for the City of Lostine, the other cities, and Wallowa County. Since each of the communities needed to address similar transportation and land use issues, a public involvement program involving all the jurisdictions was used. Several different techniques were utilized to involve each local jurisdiction, ODOT, and the general public.

A combined management team and TAC provided guidance on technical issues and direction regarding policy issues to the consultant team. Staff members from each local jurisdiction and ODOT and a local resident from each community served on this committee. This group met three times during the course of the project.

The second part of the community involvement effort involved the consultant team meeting individually with representatives of each jurisdiction. The purpose of these meetings was to collect information specific to each jurisdiction and to discuss the development of the TSPs for the individual cities and county. The consultant team met two times with each jurisdiction during the project.

The third part consisted of community meetings within Wallowa County. The first set of public meetings was held in early January in Joseph, Enterprise, and Wallowa. The general public was invited to learn about the TSP planning process and provide input on transportation issues and concerns. A second set of public meetings was held in Wallowa County in late April. The final set of public meetings, which consisted of presentations to the management team and TAC, was held during the month of June. The public was notified of the public meetings through public announcements in the local newspapers and on the local radio station.

Goals and Objectives

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

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

To begin the planning process, all applicable Lostine and Wallowa County transportation and land use plans and policies were reviewed and an inventory of public facilities was conducted. The purpose of these efforts was to understand the history of transportation planning in the Lostine area, including the street system improvements planned and implemented in the past, and how the city is currently managing its ongoing development.

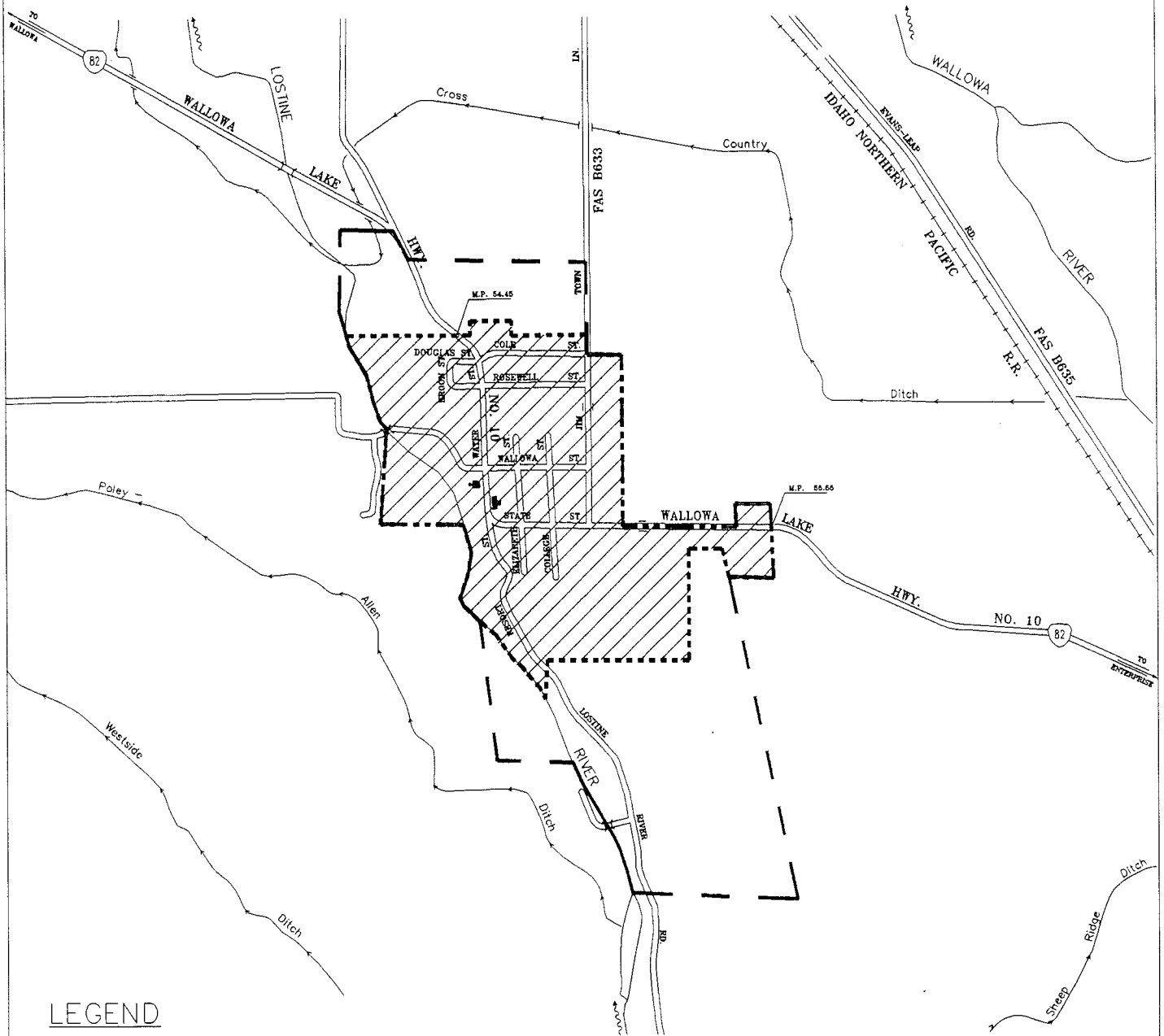
The inventory of existing facilities catalogs the current transportation system. The results of the inventory are described in Chapter 3, while Chapter 4 describes how the system operates.

Future Transportation System Demands

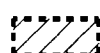

The Transportation Planning Rule requires the Transportation System Plan to address a 20-year forecasting period. Future traffic volumes for the existing plus committed transportation systems were



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LEGEND

-  CITY LIMITS
-  URBAN GROWTH BOUNDARY

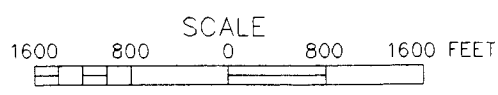


FIGURE 1-1
LOSTINE PLANNING AREA

projected using ODOT's *Level 1 -- Trending Analysis* methodology. The overall travel demand forecasting process is described in Chapter 5.

Transportation System Potential Improvements

Once the travel forecasts were developed, it was possible to evaluate a series of potential transportation system improvements. The evaluation of the potential transportation improvements was based on a qualitative review of safety, environmental, socioeconomic, and land use impacts, as well as estimated cost. These improvements were developed with the help of the local working group, and they attempt to address the concerns specified in the goals and objectives (Chapter 2). After evaluating the results of the potential improvements analysis, a series of transportation system improvements were selected. These recommended improvements are described in Chapter 6.

Transportation System Plan

The TSP addresses each mode of transportation and provides an overall implementation program. The street system plan was developed from the forecasting and potential improvements evaluation described above. The bicycle and pedestrian plans were developed based on current usage, land use patterns, and the requirements set forth by the Transportation Planning Rule. The public transportation, air, water, rail, and pipeline plans were developed based on discussions with the owners and operators of those facilities. Chapter 7 details the plan elements for each mode.

Funding Options

The City of Lostine will need to work with Wallowa County and ODOT to finance new transportation projects over the 20-year planning period. An overview of funding and financing options that might be available to the community are described in Chapter 8.

Recommended Policies and Ordinances

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

CHAPTER 2: GOALS AND OBJECTIVES

The purpose of the TSP is to provide a guide for the City of Lostine to meet its transportation goals and objectives. The following goals and objectives were developed from concerns expressed during public meetings. An overall goal was drawn, along with more specific goals and objectives. Throughout the planning process, each element of the plan was evaluated against these parameters.

OVERALL TRANSPORTATION GOAL

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

Goal 1

Preserve the function, capacity, level of service, and safety of the state highways.

Objectives

- A. Develop access management standards.
- B. Develop alternative, parallel routes.
- C. Promote alternative modes of transportation.
- D. Promote transportation demand management programs.
- E. Promote transportation system management.
- F. Develop procedures to minimize impacts to and protect transportation facilities, corridors, or sites during the development review process.

Goal 2

Ensure that the road system within the city and urban area is adequate to meet public needs, including the transportation disadvantaged.

Objectives

- A. Develop a city transportation plan.
- B. Meet identified maintenance level of service on the county and state highway systems.
- C. Review and revise, if necessary, street cross section standards for local, collector, and arterial streets to enhance safety and mobility.
- D. Develop access management strategies for Highway 82.
- E. Evaluate the need for traffic control devices, particularly along Highway 82.

Community Involvement

Community involvement is an integral component in the development of a TSP for the City of Lostine, the other cities, and Wallowa County. Since each of the communities needed to address similar transportation and land use issues, a public involvement program involving all the jurisdictions was used. Several different techniques were utilized to involve each local jurisdiction, ODOT, and the general public.

A combined management team and TAC provided guidance on technical issues and direction regarding policy issues to the consultant team. Staff members from each local jurisdiction and ODOT and a local resident from each community served on this committee. This group met three times during the course of the project.

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The inventory of existing facilities catalogs the current transportation system. The results of the inventory are described in Chapter 3, while Chapter 4 describes how the system operates.

Future Transportation System Demands

The Transportation Planning Rule requires the Transportation System Plan to address a 20-year forecasting period. Future traffic volumes for the existing plus committed transportation systems were

CHAPTER 3: TRANSPORTATION SYSTEM INVENTORY

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

STREET SYSTEM

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

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

The existing street system inventory was conducted for all highways, arterial roadways, and collector roadways within Lostine, as well as those in Wallowa County that are included in the TSP planning area. Inventory elements include:

- street classification and jurisdiction;
- street width and right-of-way;
- number of travel lanes;
- presence of on-street parking, sidewalks, or bikeways;
- speed limits; and
- general pavement conditions.

Figure 3-1 shows the roadway functional classification and jurisdiction. Appendix A lists the complete inventory.

State Highways

Discussion of the Lostine street system must include the state highways that traverse the planning area. Although Lostine has no direct control over the state highways, adjacent development and local traffic patterns are heavily influenced by the highways. Lostine is served by one state highway: Highway 82. This highway serves as the major route through town with commercial and industrial development focused along its corridor.

Goal 3

Improve coordination among Wallowa County, the Oregon Department of Transportation (ODOT), the US Forest Service (USFS), the Federal Highway Administration (FHWA), and the city.

Objectives

- A. Cooperate with ODOT in the implementation of the Statewide Transportation Improvement Program (STIP).
- B. Work with the county in establishing cooperative road improvement programs and schedules.
- C. Work with the county in establishing the right-of-way needed for new roads identified in the transportation system plan.
- D. Take advantage of federal and state highway funding programs.

Goal 4

Increase the use of alternative modes of transportation (walking, bicycling, and public transportation) through improved access, safety, and service.

Objectives

- A. Continue and improve service of the Wallowa Valley Stage line between Wallowa and La Grande and the Senior Citizens' bus program.
- B. Provide sidewalks or shoulders and safe crossings on collectors and arterials.
- C. Amend and implement a city bicycle plan.
- D. Seek Transportation and Growth Management (TGM) and other funding for projects evaluating and improving the environment for alternative modes of transportation.

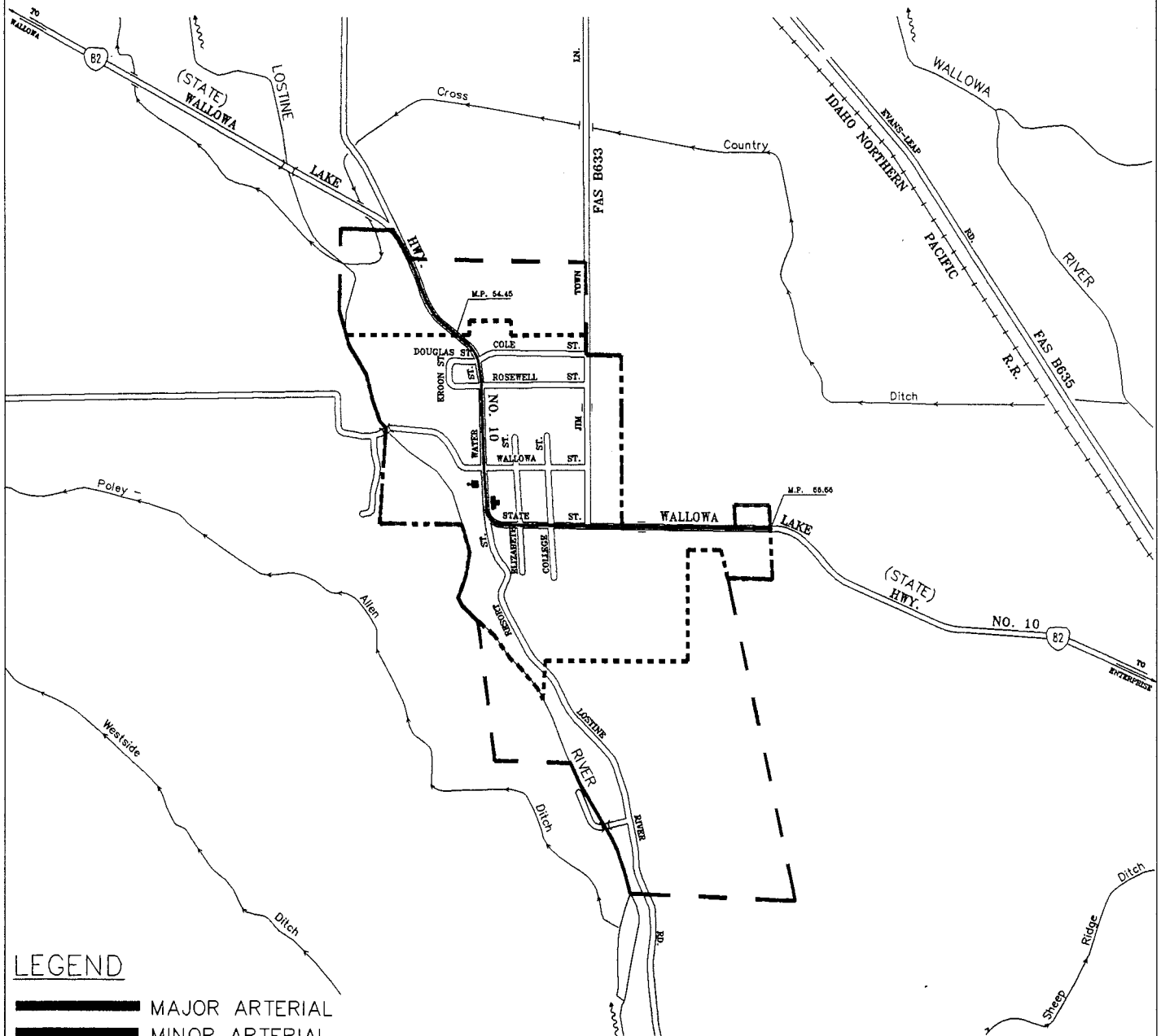
Goal 5

Encourage the continued and improved rail transportation of goods.

- A. Maintain operational status of the Idaho Northern Pacific rail line.



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LEGEND

- MAJOR ARTERIAL
- MINOR ARTERIAL
- COLLECTOR

CITY LIMITS

URBAN GROWTH BOUNDARY

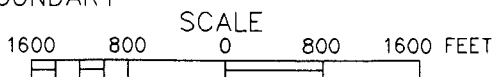


FIGURE 3-1
STREET CLASSIFICATION
AND JURISDICTION

Minor Arterials

Minor arterials connect local neighborhoods or districts to the major arterial network. Lostine has no designated minor arterials.

Collector Streets

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

Street Layout

The majority of the Lostine streets are positioned in a grid pattern. Block sizes vary but are typically 400 feet square.

PEDESTRIAN SYSTEM

The most basic transportation option is walking. Walking is the most popular form of exercise in the United States and can be performed by people of all ages and all income levels. However, it is not often considered as a means of travel. Because pedestrian facilities are generally an afterthought, they are not planned as an essential component of the transportation system.

The relatively small size of Lostine indicates that walking could be employed regularly, weather permitting, to reach a variety of destinations. Encouraging pedestrian activities may not only decrease the use of the personal automobile but may also provide benefits for retail businesses. Where people find it safe, convenient, and pleasant to walk, they may linger and take notice of shops overlooked before. They may also feel inclined to return to renew the pleasant experience time and again.

As is typical of most towns the size of Lostine, the sidewalk system is limited to just a few blocks. Sidewalks exist along two blocks of Water Street between State Street and Rosewell Street as shown in Figure 3-2. Sidewalks and other pedestrian facilities, including curb cuts for wheelchair access are notably lacking throughout the rest of the city.

BIKEWAY SYSTEM

Like pedestrians, bicyclists are often overlooked when considering transportation facilities. Bicycles are often considered merely as children's toys. However, cycling is a very efficient mode of travel. Bicycles take up little space on the road or when parked, do not contribute to air or noise pollution, and offer relatively higher speeds than walking. Because of the small size of Lostine, a cyclist can travel to any destination in town within a matter of minutes.

Bicycling should be encouraged to reduce the use of automobiles for short trips in order to reduce some of the negative aspects of urban growth. Noise, air pollution, and traffic congestion could be mitigated if more

short trips were taken by bicycle or on foot. Typically, a short trip that would be taken by bicycle is around two miles; on foot, the distance commonly walked is around 1/2 mile.

Lostine currently has no sanctioned bikeways; bicyclists must share the roadways with motorized vehicles. On low volume roadways, such as many of the local streets, bicyclists and autos can both safely and easily use the roadway. On higher volume roadways, particularly the arterial streets, safety for the bicyclists is an important issue.

Another impediment to bicycle use is the lack of parking and storage facilities for bikes throughout the City of Lostine.

The City of Lostine prepared a draft bikeway master plan through an earlier TGM grant. The plan sets forth goals and objectives for the county which include providing safe and efficient bicycle access, reducing conflicts between bicyclists and motorized vehicle traffic, developing a system dedicated to bicycles, providing opportunities for recreational bicycle use, supplying information to the public about the location of bicycle facilities, and promoting citizen involvement through the development of a citizen bicycle committee and holding meetings in an open forum. The plan lists desirable projects and prioritizes them based on financial aspects, current use, and safety considerations. The projects listed (in priority order) are on State Street (Highway 82) and Cole Street/Jim Town Road.

PUBLIC TRANSPORTATION

Public transportation in Lostine consists of the Wallowa Valley Stage Line and Dial-A-Ride service for senior citizens and the disabled.

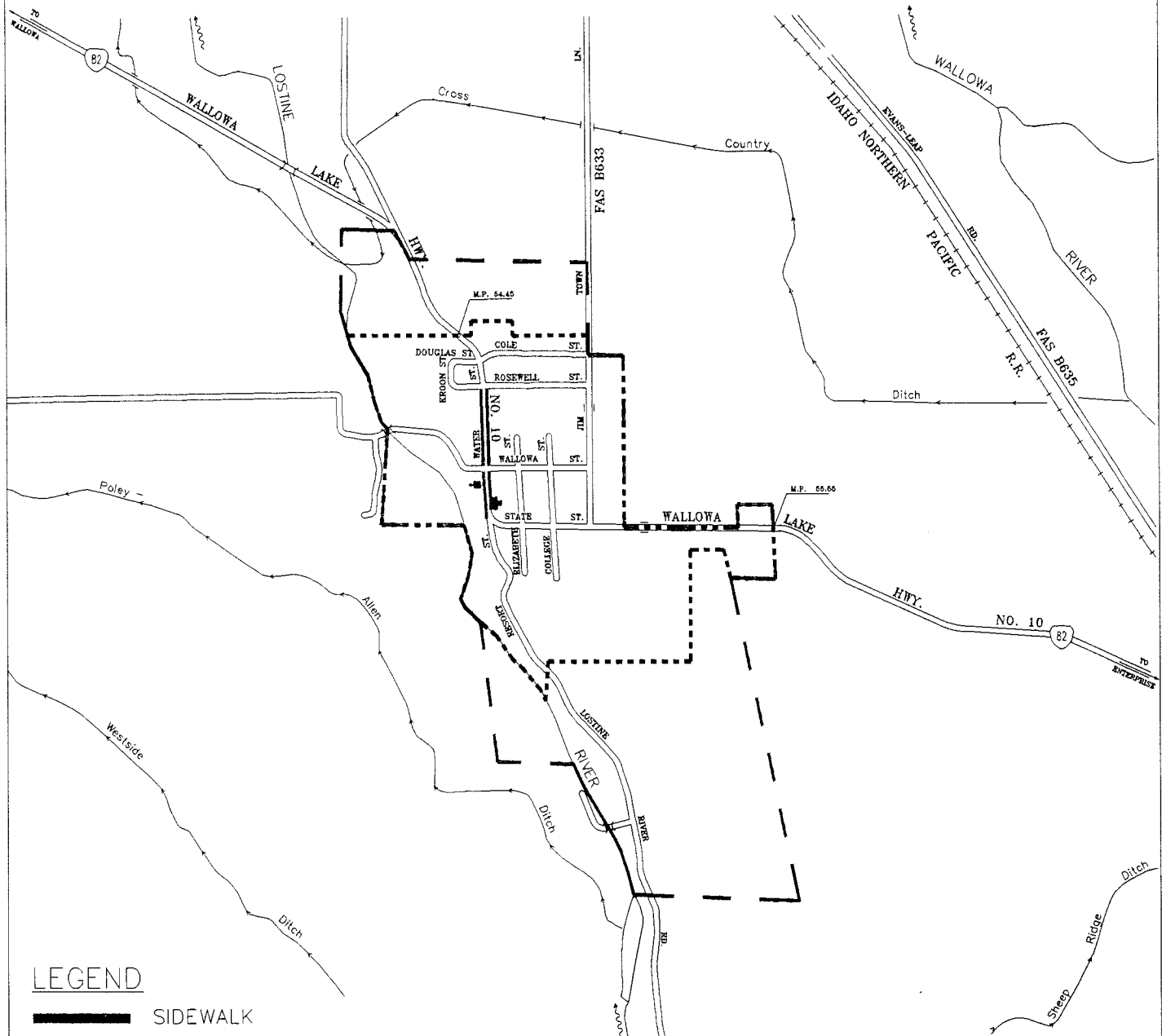
The Wallowa Valley Stage Line is operated by the Moffit Brothers and is based in Lostine. It provides van service which transports passengers to Enterprise, Joseph, Wallowa, and several cities in Union County, including La Grande. In La Grande, passengers can connect to Greyhound bus service. In addition to transporting passengers, the line also transports packages. It provides regularly scheduled service, with a westbound trip departing from Joseph at 6:30 a.m. and an eastbound trip departing from La Grande at 11:55 a.m. daily, except Sundays and holidays. The one-way fare between Joseph and La Grande is \$8.80, and the round trip fare is \$15.85; lower fares are charged for shorter trips.

