SHERMAN COUNTY
TRANSPORTATION SYSTEM PLAN

Including the cities of

Rufus, Wasco, Moro, Grass Valley

Adopted May 2003

Prepared for

Sherman County and the cities of

Rufus, Wasco, Moro, and Grass Valley

Prepared by

Sherman County Planning and Economic Development Department

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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 Sherman County 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 TSP constitutes the transportation element of the county's comprehensive plan and satisfies the requirements of the Oregon Transportation Planning Rule (TPR) 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 Sherman County TSP covers the incorporated Cities of Rufus, Wasco, Moro and Grass Valley and the unincorporated areas of Sherman County. Sherman County, established in 1899 includes the special district area of Biggs Junction and the unincorporated area of Kent. These two areas were established as a Rural Service Center and Rural Community respectively under a periodic review grant from the Department of Land Conservation and Development (LCDC) in 1998.

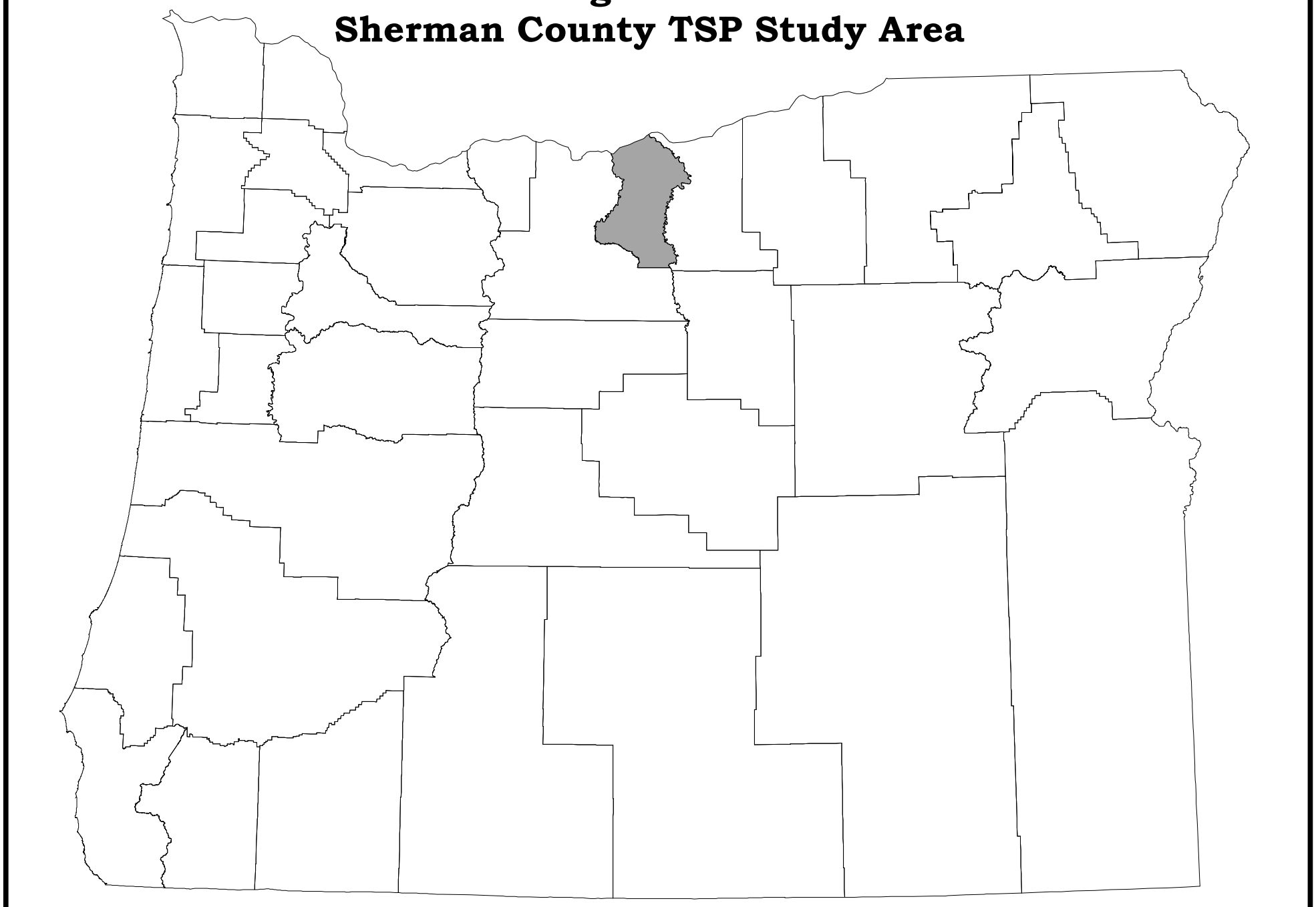
The planning area for the Sherman County TSP is shown on Figure 1-1[1]. The planning area for Cities of Rufus, Wasco, Moro and Grass Valley are shown on Figure 1-2. Roadways included in the TSP fall under several jurisdictions: the incorporated cities, Sherman County, and the State of Oregon. The TSP also addresses transportation issues specific to the Special District area of Biggs Junction as emphasized in the Biggs Junction Refinement Plan completed by ODOT in December 2000.

Sherman County is located in north central Oregon. It is 834 square miles in area. Although the county has a population of 1,990, nearly 60 percent of the population (1,155) is concentrated in the cities. Moro is the county seat and Wasco is the largest city in the county. The city populations are as follows; Rufus 290; Wasco 390; Moro 295 and Grass Valley 180.

The county is bordered by Wasco County to the west and south, Gilliam County to the east, and the Columbia River and State of Washington to the north. The elevation at Moro is 1800 feet above mean sea level and much of the county terrain transitions between deep valleys such as the John Day and Deschutes River Valleys and expansive smooth gentle slopes of the Columbia Plateau. The county

[1] All maps referenced in the transportation system plan are located in the back of the report in the map section.

Figure 1-1
Sherman County TSP Study Area



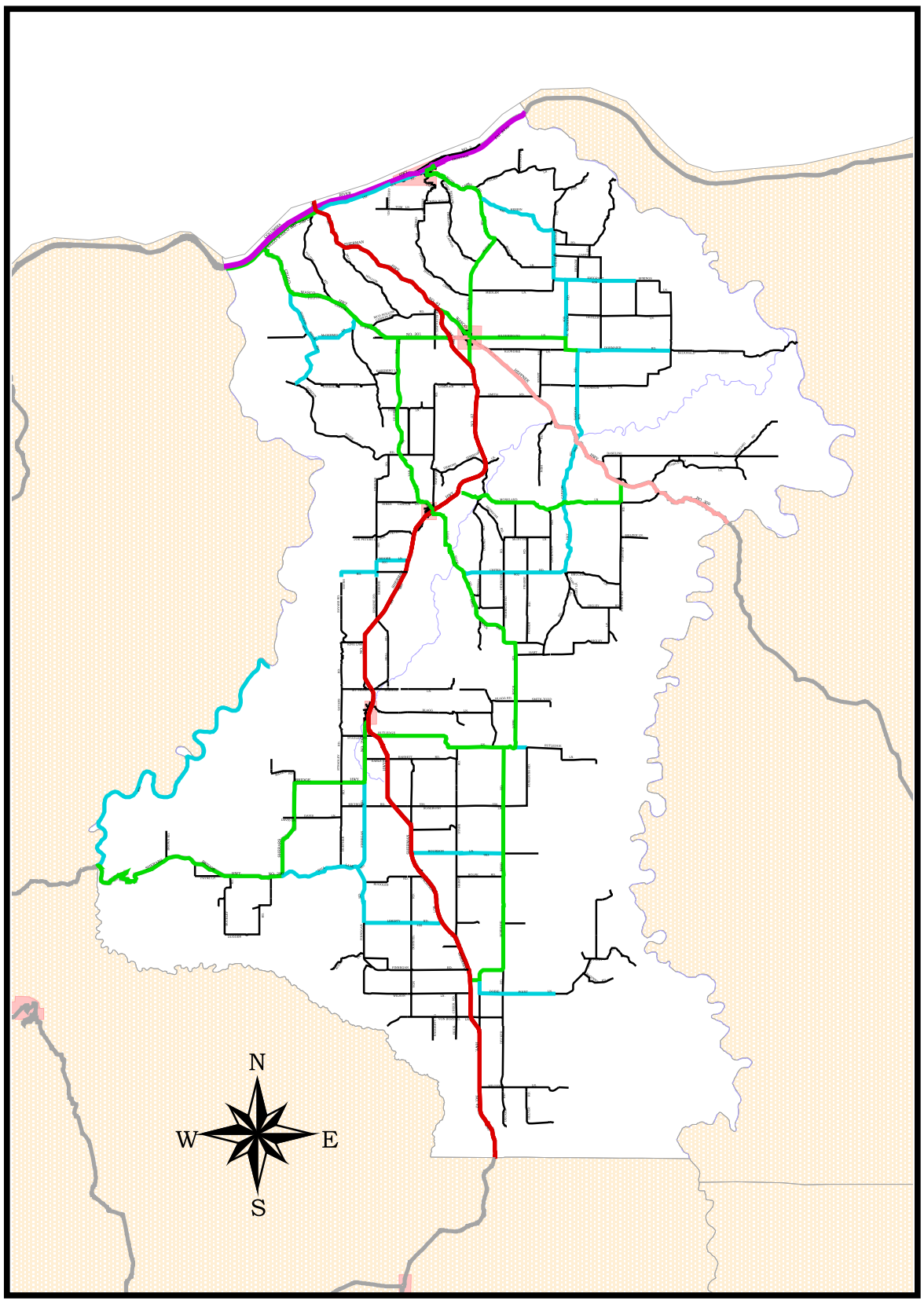


Figure 1-2
Municipal Planning Areas

sits in the heart of the Columbia Basin wheat area and receives only about 11 inches of precipitation a year.

The main east-west routes through the county are I-84 and OR 206 (Wasco-Heppner Highway). I-84 & old US Highway 30 run through Biggs Junction and Rufus. The main north-south route is US 97 which connects the cities of Grass Valley, Moro, and Wasco. US 97 serves as the main street through Grass Valley and Moro, and by-passes Wasco approximately 1/2 mile to the west of the city. OR 206 connects Wasco with the city of Condon in Gilliam County and continues west to join old US Highway 30 at Fulton Canyon.

Sherman County's economy is based primarily in agriculture. There are approximately 175 farms with an average farm size of about 2,700 acres. Wheat, barley, and beef cattle form the principal crops. The county's largest individual non-governmental employers are located along the I-84 Commercial area and include Grand Central Station, Jack's Fine food and Mini-Market, Dinty's Hotel and Mini-Market, the Riviera Hotel; Biggs Cafe and Truck-stop; Bob's Texas T-bone (Rufus) and several gas stations.

Additionally within the county, Mid-Columbia Producers, the Columbia River Egg farm, Pioneer Implement, Morrow County Grain Growers and Sunrise Sanitation provide employment. Hunting, fishing, and tourism are important secondary industries and each city is served by a local market and restaurant and Grass Valley has a Gas Station/Truck stop serving the US 97 southern corridor within Sherman County.

PLANNING PROCESS

The Sherman County TSP was prepared as part of an overall countywide transportation planning and includes all four municipalities: the Cities of Rufus, Wasco, Moro and Grass Valley. The plan was developed through a series of technical analyses combined with systematic input and review by the county, the cities, the local Citizen's Advisory Committee (CAC), the Technical Advisory Committee (TAC), ODOT, and the public.

The TAC consisted of the local public works staff from each city, County Planning staff, the County representative for Emergency Management; the Lower John Day Safe Communities representative, the County Road Master, and ODOT. The CAC was made up of people on the County Economic Development Commission and consisted of elected and appointed officials, business people, and

residents from Sherman County and the Cities. The County Economic Development Department personnel staffed both committees. Key elements of the process include:

- Involving the Sherman County community (Chapter 1)
- Defining goals and objectives (Chapter 2)
- Reviewing existing plans and transportation conditions (Chapters 3 and 4; Appendices A-D)
- Developing population, employment, and travel forecasts (Chapter 5; Appendices E and F)
- Developing and evaluating potential transportation system improvements (Chapter 6)
- Developing the Transportation System Plan and Capital Improvement Program (Chapter 7)
- Developing Funding Options and a Financial plan (Chapter 8; Appendix G)
- Developing recommended policies and ordinances (Chapter 9)

COMMUNITY INVOLVEMENT

Community involvement was an integral component in the development of the Sherman County TSP. 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.

The Sherman County Economic Development Department, ODOT staff and the TAC provided guidance on technical issues and direction regarding policy issues. A joint meeting of the TAC and the Sherman County Economic Development Commission was held was held on September 14, 2000 in Moro at the County Courthouse. The purpose of the meeting was to acquaint everyone with the process and to invite the Commission to serve as the county representatives for the CAC with other interested citizens.

The first public meeting was held October 12, 2000. The general public was invited to learn about the TSP planning process and provide input on transportation issues and concerns. At this meeting the commission decided to send out a survey asking residents to submit their concerns for road issues. A survey was drafted by staff and sent out with the County Court newsletter on October 19, 2000 to every registered voter in the county.

A second public meeting was held in Moro at the County Emergency Management Office on December 6, 2000 to review maps, road survey responses and Chapters 1 through 4 of a sample TSP. The commissions reviewed the responses and added extra comments of their own. Responses to the survey with additional comments from the CAC & TAC are included in Chapter 2.

The third part of the community involvement process involved formal presentations before elected officials within the county. The first presentation to the city of Grass Valley City Council was made in February 5, 2001. The City of Wasco meeting was held on February 20, 2000; Rufus on February 26, 2000 and Moro on March 8, 2001 to review and discuss the TSP.

A second presentation will be made in June 2001 and involve formal adoption of the TSP by the County and Cities. The public will be notified of the meetings through public announcements in the local newspapers.

GOALS AND OBJECTIVES

Based on input from the county, the CAC/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 Sherman 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 Sherman County, including the street system improvements planned and implemented in the past, and how the county is currently managing its ongoing development. A brief review of existing plans and policies are described in this Chapter with a more detailed review presented in Appendix A of this report.

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. Appendix B summarizes the inventory of the existing arterial and collector street system and Appendix C provides an inventory of the county road network.

Future Transportation System Demands

The Oregon Transportation Planning Rule requires the TSP to address a 20-year forecasting period. Future traffic volumes for the existing plus committed transportation systems were 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 evaluations 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). The potential improvements were evaluated in Chapter 6 and recommended for short-range (0-5 years), intermediate-range (5-10 years), and long-range (10-20 years) implementation.

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 improvement evaluation described above. The bicycle and pedestrian plans were developed based on current usage, land use patterns, and the requirements set forth by the TPR. 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 and presents the overall Capital Improvement Program (CIP) listing prioritized projects to be implemented over the 20-year planning horizon.

Funding Options

Sherman County will need to work with ODOT and the incorporated jurisdictions to finance new transportation projects over the 20-year planning period. Overviews of funding and financing options that may 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. The county and the cities will need to consider amending their comprehensive plan policies and zoning codes as part of the TSP adoption process.

RELATED DOCUMENTS

The Sherman County TSP addresses the regional and rural transportation needs in the county as well as the incorporated Cities of Moro, Grass Valley, Rufus, and Wasco located within Sherman County. There are several other documents that address specific transportation elements or areas in Sherman County. These documents were reviewed to ensure that the Sherman County TSP is consistent with other transportation policies and plans already in effect or being developed. This section lists the applicable documents that were reviewed while a brief summary of the document elements that pertain to transportation planning, policies, and operations is outlined in Appendix A.