The senior citizens and disabled Dial-A-Ride service is provided by Community Connections. It operates two 12-passenger, lift-equipped buses, one based in Enterprise and one based in Wallowa. The buses make one trip per day between Enterprise and Joseph and between Wallowa and Lostine; the one-way fare is \$1.50. On Mondays, Wednesdays, and Fridays, the buses transport senior citizens and the disabled to meal sites in Enterprise and Wallowa for \$0.35 one-way. On Tuesdays and Thursdays, the general public can use the service as well. On Tuesdays, the bus based in Wallowa goes to Enterprise. The operator estimates that the service is currently underutilized.




Another type of public transportation service available in the county is client transportation, which is provided by a social service or health care agency to individuals participating in the agency's service program. This type of public transportation is offered by the Wallowa County Health Care District and the Wallowa County Nursing Home. A volunteer driver program is also administered in Wallowa County by each of these social service and health care agencies as well as the Department of Human Resources Volunteer Program. A volunteer driver program is a community based program to provide drivers to transport specific client groups.



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-  SIDEWALK
-  CITY LIMITS
-  URBAN GROWTH BOUNDARY

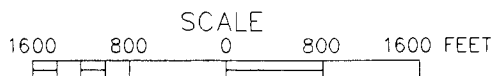


FIGURE 3-2
PEDESTRIAN SYSTEM
INVENTORY

The city has no local fixed-route transit service at this time. The small size and low traffic volumes on city streets indicate that mass transit is not necessary nor economically feasible at this time. The Transportation Planning Rule exempts cities with a population of less than 25,000 from including mass transit facilities in their development regulations.

RAIL SERVICE

Lostine has no passenger rail service. Until recently, AMTRAK service was available in La Grande (Union County) along the rail line which follows the Interstate 84 corridor from Portland to Boise, Idaho and points east. AMTRAK passenger service along the line was terminated in May 1997. This line serves only freight traffic now.

The Idaho Northern Pacific Railroad (INP) has a freight line which runs to the north of town. INP is currently pursuing abandonment of the line. The Federal Surface Transportation Board recently granted INP an exemption from regulation restricting railroad abandonments in rural areas. With the exemption, INP can operate the railroad or rip it out and sell the rails and ties as scrap. However, the rails and bridges are in good condition and retaining freight service on the line is a goal of the local jurisdictions. Discussions among INP, ODOT, local jurisdictions, and shippers concerning the future of the rail line and right-of-way are on-going.

AIR SERVICE

Lostine does not have airborne transportation service. The nearest airport open to the public is Enterprise Municipal Airport, ten miles away in the City of Enterprise. The closest airport with regularly scheduled commercial air service is located in Pendleton approximately 100 miles to the west. Scheduled air service and daily non-stop flights are available to Portland and from there to other locations in the western United States.

PIPELINE SERVICE

Although not often considered as transportation facilities, pipelines carry liquids and gases very efficiently. The use of pipelines can greatly reduce the number of trucks and railcars carrying fluids such as natural gas, oil, and gasoline. There are currently no pipelines serving Lostine. There has been interest expressed in the communities of Wallowa County to extend natural gas service from Elgin.

WATER TRANSPORTATION

Lostine has no waterborne transportation services.

CHAPTER 4: CURRENT TRANSPORTATION CONDITIONS

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

TRAFFIC VOLUMES

ODOT maintains historic average annual daily traffic volume counts for Highway 82 in Lostine. No hourly traffic data or turning movement data are available for Highway 82 or any other local roadway in Lostine.

Average Daily Traffic

The Average Daily Traffic (ADT) on Highway 82 in Lostine is shown in Figure 4-1. The average daily traffic volume on Highway 82 north of town is 2,000 vehicles per day (vpd). Traffic volumes rise to 2,300 vpd in town and south of town (between Lostine and Enterprise). Traffic growth has remained flat over the past five years.

The traffic volumes shown on Figure 4-1 and other volume figures are average volumes for the year. Summer is the season when volumes are highest. ODOT data on Highway 82 west of Wallowa County indicated that during the summer season, volumes are about 20 to 30 percent higher than average volumes. Urban sections of the highway (i.e., in Lostine) are expected to see smaller increases in summer.

Street Capacity

Transportation engineers have established various standards for measuring traffic capacity of roadways or intersections. Each standard is associated with a particular level of service (LOS). The LOS concept requires consideration of factors that include travel speed, delay, frequency of interruptions in traffic flow, relative freedom for traffic maneuvers, driving comfort and convenience, and operating cost. Six standards have been established ranging from Level A where traffic flow is relatively free-flowing, to Level F, where the street system is totally saturated with traffic and movement is very difficult. Table 4-1 presents the level of service criteria for arterial roadways.

TABLE 4-1
LEVEL OF SERVICE CRITERIA FOR ARTERIAL AND COLLECTOR STREETS

Service Level	Typical Traffic Flow Conditions
A	Relatively free flow of traffic with some stops at signalized or stop sign controlled intersections. Average speeds would be at least 30 miles per hour.
B	Stable traffic flow with slight delays at signalized or stop sign controlled intersections. Average speed would vary between 25 and 30 miles per hour.
C	Stable traffic flow with delays at signalized or stop sign controlled intersections. Delays are greater than at level B but still acceptable to the motorist. The average speeds would vary between 20 and 25 miles per hour.
D	Traffic flow would approach unstable operating conditions. Delays at signalized or stop sign controlled intersections would be tolerable and could include waiting through several signal cycles for some motorists. The average speed would vary between 15 and 20 miles per hour.
E	Traffic flow would be unstable with congestion and intolerable delays to motorists. The average speed would be approximately 10 to 15 miles per hour.
F	Traffic flow would be forced and jammed with stop and go operating conditions and intolerable delays. The average speed would be less than 10 miles per hour.

Source: Transportation Research Board, *Highway Capacity Manual*, Special Report 209. National Research Council, 1985.

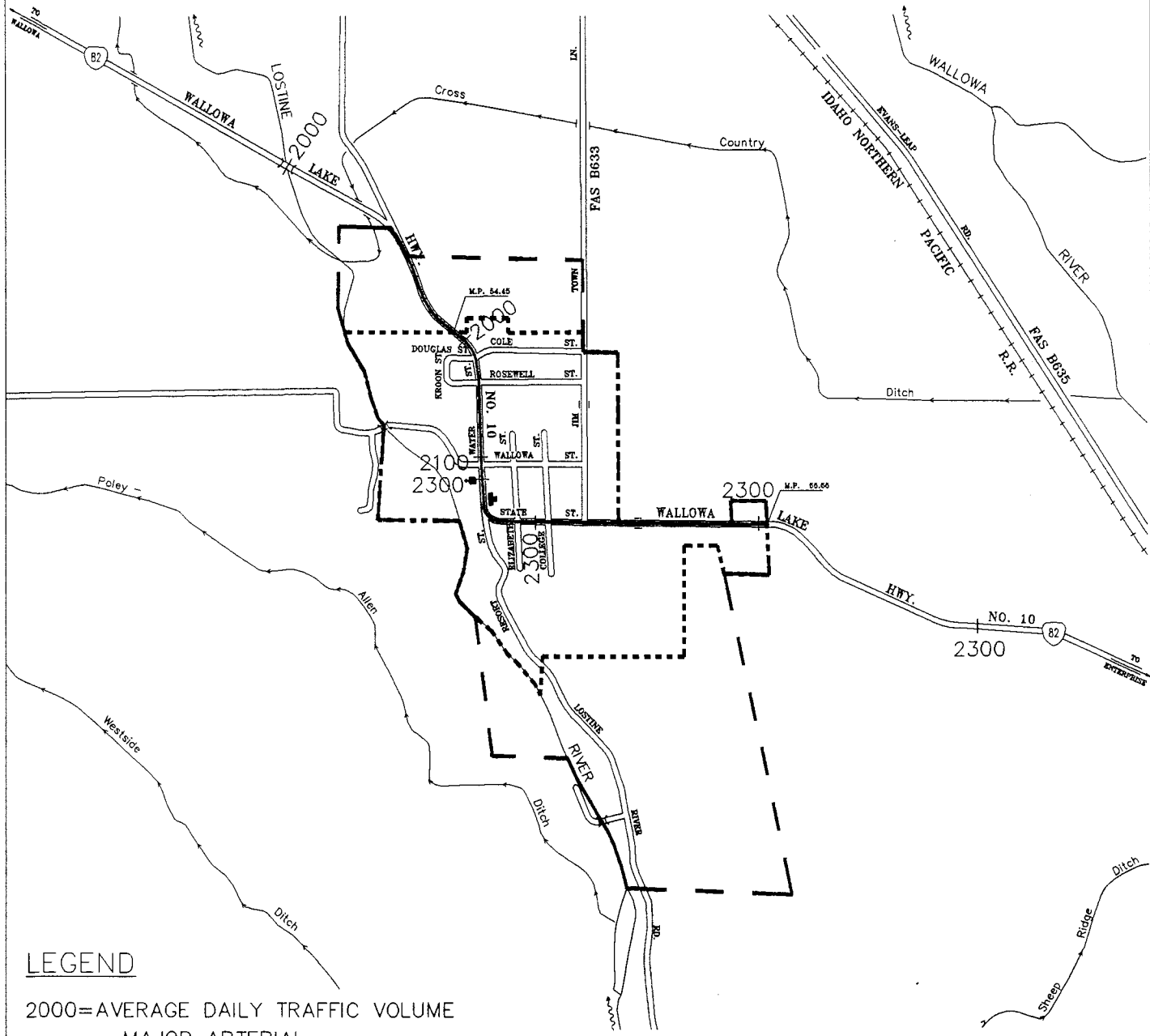
The *Oregon Highway Plan* (OHP) establishes operating level of service standards for the state highway system¹. Highways of statewide importance, such as Highway 82, should operate at LOS C or better (i.e., average speeds between 20 and 25 mph) in urban and urbanizing areas. For highways of district importance, such as Highway 3, the roadways should operate at LOS D (i.e., average speeds between 15 and 20 mph) in both urban and urbanizing areas.

The traffic operation was determined at a representative intersection along Highway 82 using the 1994 Highway Capacity Software for unsignalized intersections. This software is based on the 1994 Highway Capacity Manual, Special Report 209, published by the Transportation Research Board. Since all intersecting streets and driveways are controlled by stop signs in the city, the analysis was performed for an unsignalized intersection. The peak hour traffic was assumed to be 10 percent of the 24-hour ADT volume and the directional split was assumed to be 60/40. Because side street traffic volumes were unavailable, an assumed volume of 30 vph was used and unsignalized intersection level-of-service calculations were made for a representative intersection. The results of the level-of-service analysis are shown in Table 4-2.

¹1991 *Oregon Highway Plan*, Appendix A, Table 1, Operating Level of Service Standards for the State Highway System.



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LEGEND

- 2000=AVERAGE DAILY TRAFFIC VOLUME
- MAJOR ARTERIAL
- CITY LIMITS
- [] URBAN GROWTH BOUNDARY

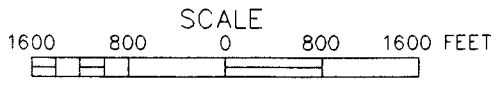


FIGURE 4-1
1995 WEEKDAY 24-HOUR
TWO-WAY TRAFFIC VOLUMES

**TABLE 4-2
SUMMARY OF OPERATIONS AT A REPRESENTATIVE INTERSECTION**

Location	Movement	1995 LOS
Highway 82	Eastbound; Left, Through, Right	A
	Westbound; Left, Through, Right	A
	Northbound; Left	A
	Southbound; Left	A

Note: The level of service is shown for all movements of the unsignalized intersections.

In general, traffic volumes in Lostine are very light and traffic flows smoothly. Traffic on the state highway and a representative cross street operates at LOS A.

TRANSPORTATION DEMAND MANAGEMENT MEASURES

In addition to taking an inventory of the transportation facilities in Lostine, transportation demand management measures that are currently in place were also reviewed.

Alternative Work Schedules

One way to maximize the use of the existing transportation system is to spread peak traffic demand over several hours instead of a single hour. Statistics from the 1990 Census show the spread of departure-to-work times over a 24-hour period (see Table 4-3). More than one quarter of the total employees depart for work between 7:00 and 8:00 a.m. Another quarter depart in either the hour before or the hour after the peak.

**TABLE 4-3
DEPARTURE TO WORK DISTRIBUTION**

Departure Time	1990 Census	
	Trips	Percent
12:00 a.m. to 4:59 a.m.	9	10.3
5:00 a.m. to 5:59 a.m.	19	21.8
6:00 a.m. to 6:59 a.m.	7	8.1
7:00 a.m. to 7:59 a.m.	23	26.4
8:00 a.m. to 8:59 a.m.	14	16.1
9:00 a.m. to 9:59 a.m.	2	2.3
10:00 a.m. to 10:59 a.m.	4	4.6
11:00 a.m. to 11:59 a.m.	1	1.2
12:00 p.m. to 3:59 p.m.	6	6.9
4:00 p.m. to 11:59 p.m.	2	2.3
Total	87	100.0

Source: US Bureau of Census.

Assuming an average nine-hour work day, the corresponding afternoon peak can be determined for work trips. Using this methodology, the peak work travel hour would occur between 4:00 and 5:00 p.m.

TRAVEL MODE DISTRIBUTION

Although the automobile is the primary mode of travel for most residents in the Lostine area, some other modes are used as well. Modal split data is not available for all types of trips; however, the 1990 census data do include statistics for journey to work trips as shown in Table 4-4.

Most Lostine residents travel to work via a private vehicle. In 1990, 93.4 percent of all trips to work were in an auto, van, or truck. Trips in single-occupancy vehicles made up 100 percent of all trips.

In no case was a bicycle reported as a means of transportation to work in 1990. Since the census data do not include trips to school or other non-work activities, some bicycle usage may actually exist. There are few roadways with dedicated bicycle lanes. In addition to bicycle lanes, bicycle parking, showers, and locker facilities can help to encourage bicycle commuting.

Pedestrian activity was low (2.2 percent of trips to work); lower than many other communities. Again, census data do not include trips to school or other non-work activities.

While the census data reflect the predominant use of the automobile, the growing population and employment opportunities, relatively short travel distances, level terrain, and clear weather conditions during the warmer seasons are favorable for other modes of transportation. The statewide emphasis on providing pedestrian and bicycle facilities along with roadways encourages the use of these modes.

TABLE 4-4
JOURNEY TO WORK TRIPS

Trip Type	1990 Census	
	Trips	Percent
Private Vehicle	85	93.4
<i>Drove Alone</i>	85	100.0
<i>Carpooled</i>	0	0
Public Transportation	0	0
Motorcycle	0	0
Bicycle	0	0
Walk	2	2.2
Other	0	0
Work at Home	4	4.4
Total	91	100.0

Source: US Bureau of Census.

ACCIDENT ANALYSIS

ODOT collects detailed accident information on an annual basis along Highway 82 in Lostine. The accident information data show overall accident rates for the route and accident locations. The accident

rate for a stretch of roadway is typically calculated as the number of accidents per million vehicle miles traveled along that segment of roadway.

Historic

Table 4-5 shows the accident rates for Highway 82 in Lostine as well as the Oregon statewide average for urban non-freeway primary state highways from January 1, 1993 to December 31, 1995. The accident rates for Highway 82 during those three years are consistently lower than the statewide average for similar highways.

TABLE 4-5
HISTORIC ACCIDENT RATES FOR STATE HIGHWAYS
(Accidents per Million Vehicle Miles Traveled)

Highway	1995	1994	1993
Highway 82 in Lostine	1.12	2.25	1.81
Average for all Urban Non-freeway Primary State Highways	3.98	3.45	3.55

Source: Oregon Department of Transportation Accident Rate Tables.

Table 4-6 contains detailed accident information on Highway 82 in Lostine from January 1, 1993 to December 31, 1995. It shows the number of fatalities and injuries, property damage only accidents, the total number of accidents, and the overall accident frequency and rate for the segment of roadway in Lostine. During the three-year period there was a total of 5 accidents, all of which were reported as property damage only. There were no fatalities or injuries on this roadway segment during the period. One of the accidents occurred at an intersection and three occurred on icy pavement. The accidents were scattered along the roadway segment and there were no particular locations which showed a consistent accident pattern. The accident rate on Highway 82 is significantly below the statewide average, indicating that this roadway segment does not have any safety problems.

TABLE 4-6
ACCIDENT SUMMARIES FOR HIGHWAY 82
(January 1, 1993 to December 31, 1995)

Location	Fatalities	Injuries	Property Damage Only	Total Accidents	Accident Frequency (acc/mi/yr)	Accident Rate (acc/mvm)
Highway 82 (MP 54.45 to 55.55)	0	0	5	5	1.52	1.94

Source: Oregon Department of Transportation Accident Summary Database Investigative Report.

CHAPTER 5: TRAVEL FORECASTS

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

LAND USE

Land use and population growth play an important part in projecting future traffic volumes. Historic trends and their relationship to historic traffic demand are the basis of those projections. These population and employment forecasts were developed to determine future transportation needs. The amount of growth, and where it occurs, will affect traffic and transportation facilities in the study area. This report is not intended to provide a complete economic forecast or housing analysis, and it should not be used for any purpose other than that for which it is designed.

A more detailed description of existing and future land use projections is contained in the Population and Employment Analysis located in Appendix B. Both historic and projected population for Wallowa County and its incorporated cities are summarized in Table 5-1.

TABLE 5-1
WALLOWA COUNTY POPULATION TRENDS

	1970	1980	1990	1996 Estimate	2015 Projected
Wallowa County	6,247	7,273	6,911	7,250	8,025
Incorporated Cities:					
Enterprise	1,680	2,003	1,905	2,020	2,206
Joseph	839	999	1,073	1,255	1,460
Lostine	196	250	231	235	242
City of Wallowa	811	847	748	755	789

Source:

- 1) US Bureau of the Census.
- 2) Portland State University Center for Population Research and Census.
- 3) State of Oregon Office of Economic Analysis.

Historic

Population levels in most of Eastern Oregon are close to, or actually lower than, those experienced earlier in the century. Counties included in this phenomenon include Baker, Harney, Union, Grant, and Wallowa Counties. The population of Wallowa County actually declined in the 1960s and 1980s, reflecting the general slowdown in the state's economy during these time periods. As a result of this activity, the population of Wallowa County declined by 3 percent between the 1960 and 1990 Censuses (from 7,102 in 1960 to 6,911 in 1990). Lostine's population rose from 196 in 1970 to 250 in 1980, falling again to 231 in the 1990 Census.

Projected

Population projections in Wallowa County are based on historic growth rates and forecasts by the State of Oregon Office of Economic Analysis. Factors that will affect the future growth rate of Wallowa County include employment opportunities, available land area for development, and community efforts to manage growth.

Wallowa County is expected to experience small population gains for the next 20 years. Like much of Eastern Oregon, the economy of Wallowa County remains largely seasonal, with more than one-quarter of all employment agriculture-based. Therefore, population increases are difficult to predict, and are not likely to be as stable as the forecasts appear to imply.

The population of Wallowa County is expected to increase by 11 percent over the next 20 years, from the 1995 estimate of 7,250 to an estimated 8,025 in year 2015. The only jurisdiction expected to grow faster is Joseph, with a forecast increase of nearly 23 percent over 20 years, from 1,190 in 1995 to 1,460 in 2015. Lostine is expected to maintain a stable population base throughout the planning horizon, rising slightly to 242 by year 2015.

TRAFFIC VOLUMES

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

Historic

Before projecting future traffic growth, it is important to examine past growth trends on the Lostine roadway system. Historic data is only available for State Highway 82 in Lostine; however, this roadway carries far more traffic than any other streets in the city. The Oregon Department of Transportation (ODOT) collects traffic count data on the state highways (rural and urban sections) every year at the same locations. These counts have been conducted at five locations on Highway 82 in Lostine.

Historical growth trends on the state highways in and around Lostine were established using the average annual daily traffic (AADT) volume information presented in the ODOT Traffic Volume Tables for the years 1975 through 1995. The AADT volumes were obtained for each of these years at several locations along each highway. Using a linear regression analysis of the average AADT volumes between 1975 and 1995, an average annual growth rate was determined. Table 5-2 summarizes the historic average growth rate on each of these sections.

TABLE 5-2
HISTORIC TRAFFIC GROWTH RATES ON STATE HIGHWAYS

Highway Section	Average Annual Growth Rate 1975-1995	Total Growth 1975- 1995
Highway 82 west of Lostine	1.8%	43%
Highway 82 in Lostine	3.0%	79%
Highway 82 east of Lostine	3.2%	88%

Over the past 20 years, growth on Highway 82 in Lostine has averaged 3.0 percent per year. On the rural section of Highway 82 west of Lostine, traffic has been growing at a rate of 1.8 percent per year. East of Lostine, traffic has been growing at a rate of 3.2 percent per year.

In all cases, growth on the highways far exceeded the population growth in Lostine itself. This relationship reflects the modern trend toward an increase in per capita vehicle miles traveled and the increase in tourist traffic.

Forecasting Methodology

It was decided that the most appropriate growth rates to project future traffic are those calculated from the historic traffic growth and not those calculated from the historic and future population and employment forecasts. Using the same linear regression analysis used to calculate the historic growth rate of traffic, forecasts were made for the years 1997 through 2017. Traffic volumes are expected to grow at a rate of 1.8 percent per year (42 percent over the next 20 years) to 3,850 vpd on Highway 82 within Lostine. This annual growth rate is higher than either of the estimated population and employment growth rates as described earlier in this chapter, and provide a more conservative estimate. Also, much of the traffic on this highway in Lostine is tourist traffic, whose growth is not directly determined by the population and employment growth in the study area.

It is important to note that using the historical growth trends assumes that future traffic patterns will remain consistent with historical patterns, without consideration of future planned developments.

HIGHWAY SYSTEM CAPACITY

For the year 2017, unsignalized intersection analysis was performed using the overall growth (42 percent) expected on Highway 82 at the same representative intersection in Lostine for which the existing conditions were analyzed. The analysis indicated that this intersection is expected to meet ODOT level of service standards over the 20-year forecast period. The results of the unsignalized intersection analysis are shown in Table 5-3.

Analysis Results

At a representative intersection on Highway 82, traffic volumes are expected to be 42 percent higher than traffic volumes today. This increase in traffic volumes over the 20-year projection period will not impact

the level-of-service (LOS) at this intersection. The northbound and southbound left turns at this intersection will continue to operate at LOS A, and the level of service for the eastbound and westbound left, through and right turns will drop to LOS B; however, this is still in the range of acceptable delay for drivers.

TABLE 5-3
SUMMARY OF OPERATIONS AT A REPRESENTATIVE INTERSECTION

Location	Movement	1995 LOS	2017 LOS
Highway 82	Eastbound; Left, Through, Right	A	B
	Westbound; Left, Through, Right	A	B
	Northbound; Left	A	A
	Southbound; Left	A	A

Note: The level of service is shown for all movements of the unsignalized intersections.

CHAPTER 6: IMPROVEMENT OPTIONS ANALYSIS

As required by the Oregon Transportation Planning Rule, transportation alternatives were formulated and evaluated for the Lostine Transportation System Plan. These potential improvements were developed with the help of the TAC, and the individual communities and attempt to address the concerns specified in the goals and objectives (Chapter 2).

Each of the transportation system improvement options was developed to address specific deficiencies or access concerns. The following list includes all of the potential transportation system improvements considered. Improvement Options 2 and 4 are illustrated in Figure 6-1.

The proposed transportation system improvements recommended for the Lostine TSP include both state highway and local road projects. This section of the TSP describes the individual improvements and their associated costs. Improvement options include:

1. Revise zoning code to allow and encourage mixed-use development and redevelopment.
2. Improve highway signage at the south end of town -- clearly mark the highway route.
3. Control speeds on Highway 82.
4. Provide a bikeway on Highway 82.
5. Implement Transportation Demand Management Strategies.

As discussed in the remaining sections of this chapter, not all of these considered improvements were recommended. The recommendation were based on costs and benefits relative to traffic operation, the transportation system, and the community livability.

EVALUATION CRITERIA

The evaluation of the potential transportation improvements was based on a qualitative review of safety, environmental, socioeconomic, and land use impacts, as well as estimated cost. The effect of each potential project on traffic patterns was not evaluated since existing and future traffic projections for the city indicate there will be no deficiencies in the capacity of the street system over the next 20 years.

Safety was the first qualitative factor to be evaluated. Although driver safety is considered in these projects, pedestrian and bicycle safety are a critical concern for the city. Environmental factors were also evaluated, such as air quality, noise, and water quality. Evaluation of socioeconomic and land use impacts considered right-of-way requirements, impacts to adjacent lands, and community livability. The final factor in the evaluation of each potential transportation improvement was cost. Costs were estimated in 1997 dollars based on preliminary alignments for each potential transportation system improvement.

STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM PROJECTS

The Oregon Department of Transportation has a comprehensive transportation improvement and maintenance program that covers the entire state highway system. The Statewide Transportation

Improvement Program (STIP) identifies all the highway improvement projects in Oregon. The STIP lists specific projects, the counties in which they are located, and their construction year.

There were no highway improvement projects for the City of Lostine listed in the 1998-2001 STIP, published in 1996.

IMPROVEMENT OPTIONS EVALUATION

Through the transportation analysis and input provided from the public involvement program, multiple improvement projects were identified. These options included providing improved pedestrian and bicycle facilities.

Option 1. Revise Zoning and Development Codes

One of the goals of the Oregon Transportation Planning Rule (TPR) is to reduce the reliance on the automobile. One way city jurisdictions can do this is through amendments to zoning and development codes to permit mixed use developments and increases in density in certain areas. Specific amendments include allowing neighborhood commercial uses within residential zones and allowing residential uses within commercial zones. Such code amendments can encourage residents to walk and bicycle throughout the community by providing shorter travel distances between land uses.

These code revisions are more effective in medium to large sized cities with populations of 25,000 and over, but in cities such as Lostine, they are not appropriate. Because of Lostine's size, the decision of what mode of transportation to use when making a trip inside the city is not influenced by distance. The longest distance between city limit boundaries in Lostine is around one mile, a distance short enough to walk, ride a bike, or drive. Distances between different land uses, such as residential and commercial, is even shorter.

Revisions to zoning and development codes to allow for increased density are not applicable to Lostine. Because of the small size of Lostine, the relationship between land uses is already similar to the mixed use zoning patterns that are recommended in larger urban areas. Increasing density is also likely to have little effect on development in a community which is expecting a population increase of 3 percent (7 additional residents) in the next 20 years.

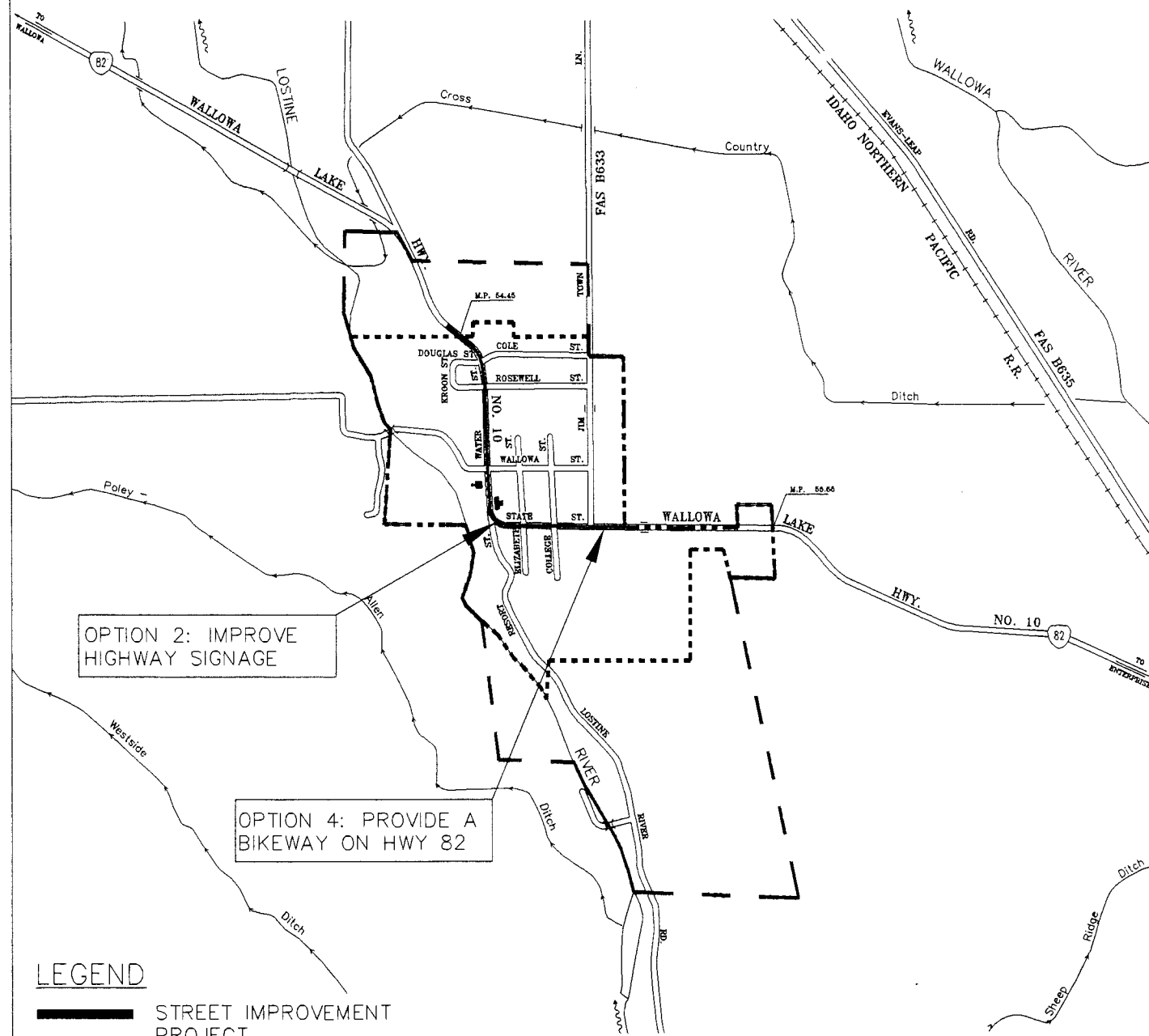
Option 2. Improve Highway Signage

During one of the community meetings, it was suggested that the highway signage at the south end of town be improved to clearly mark the highway route. When traveling south on Highway 82, the highway turns left (east) at the southwest corner of town. If an unsuspecting motorist was to continue straight at that location, he would find himself on Resort Street, and no longer on Highway 82. This traffic pattern may be confusing to some motorists, therefore, improved signage clearly marking the highway route would improve the flow of traffic.

This improvement can be implemented at a very low cost and is recommended. ODOT has jurisdiction over the signs on a state highway, therefore, the city would have to request that ODOT make the improvement.






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OPTION 2: IMPROVE
HIGHWAY SIGNAGE

OPTION 4: PROVIDE A
BIKEWAY ON HWY 82

LEGEND

-  STREET IMPROVEMENT PROJECT
-  CITY LIMITS
-  URBAN GROWTH BOUNDARY

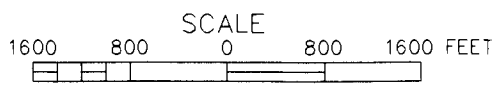


FIGURE 6-1
IMPROVEMENT OPTIONS

Option 3. Control Speeds on Highway 82

The residents of Lostine are concerned about traffic exceeding the posted speed limit along Highway 82 through the city. Residents would like to see a system developed that would encourage traffic to slow down to a more appropriate speed.

It is recommended that a system be developed that would discourage motorists from exceeding the speed limit along Highway 82 within Lostine. There are a variety of different speed control measures used on the roadways of many cities in the state ranging from narrowing lane widths to more stringent enforcement. A technical memorandum describing the different types of speed control measures available can be found in Appendix C. A specific cost cannot be identified until a speed control program is developed.

Option 4. Provide a Bikeway on Highway 82

Goals and objectives of the City's bicycle plan include reducing conflicts between bicyclists and motorized vehicle traffic, developing a system dedicated to bicycles, and providing opportunities for recreational bicycle use. One option for meeting these goals is adding a bikeway on Highway 82.

Shared roadways, where bicyclists share normal vehicle lanes with motorists, are generally acceptable if speeds and traffic volumes are relatively low. On the local streets in Lostine, shared roadways are not an issue; however, on arterial roadways bike lanes are recommended.

Highway 82 functions as an arterial street through Lostine, which means that it should have bike lanes on both sides of the street as specified in the recommended street standards listed in Chapter 7 and as required by the TPR.

On Highway 82, volumes are approximately 2,300 vehicles per day. Accident statistics on the highway do not indicate that there are frequent conflicts between bicyclists and motorized vehicles. This is due in part to relatively low bicycle usage in the area. To install bicycle lanes along Highway 82 would involve removing on-street parking through Lostine. Shoulders would need widening on sections where no on-street parking exists. Some of these improvements would be expensive and others would be controversial. At this time, no specific bikeway improvements are recommended for Highway 82; however, ODOT should track both traffic volumes and accident rates on this facility to identify any problems in the future.

The *Oregon Highway 82 Corridor Plan* describes a shoulder widening program on Highway 82 to increase the safety and access to bicyclists, motorists, road maintenance crews while supporting related state and federal mandates. It would widen and restripe all substandard shoulders on Highway 82 to six feet unless there are physical width limitations, where a minimum four foot shoulder may be used. This could be accomplished as a singular project or as part of other improvement projects. This project is listed as a low priority project (for the next 10 to 20 years) and cost \$27 million (1995 dollars), assuming the construction of 33 miles of shoulder.

Option 5. Implement Transportation Demand Management Strategies

Transportation demand management (TDM) strategies change the demand on the transportation system by providing facilities for modes of transportation other than single occupant passenger vehicles, such as

implementing carpooling programs, altering work shift schedules, and applying other transportation measures within the community. The State Transportation Planning Rule recommends that cities should evaluate TDM measures as part of their Transportation System Plans.

TDM strategies are most effective in large, urban cities; however, some strategies can still be useful in small cities such as Lostine. For example, staggering work shift schedules at local businesses may not be appropriate in Lostine since there are no large employers in the area; however, provisions for alternative modes of transportation, such as sidewalks and bike lanes, and implementing a county-wide carpooling program can be beneficial for residents of the city. In rural communities, TDM strategies include providing mobility options.

Lostine can implement TDM strategies by requiring all future street improvement projects to include the addition of some sort of pedestrian facility, such as new sidewalks or walkways, which will effectively separate pedestrians from motorized traffic. All new street improvement projects should also consider bicycle lanes as well.

Implementing a local carpool program in Lostine alone is not necessary because of Lostine's geographical size; however, a county-wide carpool program is possible. Residents who live in Lostine and residents who live in other cities and rural areas should be encouraged to carpool with a fellow coworker or someone who works in the same area.

Although the primary goal of these measures is to reduce the number of vehicle trips made within the city, especially during peak periods, street capacity for automobiles and trucks is generally not an issue in Lostine. However, providing adequate facilities for pedestrians and bicyclists increases the livability of a city, and improves traffic and pedestrian safety. With more emphasis on walking or biking in the city, conditions such as air quality and noise levels would be improved as well, therefore, this option is recommended.

Costs associated with implementing TDM strategies were not determined.

SUMMARY

Table 6-1 summarizes the recommendations of the street system modal plan based on the evaluation process described in this chapter. Chapter 7 discusses how these improvement options fit into the modal plans for the Lostine area.

TABLE 6-1
TRANSPORTATION IMPROVEMENT OPTIONS: RECOMMENDATION SUMMARY

Option	Recommendation
1. Revise Zoning and Development Codes	• Do not implement; not applicable
2. Improve Highway Signage	• Implement, ODOT has jurisdiction
3. Control the Speed on Highway 82	• Desirable to implement; ODOT has jurisdiction
4. Provide a Bikeway on Highway 82	• Do not implement
5. Implement Transportation Demand Management Strategies	• Implement

CHAPTER 7: TRANSPORTATION SYSTEM PLAN

The purpose of this chapter is to provide detailed operational plans for each of the transportation systems within the community. The Lostine TSP covers all the transportation modes that exist and are interconnected throughout the urban area. Components of the street system plan include street classification standards, access management recommendations, transportation demand management measures, modal plans, and a system plan implementation program.

STREET DESIGN STANDARDS

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

Existing Street Classification Standards

Currently, preliminary street standards exist for minimum pavement widths of 22 to 24 feet.

Recommended Street Standards

The development of the Lostine TSP provides the city with an opportunity to review and revise street design standards to more closely fit with the functional street classification, and the goals and objectives of the TSP. The recommended street standards are shown graphically in Figure 7-1 through Figure 7-3 and summarized in . Since the Lostine TSP includes land within the UGB, urban road standards should be applied in these outlying areas as well. Although portions of the city, especially outside the city boundary, may presently have a rural appearance, these lands will ultimately be part of the urban area. Retrofitting rural streets to urban standards in the future is expensive and controversial; it is better to initially build them to an acceptable urban standard.

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

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

**TABLE 7-1
RECOMMENDED STREET DESIGN STANDARDS**

Classification	Pavement Width	Right-of-Way Width	Min. Posted Speed
Residential -- Option 1	28 ft.	40 ft.	15-25 mph
Residential -- Option 2	20-24 ft.	60 ft.	15-25 mph
Alley	16-20 ft.	20 ft.	15 mph
Collector -- Option 1	36 ft.	60 ft.	25-35 mph
Collector -- Option 2	30 ft.	50 ft.	25-35 mph
Arterial -- Option 1	36 ft.	60 ft.	25-45 mph
Arterial -- Option 2	52 ft.	80 ft.	25-45 mph

Residential Streets

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

Cul-de-sac, or "dead-end" residential streets are intended to serve only the adjacent land in residential neighborhoods. These streets should be short (less than 300 feet long) and serve a maximum of 20 single-family houses. Because the streets are short and the traffic volumes relatively low, the street width can be narrower than a standard residential street, allowing for the passage of two lanes of traffic when no vehicles are parked at the curb at one lane of traffic when vehicles are parked at the curb.

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

Two recommended street standard options are provided for residential streets, as shown in Figure 7-1. Each option provides a minimum of 24 feet of pavement and provide varying degrees of on-street parking. The city should choose one of these options for each residential street based on the existing right-of-way and neighborhood character.

Option 1

The standard to a local residential street should be a 28-foot roadway surface within a 40-foot right-of-way. The cross section will accommodate passage of one lane of moving traffic in each direction, with curb parking on one side of the street. Five-foot sidewalks should be provided on each side of the roadway.



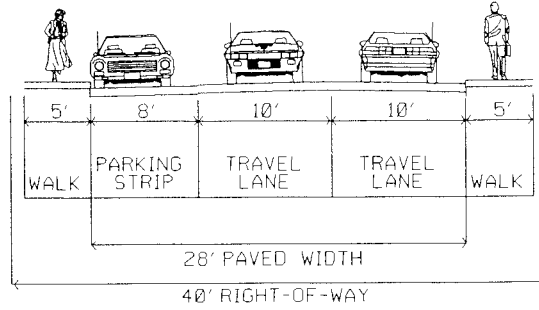
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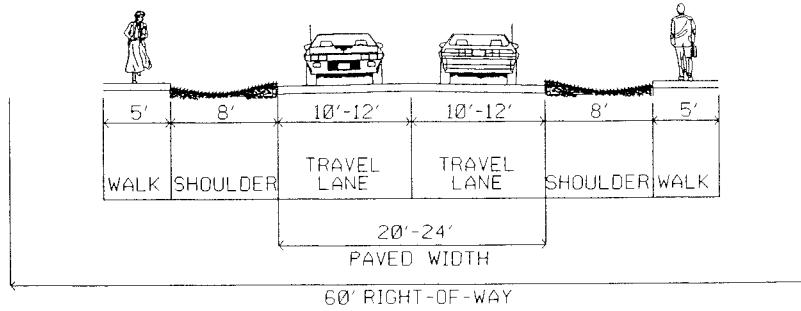
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OPTION 1:



OPTION 2:



ALLEY

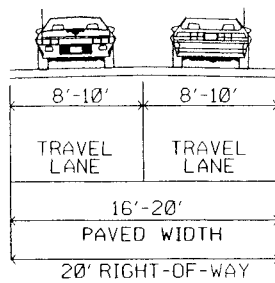


FIGURE 7-1
RECOMMENDED
STREET STANDARDS
-LOCAL RESIDENTIAL
AND ALLEY STREETS



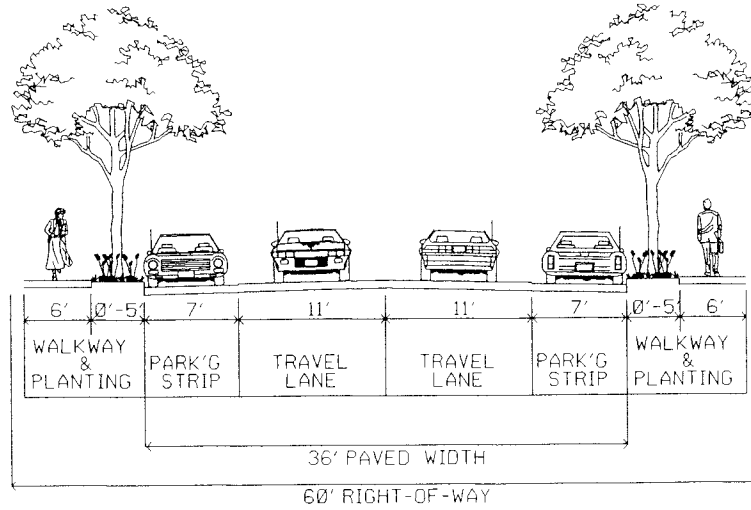
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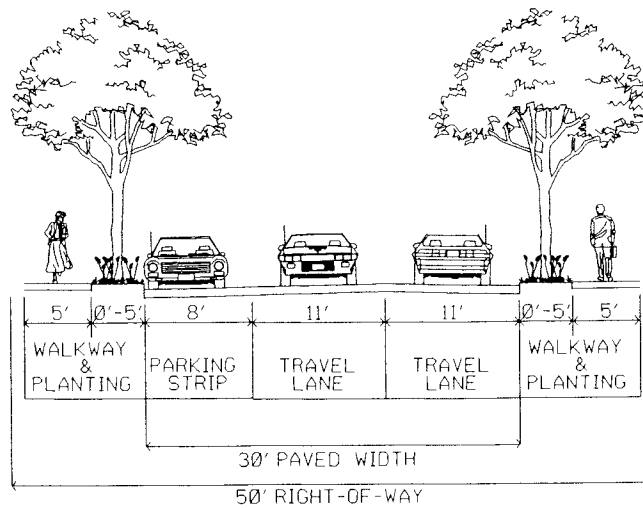
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OPTION 1:



OPTION 2:



**FIGURE 7-2
RECOMMENDED
STREET STANDARDS
-COLLECTOR STREETS**



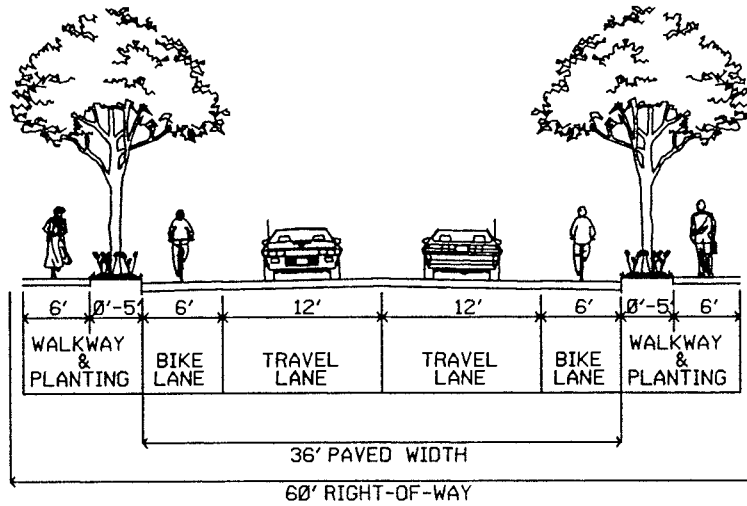
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OPTION 1:



OPTION 2:

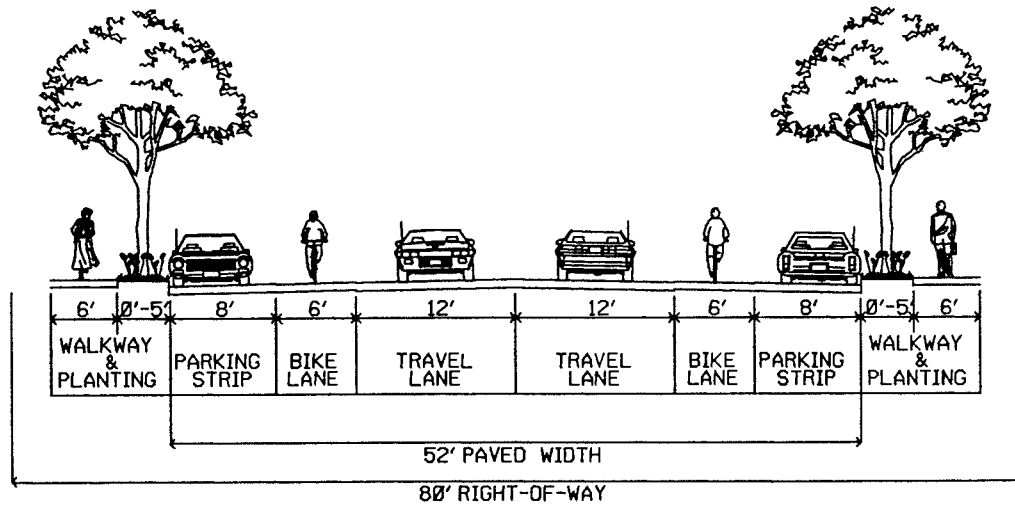


FIGURE 7-3
RECOMMENDED
STREET STANDARDS
-ARTERIAL STREETS

Option 2

This option provides a 20- to 24-foot roadway surface within a 60-foot right-of-way. The cross section will accommodate passage of one lane of moving traffic in each direction, with eight-foot shoulders on both sides. Five-foot sidewalks should be provided on each side of the roadway.

Narrower streets improve neighborhood aesthetics and discourage speeding and through traffic. They also reduce right-of-way needs, construction costs, stormwater run-off, and the need to clear vegetation.

Alleys

Alleys can be a useful way to diminish street width by providing rear access and parking to residential areas. Including alleys in a subdivision design allows homes to be placed closer to the street and eliminates the need for garages to be the dominant architectural feature. This pattern, once common, has been recently revived as a way to build better neighborhoods. In addition, alleys can be useful in commercial and industrial areas, allowing access by delivery trucks that is off of the main streets. Alleys should be encouraged in the urban area of Lostine. Alleys should be 16 to 20 feet wide, with a 20-foot right-of-way. (See Figure 7-1.)

Collector Streets

Collectors are intended to carry between 1,200 and 10,000 vehicles per day, including limited through traffic, at a design speed of 25 to 35 mph. A collector can serve residential, commercial, industrial, or mixed land uses. Collectors are primarily intended to serve local access needs of residential neighborhoods through connecting local streets to arterials. Bike lanes are typically not needed due to slower traffic speeds.

Two recommended street standard options are provided for collectors, as shown in Figure 7-2. Both options provide one lane of moving traffic in each direction and can also be striped to provide two travel lanes plus left-turn lanes at intersections or driveways by removing parking for short distances. The city should choose one of these options for each collector based on the existing right-of-way and neighborhood character.

Option 1

This option provides a 36-foot roadway surface within a 60-foot right-of-way. The cross section will accommodate passage of one lane of moving traffic in each direction, with curb parking on both sides of the street. Five-foot sidewalks should be provided on each side of the roadway. An optional planting strip has been included with a width up to five feet.

Option 2

This option provides a 30-foot roadway surface within a 50-foot right-of-way. The cross section will accommodate passage of one lane of moving traffic in each direction, with curb parking on one side. Five-foot sidewalks should be provided on each side of the roadway, adjacent to the curb.

Arterial Streets

Arterial streets form the primary roadway network within and through a region. They provide a continuous roadway system that distributes traffic between different neighborhoods and districts. Generally, arterial streets are high capacity roadways that carry high traffic volumes with minimal localized activity. Design speeds should be between 25 and 45 mph. (See Figure 7-3.)

Option 1

This option consists of a 60-foot right-of-way and a 36-foot paved width. The 36-foot cross section allows two 12-foot travel lanes with two six-foot bike lanes. Six-foot sidewalks should be provided on each side of the roadway. An optional planting strip has been included with a width up to five feet. In commercial or business areas, the sidewalks may be 12 feet wide or extend to the property line, and may be located adjacent to the curb to facilitate loading and unloading at the curb.

Option 2

Another option for arterial streets maintains on-street parking. The section provides a 52-foot paved surface within an 80-foot right-of-way to allow for two 12-foot travel lanes, two six-foot bike lanes, and two eight-foot parking lanes. The bike lanes should be striped between the parking lane and the travel lane.

Six-foot sidewalks should be provided on each side of the roadway. An optional planting strip has been included with a width up to five feet. In commercial or business areas, the sidewalks may be 12 feet wide or extend to the property line, and may be located adjacent to the curb to facilitate loading and unloading at the curb.

Bike Lanes

In cases where a bikeway is proposed within the street right-of-way, 12 feet of roadway pavement (between curbs) should be provided for a six-foot bikeway on each side of the street, as shown on the cross sections in Figure 7-3. Except in rare circumstances, bike lanes on one-way streets should be located on the right side of the roadway, be one-way, and flow in the same direction as vehicular traffic. The striping should be to conform with the State Bicycle and Pedestrian Plan (1995). In cases where curb parking will exist with a bike lane, the bike lane will be located between the parking and travel lanes. In some situations, curb parking may have to be removed to permit a bike lane.

The bikeways on new streets or streets to be improved as part of the street system plan should be added when the improvements are made. The implementation program identifies an approximate schedule for these improvements.

On arterial and collector streets that are not scheduled to be improved as part of the street system plan, bike lanes may be added to the existing roadway at any time to encourage cycling, or when forecast traffic volumes exceed 2,500 to 3,000 vehicles per day. The striping of bike lanes on streets which lead directly to schools should be high priority.

Sidewalks

A complete pedestrian system should be implemented in the urban portion of Lostine. Every urban street should have sidewalks on both sides of the roadway as shown on the cross sections in Figure 7-1 through Figure 7-3. Sidewalks on residential streets should have a five-foot-wide paved width. Collector and arterial streets should have six-foot-wide sidewalks. In addition, pedestrian and bicycle connections should be provided between any cul-de-sac or other dead-end streets.

Another essential component of the urban sidewalk system is street crossings. Intersections must be designed to provide safe and comfortable crossing opportunities. This includes not only signal timing (to ensure adequate crossing time) and crosswalks, but also such enhancements as curb extensions as traffic calming measures and to decrease pedestrian crossing distance.

Curb Parking Restrictions

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

Street Connectivity

Street connectivity is important because a well-connected street system provides more capacity than a disconnected one, provides alternate routes for local traffic, and is more pedestrian and bicycle-friendly. It is likely that the City of Lostine's relative lack of congestion is in part due to its grid system. Ensuring that this grid is extended as development occurs is critical to Lostine's continued livability. To this end, a maximum block perimeter of 1,200 feet is recommended.

ACCESS MANAGEMENT

Access management is an important tool for maintaining a transportation system. Too many access points can diminish the function of an arterial, mainly due to delays and safety hazards created by turning movements. Traditionally, the response to this situation is to add lanes to the street. However, this can lead to increases in traffic and, in a cyclical fashion, require increasingly expensive capital investments to continue to expand the roadway.

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

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

Access Management Techniques

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

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

Recommended Access Management Standards

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

TABLE 7-2
RECOMMENDED ACCESS MANAGEMENT STANDARDS

Functional Classification	Intersections			
	Public Road		Private Drive ⁽²⁾	
	Type ⁽¹⁾	Spacing	Type	Spacing
Arterial				
Highway 82: General	at-grade	¼ mile	L/R Turns	500 ft.
STA (Cole St. to Jim Town Ln.)	at-grade	250 ft.	L/R Turns	100 ft.
Other Arterials within UGB	at-grade	250 ft.	L/R Turns	100 ft.
Collector	at-grade	250 ft.	L/R Turns	100 ft.
Residential Street	at-grade	250 ft.	L/R Turns	Access to Each Lot
Alley (Urban)	at-grade	100 ft.	L/R Turns	Access to Each Lot

Notes:

STA = Special Transportation Area

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

(2) Allowed moves and spacing requirements may be more restrictive than those shown to optimize capacity and safety. Any access to a state highway requires a permit from the ODOT District Office. Access will generally not be granted where there is a reasonable alternative access.

Application

These access management restrictions are generally not intended to eliminate existing intersections or driveways. Rather, they should be applied as new development occurs. Over time, as land is developed and

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

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

State Highways

Access management is important to promoting safe and efficient travel for both local and long distance users along State Highway 82 in Lostine. The 1991 *Oregon Highway Plan* specifies an access management classification system for state facilities. Although Lostine may designate state highways as arterial roadways within their transportation systems, the access management categories for these facilities should generally follow the guidelines of the Oregon Highway Plan. This section of the TSP describes the state highway access categories and specific roadway segments where special access areas may apply.

General

Highway 82 through Lostine is a state highway of statewide level of importance. Within the Lostine UGB, Oregon Highway Plan Category 4, "Limited Control"² applies. This classification permits at-grade intersections or interchanges at a minimum spacing of one-quarter mile. Private driveways should have a minimum spacing of 500 feet from each other and from intersections. Traffic signals are permitted at a minimum of one-half mile spacing. These requirements are similar to the general access management guidelines specified for major arterial roadways.

Special Transportation Area

While the access management guidelines can be applied to some portions of Highway 82, the city has a grid system through the downtown area, with intersections spaced as closely as 250 feet apart. Neither the general access category for major arterial roadways nor the OHP Category 4 classification can be met on these sections of the roadways.

Indeed, the highway standards are too restrictive for areas within the city limits of Lostine. Shorter block lengths and a well-developed grid system are important to small cities, along with convenient and safe pedestrian facilities. In general, downtown commercial arterial streets typically have blocks 200-400 feet long, driveway access points are sometimes as close as 100-foot intervals, and, occasionally, signals may be spaced as close as every 400 feet. The streets in downtown areas must have sidewalks and crosswalks, along with on-street parking. The need to maintain these typical downtown characteristics must be carefully considered along with the need to maintain the safe and efficient movement of through traffic.

To address this issue, a Special Transportation Area (STA) is recommended from Cole Street to Jim Town Lane on Highway 82. To accommodate existing public roadway spacing and allow reasonable access spacing for private driveways, less restrictive access standards are recommended for this

² 1991 *Oregon Highway Plan*, Appendix B, Table 1, Access Management Classification System.

downtown section. Within the STA, access standards should allow intersection spacing at a minimum of 250 feet and driveway spacing at a minimum of 100 feet (see Table 7-2).

Furthermore, the *Oregon Highway 82 Corridor Plan* considers reclassifying the Highway 82 level of importance from statewide to regional. This change would permit private driveway spacing at a minimum of 300 feet from each other and from intersections and permit signals at a minimum of one-quarter mile spacing on Highway 82. This classification gives more options for access management; however, there are trade-offs with funding options for improvements.

MODAL PLANS

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

Street System Plan

The street system plan recommends changes to the current street classification system and outlines a series of improvements that are recommended for construction within the City of Lostine during the next 20 years. These options have been discussed in Chapter 6 (Improvement Options Analysis). The proposed street system plan is shown in Figure 7-4.

Street System Functional Classification

Street system functional classifications relate the design of a roadway to its function. The function is determined by operational characteristics such as traffic volume, operation speed, safety and capacity.

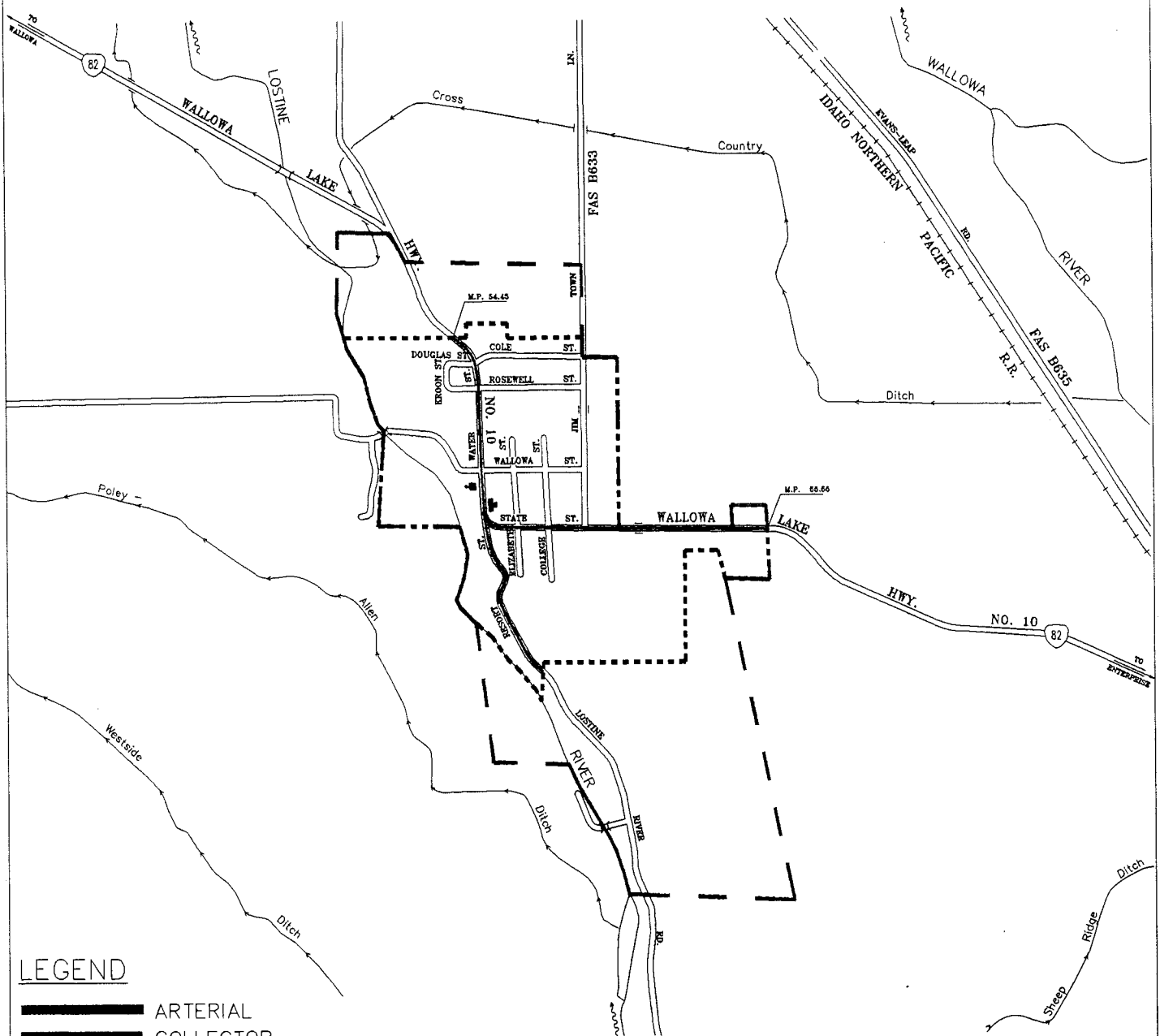
The City of Lostine currently classifies all streets within the corporate boundary as either major arterials, minor arterials or collectors. The analysis of the existing street system indicated that many of the streets within the community function differently than their classification. For example, most roadways are classified as collectors when they actually function as local streets. Most of these streets do not meet the design standards of collectors which include multiple travel lanes, on-street parking, curbs and sidewalks and access limitations. In addition, the Oregon Transportation Planning Rule requires that streets classified as major collectors or higher (includes major and minor arterials) must include bike lanes. Currently, none of the major or minor arterials in Lostine include bike lanes.

It is recommended that Lostine reclassify its street system in such a way that each street's classification more closely matches its actual design and function. This could be accomplished by classifying all streets as either arterial, collector, residential, or alley. The following roadway classifications are recommended:



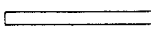


- Highway 82 (Water Street and State Street) -- change classification from major arterial to arterial, as it is a state highway of statewide level of importance, it carries the highest traffic volumes in the city, and it is the primary route to Lostine from the rest of the state.



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LEGEND

-  ARTERIAL
-  COLLECTOR
-  RESIDENTIAL STREET
-  CITY LIMITS
-  URBAN GROWTH BOUNDARY

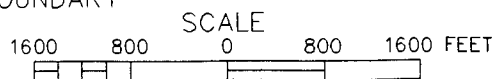


FIGURE 7-4
RECOMMENDED STREET
SYSTEM PLAN

- Resort Street/Lostine River Road – change classification from minor arterial to arterial, as it is a County Road which functions as an arterial.
- All other roadways – change classification from collector to residential.

No direct costs are associated with making the classification changes.

Street Improvement Projects

There is one recommended improvement to the roadway system included in the roadway system plan:

- Highway 82 – Improve the highway signage at the south end of town. This is a high priority improvement (expected in the next 0 to 5 years) and could be constructed for an estimated \$1,000.

Speed Control Measures

The City of Lostine should develop a system of speed control measures that will discourage motorists from exceeding the speed limit along Highway 82 within Lostine. There are a variety of different speed control measures which can be implemented, ranging from narrowing lane widths to more stringent enforcement.

The small size of the City of Lostine might make it difficult to raise funding to pay for these measures. However, if the costs are shared with several other cities, Wallowa County, and even the state, it may be possible for Lostine to implement a speed control program. Discussions with other jurisdictions should be a high priority for city officials to determine what kind of county-wide enforcement program may be possible and how the city could participate in and contribute to it. The total estimated cost of these speed control measures cannot be easily calculated because exact programs are unknown at this time.

Pedestrian System Plan

A complete pedestrian system should be implemented in the city. Every paved street should have sidewalks on both sides of the roadway, except in extenuating circumstances, meeting the requirements set forth in the recommended street standards. Pedestrian access on walkways should be provided between all buildings including shopping centers and abutting streets and adjacent neighborhoods. (Ordinances specifying these requirements are included in Chapter 9.)

A sidewalk inventory revealed that Lostine has sidewalks on just two blocks on Water Street (Highway 82).

The city's sidewalk system should be expanded to include, at a minimum, sidewalks along both sides of Highways 82. Other blocks within the city's grid system which have a significant amount of pedestrian activity, such as in front of stores or schools, etc., should also have sidewalks.

The primary goal of this improvement option is to improve pedestrian safety; however, an effective sidewalk system has several qualitative benefits as well. Providing adequate pedestrian facilities increases the livability of a city. When pedestrians can walk on a sidewalk, separated from vehicular street traffic,

it makes the walking experience more enjoyable and may encourage walking, rather than driving, for short trips. Sidewalks enliven a downtown and encourage leisurely strolling and window shopping in commercial areas. This "Main Street" effect improves business for downtown merchants and provides opportunities for friendly interaction among residents. It may also have an appeal to tourists as an inviting place to stop and walk around.

The cost to construct a concrete sidewalk facility is around \$35 per linear foot. This assumes that the sidewalks are 6 feet wide and include curbs. The cost estimate also assumes the sidewalks are composed of 4 inches of concrete and 6 inches of aggregate.

New sidewalks should be constructed with curb cuts for wheelchairs at every crosswalk to comply with the Americans with Disabilities Act (ADA).

As street improvements are made to the existing street system, projects involving the construction of new sidewalks may require on-street parking to be implemented in place of parking on grass or gravel shoulders.