County and City Planning Documents

- Sherman County Comprehensive Plan, Zoning and Land Development Ordinance
- City of Moro Comprehensive Plan, Zoning and Land Development Ordinance
- City of Grass Valley Comprehensive Plan, Zoning and Land Development Ordinance
- City of Rufus Comprehensive Plan, Zoning and Land Development Ordinance
- City of Wasco Comprehensive Plan, Zoning and Land Development Ordinance

Other State Plans

- Oregon Transportation Plan
- Oregon Highway Plan
- Oregon Bicycle and Pedestrian Plan
- Oregon Public Transportation Plan
- Oregon Rail Freight Plan
- Oregon Transportation Safety Action Plan
- Oregon Aviation Plan

Other Plans

- US Highway 97 Corridor Plan - Draft
- Biggs Junction Refinement Plan - Phase 1

Administrative Rules

- OAR 734.051 - Access Management
- OAR 660.012 - Transportation Planning Rule

CHAPTER 2
GOALS AND OBJECTIVES

The purpose of the TSP is to provide a guide for Sherman County to meet its transportation goals and objectives. The following goals and objectives were developed from information contained in the county's and cities' comprehensive plans and public concerns as expressed during public meetings. ODOT's US Highway 97 draft Corridor Plan and Biggs Junction Refinement Plan were also considered. An overall goal was drawn from the plan, 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 accommodate the efficient movement of people, goods and services while maintaining the livability of existing communities within the county by encouraging development within communities and rural service centers, protecting the integrity of the environment, enhancing travel safety and supporting economic development within the county, region and the state.

Overall Direction

The role of and management solutions for the auto differ throughout the Corridor. In the urban area, it is one of many possible travel choices. In the rural area, in many cases the automobile is the only transportation mode available, making the rural portion of the Corridor more reliant on automobile travel.

In the rural areas, it is recognized that the automobile will, out of necessity, continue to be the overwhelmingly dominant mode for moving people in the Corridor. Travel distances between residences and destinations are generally too great for bicycling and walking. The absence of transit service reduces travel options for those without ready access to an auto in rural areas. Generally, the management approach is to:

Focus on management, maintenance, operations and service improvements in the county, rather than modernization and large capital improvements.
Reduce auto/truck conflicts through the strategic use of passing and climbing lanes on US 97.
Establish a Special Transportation Area in Moro to improve safety for a variety of modes – trucks, bicycles, pedestrians and autos.

Continue to develop transportation alternatives that reduce reliance on the auto.

POLICIES:

General

1. Maintain and upgrade the overall transportation system within the county and cities to meet present and future needs.
2. Cooperate with ODOT in the implementation of the STIP.
3. Take advantage of federal and state highway funding programs.
4. Increase the use of alternative modes of transportation (walking, bicycling, rideshare/carpooling, and dial-a-ride transit) through improved access, safety, and service within urban areas and rural service centers within the county.
5. Ensure planning coordination between the local jurisdictions, the county and the state.
6. Seek Transportation and Growth Management (TGM) and other funding for projects evaluating and improving the environment for alternative modes of transportation.
7. Develop and upgrade transportation facilities in such a manner consistant with the adopted Oregon Transportation Plan (OTP), The Oregon Highway Plan (OHP), and the Transportation Planning Rule (TPR), and insure that valuable soil, water, scenic, historic, or cultural resources are not damaged or impaired.
8. Encourage citizen involvement in identifying and solving local problem spots.
9. Work with the local jurisdictions in establishing cooperative road improvement programs, funding alternatives, and schedules.
10. Comply with all applicable state and federal noise, air, water, and land quality regulations.
11. Promote alternative modes and rideshare/carpool programs through community awareness and education.
12. The general policy of the Planning Commission will be to not create any traffic hazard in the granting of variances, conditional uses permits, and zone amendments.
13. Encourage active pedestrian and bicycle use within urban areas and along state highways.
14. Promote use of available dial-a-ride transit, carpooling, and telecommuting.

Auto

15. Preserve the function, capacity, level of service, and safety of the state highways and local roads in a manner consistent with the adopted OTP, OHP, TPR, draft US Highway 97 Corridor Plan, and the February 2001 Biggs Junction Refinement Plan.

16. Adopt access management standards that will meet the requirements of the TPR, the OHP, US Highway 97 Corridor Plan, Biggs Junction Refinement Plan, and Oregon Administrative Rule (OAR) 734-051, and also consider the needs of the affected communities.
17. Provide for safe and efficient high-speed continuous flow operation in rural areas (a V/C of 7.0 or less) and moderate-speed operations of flow in the urban areas of Rufus, Wasco, Moro and Grass Valley and the rural development centers of Biggs Junction and Kent (a V/C ratio of 0.75) and 0.85 within an STA.
18. Improve and maintain all existing public roadways to: 1) achieve a pavement condition of 70% in fair or better condition, 2) provide bike lanes on all arterials within urban areas, 3) provide shoulder widths adequate to accommodate bicycles on rural arterial and major collectors, and 4) provide crosswalks when warranted.
19. Improve the access on to and off of arterial roadways to accommodate projected growth in a manner consistent with adopted comprehensive plans and implementing regulations.
20. Encourage development to occur within existing urban area and rural service centers where services are presently available so as to reduce the dependence on automotive transportation.
21. Provide adequate signage along major and minor county roads for the purpose of easy identification.
22. Adopt policies and standards that address street connectivity, spacing, and access management.
23. Work with the local jurisdictions in establishing the right-of-way needed for new roads identified in the TSP.
24. Ensure that roads created in land division and development be designed to tie into existing and anticipated road circulation patterns.
25. Direct commercial development and use access onto major arterials by means of improved county roads.
26. Continue to develop and maintain the road system as the principal mode of transportation both for access to the county and within the county.
27. Review and revise, if necessary, street cross section standards for local, collector, and arterial streets to enhance safety and mobility.
28. Analyze the safety of traveling speeds and consider modifying posted speeds as necessary.
29. Expanded shoulder areas, and pull-outs along U.S. 97.
30. Design all transportation improvements to preserve and enhance natural and scenic resources, i.e., new roads should not be constructed in areas identified as sensitive wildlife areas.
31. Retain countywide school bus service.

Bicycle

32. Incorporate balanced opportunities for bicyclists in new or reconstructed transportation facilities.
33. Develop a county bicycle plan.
34. Identify needs for bike lanes in urban areas and develop programs to fulfill needs.
35. Support maintenance of State highways as a bicycle routes, with use of local parallel routes as alternative routes where feasible.
36. Undertake bicycle facility improvements, such as establishing bike lanes and paths, where appropriate, within the cities of Rufus, Wasco, Moro, and Grass Valley that will balance the need for safe and convenient bicycle travel within the communities against the need to preserve through movement of traffic on the roadway.
37. Support widening shoulders as for bicycle travel as part of roadway preservation and improvement projects or as separate projects. Where feasible, provide standard continuous five-foot (4-foot at a minimum) shoulders on all State highways.
38. Emphasize shoulder maintenance (surfacing, cleaning, vegetation removal), particularly in the peak summer cycling months.

Pedestrian

39. Provide pedestrian facilities, such as establishing sidewalks and paths, where appropriate, within the cities of Rufus, Wasco, Moro, and Grass Valley that connect residential areas with important destinations such as parks, schools, commercial areas and community buildings.
40. Identify needs for sidewalks in urban areas and develop programs to fulfill needs.
41. Encourage development of connective sidewalk systems in commercial areas, and along arterials, and major and minor collectors within urban areas.
42. All pedestrian facilities and crossings should be accessible to people with disabilities to meet the standards of the Americans with Disabilities Act.
43. Examine the need for specific pedestrian crossing locations in urban areas.
44. Sidewalks should be buffered from the Highway with adequate landscaping, shoulders, and/or parking in areas with design speeds of 45 mph or above.
45. Within the corridor's urban section, provide, at a minimum, six-foot sidewalks to increase mobility and safety of pedestrian activities.
46. Where feasible, provide separation between pedestrians and autos through access management and landscaping, or street design guidelines within urban areas.
47. Provide adequate shoulders on rural collector and arterial roads to support biking and walking.

48. Incorporate traffic calming measures (curb extensions, raised medians, landscape treatments) within designated Special Transportation Areas as part of new highway projects or major reconstruction. Retrofit projects should be programmed based on need.
49. Provide adequate pedestrian warning signs in rural service centers.

Public Transit

50. Support OTP policies to develop a "seamless" public transportation system over time with multimodal alternatives and proper facilities.
51. Work with existing inter-city bus districts and special needs transportation operations to maintain or increase bus service frequency.
52. Explore potential for a new passenger collector depot station, where local service providers from the surrounding counties (Sherman, Gilliam and Wheeler) could meet and transfer passengers to larger busses bound for The Dalles and other destinations.
53. Ensure that adequate services are provided for the transportation disadvantaged in the Corridor.
54. Provide paratransit, dial-a-ride service to all residents within the county matched to the availability of financial resources.
55. Coordinate paratransit service with other providers and between modes within and outside the corridor to optimize use of equipment and minimize costs to government and the user.
56. Enhance and/or maintain regularly scheduled commercial transit service along the corridor.
57. Support local efforts to establish a public or private bus passenger terminal at Biggs Junction.

Rail Freight

58. Retain and promote rail freight service along I-84 and southward along the Deschutes River in a manner consistent with the OTP and adopted Oregon Rail Freight Plan.
59. Support long-term improvements in connections to major agricultural distribution facilities in Biggs and Moro.
60. Partner with carriers and receivers to facilitate transfer of highway freight to rail where economically feasible.
61. Work with the Burlington Northern/Santa Fe and Union Pacific railroads and Sherman County staff, key businesses, and other interested parties to explore redevelopment of a truck/rail distribution facility in Biggs.

Truck Freight

62. Provide for safe and efficient high-speed continuous flow operation in rural areas and moderate-speed operations of flow in urban and urbanizing areas and rural development centers.
63. Partner with carriers and receivers to facilitate transfer of highway freight to rail where economically feasible.
64. Identify truck routes to focus truck traffic to a limited number of roads in urban areas.
65. Support long-term improvements in connections to major agricultural distribution facilities in Biggs.
66. Support construction of additional truck climbing/passing lanes on US 97.
67. Support truck access to industrial sites, including turn and acceleration/deceleration lanes where appropriate.
68. Support improvements to US 97 Interchange with I-84 in Biggs Junction to improve overall operation of the interchange as part of the Statewide Freight System.

Water Transport

69. Actively encourage development of enterprises and commerce in the Port at Biggs Junction.
70. Maintain travel times for the movement of freight through the corridor to port facilities.
71. Support improvements to access and intermodal connections to port facilities.

Air Transport

72. Protect the Wasco State Airport from the encroachment of incompatible land uses to ensure efficient aviation operations and to minimize the noise and safety problems for the general public in a manner consistent with the adopted Oregon Aviation Plan.

CHAPTER 3
TRANSPORTATION SYSTEM INVENTORY

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

ROADWAY 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. 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 all American cities is the roadway system. This trend is clearly seen in the existing Sherman County transportation system, which consists predominantly of roadway facilities for cars and trucks. 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 road system inventory was reviewed for all highways, arterial roadways, and collector roadways within Sherman County that are included in the TSP planning area. Appendix B lists the complete inventory for state highways while Appendix C lists the county road inventory. ODOT and the Economic Development Department prepared the state highway inventory, and the Sherman County Road Department prepared the county road inventory.

Roadway Classification

The roads in the unincorporated or rural areas of Sherman County fall under two jurisdictions: county and state. The state highways generally function as major or principal arterials through the county. Figure 3-1 shows the existing functional classification of the state and county road system.

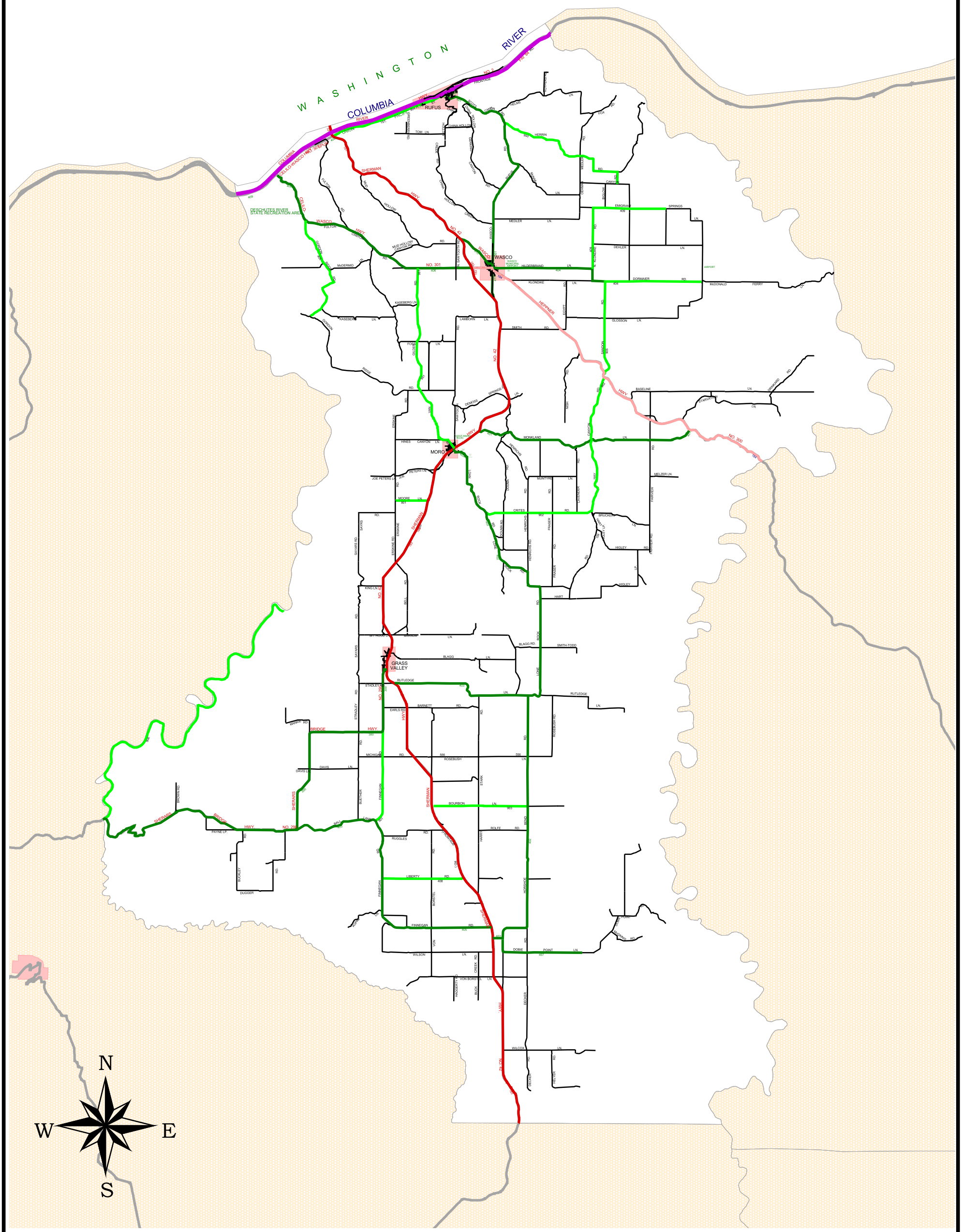


Figure 3-1
Existing Functional Classification of Roads
Sherman County, Oregon

County Roads

Although the state highway system forms the backbone of the roadway system in Sherman County, county roads are a vital part of the circulation system.

Description:

Sherman County has 127 roads under its jurisdiction covering approximately 471 miles. Of these roadway miles, approximately 125 miles (26.5 percent) are paved, another 291 miles (62 percent) are gravel, and the remaining 55 miles (11.5 percent) are dirt roads. These roadways are an integral part of the transportation system. In addition to providing alternate or more direct routes than the state highways, they also serve rural areas, connecting them with each other, state highways, recreational areas, and cities.

County roads are generally two lanes wide. Paved roads are generally 24 feet wide with two-foot gravel shoulders on both sides, and gravel roads are generally 20 feet wide with no shoulders.

The Sherman County Road Department follows ODOT's roadway classification system for all roads under county jurisdiction dividing county roads into three classification levels: major collector, minor collector, and local street. Only state highways are classified at the arterial level. Of the 471 miles of county roads, 49 miles are classified as major collectors and 35 miles as minor collectors. The remaining 387 miles of county roads are classified as local roads.

Maintenance:

Sherman County has not adopted a formal county roadway maintenance program. Typical of larger primarily rural counties in Oregon with limited budgets and personnel, the county has worked to develop maintenance processes that make sense and are manageable for the size of the county and its associated road system. The county primarily addresses roadway maintenance on an "as needed" basis. They develop prioritized project lists each year through roadway inspection by maintenance crews and through the help of citizens that inform the county of maintenance needs, especially in rural areas not routinely traveled by maintenance personnel. Like many counties, Sherman County's maintenance department is responsible for all aspects of road maintenance including, but not limited to, pavement rehabilitation, roadway signing and lighting needs, ditch and culvert clearing, pavement marking, and more.

Sherman County has classified all county roads into five prioritized maintenance classes. Although the maintenance classes are generally not defined by specific routine maintenance activities, the classification system does focus the priority of county maintenance resources where most needed.

Class I: These roadways are the highest traffic use market roads.
Class II: These roadways are moderate traffic use market roads.
Class III: These are moderate traffic use roads requiring grading once a year.
Class IV: These are low traffic use roads receiving infrequent maintenance "as needed."
Class V: These limited traffic use roads receive emergency maintenance only.

The Sherman County maintenance department consists of a working Roadmaster and six (6) additional crew-members and is based in Moro. The Sherman County Roadmaster provided insight into typical maintenance practices within the county.

Paved Roads - The county has not been paving new roads and is not likely to in the near future, primarily due to budget constraints. The county approaches maintenance of paved roads on an "as needed" basis without any formal routine or preventive maintenance plan. Maintenance activities range from filling potholes to overlays.

Gravel Roads - Gravel roads in Sherman County receive perhaps the most routine maintenance. According to the Roadmaster, the majority of gravel roads in the county are "bladed" twice annually: once in the spring and once in the autumn.

Dirt Roads - All county roads listed as dirt roads in the county roadway inventory are generally only graded to a minimal width to provide access to adjacent properties. The county approaches maintenance of dirt roads on an "as needed" basis without a formal routine or preventive maintenance plan.

The county additionally provides road maintenance services to the cities of Rufus, Wasco, Moro and Grass Valley. The county performs roadway maintenance on some city streets and provides some snow removal service during the winter months for the roads that are heavily traveled, such as bus routes and emergency service vehicle accesses.

Existing Rural Roadway Standards:

Roadway 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. Roadway 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. Table 3-1 summarizes existing street design standards, to be used in the County. The county's existing street standards are limited to right-of-way and pavement width on Cul-de-sac's and do not specify standards for provision of sidewalks, bike lanes, or on-street parking.

Table 3-1
EXISTING RURAL STREET DESIGN STANDARDS

Roadway Classification	Minimum Right of Way Width (ft)	Minimum Pavement Width (ft)
Arterial	NA	NA
Collector Street	NA	NA
Continuous Minor Street	NA	NA
Minor Street less than 2,400'	NA	NA
Radius for cul-de-sac turn-around *	60	45

** Source: Sherman County Zoning Ordinance, Pg. 123-125.*

The majority of paved Sherman County roads are 22-24 feet wide with 2-foot to 4-foot gravel shoulders. Gravel roads are of a similar roadway and shoulder width. The Cities of Rufus, Wasco, Moro and Grass Valley do not have separate street design standards.

State Highways

State highways function as arterial major collector streets forming the primary roadway network within and through a region. They provide a continuous road system that distributes traffic between cities. Generally, major arterial streets are high capacity roadways that carry high traffic volumes with minimal localized activity. In Sherman County, US 97 is classified as a major arterial and serves statewide, regional, and local traffic demands.

OR 206 from Wasco to the John Day River is classified as a minor arterial and serves regional and local traffic demands. OR 206 from the Deschutes River to Wasco is classified as a major collector, like a minor arterial, serves regional and local traffic demands. The primary difference between the two is daily traffic volume. Finally, OR 216 is also classified as a major collector.

Discussion of the Sherman County street system must include the state highways that traverse the planning area. Although Sherman County has no direct control over the state highways, the highways

heavily influence adjacent development as well as traffic patterns. Five state highways as listed below serve Sherman County. These highways serve as the major routes through the county with urban development focused along the corridors. Table 3-2 lists the highways within Sherman County.

TABLE 3-2
STATE HIGHWAYS

State Route Number	Highway Name	ODOT Highway Number
I-84	Columbia River Highway	2
US 97	Sherman Highway	42
OR 206	Celilo-Wasco Highway	301
OR 206	Wasco-Heppner Highway	300
OR 216	Shears Bridge Highway	290

The ***1999 Oregon Highway Plan*** (OHP) classifies the state highway system into five categories to guide planning, management, and investment decisions. The five categories of highways are interstate, statewide, regional, district, and local interest.

Sherman County has one highway classified as interstate: I-84; one highway classified as statewide: US 97; one highway classified as regional: OR 206 (Wasco-Heppner); two highways classified district: OR 206 (Celilo-Wasco) and OR 216; and unclassified or local interest roads: OR 206 Spur (Celilo-Wasco Highway to Biggs Junction) and the I-84 Frontage Road (Biggs-Rufus Highway).

According to the OHP, the primary function of an ***interstate highway*** is to "provide connections and links to major cities, regions of the state, and other states." The management objective for interstate highways is to "provide for safe and efficient high-speed, continuous-flow operation in urban and rural areas."

The primary function of a ***statewide highway*** is to "provide inter-urban and inter-regional mobility and provide connections to larger urban areas, ports, and major recreational areas that are not directly served by Interstate Highways." "A secondary function is to provide connections for intra-urban and intra-regional trips." The management objective for interstate highways is to "provide for safe and efficient high-speed, continuous-flow operation. In constrained and urban areas, interruptions to flow should be minimal. Inside Special Transportation Areas (STAs), local access may also be a priority."

The primary function of a ***regional highway*** is to "provide connections and links to areas within regions of the state, between small urbanized areas and larger population centers, and to higher level facilities." A secondary function is to serve land uses in the vicinity of these highways. The management objective for regional highways is to "provide for safe and efficient high-speed,

continuous-flow operation in rural areas, except where there are significant environmental constraints, and moderate to low-speed operation in urban and urbanizing areas with moderate interruptions to flow."

The primary function of a ***district highway*** is to "serve local traffic and land access." For highways of district significance, emphasis is placed on preserving safe and efficient higher speed through travel in rural areas, and moderate- to low-speed operations in urban or urbanizing areas with a moderate to high level of interruption to flow. This means that design factors such as controlling access and providing passing lanes are of primary importance. The management objective for regional highways is to "provide for safe and efficient moderate to high-speed, continuous-flow operation in rural areas reflecting the surrounding environment, and moderate to low-speed operation in urban and urbanizing areas with moderate interruptions to flow."

The function of local interest roads serve little or no purpose for through traffic mobility. Some are frontage roads; some are not eligible for federal funding. Currently, these roads are District Highways or unclassified. The management objective is to provide for safe and efficient, low to moderate speed traffic flow and for pedestrian and bicycle movements. Inside STAs, local access is a priority. ODOT will seek opportunities to transfer these roads to local jurisdictions.

I-84 (Columbia River Highway):

I-84 (Columbia River Highway) is a highway of interstate importance. Beginning in Portland at the junction of Interstate 5 near the Willamette River, the highway winds through the Columbia River Gorge and Eastern Oregon before continuing into Idaho. I-84 is the main east-west highway through central Oregon. Throughout Sherman County, I-84 operates as a four-lane freeway with two travel lanes in each direction. The posted speed is 55 mph for trucks and 65 mph for other passenger vehicles. Roadway shoulders on the left side of the highway in each travel direction are generally two to four feet wide and paved. Roadway shoulders on the right side of the highway in each travel direction are generally eight to ten-feet wide, paved, and more than adequate to accommodate bicyclists. Shoulders on both sides constrict to two to four feet wide when crossing most bridges.

Throughout much of Sherman County, the expansive Columbia River to the north and steep mountain slopes to the south border the highway. Both travel directions are adjacent and separated by a concrete median and the highway shoulders are lined with intermittent paved vehicle pullouts. Throughout Sherman County the highway is primarily grade-separated.

US 97 (Sherman Highway):

The US Highway 97 (Sherman Highway) traverses Sherman County in a north-south direction. Starting at Biggs Junction at I-84 and the Columbia River, US 97 connects al the cities in Sherman County to major population centers in Central Oregon as well as provide connections to Portland to the west, Boise, Idaho to the east, and Yakima, Washington to the north.

US Highway 97 is the primary transportation facility in the county, serving automobile, truck, public transportation, bicycle and pedestrian modes. As part of the State's Scenic Byway Program, US 97 from Biggs Junction to Shaniko was designated the "Journey Through Time" Scenic Byway. Part of the US 97 route includes the "Barlow Road Cut-off" of the Oregon Trail.

US Highway 97 provides important interstate, regional and local transportation linkages. The highway is used as a major truck route for the Western United States, and provides relatively shorter, more direct access for goods moving between California, the Willamette Valley, Central Oregon, eastern Washington, northern Idaho and points east. It also serves as an alternative to I-5 for goods moving between California and Washington.

In the 1999 Oregon Highway Plan, US 97 is also designated as a statewide freight route. The existing use of US 97 and its designation as a scenic byway and freight route present unique challenges in planning for the long-term management, operation, and maintenance of the highway.

US Highway 97 provides the major economic link for Central Oregon communities and serves as the primary facility for moving people, goods and services in the region. It supports the region's economic base, which primarily consists of timber, tourism and agriculture. The northern region plays an important role in the production and distribution of wheat, oats and livestock.

OR 206 (Wasco-Heppner Highway):

OR 206 begins at the connection to US 97 just west of the City of Wasco and runs northwest - southeast to the City of Condon and into Morrow County. OR 206 is a highway of regional importance and serves as the primary farm to market route between Sherman County and Condon. The highway shares alignment with Armsworthy Street and Scotts Canyon Road in Wasco and with Bayard, Walnut, and Main Streets in Condon. In both cities, the highway serves as the main street through town, forming the downtown business core.

The highway is a two-lane roadway with a posted speed of 55 mph except within the city limits of Wasco and Condon. The route is comprised of numerous curves and moderate grade changes resulting in localized rural speed reductions ranging from 35 to 45 mph. Although the highway traverses fairly steep intermittent upgrades in both directions, there are no passing lanes along the highway within Sherman County. The highway has roadway shoulders on both sides of the highway that are typically one foot or less in width and partially paved. The substandard shoulder width (4' paved shoulders is the State adopted minimum standard in rural areas) does not provide for a bicycle system along the highway.

OR 206 (Celilo-Wasco Highway):

OR 206 is a highway of district importance. Beginning at the connection to I-84 at Celilo Village in Wasco County, OR 206 parallels I-84 across the Deschutes River into Sherman County. OR 206 continues to parallel I-84 for approximately two miles to the mouth of Fulton Canyon. OR 206 then travels in a Southeast direction up Fulton Canyon to US 97 just west of the City of Wasco a distance of approximately 10 miles. Within Sherman County, the highway is a two-lane roadway with a posted speed of 55 mph. The route is comprised of numerous curves and severe grades resulting in localized rural speed reductions ranging from 15 to 30 mph. The highway has shoulders on both sides of the roadway that are typically four or less in width and partially paved. Due to narrow paving and the presence of loose gravel the shoulders are not adequately designed to accommodate bicycle use.

OR 216 (Shears Bridge Highway):

OR 216 is a highway of district importance. The highway enters Sherman County from Wasco County on a fairly steep ascent from the Deschutes River bordered by steep slopes. After approximately eight miles through mountainous terrain with severe grades and numerous sharp curves, the highway emerges into an expansive plateau with rolling terrain. Within Sherman County, the highway is a two-lane roadway with a posted speed of 55 mph. The route is comprised of numerous curves and moderate grade changes resulting in localized rural speed reductions ranging from 15 to 30 mph. Although the highway traverses steep grades in both directions, there are no passing lanes along the highway within Sherman County. The highway has no paved shoulders on both sides of the roadway. The absence of paved shoulders and poor sight distance does not provide for adequate accommodation for bicycle use.

Pavement Conditions

All Oregon State highways are surveyed and assessed annually to determine current pavement conditions. The five pavement condition categories used include Very Good, Good, Fair, Poor, and Very Poor. A brief definition of the pavement condition categories used by ODOT for both asphalt and Portland cement concrete pavements is provided.

Very Good:

Asphalt pavements in this category are stable, display no cracking, patching or deformation and provide excellent riding qualities. Nothing would improve the roadway at this time.
Concrete pavements in this category provide good ride quality, display original surface texture, and show no signs of faulting (vertical displacement of one slab in relation to another). Jointed, reinforced pavements display no mid-slab cracks and continuously reinforced pavements may have tight transverse cracks with no evidence of spalling (or chipping away).

Good:

Asphalt pavements in this category are stable and may display minor cracking (generally hairline and hard to detect), minor patching, and possibly some minor deformation. These pavements appear dry or light colored, provide good ride quality, and display rutting less than ½ inch deep. Concrete pavements in this category provide good ride quality. Original surface texture is worn in wheel tracks exposing coarse aggregate. Jointed, reinforced pavements may display tight mid-slab transverse cracks, and continuously reinforced pavements may show evidence of minor spalling. Pavements may have an occasional longitudinal crack but no faulting is evident.

Fair:

Asphalt pavements in this category are generally stable while displaying minor areas of structural weakness. Cracking is easier to detect, patching is more evident (although not excessive), and deformation is more pronounced and easily noticed. Ride quality is good to acceptable. Concrete pavements in this category provide good ride quality. Jointed, reinforced pavements may display some spalling at cracks and joint edges with longitudinal cracks appearing at less than 20 percent of the joints. A few areas may require a minor level of repair. Continuously reinforced pavements may show evidence of spalling with longitudinal cracks appearing in the wheel paths on less than 20

percent of the rated section. Shoulder joints may show evidence of deterioration and loss of slab support and faulting may be evident.

Poor:

Asphalt pavements in this category are marked by areas of instability, structural deficiency, large crack patterns (alligatoring), heavy and numerous patches, and visible deformation. Ride quality ranges from acceptable to poor. Concrete pavements in this category may continue to provide acceptable ride quality. Both jointed and continually reinforced pavements display cracking patterns with longitudinal cracks connecting joints and transverse cracks occurring more frequently. Occasional punchout (or pothole) repair is evident. Some joints and cracks show loss of base support.

Very Poor:

Asphalt pavements in this category are in extremely deteriorated condition marked by numerous areas of instability and structural deficiency. Ride quality is unacceptable. Concrete pavements in this category display a rate of deterioration that is rapidly accelerating.

Figure 3-2 through 3-6 graphically shows the pavement conditions along the five state highway segments within Sherman County vary in both the rural and urban areas, Sherman County roads, and the streets within the four incorporated cities in the county. There are nearly 100 miles of state highway pavement mileage in Sherman County. Approximately 50 percent of the highway mileage in Sherman County are in Good or Very Good pavement condition while 33 percent is in Fair condition. Therefore, approximately 88 percent of all highway mileage meet ODOT's standard of "fair or better" pavement condition. The final 17 percent of highway mileage is in Poor pavement condition. The entire Poor condition pavement lies along OR 216 between Grass Valley and Wasco County. Table 3-3 summarizes the state highway pavement conditions as of 1998.