The following is a list of specific pedestrian improvements that will be needed over the next 20 years. (Figure 7-5 also shows these projects.) Sidewalks should be added as new streets are constructed and existing streets reconstructed. The implementation program identifies an approximate schedule for these improvements.

- Water Street (Highway 82) -- Provide a sidewalk between Rosewell Street and the North City Line. This is a high priority project and, at a length of 400 feet, is expected to cost \$28,000.
- State Street (Highway 82) -- Provide a sidewalk between Water Street and the East City Line. This is a high priority project and, at a length of 1,000 feet, is expected to cost \$70,000.

Pedestrian projects include sidewalks on both sides of the street, unless otherwise noted.

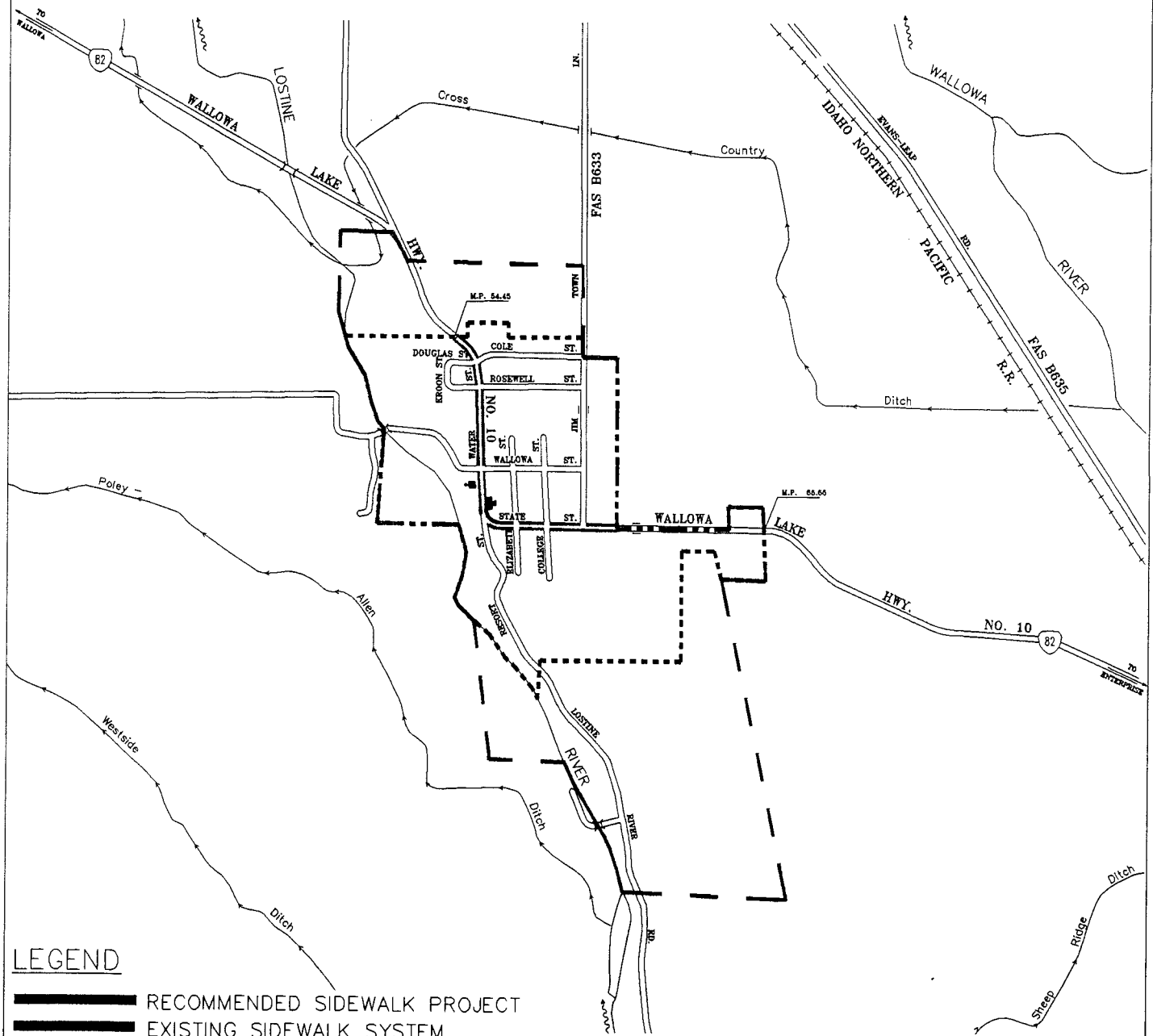
The on-street pedestrian improvements only include sidewalk projects. Although shoulder additions serve pedestrians, they are not ideal because they are not separated from the roadway; however, in rural areas where development may not occur quickly, the addition of shoulders is often the most practical improvement that can be implemented. Generally, shoulders are more of a benefit to cyclists than to pedestrians; therefore, proposed shoulder-widening or additions are discussed in the Bicycle System Plan section of this chapter.

A six-foot-wide sidewalk with curbs already in place costs about \$30 per linear foot. Adding a curb as well as a six-foot-wide sidewalk costs about \$35 per linear foot. In commercial areas, a 12-foot wide sidewalk with a curb would cost about \$65 per linear foot. Applying these costs to a typical block in Lostine would require about 600 linear feet of sidewalk (2 x 300 feet). For a six-foot-wide sidewalk including curbs, the cost would be approximately \$21,000. With curbs already in place, the cost would be approximately \$18,000.





Asphalt pathways could be provided instead of a concrete sidewalk. In general, asphalt pathways are a lower cost alternative to concrete sidewalks. Construction costs for asphalt pathways are about 40 percent of the costs for concrete sidewalks; however, maintenance, such as sealing and resurfacing the asphalt, must occur more frequently.



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LEGEND

-  RECOMMENDED SIDEWALK PROJECT
-  EXISTING SIDEWALK SYSTEM
-  CITY LIMITS
-  URBAN GROWTH BOUNDARY

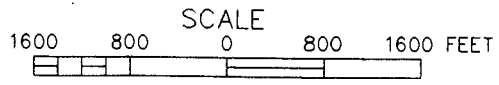


FIGURE 7-5
RECOMMENDED
PEDESTRIAN PLAN

Missing sidewalk segments should be infilled whenever an opportunity presents itself (such as infill development, special grants, etc.), concentrating on arterial streets, collectors, and school routes.

Bicycle System Plan

Goals and objectives of the city's bicycle plan include reducing conflicts between bicyclists and motorized vehicle traffic, developing a system dedicated to bicycles, and providing opportunities for recreational bicycle use. One option for meeting these goals includes adding a bikeway on Highway 82.

Shared roadways, where bicyclists share normal vehicle lanes with motorists, are generally acceptable if speeds and traffic volumes are relatively low. On the local streets in Lostine, shared roadways are not an issue; however, on arterial roadways bike lanes are recommended.

Highway 82 functions as an arterial street through Lostine, which means that it should have bike lanes on both sides of the street as specified in the recommended street standards described earlier and as required by the TPR. Accident statistics on the highway do not indicate that there are frequent conflicts between bicyclists and motorized vehicles. To install bicycle lanes along Highway 82 would involve removing on-street parking through Lostine. Shoulders would need widening on sections where no on-street parking exists. Some of these improvements would be expensive and others would be controversial. At this time, no specific bikeway improvements are recommended for Highway 82; however, ODOT should track both traffic volumes and accident rates on this facility to identify any problems in the future.

Bicycle parking is generally lacking in Lostine. Bike racks should be installed in front of downtown businesses and all public facilities (schools, post office, library, city hall, and parks). Typical rack designs cost about \$50 per bike plus installation. Lostine should begin to place racks where needs are identified and to respond to requests for racks at specific locations. Bicycle parking requirements are further addressed in Chapter 9 (Policies and Ordinances).

Oregon Highway 82 Corridor Plan

The *Oregon Highway 82 Corridor Plan* recommends collaboration among ODOT, Wallowa County, local jurisdictions, and other appropriate agencies to develop a Highway 82 corridor bicycle refinement plan. The plan will integrate municipal and county bike plans with the existing statewide plan and could be used to determine where to prioritize investment in Highway 82. A promotional strategy for the corridor bicycle system will be developed including mapping, signage and marketing.

Transportation Demand Management Plan

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

In Lostine, where traffic volumes are low and the population and employment is small, implementing TDM strategies is not practical in most cases. However, the sidewalk improvements recommended earlier

in this chapter are also considered TDM strategies. By providing these facilities, the City of Lostine is encouraging people to travel by other modes than the automobile. In rural communities, TDM strategies include providing mobility options.

Because intercity commuting is a factor in Wallowa County, residents who live in Lostine and work in other cities should be encouraged to carpool with a fellow coworker or someone who works in the same area. Implementing a local carpool program in Lostine alone is not practical because of the city's small size; however, a county-wide carpool program is possible. The City of Lostine should support state and county carpooling and vanpooling programs which could further boost carpooling ridership.

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

Public Transportation Plan

Public transportation in Lostine consists of the Wallowa Valley Stage Line and Dial-A-Ride service for senior citizens and the disabled.

The Wallowa Valley Stage Line is operated by the Moffit Brothers and is based in Lostine. It provides van service which transports passengers to Enterprise, Joseph, Wallowa, and several cities in Union County, including La Grande. In La Grande, passengers can connect to Greyhound bus service. In addition to transporting passengers, the line also transports packages.

The senior citizens and disabled Dial-A-Ride service is provided by Community Connections. It operates two 12-passenger, lift-equipped buses, one based in Enterprise and one based in Wallowa. The buses make one trip per day between Enterprise and Joseph and between Wallowa and Lostine. On Mondays, Wednesdays, and Fridays, the buses transport senior citizens and the disabled to meal sites in Enterprise and Wallowa. On Tuesdays and Thursdays, the general public can use the service as well. On Tuesdays, the bus based in Wallowa goes to Enterprise. The operator estimates that the service is currently underutilized.

Another type of public transportation service available in the county is client transportation, which is provided by a social service or health care agency to individuals participating in the agency's service program. This type of public transportation is offered by the Wallowa County Health Care District and the Wallowa County Nursing Home. A volunteer driver program is also administered in Wallowa County by each of these social service and health care agencies as well as the Department of Human Resources Volunteer Program. A volunteer driver program is a community based program to provide drivers to transport specific client groups.

No specific expansions of these services are currently planned; however, intercity connections and senior citizen and disabled public transportation should be maintained and increased usage of these services should be encouraged.

The city has no local fixed-route transit service at this time. The small size and low traffic volumes on city streets indicate that mass transit is not necessary nor economically feasible at this time. The Transportation Planning Rule exempts cities with a population of less than 25,000 from including mass transit facilities in their development regulations. However, Lostine can plan for future transit services with growth patterns that support rather than discourage transit use in the future.

The existing stage line and Dial-A-Ride services already meet the required daily trip to a larger city specified for communities the size of Lostine in the Oregon Transportation Plan.

No costs have been estimated for this modal plan. Grants may be available to conduct feasibility studies. State and Federal funding may be available to purchase equipment.

Oregon Highway 82 Corridor Plan

The *Oregon Highway 82 Corridor Plan* calls for preparation of a Public Transportation Plan that integrates all appropriate public transit to make the most efficient use of scarce public transit resources. The product will be a comprehensive public/private transit plan for the corridor.

Rail Service Plan

Lostine has no passenger rail service. The Idaho Northern Pacific Railroad (INP) has a freight line which runs to the north of town. INP is currently pursuing abandonment of the line. The Federal Surface Transportation Board recently granted INP an exemption from regulation restricting railroad abandonments in rural areas. With the exemption, INP can operate the railroad or rip it out and sell the rails and ties for scrap. However, the rails and bridges are in good condition and retaining freight service on the line is a goal of the local jurisdictions. Discussions among INP, ODOT, local jurisdictions, and shippers concerning the future of the rail line and right-of-way are on-going.

If the line is abandoned, and the rails and ties ripped out and sold as scrap as planned, efforts should be made to retain the right-of-way as a utility corridor and as a possible recreational trail. The existing right-of-way can be preserved through a Public Use Condition with Interim Trail Use granted by the Interstate Commerce Commission. Such a situation would preserve the integrity of the right-of-way and the possibility of future rail service while also allowing trail use. The Transportation Planning Rule requires that jurisdictions protect right-of-ways for future operation of transportation corridors.

The *Oregon Highway 82 Corridor Plan* describes a service improvement decision to work with Wallowa County and local jurisdictions, the ODOT Rail Section and INP to develop a plan that addresses the ongoing preservation of the Elgin-Joseph rail line for freight transportation. Potential alternatives considered for the line include preserving the line as a freight railroad, modifying it for an excursion train, converting it into a trail system, or as a corridor for fiber optic cables. The cost of the right-of-way between Elgin and Joseph was estimated at \$2.5 million (1995 dollars).

Air Service Plan

Lostine does not have airborne transportation service.

Pipeline Service Plan

There are currently no pipelines serving Lostine. There has been interest expressed in the communities of Wallowa County to extend natural gas service from Elgin.

Water Transportation Plan

Lostine has no waterborne transportation services.

TRANSPORTATION SYSTEM PLAN IMPLEMENTATION PROGRAM

Implementation of the Lostine Transportation System Plan will require both changes to the city comprehensive plan and zoning code and preparation of a 20-year Capital Improvement Plan. These actions will enable Lostine to address both existing and emerging transportation issues throughout the urban area in a timely and cost effective manner.

One part of the implementation program is the formulation of a 20-year Capital Improvement Plan (CIP). The purpose of the CIP is to detail what transportation system improvements will be needed as Lostine grows and provide a process to fund and schedule the identified transportation system improvements. It is expected that the Transportation System Plan Capital Improvement Plan can be integrated into the existing city CIP and the ODOT STIP. This integration is important since the Transportation System Plan proposes that both governmental agencies will fund some of the transportation improvement projects.

Model policy and ordinance language that conforms with the requirements of the Transportation Planning Rule is included in Chapter 9. The proposed ordinance amendments will require approval by the City Council and those that affect the unincorporated urban area will also require approval by the Board of County Commissioners.

20-Year Capital Improvement Program

Lostine has identified a total of four projects in its CIP with a cost of \$99,000. All four projects have been identified as high priority (for the next 0 to 5 years).

These priorities are based on current need, the relationship between transportation service needs, and the expected growth of the city. The following schedule indicates priorities and may be modified to reflect the availability of finances or the actual growth in population and employment.

Table 7-3 summarizes the CIP. The cost estimates for all the projects listed on the CIP were calculated on the basis of 1997 dollars. These costs include design, construction, and some contingency costs. They are preliminary estimates and generally do not include right-of-way acquisition, water or sewer facilities, adding or relocating public utilities, or detailed intersection design.

TABLE 7-3
PRIORITIZED CAPITAL IMPROVEMENT PROGRAM (1997) DOLLARS

Project Description	Local Cost	County Cost	State Cost	Total Cost
Improve the signage on Highway 82 at the south end of town			\$1,000	\$1,000
Sidewalk on Water Street (Highway 82) between Rosewell Street and North City Line			\$28,000	\$28,000
Sidewalk on State Street (Highway 82) between Water Street and East City Line			\$70,000	\$70,000
Implement Speed Control Measures on Highway 82	unknown		unknown	unknown
Total	\$0	\$0	\$99,000	\$99,000

CHAPTER 8: FUNDING OPTIONS AND FINANCIAL PLAN

The Transportation Planning Rule requires TSPs to evaluate the funding environment for recommended improvements. This evaluation must include a listing of all recommended improvements, estimated costs to implement those improvements, and a review of potential financing mechanisms to fund the proposed transportation improvement projects. The City of Lostine's TSP identifies \$99,000 in improvements recommended over the next 20 years. This section of the TSP provides an overview of the City of Lostine's revenue outlook and a review of some funding and financing options that may be available to the City of Lostine.

Pressures from increasing growth throughout much of Oregon have created an environment of recommended improvements that remain unfunded. The City of Lostine will need to work with Wallowa County and ODOT to finance new transportation projects over the 20-year planning horizon. The actual timing of these projects will be determined by the rate of population and employment growth actually experienced by the community. If population growth exceeds the anticipated rate, the improvements may need to be accelerated. Slower than expected growth will relax the improvement schedule. Availability of funding will also play an important role in the implementation program.

HISTORICAL STREET IMPROVEMENT FUNDING SOURCES

In Oregon, state, county, and city jurisdictions work together to coordinate transportation improvements. In addition to this overlapping jurisdiction of the road network, transportation improvements are funded through a combination of federal, state, county, and city sources.

Table 8-1 shows the distribution of road revenues for the different levels of government within the state by jurisdiction level. Although these numbers were collected and tallied in 1991, ODOT estimates that these figures accurately present the current revenue structure for transportation-related needs.

TABLE 8-1
SOURCES OF ROAD REVENUES BY JURISDICTION LEVEL

Revenue Source	Jurisdiction Level			Statewide
	State	County	City	Total
State Road Trust	58%	38%	41%	48%
Local	0%	22%	55%	17%
Federal Road	34%	40%	4%	30%
Other	9%	0%	0%	4%

Source: ODOT 1993 Oregon Road Finance Study.

At the state level, nearly half (48 percent in Fiscal Year 1991) of all road-related revenues are attributable to the State Highway Fund, whose sources of revenue include fuel taxes, weight-mile taxes on trucks, and vehicle registration fees. As shown in the table, the state road trust is a considerable source of revenue for

all levels of government. Federal sources (generally the federal highway trust account and federal forest revenues) comprise another 30 percent of all road-related revenue. The remaining sources of road-related revenues are generated locally, and include property taxes, LIDs, bonds, traffic impact fees, road user taxes, general fund transfers, receipts from other local governments, and other sources.

As a state, Oregon generates 94 percent of its highway revenues from user fees, compared to an average of 78 percent among all states. This fee system, including fuel taxes, weight distance charges, and registration fees, is regarded as equitable because it places the greatest financial burden upon those who create the greatest need for road maintenance and improvements. Unlike many states that have indexed user fees to inflation, Oregon has static road-revenue sources. For example, rather than assessing fuel taxes as a *percentage* of price per gallon, Oregon's fuel tax is a fixed amount (currently 24 cents) per gallon.

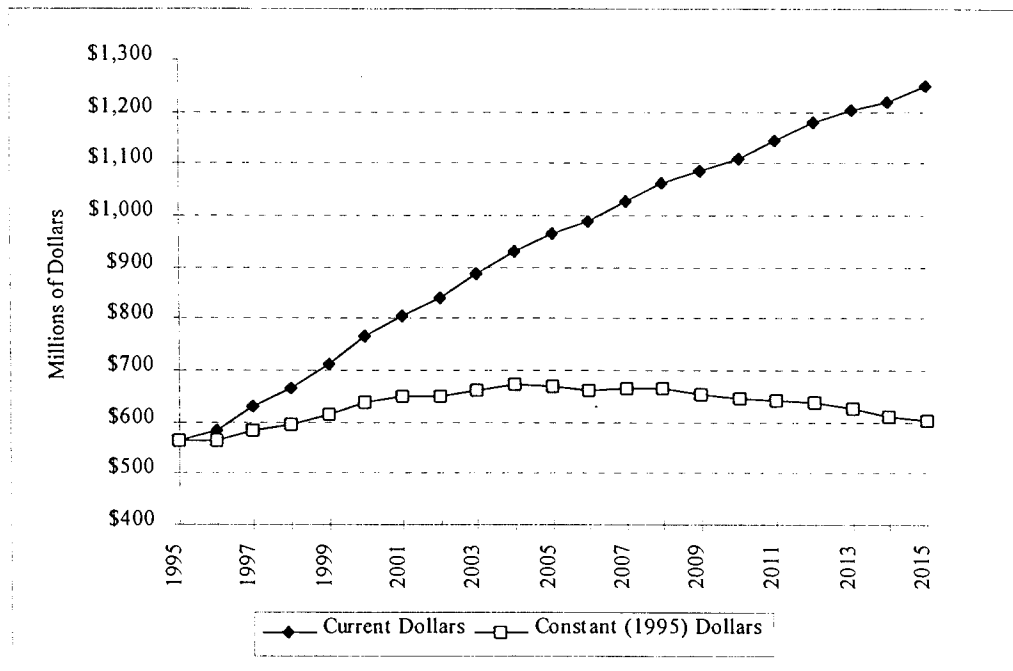
Transportation Revenue Outlook

ODOT's policy section recommends certain assumptions in the preparation of transportation plans. In its *Financial Assumptions* document prepared in March 1995, ODOT projected the revenue of the State Highway Fund through year 2018. The estimates are based on the following assumptions:

- Fuel tax (and weight-mile fee) increases of one cent per gallon per year, with an additional one cent per gallon every fourth year;
- Transportation Planning Rule goals are met; and
- Inflation occurs at an average annual rate of 3.7 percent (as assumed by ODOT).

Figure 8-1 shows the forecast in both current-dollar and inflation-deflated constant (1995) dollars. As highlighted by the constant-dollar data, the highway fund is expected to grow faster than inflation early in the planning horizon, with growth slowing to a rate somewhat less than inflation around year 2004, continuing a slight decline through the remainder of the planning horizon.

**FIGURE 8-1
STATE HIGHWAY FUND**



Source: ODOT Financial Assumptions.

The State Highway Fund is expected to remain a significant source of funding for the City of Lostine during the next 20 years. Although the city has historically received revenue from this fund for transportation maintenance and improvements, Lostine should be cautious of relying heavily on this source, since funds are expected to decline after 2005.