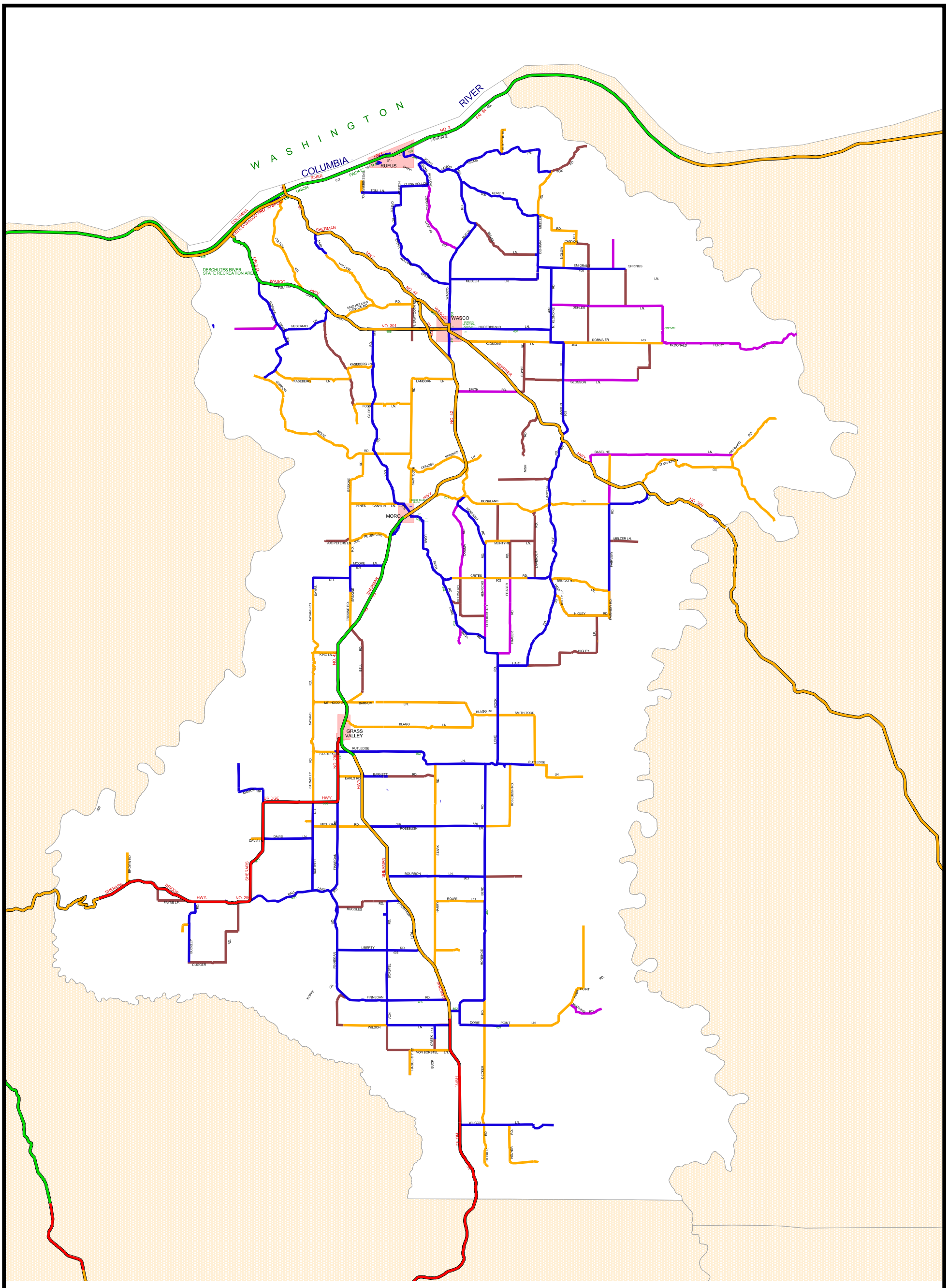


Figure 3-2
1998 Pavement Conditions
Sherman County, Oregon

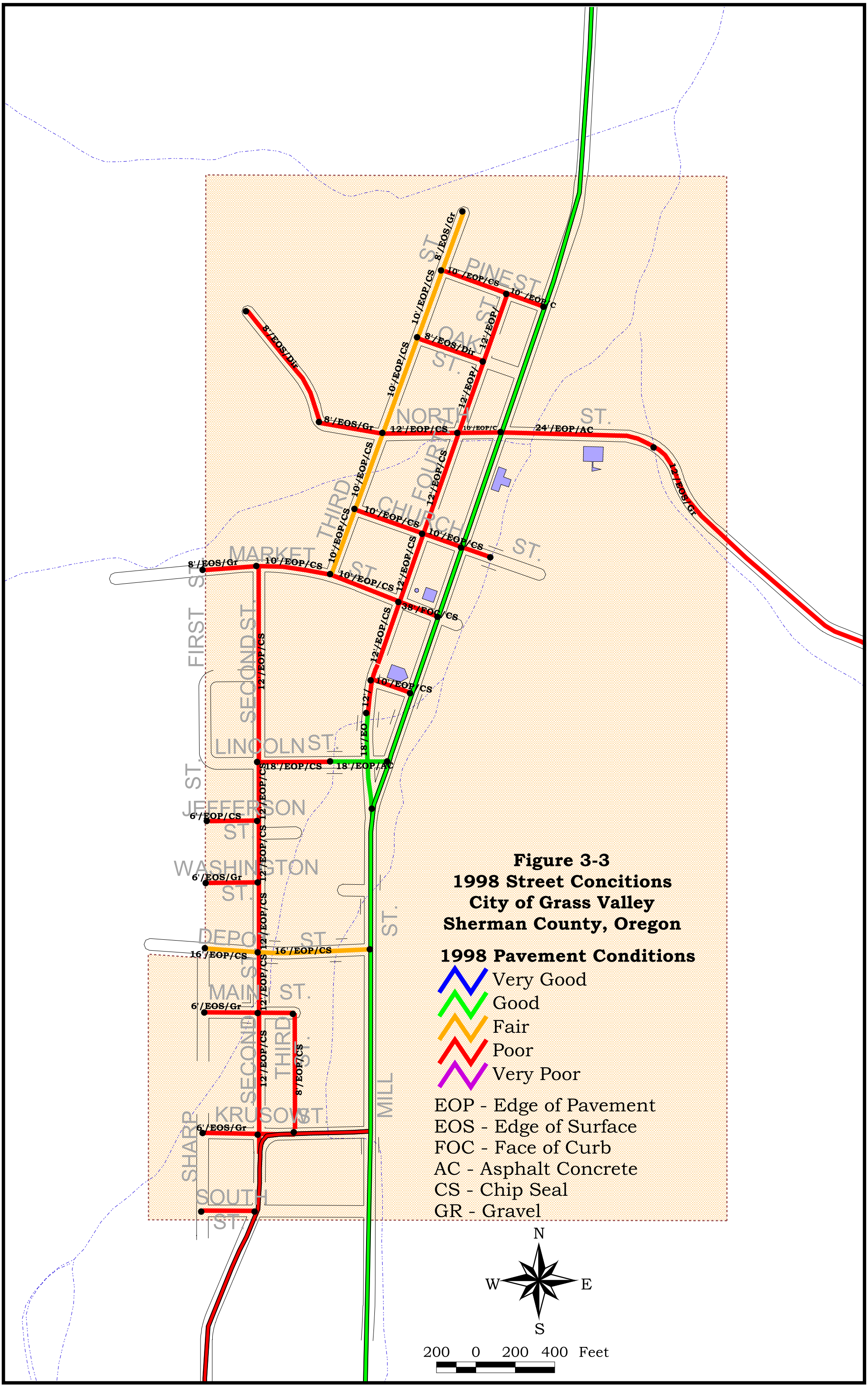


Figure 3-3
1998 Street Concitions
City of Grass Valley
Sherman County, Oregon

1998 Pavement Conditions

- Very Good
- Good
- Fair
- Poor
- Very Poor

EOP - Edge of Pavement
EOS - Edge of Surface
FOC - Face of Curb
AC - Asphalt Concrete
CS - Chip Seal
GR - Gravel

N
W E
S

200 0 200 400 Feet

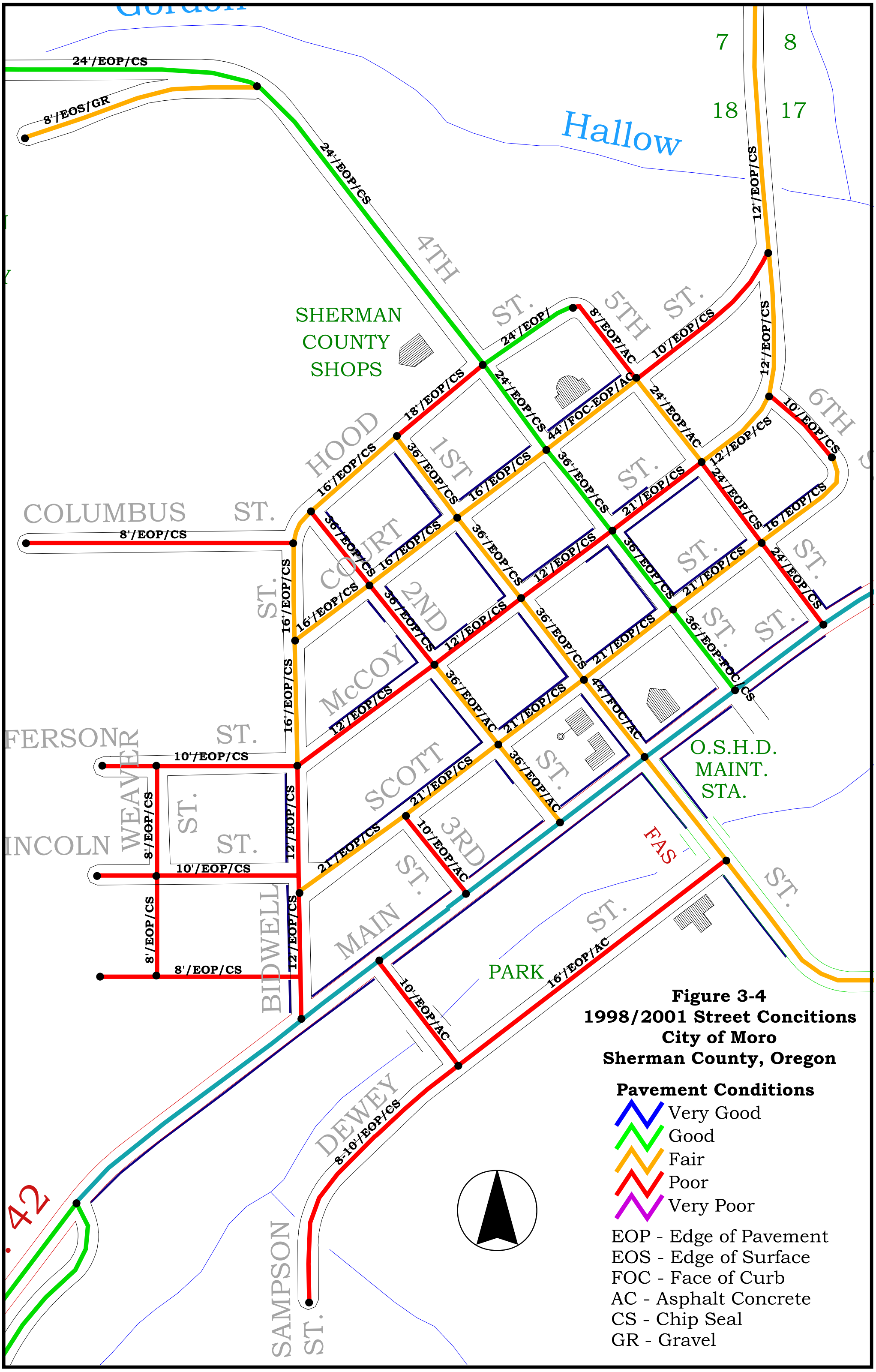


Figure 3-4
1998/2001 Street Concitions
City of Moro
Sherman County, Oregon

Pavement Conditions

- Very Good
- Good
- Fair
- Poor
- Very Poor

EOP - Edge of Pavement
EOS - Edge of Surface
FOC - Face of Curb
AC - Asphalt Concrete
CS - Chip Seal
GR - Gravel

Figure 3-5
Existing Street Conditions
City of Rufus, Sherman County, Oregon

1999 Pavement Conditions

Fair
Poor

EOP - Edge of Pavement
EOS - Edge of Surface
FOC - Face of Curb
AC - Asphalt Concrete
CS - Chip Seal
GR - Gravel

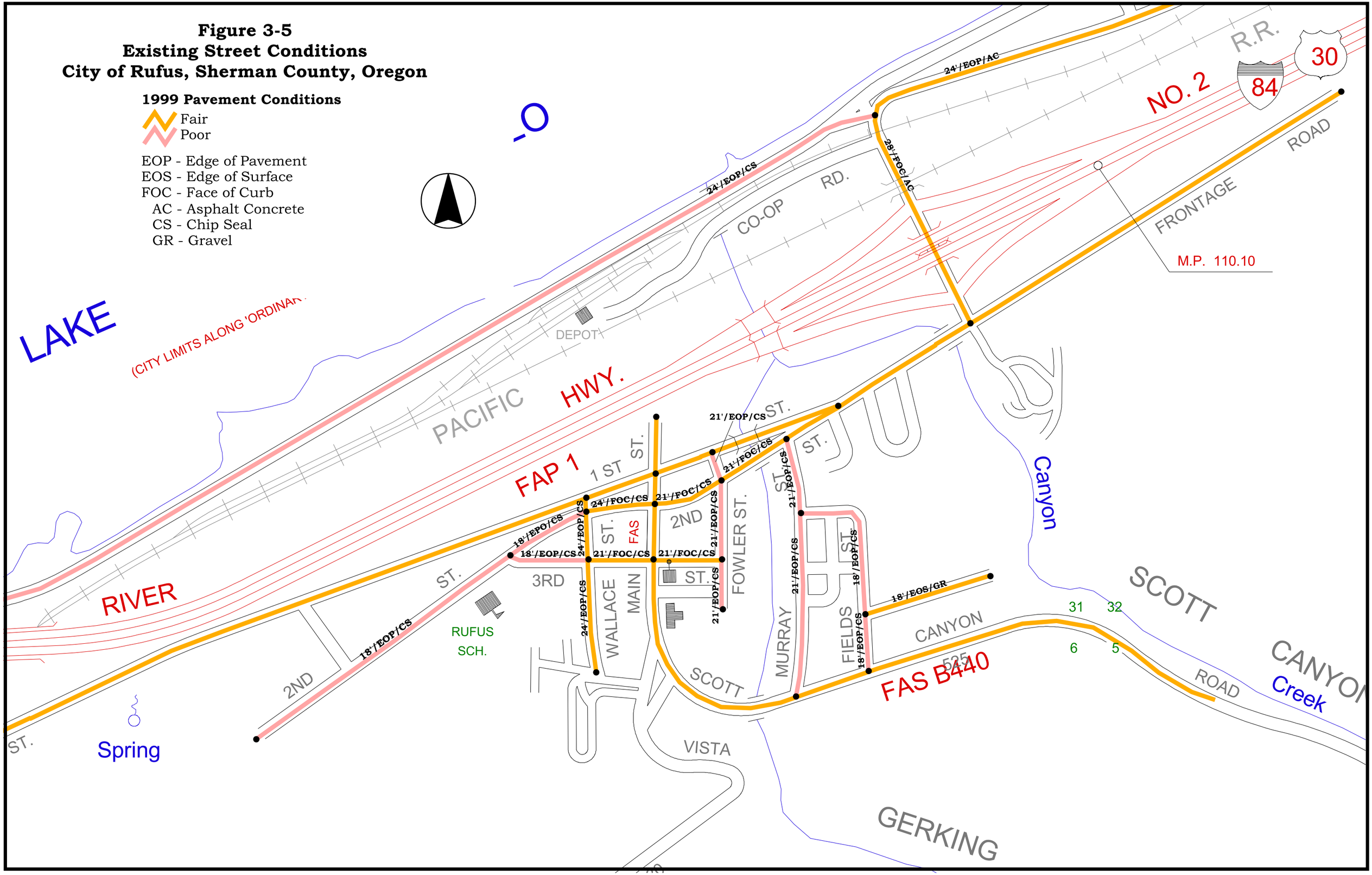


Figure 3-6
Existing Street Conditions
City of Wasco, Sherman County, Oregon

1999 Pavement Conditions

Fair
Poor

EOP - Edge of Pavement
EOS - Edge of Surface
FOC - Face of Curb
AC - Asphalt Concrete
CS - Chip Seal
GR - Gravel

Table 3-3
1998 STATE HIGHWAY PAVEMENT CONDITIONS

Highway	Milepost	Section Description	1997 Pavement Condition
I-84	99.92 - 114.55	Wasco Co. to Gilliam Co.	Good
US 97	-0.43 - 18.60	I-84 jct. to Bidwell St. (Moro)	Fair
	18.60 - 48.81	Bidwell St (Moro) to Wasco Co.	Good
OR 206	2.92 - 5.00	Wasco Co. to Fulton Canyon	Fair
	5.00 - 10.20	Fulton Canyon to Neece Canyon Rd.	Good
	10.20 - 15.57	Neece Canyon Rd. to Gilliam Co.	Fair
OR 206 Spur	4.80 - 7.62	Fulton Canyon to US 97	Fair
OR 216	8.30 - 12.00	Wasco County to MP 12.00	Fair
	12.00 - 28.42	MP 12.00 to US 97	Poor

Source: 1998 Pavement Condition Report - Oregon Department of Transportation Pavements Unit.

Bridges

Bridge inventory data as of April 1998 was obtained from ODOT's Bridge Maintenance Section and was reviewed. Three mutually exclusive elements are used to rate bridge conditions: structural deficiency, functional obsolescence, and sufficiency rating. Structural deficiency is determined based on the condition rating for the deck, superstructure, substructure, or culvert and retaining walls. It may also be based on the appraisal rating of the structural condition or waterway adequacy. Functional obsolescence is determined based on the appraisal rating for the deck geometry, underclearances, approach roadway alignment, structural condition, or waterway adequacy. The sufficiency rating is a complex formula which takes into account four separate factors to obtain a numeric value rating the ability of a bridge to service demand. The scale ranges from zero to 100 with higher ratings indicating optimal conditions and lower ratings indicating insufficiency. Bridges with ratings under 55 may be nearing a structurally deficient condition.

County Bridges:

Sherman County owns and maintains 10 bridges, which are included in the state bridge inspection inventory. Currently, one county-owned bridge is identified as being Structurally deficient. The bridge (ODOT Bridge No. 55C010000528) spans Mud Hollow Canyon and is located along Mud Hollow Road just west of US 97. The bridge is not scheduled for improvements under ODOT's final 1998-2001 or draft 2002-2005 STIP. No county-owned bridges were identified as being obsolete.

State Bridges:

The state owns and maintains 77 bridges located on state highways in both rural and urban Sherman County. There are 16 bridges located on I-84, 28 bridges located on US 97, 16 bridges on OR 206 (Wasco-Heppner Highway), 15 bridges on OR 206 (Celilo-Wasco Highway) and spur, and 3 bridges on OR 216.

Currently, four state-owned bridges are identified as being functionally obsolete. Two of the bridges (ODOT Bridge No. 09225 and 08942) are located on I-84 at MP 109.95 and 114.23 respectively. The third bridge (ODOT Bridge No. 00849A) is located on US 97 at MP 0.00 as it crosses over I-84. The forth bridge (ODOT Bridge No. 0M093) is located at MP 6.45 on OR 206 (Celilo-Wasco Highway) in Fulton Canyon. None of the bridges are scheduled for improvements under ODOT's final 1998-2001 or draft 2002-2005 STIP. Two state-owned bridges were identified as having a sufficiency rating below 55.

PEDESTRIAN SYSTEM

The most basic form of transportation 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 a means of travel. This is mainly because pedestrian facilities are generally an afterthought and not planned as an essential component of the transportation system.

The majority of pedestrian traffic in Sherman County is found within the Cities of Rufus, Wasco, Moro and Grass Valley, and the rural service centers of Biggs Junction and Kent. There is little, if any, demand for pedestrian facilities outside the cities due to the rural nature of the county and the vast distances between trip generators. Attempts to encourage people to walk many miles between these destinations would likely be ineffective.

BIKEWAY SYSTEM

Like pedestrians, bicyclists are often overlooked when considering transportation facilities. Bicycles are not often considered as a serious mode of transportation. However, cycling is a very efficient mode of travel. Bicycles take up little space on the road or while parked, do not contribute to air or noise pollution, and offer relatively higher speeds than walking.

Currently, there are no sanctioned bikeways in Sherman County. Intermittent rural segments of US Highway 97 have adequately designed shoulders that are paved and wide enough (minimum 4 feet) to accommodate bicyclists. For a majority of their length through the county, OR highways 206 and 216 lack adequate shoulders to accommodate cyclists. Figure 3-7 shows the existing shoulder widths on all state highways in the county.

Although bicycle use along rural highway segments in Sherman County is low, and likely predominated by recreational users, the discontinuity of adequate shoulders along highways discourages bicycle use. With slightly more than 62 percent of all roadway mileage in the county being gravel, the state highway system provides the only viable link for bicyclists to destinations within the county.

PUBLIC TRANSPORTATION

The population density and settlement within Sherman County is concentrated immediately along I-84 and US 97. Outside of the communities of Biggs Junction, Wasco, Moro, Grass Valley, Kent, Shaniko, and Madras, the population is widely dispersed on large farms. This settlement pattern has required public transportation to be flexible and demand based.

Currently, Greyhound provides the only intercity bus service in the corridor. Service consists of one northbound bus in the AM, and one southbound bus in the PM daily on US 97. Greyhound's current schedule has their bus making scheduled stops to pick-up/drop-off passengers at Madras and Biggs Junction. However, they will pick-up/drop-off passengers at Shaniko, Grass Valley or Moro if prior arrangements are made.

In addition to Greyhound, there are two charter bus services that operate along the US 97 corridor - Fronteras del Norte and Golden State. Both companies are based out of California and carry migrant laborers between Tijuana, Baja California; and Seattle, Washington. There are also several private and community-based para-transit providers along the corridor. These include Sherman County Bus Service, Displaced Senior Citizen Bus Service, and White Lion Cab (Leo's Taxi), and the Madras Senior Center. Figure 3-8 above shows the service areas of the above providers.[28]

Sherman County Bus Service is operated by volunteers and has the largest service area of any public transportation service provider in the corridor. The Sherman County Bus Service operates three buses on a "dial-a-ride" basis. Anyone in Sherman County can ride the bus, at no charge (donations are

Figure 3-7
Highway Shoulder Width
Sherman County, Oregon

0-3'

4-6'

>6'

encouraged). However, buses operate only three days per week (Tuesday, Wednesday and Thursday). Furthermore, bus service on Tuesday and Wednesday are restricted to providing transportation to meal sites in Biggs Junction and Moro, respectively. Service on Thursday is to provide transportation service to The Dalles for shopping, medical and other services not available in Sherman County.

The Displaced Senior Citizen Bus Service is a volunteer service that operates a "dial-a-ride" service to senior citizens in Sherman County. Service is generally limited to Sherman County, at no charge (donations are encouraged).

White Lion Cab operates along I-84 within the corridor, connecting Biggs Junction with The Dalles. The cost of the service is $3.00 for pick-up and the first ½-mile and $1.80 per additional mile.

TRANSPORTATION DISADVANTAGED

The transportation disadvantaged are generally those people that either due to age, economic status, or physical or mobility impairment do not have access to mainstream transportation modes such as automobiles, bicycles, or walking. Young children for instance are generally dependent upon parents to serve their transportation needs. Many elderly people that can no longer drive are dependent on other transportation sources including demand responsive or "dial-a-ride" transportation. It is important for communities to understand what segment of the population is considered transportation disadvantaged and to take steps to plan service to these people.

Populations with Specific Transportation Needs

Certain populations have been identified as having more intensive transportation needs than the general population. These populations include at or under the legal driving age, those under the poverty level and those with mobility limitations.

The initial results form the 2000 US Census identify the Sherman County population at 1,934 residents in 2000. Further information on poverty levels and mobility limitations are forthcoming later this year and early in 2002. Because this breakdown for the 2000 Census is not available at this time the U.S. Census estimates for 1997 are used to identify the populations with specific transportation needs for this study.

[28] Geographic coverage was determined through phone interviews with service providers on February 3, 1998.

The U. S. Census Bureau estimated the Sherman County population in 1997 at 1898. The Bureau further identifies 468 of those people, or nearly one-quarter of the population (24.65%), as under the age of 18. Because the purpose of this analysis is to determine the number of people with specific transportation needs, figures were used from the 1997 Census estimates to determine the number of people 5 to 17.

According to the 1997 Census estimates, 11.59 percent of the 1898 persons living in Sherman County at the time were below the poverty level. Poverty statistics are based on a threshold of nutritionally-adequate food plans by the Department of Agriculture for the specific size of the family unit in question. The distribution of the population below poverty level shows that a larger proportion of younger persons than older persons are affected by this indicator, as shown in Table 3-4.

Economic status has traditionally been linked with auto ownership. People living below the poverty line are less likely to be able to afford ever-increasing ownership and operating costs associated with auto use. Lack of access to the automobile has also traditionally been linked with inability to access better paying jobs above the poverty line since many poor people do not live within walking or biking distance to these jobs.

TABLE 3-4
SHERMAN COUNTY POVERTY STATUS- 1997

Age	Number Below Poverty Level	Total Age Group Population	Percent of Total Age Group Population Below Poverty
4 and under	23	125	18.40%
5 to 17	53	343	15.45%
18 and older	144	1430	10.06%
Total	220	1898	11.59%

Source: U.S. Census Bureau Estimates for 1997, reported in the Current Population Survey, March 1999

Mobility impairment can impact a person's access to destinations outside of the home unless specially equipped transportation is available. As mentioned previously, Sherman County does provide handicapped access to residents in all four cities and the unincorporated areas. Provision of specialty services to more rural residents may need to be addressed by the county. The Census Bureau reports that 1.95 percent of the population in Sherman County had a mobility limitation in 1990. Persons were identified as having a mobility limitation if they had a health condition (physical and/or mental) that lasted for six or more months and which made it difficult to go outside the home alone. A temporary health problem, such as a broken bone that was expected to heal normally, was not considered a health condition. Table 3-5 summarizes the mobility status of Sherman County residents as reported in the 1990 Census.

TABLE 3-5
SHERMAN COUNTY MOBILITY STATUS- 1990 CENSUS RESULTS

	Mobility Limitation				
Age	**Male**	**Female**	**Total**	**Total Population in Age Groups**	**Percent of Total Age Group Population with Mobility Limitation**
16 to 64	9	7	16	1110	1.44%
65 to 74	1	3	4	211	1.89%
75 and over	2	6	8	112	7.14%
Total	12	16	28	1433	1.95%

Source: 1990 Census.

Using the proportion of the population with a mobility limitation in 1990 and estimates for people below the poverty level in 1997, the number of people with specific transportation needs in 1997 were calculated. Children under the age of five were not included assuming that their transportation needs would be provided for in some way most likely by parents. Table 3-6 indicates that as of 1997, over 25 percent of the Sherman County population may have specific transportation needs. There is likely to be some overlap between the 1.95 percent of the population with mobility limitations and the 7.58 percent below the poverty level; therefore, the sum of the figures may slightly overstate the proportion of the population with specific transportation needs.

TABLE 3-6
ESTIMATED 1997 SHERMAN COUNTY POPULATION WITH SPECIFIC TRANSPORTATION NEEDS

	Percent of Total	**Estimated**
Demographic Group	**County Population**	**Number**
Persons between the ages of 5 and 17	18.07%	343
Persons 18 and older under the Poverty Level	7.58%	144
Persons 18 and older with Mobility Limitations	1.95%	37
Total Specific Transportation Needs Populations	27.13%	515

In many communities, public transit serves a large segment of the transportation disadvantaged. Public transit can serve children, elderly, poor, and handicapped patrons. A traditional fixed route does not exist in Sherman County however, dial-a-ride bus services do exist on a limited basis (see above under public transportation). Evaluation and expansion of existing services may be appropriate.

RAIL SERVICE

The Union Pacific Main Line (UP) and the Burlington Northern/Santa Fe Bend Branch (BNSF) serve Sherman County at Biggs Junction. The BNSF maintain an east-west main line across the Columbia River in the state of Washington. The UP maintains an east- west main line on the Oregon side of the Columbia River. The UP Line carries 40 million tons of freight per year, and includes a spur serving the Mid-Columbia Producers Grain Terminal at Biggs Junction.

AIR SERVICE

Sherman County is served by one general aviation airport, the Wasco State Airport. The 1997 Oregon Continuous Aviation System Plan[19] (OCASP) documents that the only existing air service for a majority of the corridor is accommodated by private airfields. Given the location of the airport, the OCASP shows that Sherman County does not have general aviation airport service coverage from approximately Grass Valley south.

The OCASP shows the service area of the Wasco State Airport as being in an area that the Regional Strategies Program has identified for Interstate Tourism. The OCASP also identified Sherman County, where the Wasco State Airport is located, as being without an economic development airport.

On March 8, 2000 the Oregon Transportation Commission adopted the Oregon Aviation Plan prepared by the Oregon Department of Transportation, Aeronautics Division. The OAP is the modal plan for aviation that implements the Oregon Transportation Plan. The OAP has:

- A Policy Element;
- A System Element; and
- A System Investment Strategy.

Within Sherman County, the major issues facing the Wasco State Airport include:

- Encroachment of incompatible land uses;
- Pavement condition; and
- Funding of operation, maintenance, and capital improvements.[20]

The OAP identifies five functional categories of airports in the State (Commercial Service Airports, Business or High Activity General Aviation Airports, Regional General Aviation Airports, Community General Aviation Airports, and Low Activity General Aviation Airports).[21]

[19] Oregon Continuous Aviation System Plan, Volume I: Inventory and Forecasts, March 1997, Oregon Department of Transportation, Aeronautics Division
[20] Page 1, Oregon Aviation Plan, March 8, 2000, Oregon Department of Transportation, Aeronautics Division
[21] Page 18,19, Exhibit III-3 and III-4, Oregon Airport functional Categories, Oregon Aviation Plan, March 8, 2000, Oregon Department of Transportation, Aeronautics Division

The Wasco State Airport has been classified as Category 4, Community General Aviation Airports. The draft Oregon Aviation Plan identifies their significant function as accommodating general aviation users and local business activities. Their designation criteria are that they accommodate either 2,500 or more annual operations, or more than ten based aircraft.

In the Policy Element of the OAP, Oregon's interests in Aviation include:

- Preservation - Preserve investment in Oregon's system of airports and its level of service;
- Protection - Protect airports from incompatible adjacent land uses;
- Safety - Maintain Oregon's public-use airports so that they are safe, and ensure that the airport system can fulfill its role in the State's emergency response system;
- Economic Development - Support economic development by providing access to regional, state, national, and international markets;
- Intermodal Accessibility - Provide access to the air transportation system and its connections with other modes for people and freight throughout the State;
- Environment - Comply with state and federal environmental protection requirements;
- Modernization and Capacity - Support efforts to ensure sufficient airport capacity and airport modernization;
- Funding - Seek adequate and stable statewide funding to preserve airports;
- Advocacy and technical assistance - Provide advocacy and technical assistance for airports and their users; and
- Ownership of state-owned airports - Manage state-owned airports efficiently and effectively.

In each of the above areas, policies and actions are established.

The System element of the OAP, Exhibit V-17[22] identifies the following facility condition deficiencies for the Wasco State Airport:

- Taxiway access;
- Taxiway lighting;
- Visual Guidance Ind. (VGI); and
- Aviation Services.

Exhibit V-18[23] identifies the following land use compatibility deficiencies for the Wasco State Airport:

- Incompatible land uses nearby;
- Open landfills near airport;
- Water impoundment near airport; and
- Bird migratory areas near airport.