REVENUE SOURCES

In order to finance the recommended transportation system improvements in Lostine, it will be important to consider a range of funding sources. Recent property tax limitations have created the need for local governments to seek revenue sources other than the traditional property tax. The use of alternative revenue funding has been a trend throughout Oregon as the full implementation of Measure 5 has significantly reduced property tax revenues. This trend is expected to continue with the recent passage of Measure 47 and its revised version, Measure 50. The alternative revenue sources described in this section may not all be appropriate in the City of Lostine; however, this overview is being provided to illustrate the range of options currently available to finance transportation improvements during the next 20 years.

Property Taxes

Property taxes have historically been the primary revenue sources for local governments. This dependence is due, in large part, to the fact that property taxes are easy to implement and enforce. Property taxes are based on real property (i.e., land and buildings) which have a predictable value and

appreciation to base taxes upon. This is opposed to income or sales taxes which can fluctuate with economic trends or unforeseen events.

Property taxes can be levied through: 1) tax base levies, 2) serial levies, and 3) bond levies. The most common method uses tax base levies which do not expire and are allowed to increase by six percent per annum. Serial levies are limited by amount and time they can be imposed. Bond levies are for specific projects and are limited by time based on the debt load of the local government or the project.

The historic dependence on property taxes changed with the passage of Ballot Measure 5 in the early 1990s. Ballot Measure 5 limits the property tax rate for purposes other than payment of certain voter-approved general obligation indebtedness. Under full implementation, the tax rate for all local taxing authorities is limited to \$15 per \$1,000 of assessed valuation. As a group, all non-school taxing authorities are limited to \$10 per \$1,000 of assessed valuation. All tax base, serial, and special levies are subject to the tax rate limitation. Ballot Measure 5 requires that all non-school taxing districts property tax rate be reduced if together they exceed \$10 per \$1,000 per assessed valuation by county. If the non-debt tax rate exceeds the constitutional limit of \$10 per \$1,000 of assessed valuation, then all of the taxing districts' tax rates are reduced on a proportional basis. The proportional reduction in the tax rate is commonly referred to as compression of the tax rate.

Measure 47, an initiative petition, was passed by Oregon voters in November 1996. It is a constitutional amendment that reduces and limits property taxes and limits local revenues and replacement fees. The measure limits 1997-98 property taxes to lesser of 1995-96 tax minus 10 percent, or 1994-95 tax. It limits future annual property tax increase to three percent, with exceptions. Local governments' lost revenue may be replaced only with state income tax, unless voters approve replacement fees or charges. Tax levy approvals in certain elections require 50 percent voter participation.

The state legislature created Measure 50, which retains the tax relief of Measure 47 but clarifies some legal issues. This revised tax measure was approved by voters in May 1997 and it now replaces Measure 47.

The League of Oregon Cities (LOC) estimated that direct revenue losses to local governments, including school districts, will total \$467 million in fiscal year 1998, \$553 million in 1999, and increasing thereafter. The actual revenue losses to local governments will depend on actions of the Oregon Legislature. LOC also estimates that the state will have revenue gains of \$23 million in 1998, \$27 million in 1999, and increasing thereafter because of increased personal and corporate tax receipts due to lower property tax deduction.

Measure 50 adds another layer of restrictions to those which govern the adoption of tax bases and levies outside the tax base, as well as Measure 5's tax rate limits for schools and non-schools and tax rate exceptions for voter-approved debt. Each new levy and the imposition of a property tax must be tested against a longer series of criteria before the collectible tax amount on a parcel of property can be determined.

The implementation of Measure 50 will require that cities and counties protect and prioritize funding for public safety and public education. Another major requirement of Measure 50 is that cities and counties must obtain voter approval to raise fees for services, if the increased fee revenue is a substitute for property tax support.

The Governor's Office and state legislature are in the process of preparing the new budget for the next biennium. Based on the preliminary budget released by the Governor's Office, cities and counties will

not receive additional funding from the state to reduce the impacts of Measure 50. Instead, the new budget will focus on retaining and increasing support for basic school education programs. Again, the preliminary budget will likely be modified during the current legislative session.

System Development Charges

System Development Charges (SDCs) are becoming increasingly popular in funding public works infrastructure needed for new local development. Generally, the objective of systems development charges is to allocate portions of the costs associated with capital improvements upon the developments which increase demand on transportation, sewer or other infrastructure systems.

Local governments have the legal authority to charge property owners and/or developers fees for improving the local public works infrastructure based on projected demand resulting from their development. The charges are most often targeted towards improving community water, sewer, or transportation systems. Cities and counties must have specific infrastructure plans in place that comply with state guidelines in order to collect SDCs.

The City of Lostine could implement SDCs for their transportation system. The fee is collected when new building permits are issued. The cities would calculate the fee based on trip generation of the proposed development. Residential calculations would be based on the assumption that a typical household will generate a given number of vehicle trips per day. Nonresidential use calculations are based on the number of trips generated or on employee ratios for the type of business or industrial uses. The SDC fees will help construct and maintain of the transportation network throughout the TSP study area. The implementation of SDCs in the City of Lostine is not considered a practical funding option since the rate of new development has been slow, and is not expected to grow significantly in the future.

State Gas Taxes

Gas tax revenues received from the State of Oregon are used by all counties and cities to fund street and road construction and maintenance. In Oregon, the state collects gas taxes, vehicle registration fees, overweight/overheight fines and weight/mile taxes and returns a portion of the revenues to cities and counties through an allocation formula. The revenue share to cities is divided among all incorporated cities based on population. The theory is that these taxes are somewhat tied to the benefits people receive, since those who drive more would pay more. Like other Oregon cities, the City of Lostine uses its State Gas Tax allocation to fund street construction and maintenance.

Local Gas Taxes

The Oregon Constitution permits counties and incorporated cities to levy additional local gas taxes with the stipulation that the moneys generated from the taxes will be dedicated to street-related improvements and maintenance within the jurisdiction. At present, only a few local governments (including the cities of Woodburn and The Dalles, and Multnomah and Washington Counties) levy a local gas tax. Based on the experiences of other local jurisdictions, the City of Lostine may have difficulty gaining public support for a local gas tax, even on a countywide basis.

Vehicle Registration Fees

The Oregon Vehicle Registration Fee is allocated to the state, counties and cities for road funding. Oregon counties are granted authority to impose a vehicle registration fee covering the entire county. The Oregon Revised Statutes allow Wallowa County to impose a biannual registration fee for all passenger cars licensed within the County. Although both counties and special districts have this legal authority, vehicle registration fees have not been imposed by local jurisdictions. Like fuel taxes, this fee would be somewhat tied to the benefits of the transportation system, because it would be paid by automobile owners in the county. In order for a local vehicle registration fee program to be viable in Wallowa County, all the incorporated cities and the county would need to formulate an agreement which would detail how the fees would be spent on future street construction and maintenance.

Local Improvement Districts

The Oregon Revised Statutes allow local governments to form Local Improvement Districts (LIDs) to construct public improvements. LIDs are most often used by cities to construct localized projects such as streets, sidewalks or bikeways. The statutes allow formation of a district by either the city government or property owners. Cities that use LIDs are required to have a local LID ordinance that provides a process for district formation and payback provisions. Through the LID process, the cost of local improvements are generally spread out among a group of property owners within a specified area. The cost can be allocated based on property frontage or other methods such as traffic trip generation. The types of allocation methods are only limited by the Local Improvement Ordinance. The cost of LID participation is considered an assessment against the property which is a lien equivalent to a tax lien. Individual property owners typically have the option of paying the assessment in cash or applying for assessment financing through the city. Since the passage of Ballot Measure 5, cities have most often funded local improvement districts through the sale of special assessment bonds.

Grants and Loans

The majority of the grant and loan programs available today are geared towards economic development and not specifically for construction of new streets. Typically, grant programs target areas that lack the basic public works infrastructure needed to support new or expanded industrial businesses. Because of the popularity of some grant programs such as the Oregon Special Public Works Fund, the emphasis has shifted to more of a loan program. Many programs require a match from the local jurisdiction as a condition of approval. Because grant programs are subject to change, they should not be considered a secure long-term funding source for the City of Lostine.

These programs include the Immediate Opportunity Grant, the Oregon Special Public Works Fund program, and the Special Small City Allotment program which are described below. Some special programs for public transportation and non-auto modes are also described briefly.

Immediate Opportunity Grant Program

The Oregon Economic Development Department (OEDD) and ODOT collaborate to administer a grant program designed to assist local and regional economic development efforts. The program is funded to a

level of approximately \$5,000,000 per year through state gas tax revenues. The following are primary factors in determining eligible projects:

- Improvement of public roads;
- Inclusion of an economic development-related project of regional significance;
- Creation of primary employment; and
- Ability to provide local funds to match grant (lesser matches may also be considered).

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

Oregon Special Public Works Fund

The Special Public Works Fund (SPWF) program was created by the 1995 State Legislature as one of several programs for the distribution of funds from the Oregon Lottery to economic development projects in communities throughout the state. The program provides grant and loan assistance to eligible municipalities primarily for the construction of public infrastructure which support commercial and industrial development that result in permanent job creation or job retention. To be awarded funds, each infrastructure project must support businesses wishing to locate, expand, or remain in Oregon. SPWF awards can be used for improvement, expansion, and new construction of public sewage treatment plants, water supply works, public roads, and transportation facilities.

While SPWF program assistance is provided in the form of both loans and grants, the program emphasizes loans in order to ensure that funds will return to the state over time for reinvestment in local economic development infrastructure projects. The maximum loan amount per project is \$11,000,000 and the term of the loan cannot exceed the useful life of the project or 25 years, whichever is less. Interest rates for loans funded with the State of Oregon Revenue Bonds are based on the rate the state may borrow through the Oregon Economic Development Department Bond Bank. The department may also make loans directly from the SPWF and the term and rate on direct loans can be structured to meet project needs. The maximum grant per project is \$500,000, but may not exceed 85 percent of the total project cost.

Jurisdictions that have received SPWF funding for projects that include some type of transportation-related improvement include Douglas County and the Cities of Baker City, Bend, Cornelius, Forest Grove, Madras, Portland, Redmond, Reedsport, Toledo, Wilsonville, and Woodburn.

Special Small City Allotment Program

This program is restricted to cities with populations under 5,000 residents. Unlike the OEDD Immediate Opportunity Grant program and the Oregon Special Public Works Fund, no locally funded match is required for participation. Grant amounts are limited to \$25,000 and must be earmarked for surface projects (drainage, curbs, sidewalks, etc.). However, the program does allow jurisdictions to use the grants to leverage local funds on non-surface projects if the grant is used specifically to repair the affected area.

Public Transportation Funds

There are several different grants and loans which are available to fund public transportation, including:

- Special Transportation Fund (STF)
- Section 5311
- Community Transportation Program
- Special Transportation District

These grant and loan programs require a local funding match from the participating local government agencies.

Bicycle and Pedestrian Program Funds

The State Bicycle and Pedestrian Program has grants available for bicycle and pedestrian system improvements. These improvements must benefit the overall transportation system by providing good, alternative transportation options to the automobile. Funds are not available for bicycle and pedestrian facilities which serve a purely recreational use. The bicycle and pedestrian grant program requires a local match to fund the identified improvements.

ODOT Funding Options

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

The highway-related projects identified in the City of Lostine's TSP will be considered for future inclusion on the STIP. The timing of including specific projects will be determined by ODOT based on an analysis of all the project needs within Region 5. The TSP will provide ODOT with a prioritized project list for the City of Lostine for the next 20 years. The City of Lostine, Wallowa County, and ODOT will need to communicate on an annual basis to review the status of the STIP and the prioritization of individual projects within the project area. Ongoing communication will be important for the city, county, and ODOT to coordinate the construction of both local and state transportation projects.

An ODOT funding technique that will likely have future application to the City of Lostine's TSP is the use of state and federal transportation dollars for off-system improvements. Until the passage and implementation of ISTEA, state and federal funds were limited to transportation improvements within highway corridors. ODOT now has the authority and ability to fund transportation projects that are

located outside the boundaries of the highway corridors. The criteria for determining what off-system improvements can be funded has not yet been clearly established. It is expected that this new funding technique will be used to finance local system improvements that reduce traffic on state highways while preserving the existing function, capacity, level of service, and safety of the existing state highway.

The transportation funding program ISTEA expires at the end of this fiscal year. Congress is considering several bills which would reauthorize the program in various forms. In general, funding levels are expected to remain stable or slightly higher.

FINANCING TOOLS

In addition to funding options, the recommended improvements listed in this plan may benefit from a variety of financing options. Although often used interchangeably, the words financing and funding are not the same. Funding is the actual generation of revenue by which a jurisdiction pays for improvements, some examples of which include the sources discussed above: property taxes, SDCs, fuel taxes, vehicle registration fees, LIDs, and various grant programs. In contrast, financing refers to the collecting of funds through debt obligations.

There are a number of debt financing options available to the City of Lostine. The use of debt to finance capital improvements must be balanced with the ability to make future debt service payments and to deal with the impact on its overall debt capacity and underlying credit rating. Again, debt financing should be viewed not as a source of funding, but as a time shifting of funds. The use of debt to finance these transportation-system improvements is appropriate since the benefits from the transportation improvements will extend over the period of years. If such improvements were to be tax financed immediately, a large short-term increase in the tax rate would be required. By utilizing debt financing, local governments are essentially spreading the burden of the costs of these improvements to more of the people who are likely to benefit from the improvements and lowering immediate payments.

General Obligation Bonds

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

State statutes require that the general obligation indebtedness of a city not exceed three percent of the real market value of all taxable property in the city. Since general obligation bonds would be issued subsequent to voter approval, they would not be restricted to the limitations set forth in Ballot Measures 5 and 50 (revised Measure 47). Although new bonds must be specifically voter approved, Measure 50 provisions are not applicable to outstanding bonds, unissued voter-approved bonds, or refunding bonds.

Limited Tax Bonds

Limited tax general obligation bonds (LTGOs) are similar to general obligation bonds in that they represent an obligation of the municipality. However, a municipality's obligation is limited to its current revenue sources and is not secured by the public entity's ability to raise taxes. As a result, LTGOs do not require voter approval. However, since the LTGOs are not secured by the full taxing power of the issuer, the limited tax bond represents a higher borrowing cost than general obligation bonds. The municipality must pledge to levy the maximum amount under constitutional and statutory limits, but not the unlimited taxing authority pledged with GO bonds. Because LTGOs are not voter-approved, they are subject to the limitations of Ballot Measures 5 and 47.

Bancroft Bonds

Under Oregon Statute, municipalities are allowed to issue Bancroft bonds which pledge the city's full faith and credit to assessment bonds. As a result, the bonds become general obligations of the city but are paid with assessments. Historically, these bonds provided a city with the ability to pledge its full faith and credit in order to obtain a lower borrowing cost without requiring voter approval. However, since Bancroft bonds are not voter approved, taxes levied to pay debt service on them are subject to the limitations of Ballot Measures 5 and 50 (revised Measure 47). As a result, since 1991, Bancroft bonds have not been used by municipalities who were required to compress their tax rates.

CHAPTER 9: RECOMMENDED POLICIES AND ORDINANCES

In 1991, the Oregon Transportation Planning Rule was adopted to implement State Planning Goal 12 – Transportation (amended in May and September 1995). The Transportation Planning Rule requires counties and cities to complete a TSP that includes policies and ordinances to implement that plan. The City of Lostine's Land Use Plan and ordinances were not supplied for review; therefore, for the purposes of this chapter, it is assumed that they need updating to meet the requirements of the Transportation Planning Rule and this TSP.

ELEMENTS REQUIRED BY THE TRANSPORTATION PLANNING RULE

The applicable portion of the Transportation Planning Rule is found in Section 660-12-045—*Implementation of the Transportation System Plan*. In summary, the Transportation Planning Rule requires that local governments revise their land use regulations to implement the Transportation System Plan in the following manner:

- *Amend land use regulations to reflect and implement the Transportation System Plan.*
- *Clearly identify which transportation facilities, services, and improvements are allowed outright, and which will be conditionally permitted or permitted through other procedures.*
- *Adopt land use or subdivision ordinance measures, consistent with applicable federal and state requirements, to protect transportation facilities, corridors and sites for their identified functions, to include the following topics:*
 - ⇒ *access management and control;*
 - ⇒ *protection of public use airports;*
 - ⇒ *coordinated review of land use decisions potentially affecting transportation facilities;*
 - ⇒ *conditions to minimize development impacts to transportation facilities;*
 - ⇒ *regulations to provide notice to public agencies providing transportation facilities and services of land use applications that potentially affect transportation facilities;*
 - ⇒ *regulations assuring that amendments to land use applications, densities, and design standards are consistent with the Transportation System Plan.*
- *Adopt land use or subdivision regulations for urban areas and rural communities to provide safe and convenient pedestrian and bicycle circulation and bicycle parking, and to ensure that new development provides on-site streets and accessways that provide reasonably direct routes for pedestrian and bicycle travel.*
- *Establish street standards that minimize pavement width and total right-of-way.*

These elements are discussed in the following sections, where they are grouped by similarity in terms of appropriate policy and ordinance.

APPROVAL PROCESSES FOR TRANSPORTATION FACILITIES

Section 660-12-045(1) of the Transportation Planning Rule requires that cities and counties amend their land use regulations to conform with the jurisdiction's adopted Transportation System Plan. This section of the Transportation Planning Rule is intended to clarify the approval process for transportation-related projects.

Recommended Policies for Approval Process

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

- *The Transportation System Plan is an element of the City of Lostine Comprehensive Plan. It identifies the general location of transportation improvements. Changes in the specific alignment of proposed public road and highway projects that shall be permitted without plan amendment if the new alignment falls within a transportation corridor identified in the Transportation System Plan.*
- *Operation, maintenance, repair, and preservation of existing transportation facilities shall be allowed without land use review, except where specifically regulated.*
- *Dedication of right-of-way, authorization of construction and the construction of facilities and improvements, for improvements designated in the Transportation System Plan, the classification of the roadway and approved road standards shall be allowed without land use review.*
- *For state projects that require an Environmental Impact Study (EIS) or Environmental Assessment (EA), the draft EIS or EA shall serve as the documentation for local land use review, if local review is required.*

Recommended Ordinances for Approval Process

Projects that are specifically identified in the Transportation System Plan and for which the jurisdiction has made all the required land use and goal compliance finding are permitted outright, subject only to the standards established by the Plan.

However, a city may not allow outright an improvement that is included in the Transportation System Plan but for which no site-specific decisions have been made. Therefore, it is recommended that small jurisdictions review these transportation projects within the Urban Growth Boundary as regulated land use actions, using conditional use process. This following process is recommended for inclusion in the supplementary provisions section or as a new section within the development code.

___ Standards for Transportation Improvements

___ Uses Permitted Outright. Except where otherwise specifically regulated by this ordinance, the following improvements are permitted outright:

- A. *Normal operation, maintenance, repair, and preservation activities of existing transportation facilities.*
- B. *Installation of culverts, pathways, medians, fencing, guardrails, lighting, and similar types of improvements within the existing right-of-way.*

- C. *Projects specifically identified in the Transportation System Plan as not requiring further land use regulation.*
- D. *Landscaping as part of a transportation facility.*
- E. *Emergency measures necessary for the safety and protection of property*
- F. *Acquisition of right-of-way for public roads, highways, and other transportation improvements designated in the Transportation System Plan except for those that are located in exclusive farm use or forest zones.*
- G. *Construction of a street or road as part of an approved subdivision or land partition approved consistent with the applicable land division ordinance.*

Conditional Uses Permitted

- A. *Construction, reconstruction, or widening of highways, roads, bridges or other transportation projects that are: (1) not improvements designated in the Transportation System Plan or (2) not designed and constructed as part of a subdivision or planned development subject to site plan and/or conditional use review, shall comply with the Transportation System Plan and applicable standards, and shall address the following criteria. For State projects that require an Environmental Impact Statement (EIS) or EA (Environmental Assessment), the draft EIS or EA shall be reviewed and used as the basis for findings to comply with the following criteria:*
 - 1. *The project is designed to be compatible with existing land use and social patterns, including noise generation, safety, and zoning.*
 - 2. *The project is designed to minimize avoidable environmental impacts to identified wetlands, wildlife habitat, air and water quality, cultural resources, and scenic qualities.*
 - 3. *The project preserves or improves the safety and function of the facility through access management, traffic calming, or other design features.*
 - 4. *Project includes provision for bicycle and pedestrian circulation as consistent with the comprehensive plan and other requirements of this ordinance.*
- B. *Construction of rest areas, weigh stations, temporary storage, and processing sites. (Counties only).*
- C. *If review under this Section indicates that the use or activity is inconsistent with the Transportation System Plan, the procedure for a plan amendment shall be undertaken prior to or in conjunction with the conditional permit review.*

Time Limitation on Transportation-Related Conditional Use Permits

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

PROTECTING EXISTING AND FUTURE OPERATION OF FACILITIES

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

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

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

Recommended Policies for Protection of Transportation Facilities

- *The City of Lostine shall protect the function of existing and planned roadways as identified in the Transportation System Plan.*
- *The City of Lostine shall include a consideration of a proposal's impact on existing or planned transportation facilities in all land use decisions.*
- *The City of Lostine shall protect the function of existing or planned roadways or roadway corridors through the application of appropriate land use regulations.*
- *The City of Lostine shall consider the potential to establish or maintain accessways, paths, or trails prior to the vacation of any public easement or right-of-way.*
- *The City of Lostine shall preserve right-of-way for planned transportation facilities through exactions, voluntary dedication, or setbacks.*

Recommended Access Control Ordinances

Appropriate portions of the following ordinances should be adopted to provide access management.

Section _____ ACCESS MANAGEMENT

A. General

The intent of this ordinance is to manage access to land development to preserve the transportation system in terms of safety, capacity, and function. This ordinance shall apply to all arterials and collectors within the City of Lostine and to all properties that abut these roadways. This ordinance is adopted to implement the access management policies of the City of Lostine as set forth in the Transportation System Plan.