The Oregon Aviation Plan identifies that there will be a $98.4 million gap in funding to address minimum standard needs over the next 20 years. For Category 4 airports, which includes the Wasco State Airport, the breakdown of 20-year Airport Needs to meet Minimum Standards under existing funding levels would have a majority of the funds being spent on airport preservation, with smaller amounts being spent on airport system/modernization and airport safety.[24]

Four System Investment Strategies have been identified in the draft OAP. [25] They are:

Strategy 1 - Set system level program priorities;
Strategy 2 - Target capital expenditures on projects that most closely implement policy and actions.
Strategy 3 - Target resources on a core system of airports; and
Strategy 4 - Increase State levied user fees to establish a system-level airport preservation program.
Strategy 5 - Establish state-level funding program to address minimum standard needs.

Which of the five strategies chosen will ultimately have an effect on general aviation service within Sherman County.

PIPELINE SERVICE

Although not often considered as transportation facilities, pipelines carry liquids and gases very efficiently. The use of pipelines can greatly reduce the number of trucks and rail cars carrying fluids such as natural gas, oil, and gasoline. A natural gas pipeline maintained by Pacific Gas Transmission traverse the southeastern corner of Sherman County. The pipeline does not currently serve the county.

[22] Pages 60, Exhibit IV-17, Facility Condition Deficiencies, Oregon Aviation Plan, March 8, 2000, Oregon Department of Transportation, Aeronautics Division
[23] Page 63, Exhibit IV-18, Land Use Compatibility, Oregon Aviation Plan, March 8, 2000, Oregon Department of Transportation, Aeronautics Division
[24] Page 78, Exhibit V-29, Breakdown of 20-year Airport Needs to Meet Minimum Standards Under Existing Funding levels, Oregon Aviation Plan, March 8, 2000, Oregon Department of Transportation, Aeronautics Division
[25] Page 83, Oregon Aviation Plan, March 8, 2000, Oregon Department of Transportation, Aeronautics Division

TRUCK FREIGHT

The Biggs Junction to Madras Corridor is identified in the 1999 Oregon Highway Plan as part of a larger "freight corridor" that connects Oregon with Washington and California. US 97 carries the second highest volume of northbound and southbound truck traffic in the state. In the Biggs Junction to Madras portion of the freight corridor, approximately 767 trucks travel its length on a daily basis.

Products carried by trucks along the Corridor include raw and processed wood, agricultural products, high tech equipment, and general merchandise.

WATER TRANSPORTATION

Water transportation in Sherman County is concentrated in the Biggs Junction area and consists of river cargo operations. The US Army Corps of Engineers owns, and the Mid-Columbia Grain Producers operate a grain terminal on the Columbia River. Approximately 80% of the grain produced in the Corridor is transported by truck to the terminal facility at Biggs Junction. There the grain is temporarily stored then loaded into barges for transport to markets outside the Corridor.

The export of grain is critical to Sherman County's largely agriculture-based economy. The County is a leading grain producer in the state. The only cargo, historically and currently, exported from Biggs Junction is grain. Historically, no cargo has been imported to Biggs Junction by water. Exported grain from Biggs Junction travels via barge to Portland for export internationally.

Demand on the Port facility varies throughout the year. Farmers harvest their grain in the summer months, transporting a portion for immediate sale and export through the Port and storing some for sale later. The three peak periods of export volume through the Port are from late June to late September following harvest, November and December as farmers sell some of the grain they've been storing for money to get through the winter, and from February to March as farmers empty their storage bins in preparation for the next harvest and earn money to pay taxes.

Truck circulation through the Port facility has been a problem in the past. Trucks enter the Port facility via the westbound on ramp to I-84. Upon being off-loaded, trucks proceed back out via the I-84 westbound on ramp to US 97. While trucks circulate along the westbound on ramp, they share the roadway with motorists accessing the interstate. Recent increases in traffic and existing design of the I-84 interchange continue to be a concern regarding safety and operational capacity.

EXPANSION OF PORT FACILITIES

Sherman County has attempted to expand the capability of the Biggs Junction Port operations on several occasions. The county is very interested in increasing the functions of the terminal area to include both the export and import of goods through the facility at Biggs Junction. The location of the port facilities in Biggs at the juncture of I-84 and OR 97 is conducive for various transportation operations advantageous to both transportation corridors. The expansion of the facility beyond the export of grain is an issue that needs further investigation by the state.

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 Sherman County. Census data were examined to determine travel mode distributions.

TRAFFIC VOLUMES

A large base of traffic volume counts exists for Sherman County. Traffic counts were performed by ODOT on the state highways throughout the county during 2000 and at selected location on county roads in 2001. Figures 4-1 through 4-3 show the geographic distribution of traffic counts within the county.

Average Daily Traffic

County Roads

Other that what was collected by ODOT in 2001 (Figures 4-1 to 4-3), Sherman County has not collected or maintained traffic count information along county roads in recent years. Typical ADT volumes experienced in other largely rural Oregon counties of similar population provide a reasonable guideline for expected volumes in Gilliam County. It is expected that major collectors in the county generally carry ADT volumes in the range of 100 - 300 vehicles per day (vpd). The minor collectors generally carry ADT volumes in the range of 50 - 100 vpd. Traffic volumes on local streets are typically very low, generally less than 50 vpd.

State Highways

The 1999 ADT volumes on the state highways in Sherman County are shown in Figure 4-1. Traffic volumes are highest in the cities and drop off significantly in the rural sections.

The volumes shown in Figure 4-1 are average volumes for the year. Summertime is the season when volumes are highest. ODOT data on US Highway 97 south of Biggs Junction and north of Moro,

Figure 4-1
1999-2000 Average Daily Traffic
Sherman County, Oregon

2000 ADT

- 0 - 1,499
- 1,500 - 2,999
- 3,000 - 4,999
- 5,000 - 9,999
- 10,000-19,999

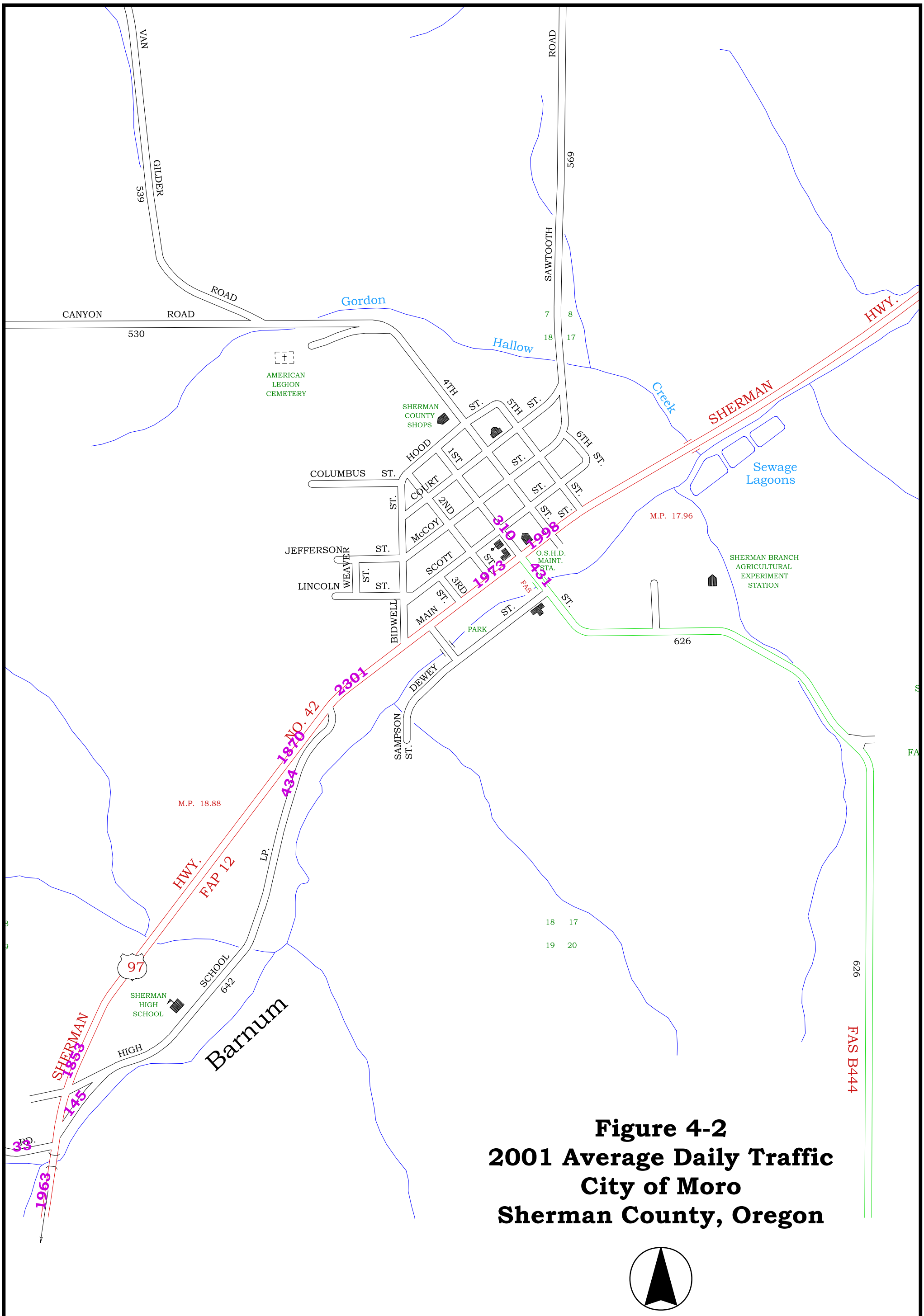


Figure 4-2
2001 Average Daily Traffic
City of Moro
Sherman County, Oregon

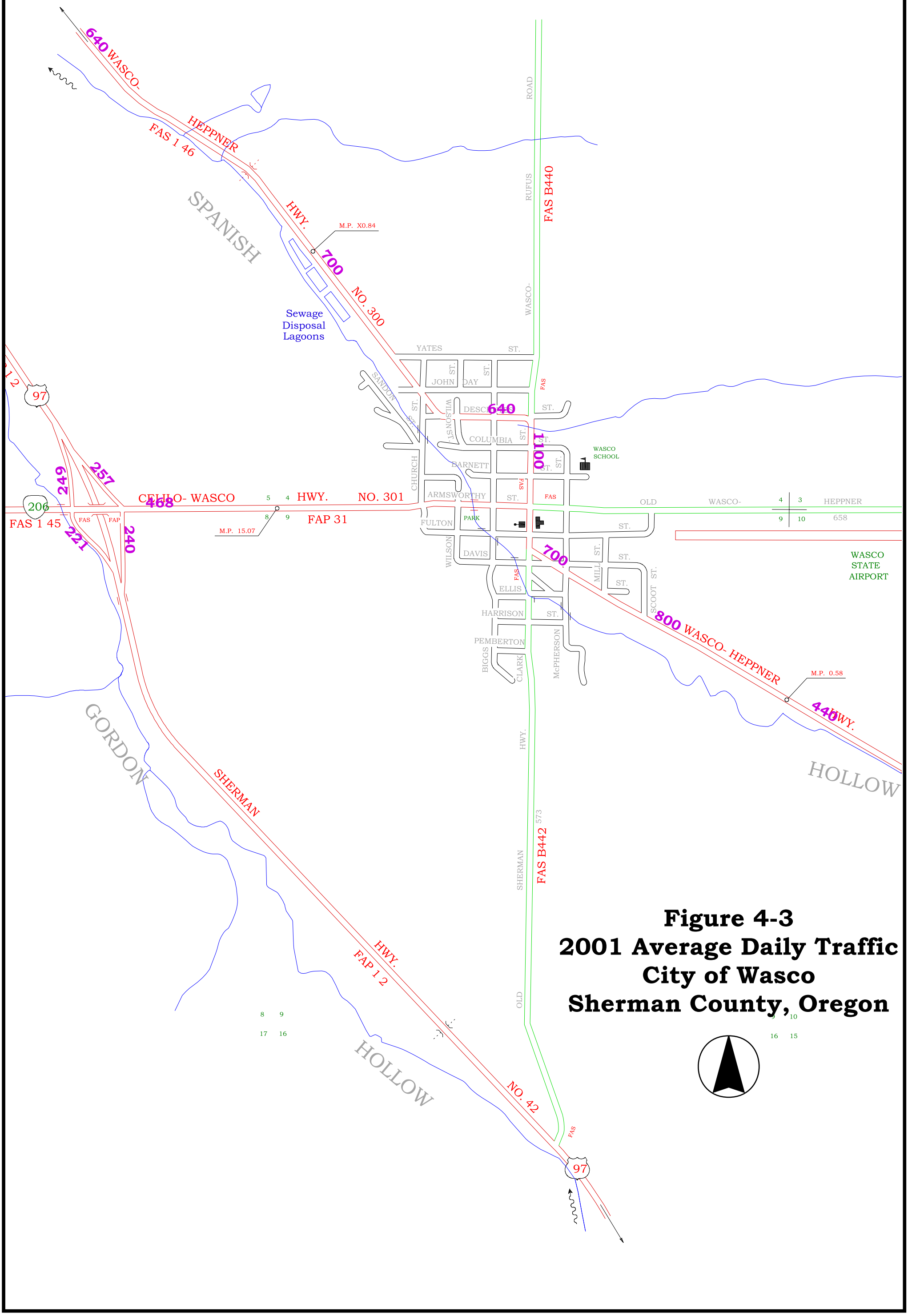


Figure 4-3
2001 Average Daily Traffic
City of Wasco
Sherman County, Oregon

respectively, indicated that during the summer season, volumes are about 60 percent higher than average volumes. Rural highway sections in Sherman County are assumed to follow the same pattern, with smaller increases in the urban areas. Summertime variations along I-84 east of Arlington ran as high as 36 percent. The summertime variations are due, in part, to increases in freight movement related to agricultural harvesting.

I-84 (Columbia River Highway):

ADT volumes along I-84 reach 14,600 vehicles per day (vpd) at the Sherman/Wasco County line, peaking at 10,900 vpd at the Biggs Junction interchange at US 97, and tapering down to 10,800 vpd at Rufus and 10,700 vpd at the Sherman/Gilliam County line. With the exception of a slight dip in 1996, traffic along I-84 has steadily increased over the last ten years.

US 97 (Sherman Highway):

US 97 (Sherman Highway) carries the highest traffic volumes in the county, excluding the interstate. Within the Biggs Junction Rural Service Center traffic volumes are significantly higher than within the urban and rural highway segments south of Spanish Hollow Creek.

Between the I-84 and north of the OR 206 Spur, US 97 carries approximately 18,900 vpd. Just south of Spanish Hollow Creek, US 97 experiences approximately 6,600 vpd. Outside of Biggs Junction, rural highway segments carry traffic levels ranging from 3,100 vpd to 2,100 vpd at the Sherman/Wasco County Line. Average rural traffic levels are roughly 2,200 to 2,500 vpd. Traffic levels are highest in the urban areas of Moro and Grass Valley. Moro experiences traffic levels of 2,800 to 2,500 vpd throughout its city limits while Grass Valley experiences traffic levels of 2,500 vpd.

OR 206 (Celilo/Wasco Highway):

Traffic volumes on the rural section of OR 206 in Sherman County range from 630 vpd near the Deschutes River to 468 vpd just east of the US 97 interchange.

OR 206 Spur (Celilo/Wasco Highway Spur):

Traffic volumes peak within the Biggs Junction Rural Service Center. At the junction of OR 206 Spur with US 97 there are between 1,900 to 2,300 vpd.

OR 206 (Wasco/Heppner Highway):

Rural traffic volumes on OR 206 range from 700 to 800 vpd in Wasco to 320 at the John Day River. The lowest ADT in the county, 310 vpd is reported at the intersection of Fairview with OR 206. Traffic volumes within Wasco range from 440 vpd at the east city limits to 1,100 vpd on Clark Street.

OR 216 (Shears Bridge Highway):

Rural traffic volumes on OR 216 range from 120 to 140 vpd in Grass Valley to 150 at the Deschutes River. The lowest ADT in the county, 40 vpd is reported at the intersection of Michigan Lane with OR 216.

Roadway Capacity

Transportation engineers have established various standards for measuring traffic capacity or mobility of roadways or intersections. Each standard is associated with a particular level of service or volume to capacity (V/C) ratio. The V/C 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. With the adoption of the 1999 Oregon Highway Plan, the State adopted maximum V/C ratios for all State highways based on location and classification.

Generally speaking the lower the V/C ration, e.g. 0.60 the traffic flow is relatively free-flowing. At a V/C ratio of 1.0 the street system is totally saturated with traffic, movement is very difficult resulting in congestion. Table 4-1 presents the level of service criteria for facilities encountered in Sherman County including: freeways, two-lane highways, and unsignalized intersections. Appendix D provides a qualitative description of level of service for freeways and two-lane rural highways.

Table 4-1
Maximum Volume to Capacity Ratios for Peak Hour Operating Conditions Through a Planning Horizon for State Highway Sections Located Outside the Portland Metropolitan Area Urban Growth Boundary[2]

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

Table 4-1 Notes:
Interstates and Expressways shall not be identified as Special Transportation Areas (STAs).
For the purposes of this policy, the peak hour shall be the 30th highest annual hour. This approximates weekday peak hour traffic in larger urban areas.

The OHP establishes operating mobility standards for the state highway system. Highways of Interstate importance, such as I-84, should operate at a V/C ratio of 0.70 or better in urban and rural areas. For highways of statewide importance that are also designated freight routes (i.e. US 97), within STAs the highway should operate at a V/C ratio of 0.85 or better. Outside STAs, both inside urban areas and through rural lands, the highway should operate at a V/C ratio of 0.70 where posted speeds are greater than 45 mph and 0.75 where posted speeds are less than 45 mph.

Highways of Regional importance such as OR 206 (Wasco/Heppner Highway), the roadway should operate at a V/C ratio of 0.95 in designated STAs, 0.75 where posted speeds are greater than 45 mph and 0.85 where posted speeds are less than 45 mph within urban areas and 0.70 through rural lands.

For highways of District importance, such as OR 206 (Celilo/Wasco Highway) and OR 216, the roadways should operate at a V/C ratio of 0.95 within an STA, 0.80 where posted speeds are greater

[2] 1999 Oregon Highway Plan, Table 6, page 80

than 45 mph and 0.85 where posted speeds are less than 45 mph (within an urban area), and 0.75 through rural lands.

The operations analysis of Sherman County's state highway system focused on the rural sections of the highways (those sections outside the incorporated cities). Capacity along those roadway segments was evaluated in two different ways: traffic operations along the roadway alone and traffic operations at major intersections.

Rural Roadway Operations

The traffic operation of mainstream traffic along the rural highway sections were determined using the 1994 Highway Capacity Manual. Analysis of a rural two-lane highway takes into account the magnitude, type, and directional distribution of traffic as well as roadway features such as the percentage of no passing zones, general terrain, and lane and shoulder widths.

As previously noted, mobility (level-of-service) criteria for two-lane highways addresses both mobility and accessibility concerns. The primary measure of service quality is percent time delay, with speed and capacity utilization used as secondary measures. Mobility criteria are defined for peak 15-minute flow periods, and are intended for application to segments of significant length. The ideal capacity of a two-lane highway is 2,800 vph in both directions.

The highest quality of traffic service occurs when motorists are able to drive at their desired speed. Without strict enforcement, this highest quality, representative of level-of-service "A", would result in average speeds approaching approximately 60 mph on two-lane highways.

For each of the five rural highway segments in Sherman County, the peak hour traffic was assumed to be ten percent of the 24-hour ADT volume reported in ODOT's 1998 Traffic Volume Table and the directional split was assumed to be 60/40. Since all rural segments have multiple ADT volumes reported, a worst case analysis was performed using the highest reported volume for each segment.

The operations on the rural sections of the highway were analyzed for a typical peak hour condition. The resulting level of service for each highway segment is shown in Table 4-2. All rural segments of the state highways currently operate at LOS A.

Table 4-2
SUMMARY OF OPERATIONS ON TWO-LANE HIGHWAYS

Location	1998 LOS
US 97 between Biggs Junction and Sherman/Wasco County Line	A
OR 206 between Sherman/Wasco County Line and Wasco	A
OR 206 between Wasco and Sherman/Gilliam Co. line	A
OR 216 between Grass Valley and Sherman/Wasco County Line	A

Freeway Operations

Analysis of freeway operations is based on traffic volumes and composition (i.e., percent trucks), lane widths, lateral clearance between the edge of the travel lane and the nearest roadside or median obstacle or object influencing traffic behavior, and driver population (i.e., regular and familiar users of the facility).

Freeway operations were analyzed along I-84 west of Biggs Junction. This segment of the freeway was chosen due to the combination of high ADT volumes and the high percentage of truck traffic, which produce a worst-case freeway analysis within Sherman County. The freeway was analyzed using 1998 ADT volumes representing average daily conditions and using the same 1998 ADT volumes increased by 36 percent to represent traffic levels during peak summer conditions. Peak hour traffic was assumed to represent ten percent of the 24-hour ADT volumes used and the directional split was assumed to be 60/40.

The resulting LOS for average and peak summer traffic conditions was LOS A.

Operations at Intersections

Traffic operations were determined at intersections along the critical urban highway sections using the *1994 Highway Capacity Manual*. Since all intersecting streets and driveways are controlled by STOP signs in these areas, the analysis was performed for unsignalized intersections.

The traffic operations were analyzed for two intersections located along the critical urban sections of the state highways: US 97 and 4th Street in Moro and US 97 and North High School Loop Road in Moro. Traffic operations were analyzed using a peak hour two-way traffic volume representing ten percent of the 1998 ADT. Also, a 60/40 directional split was used to reflect the distribution of traffic on the highways during the peak hour. Under these assumptions, the highway intersections operate at

LOS A for all movements at both intersections. This indicates that all other lower-volume roads or driveways accessing any rural or urban portion of the highways are operating at LOS A as well.

TRANSPORTATION DEMAND MANAGEMENT MEASURES

Transportation Demand Management (TDM) measures consists of efforts taken to reduce the demand on an area's transportation system. TDM measures include such things as alternative work schedules, carpooling, and telecommuting.

Travel Mode Distribution

Although the automobile is the primary mode of travel for most residents in Sherman County, there is limited use of other modes as well. Modal split data are not available for all types of trips; however, the 1990 Census data does include statistics for journey to work trips as shown in Table 4-4 and travel time to work as shown in Table 4-5. The census data reflects the predominance of automobile use.

Because of the rural character of the county's population, most Sherman County residents travel to work by private vehicle. In 1990, 76.7 percent of all trips to work were in an auto, van, or truck. Trips in single-occupancy vehicles accounted for 64.3 percent of all trips and carpooling accounted for 12.4 percent.

Use of the automobile for commuting is not surprising for people with home to work travel times exceeding five minutes, since a five minute automobile trip could cover a number of miles while a five minute walking trip will likely cover about one-quarter to one-half mile. However, while 18 percent of work trips in Sherman County took less than five minutes as of 1990, walking made only eleven percent. A commonly used threshold for acceptable walking distances is one-quarter mile. At a reasonable walking pace of 240 feet per minute, an average person can walk one-quarter mile in 5.5 minutes. Therefore, the opportunity for increased walking appears to exist in the county. Since most pedestrian facilities exist in the cities, the cities are the most likely places to incur increased pedestrian usage.

The minimal (0.2%) bicycle usage as a commute mode was typical to slightly lower than many other primarily rural Oregon counties in 1990. Since the census data do not include trips to school or other non-work activities, overall bicycle usage may be higher. There are no roadways in Sherman County with dedicated bicycle lanes on them. However, because of the low traffic volumes on county roads, the lack of shoulders is not seen as an impediment to there us by bicycles. Rather it is the remote

dispersion of residential dwellings on farms, topography, and distribution of paved county roads that are the primary reasons for low bicycle usage.

Portions of state highways do have adequate shoulders to accommodate bicycle use (Figure 3-7). Unfortunately, on US 97, and to a lesser extent the other state highways, the speed of vehicles, cinders and other debris on the shoulders, and the high percentage of truck traffic detract from their use by bicycles.

Table 4-3
SHERMAN COUNTY JOURNEY TO WORK TRIPS

	1990 Census	
Trip Type	**Trips**	**Percent**
Private Vehicle	587	76.7
Drove Alone	*492*	*64.3*
Carpooled	*95*	*12.4*
Public Transportation	0	0.0
Motorcycle	4	0.5
Bicycle	2	0.2
Walk	86	11.2
Other	6	0.8
Work at Home	80	10.4
Total	**1352**	**100.0**

Source: US Bureau of Census, 1990 Census.

Table 4-4
SHERMAN COUNTY TRAVEL TIME TO WORK DISTRIBUTION

	1990 Census	
Departure Time	**Trips**	**Percent**
Less than 5 minutes	140	18.4
5 to 9 minutes	142	18.6
10 to 14 minutes	84	11
15 to 19 minutes	103	13.4
20 to 29 minutes	79	10.3
30 to 39 minutes	67	8.8
40 to 59 minutes	43	5.6
60 to 89 minutes	19	2.5
more than 90 minutes	8	1.0
Worked at home	80	10.4
Total	**765**	**100**

CRASH RATE ANALYSIS

Crash rate data along the state highways within Sherman County was reviewed to identify high accident locations, potential accident patterns, and safety concerns at these locations (Figure 4-4 and 4-5). The three sources of crash rate data reviewed included:

- Crash rate summaries generated by ODOT's Transportation Development Branch for the five-year period from January 1, 1993 to December 31, 1998.
- Crash rate summaries generated from the ODOT Accident Summary Database for locations along the state highways in Sherman County.
- Sherman County Emergency Services Crash Database.

ODOT's Crash rate Summary Database calculates two useful factors for comparison with statewide statistics based on accident information over the five-year period studied. The first factor is a computed average two-year crash rate, which compares the number of accidents with the ADT volume and the length of the segment analyzed. The second factor is the Safety Priority Index System (SPIS) value. This factor evaluates accident frequency, severity, and traffic volumes to create an index for prioritizing state highway locations with safety concerns.

Additionally, ODOT collects detailed accident information on an annual basis along I-84, US 97, and OR 206 and 216 in Sherman County. The accident information data shows overall accident rates for the routes 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 4-6 shows the accident rates for I-84, US 97, and OR 216 and 206 in Sherman County as well as the Oregon statewide average for rural freeway and urban and rural non-freeway primary state highways from January 1, 1997 to December 31, 1999.

The accident rates for the rural segments of I-84 during the three years analyzed are lower than the statewide average for similar highways except in 1997 east of Rufus. The urban segments displayed lower rates over the three-year period.

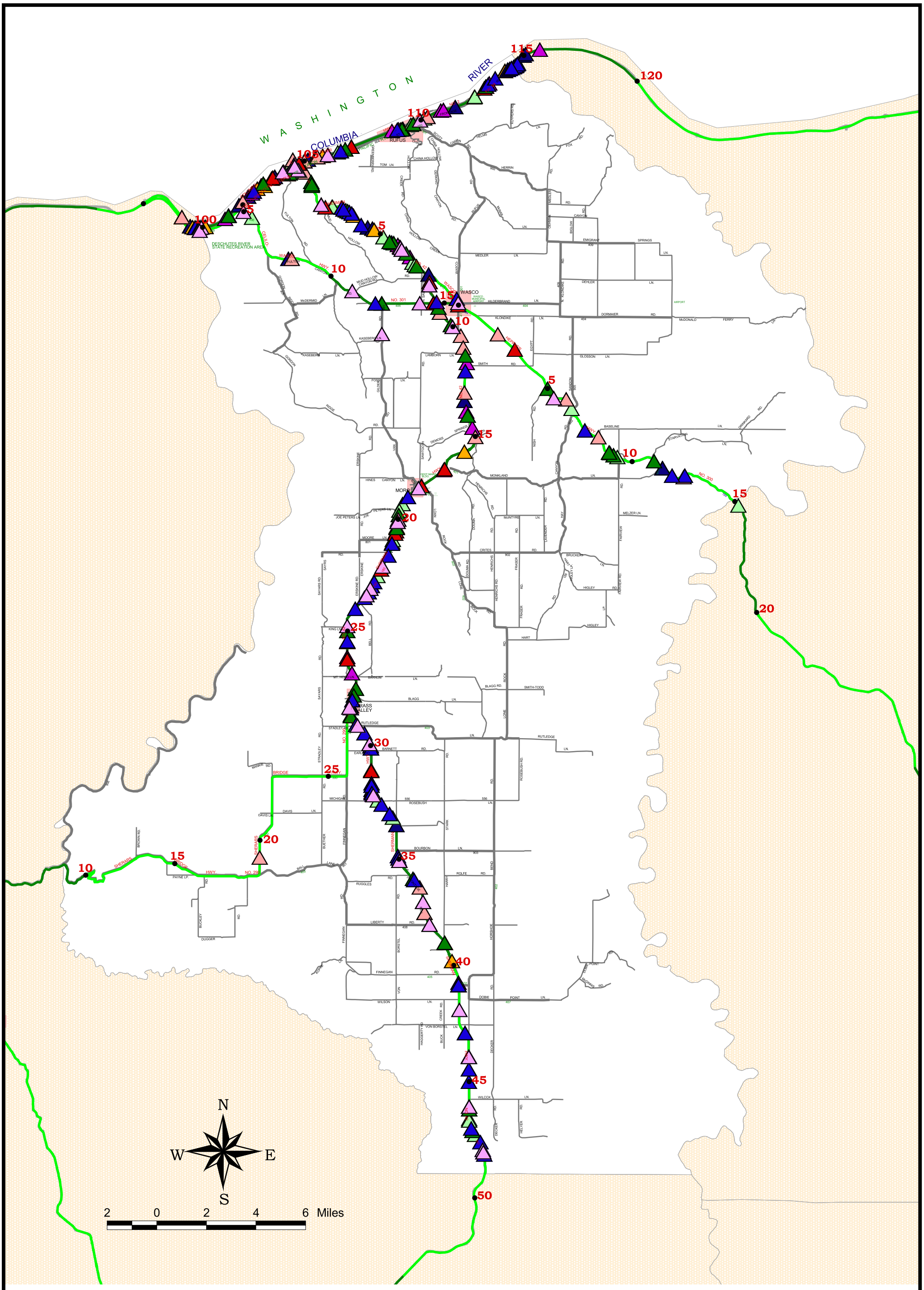


Figure 4-4 Highway Safety

Crash Year

- 2001
- 2000
- 1999
- 1998
- 1997
- 1996
- 1995
- 1994
- 1993

Number of Fatal or Serious Injury Crashes/5 Mile Segment

- 0 Crashes (Cat. 1)
- 1-2 Crashes (Cat. 2)
- 3-5 Crashes (Cat. 3)
- 6-9 Crashes (Cat. 4)
- 10+ Crashes(Cat. 5)