B. Corner Clearance

- 1. Corner clearance for connections shall meet or exceed the minimum connection spacing requirements for that roadway.*
- 2. Where no other alternatives exist, the City may allow construction of an access connection along the property line farthest from the intersection. In such cases, directional connections (i.e. right in/out, right in only, or right out only) may be required.*

C. Joint and Cross Access

- 1. Adjacent commercial or office properties classified as major traffic generators (i.e. shopping plazas, office parks), shall provide a cross access drive and pedestrian access to allow circulation between sites.*
- 2. A system of joint use driveways and cross access easements shall be established wherever feasible and shall incorporate the following:*
 - a) A continuous service drive or cross access corridor extending the entire length of each block served to provide for driveway separation consistent with the access management classification system and standards.*
 - b) A design speed of 10 mph and a maximum width of 20 feet to accommodate two-way travel aisles designated to accommodate automobiles, service vehicles, and loading vehicles;*
 - c) Stub-outs and other design features to make it visually obvious that the abutting properties may be tied in to provide cross-access via a service drive;*
 - d) A unified access and circulation system plan for coordinated or shared parking areas is encouraged.*
- 3. Shared parking areas shall be permitted and a reduction in required parking spaces if peak demands do not occur at the same time periods.*
- 4. Pursuant to this section, property owners shall:*
 - a) Record an easement with the deed allowing cross access to and from other properties served by the joint use driveways and cross access or service drive;*
 - b) Record an agreement with the deed that remaining access rights along the roadway will be dedicated to the City and pre-existing driveways will be closed and eliminated after construction of the joint-use driveway;*
 - c) Record a joint maintenance agreement with the deed defining maintenance responsibilities of property owners.*

5. *The City may reduce required separation distance of access points where they prove impractical, provided all of the following requirements are met:*
 - a) *Joint access driveways and cross access easements are provided in accordance with this section.*
 - b) *The site plan incorporates a unified access and circulation system in accordance with this section.*
 - c) *The property owner 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.*
6. *The City 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.*

D. Access Connection and Driveway Design

1. *Driveways shall meet the following standards:*
 - a) *If the driveway is a one way in or one way out drive, then the driveway shall be a minimum width of 10 feet and a maximum width of 12 feet and shall have appropriate signage designating the driveway as a one way connection.*
 - b) *For two-way access, each lane shall have a minimum width of 10 feet and a maximum width of 12 feet.*
2. *Driveway approaches must be designed and located to provide an exiting vehicle with an unobstructed view. Construction of driveways along acceleration or deceleration lanes and tapers shall be avoided due to the potential for vehicular weaving conflicts.*
3. *The length of driveways shall be designed in accordance with the anticipated storage length for entering and exiting vehicles to prevent vehicles from backing into the flow of traffic on the public street or causing unsafe conflicts with on-site circulation.*

E. Nonconforming Access Features

1. *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 increase trip generation.*

F. Reverse Frontage

1. *Lots that front on more than one street shall be required to locate motor vehicle accesses on the street with the lower functional classification.*

2. *When a residential subdivision is proposed that would abut an arterial, it shall be designed to provide through lots along the arterial with access from a frontage road or interior local road. Access rights of these lots to the arterial shall be dedicated to the City of Lostine and recorded with the deed. A berm or buffer yard may be required at the rear of through lots to buffer residences from traffic on the arterial. The berm or buffer yard shall not be located within the public right-of-way.*

G. *Flag Lot Standards*

1. *Flag lots shall not be permitted when the result would be to increase the number of properties requiring direct and individual access connections to the State Highway System or other arterials.*
2. *Flag lots may be permitted for residential development when necessary to achieve planning objectives, such as reducing direct access to roadways, providing internal platted lots with access to a residential street, or preserving natural or historic resources, under the following conditions:*
 - a) *Flag lot driveways shall be separated by at least twice the minimum frontage requirement of that zoning district.*
 - b) *The flag driveway shall have a minimum width of 10 feet and maximum width of 20 feet.*
 - c) *In no instance shall flag lots constitute more than 10 percent of the total number of building sites in a recorded or unrecorded plat, or three lots or more, whichever is greater.*
 - d) *The lot area occupied by the flag driveway shall not be counted as part of the required minimum lot area of that zoning district.*
 - e) *No more than one flag lot shall be permitted per private right-of-way or access easement.*

H. *Lot Width-to-Depth Ratios*

1. *To provide for proper site design and prevent the creation of irregularly shaped parcels, the depth of any lot or parcel shall not exceed 3 times its width (or 4 times its width in rural areas) unless there is a topographical or environmental constraint or an existing man-made feature.*

I. *Shared Access*

1. *Subdivisions with frontage on the state highway system shall be designed into shared access points to and from the highway. Normally a maximum of two accesses shall be allowed regardless of the number of lots or businesses served. If access off of a secondary street is possible, then access should not be allowed onto the state highway. If access off of a secondary street becomes available, then conversion to that access is encouraged, along with closing the state highway access.*

J. *Connectivity*

1. *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. To ensure continuation of the existing street grid and a pedestrian-friendly scale of the city blocks, block lengths in excess of 300 feet and block perimeters in excess of 1200 feet are prohibited.*

2. *Wherever a proposed development abuts unplatted land or a future development phase of the same development, street stubs shall be provided to provide access to abutting properties or to logically extend the street system into the surrounding area. All street stubs shall be provided with a temporary turn-around unless specifically exempted by the Public Works Director, and the restoration and extension of the street shall be the responsibility of any future developer of the abutting land.*
3. *Minor collector and local residential access streets shall connect with surrounding streets to permit the convenient movement of traffic between residential neighborhoods or facilitate emergency access and evacuation. Connections shall be designed to avoid or minimize through traffic on local streets. Appropriate design and traffic control such as four-way stops and traffic calming measures are the preferred means of discouraging through traffic.*

K. Variances to Access Management Standards

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

PROCESS FOR COORDINATED REVIEW OF LAND USE DECISIONS

A lack of coordination between state and local decision processes can result in costly delays and changes in public road and highway projects, as well as some maintenance and operation activities. Section 660-12-045(2)(d) of the Transportation Planning Rule requires that jurisdictions develop a process for the coordinated review of land use decisions affecting transportation facilities. The following recommended policies will establish coordinated review.

Recommended Policies for Coordinated Review

- *The City of Lostine shall coordinate with the Department of Transportation to implement the highway improvements listed in the Statewide Transportation Improvement Program (STIP) that are consistent with the Transportation System Plan and comprehensive plan.*
- *The City of Lostine shall provide notice to ODOT of land use applications and development permits for properties that have frontage or access onto Highway 82.*
- *The City of Lostine shall consider the findings of ODOT's draft Environmental Impact Statements and Environmental Assessments 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.

Recommended Process for Applying Conditions to Development Proposals

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

The Site Plan review process is a useful tool for a small jurisdiction. The City of Lostine may wish to implement a Site Plan review process that includes a requirement to provide data on the potential traffic impacts of a project through a traffic impact study or, at the minimum, an estimation of the number of trips expected to be generated. Recommended language to be included under Site Plan Criteria is as follows:

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

If the City of Lostine decides to implement a Site Plan review process, conditions such as the following may be included in the ordinance, to be applied in the event that a proposed project is demonstrated to potentially have an adverse effect on the transportation system. These are additional to the conditions imposed by the recommended Access Management Ordinance included previously.

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

Recommended Regulations to Provide Notice to Public Agencies

Review of land use actions is typically initiated by a Notice. This process is usually defined by a Procedures Ordinance or Noticing Policy. This Ordinance or Policy should be amended to provide for Notice to ODOT regarding any land use action on or adjacent to Highway 82. Similarly, all actions by the City potentially affecting a County road should provide notice to Wallowa County.

Information that should be conveyed to reviewers includes:

- *Project location.*

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

Additional information that could be supplied to the review upon request (provided the information is available) includes a site plan showing the following:

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

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

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

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

Within the zoning ordinance, development proposals can be addressed through Site Plan Review, discussed above. Zone changes and plan amendments can be partially addressed by the following language:

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

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

- A. 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 what are inconsistent with the functional classification of a transportation facility; or*
 4. *Would reduce the level of service 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.*

SAFE AND CONVENIENT PEDESTRIAN AND BICYCLE CIRCULATION

Bicycling and walking are often the most appropriate mode for short trips. Especially in small cities where the downtown area is compact, walking and bicycling can replace short auto trips, reducing the need for construction and maintenance of new roads. However, the lack of safe and convenient bikeways and walkways can be a strong discouragement for these mode choices. The Transportation Planning Rule (660-12-045(3)) requires that urban areas and rural communities plan for bicycling and walking as part of the overall transportation system.

The City of Lostine has adopted a Bicycle and Pedestrian Plan that addresses Goals and Objectives. This Plan also provides standards for bicycle parking that are appropriate for adoption into ordinance. The following ordinance language may be considered to assure a functional network of bicycle and pedestrian access throughout the community.

Recommended Ordinances for Bicycle and Pedestrian Circulation and Access

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

The Transportation Planning Rule specifies that, at a minimum, sidewalks and bikeways be provided along arterials and collectors in urban areas. Separate bicycle and pedestrian facilities should be provided where these would safely minimize trips distances by providing a "short cut." Small cities should enhance existing ordinances by including the following recommended language, additions and recommendations.

The recommendations should be placed within the appropriate section of the zoning or subdivision ordinance:

Definitions:

- A. *Accessway.* A walkway that provides pedestrian and bicycle passage either between streets or from a street to a building or other destination such as a school, park, or transit stop. Accessways generally include a walkway and additional land on either side of the walkway, often in the form of an easement or right-of-way, to provide clearance and separation between the walkway and adjacent uses. Accessways through parking lots are generally physically separated from adjacent vehicle parking or parallel vehicle traffic by curbs or similar devices and include landscaping, trees, and lighting. Where accessways cross driveways, they are generally raised, paved, or marked in a manner that provides convenient access for pedestrians.
- B. *Bicycle.* A vehicle designed to operate on the ground on wheels, propelled solely by human power, upon which any person or persons may ride, and with two tandem wheels at least 14 inches in diameter. An adult tricycle is considered a bicycle.
- C. *Bicycle Facilities.* A general term denoting improvements and provisions made to accommodate or encourage bicycling, including parking facilities and all bikeways.
- D. *Bikeway.* Any road, path, or way that is some manner specifically open to bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are shared with other transportation modes. (These are further defined in the Lostine Bicycle and Pedestrian Plan).
- E. *Pedestrian Facilities (also Walkway).* A general term denoting improvements and provisions made to accommodate or encourage walking, including sidewalks, accessways, crosswalks, ramps, paths, and trails.
- F. *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.
- G. *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.
- H. *Safe and convenient.* Bicycle and pedestrian routes that are:
 - 1. Reasonably free from hazards, and
 - 2. 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.
- I. *Walkway.* A hard-surfaced area intended and suitable for pedestrians, including sidewalks and the surfaced portions of accessways.

If the City of Lostine decides to implement a Site Plan review process, it should include a requirement to show the design and location of bicycle parking and bicycle and pedestrian circulation elements such as accessways and walkways. The following language should be added to the land-use regulations:

- A. *Bicycle Parking.* The development shall include the number and type of bicycle parking facilities required in the Off-Street Parking and Loading section of this Title. The location and design of bicycle parking facilities shall be indicated on the site plan.
- B. *Pedestrian Access and Circulation.*
1. *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.*
- C. *Commercial Development Standards.*
1. *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. For lots with more than two front yards, the building(s) shall be oriented to the two busiest streets.*
 2. *Off-street motor vehicle parking for new commercial developments shall be located at the side or behind the building(s).*
- D. *All site plans (industrial and commercial) shall clearly show how the site's internal pedestrian and bicycle facilities connect with external existing or planned facilities or systems.*

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

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

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

- A. ____ *Cul-de-Sacs and Accessways.*
1. *Cul-de-sacs or permanent dead-end streets may be used as part of a development plan; however, through streets are encouraged except where topographical, environmental, or existing adjacent land use constraints make connecting streets infeasible. Cul-de-sac lengths in excess of 300 feet are prohibited. Where cul-de-sacs are planned, accessways shall be provided connecting the ends of cul-de-sacs to each other, to other streets, or to neighborhood activity centers.*
 2. *Accessways for pedestrians and bicyclists shall be 10 feet wide and located within a 20-foot-wide right-of-way or easement. If the streets within the subdivision are lighted, the accessways shall also be lighted. Stairs or switchback paths may be used where grades are steep.*
 3. *Accessways for pedestrians and bicyclists shall be provided at mid-block where the block is longer than 600 feet.*
 4. *The Hearings Body may determine, based upon evidence in the record, that an accessway is impracticable. Such evidence may include but is not limited to:*

- a) *Physical or topographic conditions make an accessway connection impractical. Such conditions include but are not limited to extremely steep slopes, wetlands, or other bodies of water where a connection cannot reasonably be provided.*
- b) *Buildings or other existing development on adjacent lands physically preclude a connection now or in the future, considering potential for redevelopment.*
- c) *Where accessways would violate provisions of leases, easements, covenants, restrictions, or other agreements existing as of May 1, 1995 that preclude a required accessway connection.*

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APPENDIX A

Existing Street Inventory

TABLE 1												
1997 MAJOR STREETS INVENTORY												
Lostine 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	Pavement Condition	
State Street (Wallowa Lake Hwy)												
Water Street to Elizabeth Street	state	arterial	30	70	30	2	no	no	no	no	good	
Elizabeth Street to College Street	state	arterial	30	70	30	2	no	no	no	no	good	
College Street to Jim Town Lane	state	arterial	30	70	30	2	no	no	no	no	good	
east of Jim Town Lane	state	arterial	45	70	30	2	no	no	no	no	good	
Wallowa Street												
west of Water Street	city	local	25	100	20	2	no	no	no	no	fair	
Water Street to Elizabeth Street	city	local	25	100	25	2	no	no	no	no	good	
Elizabeth Street to College Street	city	local	25	100	25	2	no	no	no	no	good	
College Street to Jim Town Lane	city	local	25	100	25	2	no	no	no	no	good	
Rosewell Street												
Kroon Street to Water Street	city	local	25	60	15	2	no	no	no	no	fair	
Water Street to Jim Town Lane	city	local	25	60	15	2	no	no	no	no	good	
Douglas Street												
Kroon Street to Water Street	city	local	25	30	15	2	no	no	no	no	fair	
Cole Street												
Water Street to Jim Town Lane	city	local	25	60	20	2	no	no	no	no	good	
Wallowa Lake Highway												
west of county road	state	arterial	55	100	30	2	no	no	no	no	good	
county road to Cole Street / Douglas Street	state	arterial	30	100	30	2	no	no	no	no	good	
Water Street (Wallowa Lake Highway)												
Cole Street to Rosewell Street	state	arterial	30	100	30	2	no	no	no	no	good	
Rosewell Street to Wallowa Street	state	arterial	20	100	60	2	no	yes	yes	no	good	
Wallowa Street to State Street	state	arterial	30	100	60	2	no	yes	yes	no	good	

TABLE 1
1997 MAJOR STREETS INVENTORY
Lostine 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	Pavement Condition
Kroon Street											
Douglas Street to Rosewell Street	city	local	25	30	15	2	no	no	no	no	fair
Resort Street											
State Street to Lostine River Road	city	local	25	80	25	2	no	no	no	no	good
Elizabeth Street											
north of Wallowa Street	city	local	25	90	20	2	no	no	no	no	good
Wallowa Street to State Street	city	local	25	90	25	2	no	no	no	no	good
south of State Street	city	local	25	90	25	2	no	no	no	no	good
College Street											
north of Wallowa Street	city	local	25	90	30	2	no	no	no	no	poor
Wallowa Street to State Street	city	local	25	90	20	2	no	no	no	no	good
south of State Street	city	local	25	90	20	2	no	no	no	no	fair
Jimi Town Lane											
north of Cole Street	city	local	25	60	25	2	no	no	no	no	good
Cole Street to Rosewell Street	city	local	25	60	25	2	no	no	no	no	good
Rosewell Street to Wallowa Street	city	local	25	60	25	2	no	no	no	no	good
Wallowa Street to State Street	city	local	25	60	20	2	no	no	no	no	fair

APPENDIX B

Population and Employment Analysis

METHODOLOGY AND DATA SOURCES

Population estimates and projections were developed from historical data as reported by the Census Bureau. Portland State University's Center for Population Research and Census (PSU CPRC) developed annual population estimates for cities and counties for the purpose of allocating certain state tax revenues to cities and counties. The State of Oregon Office of Economic Analysis (OEA) provided long-term (through year 2040) state population forecasts, disaggregated by county, for state planning purposes. OEA also developed county-level employment forecasts based on covered employment payrolls as reported by the Oregon Employment Department.

The Office of Economic Analysis used business-cycle trends (as reflected by the Employment Department's employment forecasts) as the primary driver of population and employment for the short term. For the long term, the forecasts shift to a population-driven model, which emphasizes demographics of the resident population, including age and gender of the population, with assumptions regarding life expectancy, fertility rate, and immigration. DEA used a methodology based on OEA's county-distribution methodology in developing population and employment forecasts for each of the cities in Wallowa County. DEA calculated a weighted average growth rate for each jurisdiction (weighting recent growth more heavily than past growth) and combined this average growth rate with the projected county-wide growth rate. This methodology assumes convergence of growth rates because of the physical constraints of any area to sustain growth rates beyond the state or county average for long periods of time. These constraints include availability of land and housing, congestion, and other infrastructure limitations.

These population and employment forecasts were developed to determine future transportation needs. The amount of growth, and where it occurs, will affect traffic and transportation facilities in the study area. This report is not intended to provide a complete economic forecast or housing analysis, and it should not be used for any purpose other than that for which it is designed.

CURRENT POPULATION AND EMPLOYMENT LEVEL

Estimated at 7,250 in 1995, the population of Wallowa County has remained relatively stable since the 1990 Census, with an average annual growth rate of less than one percent. The following table shows the estimated change in population for Wallowa County and the jurisdictions of Enterprise, Joseph, Lostine, and the City of Wallowa from 1990 to 1995.

Wallowa County Population Level

	1990	1995	1990-1995 Change	
			Number	CAARG*
Wallowa County	6,911	7,250	339	0.96%
Enterprise	1,905	2,010	105	1.08%
Joseph	1,073	1,190	117	2.09%
Lostine	231	230	(1)	-0.09%
City of Wallowa	748	755	7	0.19%

* *Compound Average Annual Rate of Growth*

Source: *Portland State University Center for Population Research and Census.*

Employment levels have declined since 1990. This decline is, in part, attributable to an increase in the unemployment rate throughout Oregon. Average unemployment rates for Wallowa County hit a low for the decade at 7.5 percent in 1989. Since then, unemployment has climbed, reaching an average 11.1 percent in 1995.

Wallowa County Employment

	1990	1995	1990-1995 Change	
			Number	CAARG*
Wallowa County Employment	3,270	2,970	(300)	-1.91%
Unemployment Rate	7.6%	11.1%	n.a.	n.a.

* *Compound Average Annual Rate of Growth*

Note: These figures are reported as place-of-work series, rather than place-of-residence. In other words, these estimated total jobs in Wallowa County may be held by residents of other counties. The impact of this difference is considered minimal for Wallowa County as the 1990 Census reports that over 96 percent of workers who live in Wallowa County also work in the County.

Source: *Oregon Employment Department.*

The unemployment rates contrast with the economic performance of the state as a whole. The state's unemployment rate has been at approximately 5 percent for several years, and has just begun creeping upward. As of November 1996, the statewide unemployment rate was 5.5 percent--still a historically low rate, but the state's highest level in over two years.

HISTORICAL GROWTH

Interestingly, population levels in most of Eastern Oregon are close to, or actually lower than, those experienced earlier in the century. Counties included in this phenomenon include Baker, Harney, Union, Grant, and Wallowa Counties. The population of Wallowa County actually declined in the 1960s and 1980s, reflecting the general slowdown in the state's economy during these time periods. As a result of this activity, the population of Wallowa County declined overall between the 1960 and 1990 Censuses (from 7,102 in 1960 to 6,911 in 1990). The following table shows the population trend for Enterprise, Joseph, Lostine, the City of Wallowa and Wallowa County as a whole.

Wallowa County Historical Population Trend

	1960	1970	1980	1990	1960-1990 Change	
					Number	CAARG *
Wallowa County	7,102	6,247	7,273	6,911	(191)	-0.09%
Enterprise	1,932	1,680	2,003	1,905	(27)	-0.05%
Joseph	788	839	999	1,073	285	1.03%
Lostine	240	196	250	231	(9)	-0.13%
City of Wallowa	989	811	847	748	(241)	-0.93%

* *Compound Average Annual Rate of Growth*

Source: U.S. Bureau of the Census.

The only jurisdiction able to achieve positive population growth between 1960 and 1990 was Joseph, growing from 788 in 1960 to 1,073 in 1990. This growth can attributed, in part, to the community's proximity to Wallowa Lake, and the recreational opportunities this amenity provides.

Despite minimal growth in population since 1970, other demographic changes have occurred that may impact the community's employment and travel patterns. For example, there have been national trends of both decreasing household size and increasing numbers of workers per household.

Household size in Wallowa County has gone from an average of 2.93 persons per household in 1970 to an average of 2.44 persons in 1990. Changes in life expectancy and lifestyle choices (i.e. electing to delay marriage and childbearing) have resulted in relatively high proportions of "empty-nester," "singles," and "couples-without-children" households.

The number of jobs per household has also been increasing. With 6,247 reported persons in 1970 and total employment estimated at 2,420, the population/employment ratio in 1970 was 2.58 persons per job. In 1995, there were 2,970 jobs for the estimated population of 7,250, for a population/employment ratio of 2.44 persons per job. The increasing numbers of jobs in relation to population is due to a number of factors including a low savings rate, increased life expectancy, and higher education levels. These factors have combined to increase the labor participation rate, particularly by women and older adults.

POPULATION AND EMPLOYMENT FORECASTS

Wallowa County is expected to experience small population gains for the next 20 years. Like much of Eastern Oregon, the economy of Wallowa County remains largely seasonal, with more than one-quarter of all employment agriculture-based. Therefore, population increases are difficult to predict, and are not likely to be as stable as the forecasts appear to imply.

The population forecast for Wallowa County and the jurisdictions of Enterprise, Joseph, Lostine, and the City of Wallowa are shown in five-year increments in the following table.

Wallowa County Population Forecast

	1995					1995-2000	1995-2015
		2000	2005	2010	2015	CAARG	CAARG
Wallowa County	7,250	7,458	7,632	7,815	8,025	0.57%	0.51%
Enterprise	2,010	2,060	2,106	2,153	2,206	0.49%	0.47%
Joseph	1,190	1,260	1,329	1,396	1,460	1.15%	1.03%
Lostine	230	233	235	238	242	0.26%	0.25%
City of Wallowa	755	763	769	777	789	0.21%	0.17%

Source: 1995 estimates developed by Portland State University Center for Population Research and Census; County forecasts developed by State of Oregon Office of Economic Analysis; and Jurisdiction forecasts developed by David Evans and Associates, Inc.

The population of Wallowa County is expected to increase by 11 percent over the next 20 years, from the 1995 estimate of 7,250 to an estimated 8,025 in year 2015. The only jurisdiction expected to grow faster is Joseph, with a forecast increase of nearly 23 percent over 20 years, from 1,190 in 1995 to 1,460 in 2015.

The Office of Economic Analysis also developed forecasts of Non-Agricultural Employment by county. Oregon Employment data suggest that over one-quarter (an estimated 29 percent in 1995) of all employment in Wallowa County is agriculture-based. This agriculture-based proportion, although higher than the state average, is typical for counties in Eastern Oregon. The economy of Wallowa County has been moving toward a greater degree of diversification, going from 46 percent agricultural-based employment in 1970, to 29 percent in 1995, as shown in the table below.

Agricultural Employment Trend

Wallowa County

		1970	1975	1980	1985	1990	1995
Total Employment	Estimated	2,420	2,820	3,280	3,080	3,270	2,970
Nonfarm Employment	Payroll	1,310	1,620	1,860	1,780	2,270	2,110
Agricultural Proportion		46%	43%	43%	42%	31%	29%

Source: Oregon Employment Department.

The shift from agriculture occurred primarily in the late 1980s with agriculture-based employment accounting for 42 percent of all employment in 1985, falling to 31 percent just five years later. Statewide, the Office of Economic Analysis expects this diversification to continue, but at a decreasing rate. Applying this principle to Wallowa County employment, the following table shows forecast non-agricultural and estimated total employment for Wallowa County.

Wallowa County Employment Forecast*

	1995	2000	2005	2010	2015	1995-2000 CAARG	1995-2015 CAARG
Non-Agricultural Employment	2,110	2,302	2,377	2,423	2,438	1.76%	0.73%
Estimated Total Employment	2,970	3,201	3,274	3,314	3,317	1.51%	0.55%
Agricultural Proportion	29.0%	28.1%	27.4%	26.9%	26.5%	n.a.	n.a.

* The Office of Economic Analysis inflated non-agricultural employment to 2,151 to correct for Oregon jobs not attributed to any specific county.

Source: Non-Agricultural employment forecasts developed by the State of Oregon Office of Economic Analysis; 1995 estimates developed by the Oregon Employment Department; and estimated total employment forecasts developed by David Evans and Associates, Inc.

Employment is expected to grow by over 11 percent over the next twenty years, with the proportion captured by agricultural employment declining over time, from its current level of 29 percent, reaching 26.5 percent of total employment in Wallowa County in year 2015. The population/employment ratio will remain relatively stable (decreasing slightly from 2.44 persons per job to 2.42 persons per job).

APPENDIX C

Speed Control Measures

TECHNICAL MEMORANDUM

SPEED CONTROL MEASURES

Numerous studies have been carried out to determine the influence of particular roadway features on traffic speed. Some of the most significant characteristics of roadway features are curvature, grades, length of grade, number of lanes, surface condition, sight distance, lateral clearance, number of intersections, and built-up areas near the roadways. Some of the main reasons drivers give for speeding include being in a hurry, to avoid a potential danger, to keep up with other traffic, and to maintain a speed with which the driver feels comfortable.

This technical memorandum describes a variety of speed control measures to address public concern over high-speed traffic through the downtown areas of many of the cities in Grant County. Speed control measures consist of physical controls, passive controls, and psycho-perception controls. Specific speed control techniques for each of these three categories are summarized in the following pages and listed in Table 1 located at the end of this memorandum.

Physical Controls

Physical speed controls are those measures which are physically constructed to restrict or affect vehicle operation or performance. Speed control techniques that can be designed or built into transportation systems include the use of road markings, texturing, medians, street narrowing, and other physical features. They often result in other "traffic calming" benefits such as reduced traffic volumes and noise levels in congested areas. High construction costs somewhat limit extensive use of these types of speed control measures.

Speed Bumps

Speed bumps are short bumps in a roadway used in parking lots, on private roads, and around universities. Their effectiveness at reducing speed is somewhat inconsistent, as drivers tend to slow down to reduce vehicle rocking while traveling over the bumps but will then increase their speeds between the bumps to make up for lost time. They increase the likelihood of vehicle damage and loss of control even when driving over them at low speeds. Speed bumps can be effective in lowering traffic volumes; however, they cause an increase in noise. They also cause problems for snowplows. Speed bumps have moderately high construction costs and little to no maintenance costs once constructed.

Road Humps

Road humps are typically 12 feet long and three to four inches high and can be safely crossed at speeds of 30 mph. Extensive testing has indicated that road humps are effective in reducing speeds on residential streets; that in the 85th percentile, speeds closely match the 25 mph speed limit used on most residential streets. Road humps are less likely than speed bumps to cause loss of control or vehicle damage caused by vehicles bottoming-out. Tests also showed a reduction in injury accidents and no statistically significant change in accidents on surrounding streets that could have been used as alternate routes. Speed bumps tend to reduce traffic volumes by discouraging through traffic on local neighborhood streets. Noise levels go down by slowing down traffic. Speed humps have moderately high construction costs and little to no maintenance costs once constructed.

Rumble Strips

Like road humps, rumble strips have been found to be effective in reducing average travel speeds and are less likely than speed bumps to cause loss of control or vehicle damage. Rumble strips typically consist of rows of raised metallic saucer-like elements affixed to the roadway which cause a mild rumbling under the vehicle and a significant amount of noise when driven over. The effect is to make motorists more aware of their speed and their surroundings with the intent of causing drivers to slow down. This in turn improves safety. Rumble strips have moderate construction costs and low maintenance costs once installed.

A significant disadvantage to this control measure is that it is difficult to construct a rumble surface that would not generate too much noise for adjacent residents. Raised metallic rumble strips also cause maintenance problems for snowplows and can be a hazard if dislodged.

Rumble strips can also be constructed by scoring the roadway pavement, which may be more desirable as they would create less noise. They would not result in a raised profile which would interfere with snowplows and there would be nothing that could become dislodged.

Median Barrier

The primary function of medians is to restrict conflicting turning movements by not allowing left turns from a travel lane into a driveway. Wide medians can also allow for turning pockets at intersections, provide pedestrian refuge, and reduce pavement width. Medians can be as narrow as two to four feet wide within a limited right-of-way.

Medians often slow traffic by giving the appearance of a parkway setting and narrow lanes. They improve safety and may increase the capacity of high-volume streets by limiting conflicting mid-block movements and channelizing traffic at complex intersections. They may improve safety at certain locations by making side street driveways right turn in and out only. Medians also increase pedestrian

safety and ability to cross wider streets by providing mid-street pedestrian refuge. Construction costs for medians are high; however, they have low maintenance costs once constructed.

Traffic Circle

Traffic circles are primarily used to reduce delay at intersections and improve safety. Traffic circles have advantages over traffic signals because they improve intersection operations, tend to have lower accident rates, less severe accidents, and cost less. Entry into traffic circles is continuous and controlled by yield signs. In many situations the capacity is similar to other intersection traffic control.

Traffic circles may reduce delays at intersections and can improve local street access as well as decrease speed depending on design. Traffic circles reduce the number of conflict points and the number and severity of crashes at some locations. Safety may be an issue in areas where drivers are not used to and are unclear about how to use them. Other disadvantages are that they may reduce the opportunity for pedestrians to cross roads and they can be intimidating to bicyclists. Traffic circles also have high construction costs.

Chokers and Road Narrowing

Lateral clearance on a roadway has been proven to have an effect on travel speeds, albeit a minor effect. The narrower a road is, the more slowly drivers tend to travel.

Where on-street parking exists, constructing sidewalks with curb extensions, or bulbs at intersections such that the sidewalk is extended to the end of the parking lane is an effective way to narrow a road. Narrower streets mean shorter crosswalk lengths, thus improving pedestrian safety by reducing the amount of time pedestrians are in the street. Narrow streets also shorten the pedestrian phase at signalized intersections, thus allowing a redistribution of green time to the traffic movements which need it most. They can also slow traffic in these areas.

Road narrowing usually does not result in reduced traffic volumes nor in reduced noise. This measure may cause problems for cyclists if the curb extension conflicts with a bike lane.

This improvement option can be made at a moderate to high construction cost. The cost of a single curb extension is about \$2,000. For all four corners of an intersection, the total cost would be about \$8,000. Once constructed, there is little to no maintenance required for this option.

Passive Controls

Passive speed control measures do not physically alter vehicle operation or speed. They typically consist of regulatory signs or signals and rely on driver compliance to be effective. This inherently makes them

less effective at controlling speeds than physical controls. Their relatively low construction costs, however, may make them more practical to implement on a large-scale basis.

Stop Signs

Experience in the United States over the years indicates that stop signs installed on local streets have little effect on speed except in the immediate vicinity of the signs. Tests found that motorists start to slow down 200 feet before the intersection and return to near normal speed about 100 feet past the stop point. Studies also showed that speeds between intersections are not significantly changed but tend to increase slightly after the installation of stop signs. In addition, some tests found that stop signs installed to control speed were disobeyed on a wide scale. When not forced to stop by a priority vehicle, few drivers came to a complete stop and many did not stop at all. The Manual on Uniform Traffic Control Devices requires that stop signs not be used for speed control.

Speed Limit Signs

Speed limit laws often specify general limits for residential streets, business districts, school zones, or rural areas. The laws usually recognize that safe speed varies from road to road and permit highway agencies to raise or lower speed limits on the basis of an engineering or traffic survey. The basic intent of speed zoning is to identify a safe and reasonable limit for a given road section or zone. The most widely accepted method of setting speed limits is the 85th percentile speed. This is the speed that 85 percent of traffic is moving at or below and reflects the safe speed for the given roadway conditions as determined by a large majority of drivers. The 85th percentile speed is in the speed range where the accident involvement rate is lowest.

Numerous studies have been carried out on the effects of speed limits. Studies on urban and rural roads indicate that speed limits have little or no effect on traffic speed and that drivers respond to changing roadway conditions more so than posted speed limits. A survey of drivers indicated that over three-fourths of the motorists indicated they drive at a speed that traffic and road condition will permit regardless of the posted speed limit. Although the motorists tended to think of speeding as one of the primary causes of accidents, they did not feel that going ten mph over the legal limit was very wrong. One speed study indicated that when the speed limit was raised to match the 85th percentile speed, there was essentially no change in speed. Where the speed limit was lowered, the spread in speeds increased and compliance dropped from 89 percent to 24 percent.

In summary, changing the posted speed limit can be done at a low construction cost with little to no maintenance problems or cost; however, lowering posted speed limits rarely results in actual reductions in speed. Speed zones need to be constantly enforced to be effective. Lowering the posted speed limit rarely results in improved safety because any safety benefits realized by slower speeds is negated by an increase in speed variance. Speed limits can also give pedestrians a false sense of security by expecting

drivers to obey signs. Changes to the posted speed limit are not likely to result in any changes in traffic volumes or noise either.

Traffic Activated Signs

Radar can be used to activate variable message signs when vehicles are traveling faster than the speed limit. These signs display the speed indication and the message SLOW DOWN or TOO FAST with flashing beacons to drivers exceeding the posted speed limit. Speed limit signs without beacons produced no significant reductions in speed. Some tests indicated that there was an increase in the speed variance with the speed violation sign. This is an unfavorable effect since it has been shown to increase the likelihood of accidents. Other tests indicated that speeds became more uniform. It is unlikely that a traffic activated sign would have any effect on traffic volumes or noise. These signs have moderately high construction costs and low maintenance costs.

Psycho-Perception Controls

Psycho-perception controls are those speed control measures that rely on drivers' attitudes, perceptions, and reactions to their surroundings. These include knowledge about speed enforcement, perceived safe traveling speed, and reaction to changes in the surrounding environment. They rely less on physically slowing vehicles or driver compliance with the law and more on the human psyche. Nonetheless, their benefits can be quantified and they make an important contribution to speed control.

Enforcement

In the presence of police enforcement, motorists tend to slow down. The magnitude of the speed decrease depends on the relative level of the speed limit and the perceived severity of the threat and enforcement. A marked police vehicle parked with lights flashing and simulating an arrest produces the largest reduction in speed. Stationary enforcement is more effective than moving enforcement in controlling speed. In most cases, the decrease in speed is less than three mph but reductions up to ten mph have been observed. As would be expected, the greater the number of enforcement measures present in a given area or the greater the frequency of presence, the greater the impact on the speed of traffic in that area.

The distance that the speed suppression effect extends from the enforcement measure depends on the frequency or strategy of patrol, the patrol method, the traffic situation, and other factors. In most cases, this distance is less than three miles either side of the measure, but there have been reports of an effect up to four miles upstream and ten miles downstream of the enforcement.

Enforcement also appears to have a carryover effect. That is, the speed suppression effect remains for some period of time after the enforcement unit is removed. The duration of this effect and the factors

which can alter it are not well defined, but are associated with driver communication and frequency of exposure.

Speed enforcement not only reduces speed but also has the tendency to reduce accident severity as well. Studies have shown that the variance of speed distribution is reduced by enforcement. The effect of enforcement on speed variance is of interest since it is related to accident involvement. Other studies have shown that the effect of enforcement is to shift the entire speed distribution in the direction of lower speeds without actually altering speed distribution.

Economic and manpower constraints usually prohibit widespread or long-term employment of speed enforcement measures.

Transverse Markings

Transverse markings consist of a series of pavement markings placed across the road. Pavement marking materials consist of paint, thermoplastic, or pre-cut adhesive backed lines. The spacing between the markings gradually decreases as the area of speed control is approached. The marking pattern is intended to give the illusion of high speed and cause drivers to slow down. Tests have shown transverse markings to be successful in producing speed reductions, especially for speeders, and to reduce speed-related accidents, as well as all accidents. The technique may not affect those who are familiar with the area.

Transverse markings do not result in a decrease in traffic volumes nor a decrease in noise. They can create a hazard to pedestrians and bicyclists because some markings are slicker than the normal pavement when wet. Providing painted markings can be accomplished at a low construction cost and do not require much maintenance beyond routine painting.

Crosswalks

Providing marked crosswalks is primarily to improve pedestrian safety. Sometimes crosswalks are effective in causing drivers to slow down when approaching intersections with marked crosswalks. Raised or textured crosswalks are more effective than painted crosswalks at producing this effect, as they act as speed humps; however, they could result in an increase in noise and are not recommended for streets with high traffic volumes. They could also create a safety hazard for bicyclists.

Marked crosswalks indicate to drivers that they are approaching an area of high pedestrian volumes and that they are expected to yield the right-of-way to pedestrians. Crosswalks make crossing streets more pleasant because they delineate and reinforce pedestrian crossing. Area businesses may consider this option a plus.

A danger associated with this improvement option is that marked crosswalks could give pedestrians a false sense of security, especially at unsignalized intersections.

Providing painted crosswalks can be accomplished at a low construction cost (approximately \$3 per linear foot) and do not require much maintenance beyond routine painting. Raised or textured crosswalks have higher construction costs and little to no maintenance costs.

Odd Speed Limit Signs

Differentiated speed limits and advisory speed limits can be considered “odd” speed limits. Differentiated speed limits can consist of different speed limits for day and night or different speed limits for cars and trucks. Advisory speed limits are often used to aid drivers in selecting safe speeds for hazardous locations such as curves, roadwork sites, intersections, and road sections with lower design speeds.

When different speed limits are used for day and night, the night speed limits are generally set at five to ten mph lower than day speed limits. There are no reports available on the effectiveness of these limits, although speeds are generally lower and accident risk has been found to be greater at night.

Different speed limits for cars and trucks have also been used. One study of differentiated speed limits indicated that the actual difference in car and truck speeds was less than the posted ten mph differential except on steep upgrades where trucks could not maintain speed. At most sites studied the actual difference between car and truck speeds was less than six mph.

Studies have indicated that drivers exceeded advisory speeds of 15 to 35 miles per hour but did not exceed 45 and 50 mph speed advisories. Advisory and regulatory 35 mph speed limit signs were shown to have little if any effect on speed compared to the standard curve sign. In general, drivers were not influenced by raising or lowering advisory speeds, but they were influenced by the sharpness of the curve. Additionally, drivers using a highway repeatedly, quickly learn the speed that curvature and road conditions will allow and advisory speeds can be expected to have little effect on them.

As with typical speed limit signs, odd speed limit signs can be installed at a low construction cost with little to no maintenance problems or cost; however, they rarely result in actual reductions in speed. These signs also have a tendency to be ignored, and are more subject to vandalism.

Vertical Elements Along Roadway

This option consists of adding a vertical architectural element to the sides of a two-lane highway within an urban area to give the appearance of narrowness. This technique, sometimes called “Gateway Treatment,” also gives drivers a sense of “place,” i.e., the feeling that they have entered an urban area with lower speed limits, on-street parking, conflicting pedestrian and bicycle movements, and increased highway access.

This treatment may improve pedestrian safety because it causes drivers to be more alert; however, it could also distract motorists' attention.

The most common and most aesthetically pleasing way of accomplishing this is with the use of trees in a landscaped strip along the highway's edge. Trees provide shade and improve the landscape. The subliminal effect of getting drivers to slow down when driving a stretch of highway treated in this way is best achieved when the trees consist of mature shade trees which provide a canopy over the road somewhat limiting peripheral vision; however, it takes many years for newly-planted trees to reach the maturity level needed to provide the desired effect. The disadvantages of using trees are that trees may conflict with utility lines and outdoor advertising, they may obscure traffic signs and limit sight distance, and trees with heavy leaves or fruit can create slippery conditions. Issues of maintenance including irrigation and drainage must be determined. Appropriate species must be selected so that roots do not disturb sidewalks.

Other vertical elements which could be used in place of trees are period street lamps, signs or even moving building lines closer to the highway edge to provide the illusion of a more narrow right-of-way. Care should be taken so as not to block drivers' sight distance.

This option is a popular improvement because of its aesthetic value, and because it does not compromise safety nor create negative noise impacts. This improvement option is estimated to have moderate to high construction costs; however, there is little to no maintenance required after construction.

Narrowing Lane Widths

Narrowing lane widths may slow traffic through the perceived higher risk of collision in narrower lanes. One study indicated no reduction in roadway capacity when changed from 12-foot-wide to 11-foot-wide lanes. This study noted a decrease in accidents; however, the reduction could not clearly be attributed to the lane modification. Another study of arterials and collectors suggests that for speeds of 30 mph, a 20-foot width is sufficient for a two-lane, two-way road.

Narrowing lane widths marginally shortens crossing distance and may increase pedestrian safety. This technique also has the effect of widening pedestrian space.

Significant narrowing is not feasible where through traffic volumes are close to road capacity. Lanes narrower than 11 feet on through, high volume streets may have higher accident rates. In addition, this technique may limit some truck movements depending on how narrow the streets are. There may also be a decrease in bicycle safety depending on how narrow the lanes are. Motorists may not wait, but attempt to move around a bicyclist even in narrow lanes. The presence of bike lanes might help although motorists might drive in bike lanes.

Narrowing lanes with the use of pavement markings can be accomplished at a low construction cost and little to no maintenance cost.

Bicycle Lanes

Bicycles should be accommodated on virtually all roadways. For most local streets, the traffic volume and speeds are low enough that bicycles and autos can safely share the same roadway. On collector streets and arterials, both the volume and speed of the automobile traffic is high enough that a designated space is needed for bicyclists. In urban areas where there are curbs, a six-foot bike lane is recommended for bicycles, and special care taken to secure safe bicycle passage through intersections. In rural areas without curbs and sidewalks, the typical recommended facility is a shoulder bikeway, where a six-foot standard paved shoulder is provided for bicycles. According to the Oregon Bicycle and Pedestrian Plan, the guideline for rural arterials with a design hour volume of less than 200 vpd is for a paved shoulder which is four feet wide.

Bicycle lanes also improve bicyclist safety and encourage more bicycle trips by improving the cycling experience by taking bike trips out of the general flow traffic lanes. Depending on the existing pavement width, bike lanes can be provided at a low construction cost simply by restriping an existing road (approximately \$0.40 per linear foot). If a roadway has to be widened to provide a bike lane or a paved shoulder, it can be done at a relatively high construction cost (approximately \$45 per linear foot for a facility five feet wide on both sides of the road, built to highway standards, with curbs and striping). After construction, little to no maintenance is required except for routine painting of pavement markings.

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