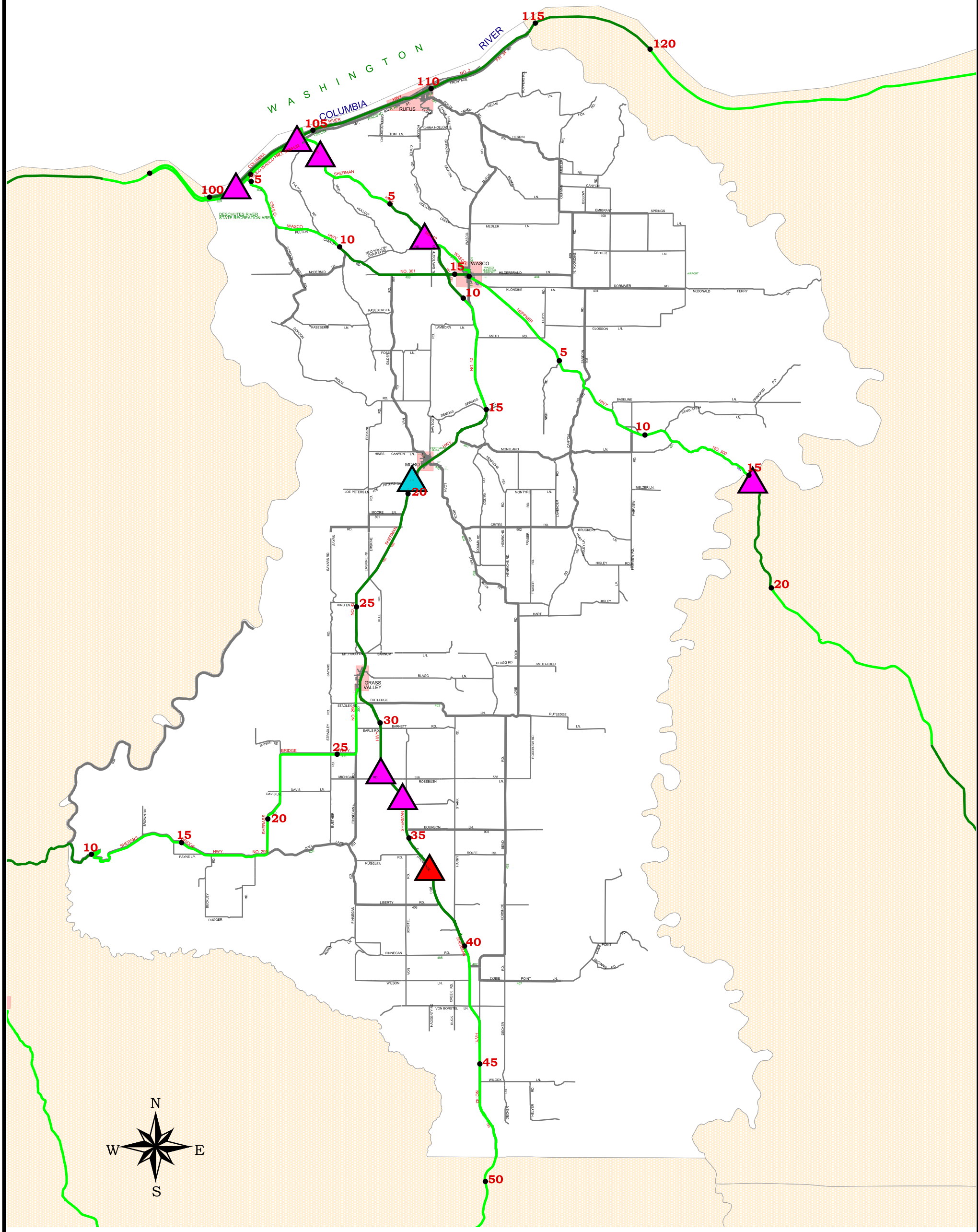


Figure 4-5
Fatal Crashes 1994-98
Sherman County, Oregon

1 Fatality 2 Fatalities 5 Fatalities

On US 97, the rural segment south of the junction of OR 206 (Spur) significantly exceeded Statewide averages for all three years. In addition, the urban segment in the City of Moro also exceed the statewide average in 1998.

The three-year accident rates for OR 216 are only available for rural segments of the highway in 1997 and were more than twice the statewide average.

The accident rates for rural OR 206 between the City of Wasco and Hay Canyon Road exceeded the statewide average for similar highways, which may indicate a safety concern along this stretch of highway. The 1997 accident rates for the rural portion of OR 206 between Hay Canyon Road and the Gilliam County Line also exceeded the statewide average.

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

Primary State Highways	1999	1998	1997
I-84 (Columbia River Highway) Hwy #2			
Rural: Sherman Co. line to Sherman Hwy 42 (US 97) Biggs Jct.	0.12	0.12	0.04
Rural: Sherman Hwy 42 (US 97) to Rufus	0.13	0.14	0.21
Urban: Rufus, West city limit to Rufus Interchange	0.28	NA	0.14
Urban: Rufus Interchange to east city limits	NA	NA	NA
Rural: Rufus to Gilliam County Line	0.05	0.12	0.60
US 97 (Sherman Highway) Hwy #42			
Rural: Oregon State line to Jct. Rt. Hwy 2-SBD (I-84)	NA	4.28	1.94
Rural: Jct. Rt. Hwy 2 (I-84) to South end of interchange	NA	5.38	NA
Rural: South end of interchange to Jct. Hwy # 301 Spur (Hwy 206)	29.37	29.37	35.02
Rural: Jct. Hwy 301 Spur (Hwy 206) to Jct. Wasco Heppner Hwy 300 (Hwy 206)	0.72	0.36	0.28
Rural: Jct. Wasco Heppner Hwy 300 (Hwy 206) to U-Xing Celilo Wasco Hwy 301 (Hwy 206)	NA	0.82	NA
Rural: U-Xing Celilo Wasco Hwy 301 (Hwy 206) to Moro	.25	NA	.23
Urban: Moro	NA	1.35	NA
Rural: Moro to Grass Valley	.51	.51	.12
Urban: North city limits to Sherars Bridge Hwy #290 (Hwy 216)	1/15	NA	NA
Urban: Shears Bridge Hwy #290 (Hwy 216) to south city limits	NA	NA	NA
Rural: South city limits to Kent, First Street	.40	.21	.31
Rural: Kent, First Street to Wasco county line	.32	.16	.17
Secondary State Highways	**1999**	**1998**	**1997**
OR 216 (Sherars Bridge Highway) Hwy #290			
Rural: West Sherman County line to Grass Valley	NA	NA	2.74
Urban: West Grass Valley city limit to Hwy #42 (US 97)	NA	NA	NA
OR 206 (Wasco-Heppner Highway) Hwy # 300			
Rural: Jct. Sherman Hwy #42 (US 97) to Wasco	NA	NA	NA
Urban: West city limit to Jct. Celilo-Wasco Hwy #301 (OR 206)	NA	NA	NA
Urban: Jct. Celilo-Wasco Hwy #301 (OR 206) to Clark Street	4.8	NA	NA
Urban: Clark Street to east city limit	NA	NA	NA
Rural: Wasco to Hay Canyon Road	1.19	1.19	1.50
Rural: Hay Canyon Road to Sherman/Gilliam Co. line	NA	NA	1.36
OR 206 (Celilo-Wasco Highway) Hwy # 301			
Rural: Sherman county line to Jct. Celilo-Wasco Spur (Fulton Cyn Rd.)	NA	NA	NA
Rural: Jct. Celilo-Wasco Spur to Wasco	.62	.63	1.26
Urban: West city limit to Jct. Wasco-Heppner Hwy #300 (OR 206)	NA	NA	NA
Hwy 30-Jct Celilo-Wasco Spur Hwy #301 to Sherman Highway #42 (US97)	1.27	NA	1.34
Statewide average for all **Rural/Urban Freeway Primary State Highways**	**0.19/0.60**	**0.25/0.71**	**0.23/0.69**
Statewide average for all **Rural Non-freeway Primary/Secondary State** Highways	**0.88/1.11**	**0.85/1.17**	**0.83/1.14**
Statewide average for all Urban Non-freeway Primary/Secondary State Highways	**3.50/2.98**	**3.83/2.97**	**3.67/2.93**

Source: 1999 Oregon Department of Transportation Crash analysis & reporting.

TABLE 4-6
HIGHWAY ACCIDENT SUMMARIES
(January 1, 1993 to December 31, 1997)

Location	Fatalities/ Serious Injuries	Injuries	PDO	Total Accident	Accident Frequency (acc/mi/yr)	Accident Rate (acc/mvm)
I-84 (Columbia River Hwy #2)						
Wasco Co. to Biggs Jct. (MP 99.92 - 104.56) 4.64 ml	7	25	0	32	1.379	
Biggs Jct. to Rufus (MP 104.56 -108.16) 3.6 ml	4	7	2	13	0.722	
Rufus to Gilliam Co. (MP 108.16- 114.55) 6.39 ml	3	20	13	36	1.126	
US 97 (Sherman Hwy #42)						
OR State line to Moro (MP -0.42 - 17.96) 18.39 ml	11	24	0	35	0.380	
Moro (MP 17.96 - 18.88) 0.92 ml	0	1	0	1	0.362	
Moro to Grass Valley (MP 18.88 - 27.4) 8.52 ml	4	15	0	19	0.446	
Grass Valley to Wasco Co. (MP 27.4-48.81) 21.4 ml	16	24	0	40	0.374	
OR 206 (Wasco-Heppner Hwy #300) Wasco to Gilliam Co. (MP -1.97-14.95) 16.92 ml	3	4	1	8	0.095	
OR 206 (Celilo-Wasco Hwy #301) 15.47 ml Sherman Co. to Wasco +Spur(MP 2.92-15.57+2.82)	1	2	0	4	0.033	
OR 216 (Sherars Bridge Highway #290) Wasco Co. to Grass Valley (MP 8.3-28.42) 20.12 ml	1	0	1	2	0.016	

Notes:
1. PDO: Property Damage Only Accident
Source: Oregon Department of Transportation Crash Rate Database Investigative Report.

I-84 (Columbia River Highway):

Within Sherman County during the three-year period analyzed, there were 81 reported accidents, 15 of which were reported as property damage only. There were 14 fatalities/Serious injury accidents and 52 injury accidents on the freeway during the five-year period. All accidents (81) occurred during pre-dawn hours and nearly 22 percent involved wet or icy pavement conditions. The most common types of accidents involved vehicles hitting fixed objects (43), non-collision (16), and rear-end collisions (12). Thirty-three percent of the accidents involving vehicles that hit fixed objects occurred under wet or icy pavement conditions.

The reported accidents were scattered along the freeway throughout the county. Of the 81 reported accident locations, 13 locations experienced multiple accidents and 1 experienced four accidents; the maximum reported. This location (MP 105) is less than 0.2 miles east of the Biggs interchange. Of

the 4 reported accidents at this location, two involved rear-end collisions and the four accidents in total resulted in no fatality or severe injuries, and three minor injuries. Two of the accidents had speed as a contributing factor and alcohol was not involved in any of the accidents.

US 97 (Sherman Highway):

There were 95 accidents along US 97 in Sherman County during the three-year period analyzed. These consisted of 6 accidents with fatalities (13 fatalities), 8 with serious injuries, 29 with injuries and 52 with property damage only. All but 3 accidents occurred along rural sections of the highway, all occurred between Midnight and 5 AM, and 19 occurred under wet/icy roadway conditions. The most common types of accidents involved vehicles hitting fixed objects (22), non-collision (13), turning maneuvers (10), and rear-end collisions (9). All of the accidents involving vehicles that hit fixed objects occurred under clear pavement conditions. Thirteen of the accidents occurred at Biggs Junction. Otherwise, the accidents were scattered along the roadway segment and there were no particular locations that showed a consistent accident pattern. Accident rate information for 1993-1997 shows that the rural section of US 97 between The Washington State Line and Moro has a three-year accident rate (0.38) less than half the statewide average for similar highways indicating no safety issues along this primary segment of highway.

OR 206 (Wasco-Heppner Hwy):

There was only 10 ODOT-reported accident along OR 206 within Sherman County during the three-year period analyzed. The accidents were scattered along the roadway segment and there were no particular locations that showed a consistent accident pattern. There was one fatal accident at MP 15.30 in 1996. It was a non-collision type accident and the pavement surface and weather were clear. Speed was indicated as a contributing factor. No alcohol was involved.

OR 206 (Celilo-Wasco Hwy):

There were only 4 accident on OR 206 in Sherman County during the three-year period analyzed resulting in no fatality, and 1 severe injury. All accidents occurred along rural sections of the highway during nighttime hours, and three occurred under icy roadway conditions. The most common types of accidents involved vehicles hitting fixed objects (3). Speed was a contributing factor in half of the accidents, and no alcohol was involved. The accidents were scattered along the roadway segment and there were no particular locations that showed a consistent accident pattern.

OR 216 (Sherars Bridge Highway):

There was only 1 accident on OR 216 in Sherman County during the three-year period analyzed resulting in one fatality, and 1 property damage only (PDO). All accidents occurred along rural sections of the highway during nighttime hours with clear road and weather conditions. Speed was a contributing factor in one of the accidents, and no alcohol was involved. The fatal occurred at the Deschutes River and the PDO occurred in Grass Valley near US 97.

CHAPTER 5
TRAVEL FORECASTS

The traffic volume forecasts for Sherman County are based on historic growth on the state highway system, historic population growth, and projected population growth. Forecasts were only prepared for the state highway system in the county, since the volumes on these roadways are much higher than on any of the county roads. More detailed traffic forecasts were performed in the urban sections of Rufus, Wasco, Moro and Grass Valley.

LAND USE

Land use and population growth plays an important part in projecting future traffic volumes. Historic trends and their relationship to historic traffic growth on state highways are the basis of those projections. Population 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.

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

A detailed description of existing and future land use projections, including the methodology and data sources used, is contained in the Population and Employment Analysis located in Appendix E. The analysis also includes population estimates for the Cities of Rufus, Wasco, Moro and Grass Valley. Historical data were compiled as reported by the Census Bureau and official population estimates as estimated by Portland State University's (PSU's) Center for Population Research and Census. Based on PSU's estimates through 1997 and a state econometric model, the State of Oregon Office of Economic Analysis (OEA) provided long-term (through year 2020) state population forecasts, disaggregated by county, for state planning purposes. These annual population estimates for cities and counties are used for the purpose of allocating certain state tax revenues to cities and counties. Historic population estimates for Sherman County are summarized in Table 5-1.

TABLE 5-1
SHERMAN COUNTY POPULATION TRENDS

Year	Population	Average Annual Growth Rate	Total Growth/Decade
1970	2139	---	---
1980	2172	0.15%	1.5%
1990	1918	-1.17%	-11.7%
1996	1900	-0.15%	---
2000	1934	0.29%	0.08%

Source: US Census Bureau (1970, 1980, 1990 censuses and preliminary 2000 Census); and Portland State University Center for Population Research and Census (1997 estimates).

HISTORIC POPULATION TRENDS

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, Gilliam, Harney, Union, Grant, and Wallowa Counties. The population of Sherman County actually declined in the 1980s and the beginning of the 1990's, reflecting a general slowdown in the state's economy. As a result, the population of Sherman County in 1996 was lower than at any time since 1960. Developments in the state economy, improvements to the Biggs Waste Water Treatment Plant completed in 1998 and the trend of people retiring into rural areas have led to increases in population and contributed to the county's recent population growth trend from the mid-1990's to 2000.

Estimated at 1,900 in 1996, the population of Sherman County has grown moderately since then as reflected in the preliminary results of the 2000 Census. The 2000 Census population count indicates there are 1934 people in Sherman County, this establishes an average annual growth rate of approximately 0.29% from the 1996 estimates or an overall 0.08% percent increase over the decade.

During the 16-year period from 1980 through 1996, Sherman County's population declined by 272 people encompassing a major rural decline of 160 people, a decline of 62 residents in Rufus, 25 in Wasco, and 41 in Moro. The only city that had an increase in that time frame was Grass Valley with an increase of 16 residents. During the recent six-year period from 1990 to 1996, rural population declined by 52 residents (-0.62%) and Rufus declined by 5 residents (-0.28%). The city of Wasco's population increased by 0.7% percent (16 residents), Moro has grown by 0.17% percent (3 residents), and Grass Valley has grown by 1.98% percent (20 residents). This recent growth must be weighed appropriately against longer 20-year growth rates.

As further result become available for the cities from the 2000 Census these trends will become clearer and growth rates will more than likely show increases as reflected in the preliminary Census 2000 results.

PROJECTED POPULATION TRENDS

State projections show that Sherman County is expected to continue to experience population gains for the next 20 years. Like much of rural Oregon, the economy of Sherman County remains largely seasonal, with a large sector of employment being agriculture-based. Therefore, population increases are difficult to predict, and may not be as stable as the forecasts appear to imply. However, the advent of Telecommuting, and the desire of the elderly to live in a quieter, small rural environment may continue to increase Sherman County's population.

The methodology used in forecasting the future population of Sherman County employs historical census data, official annual estimates, and official long-range forecasts. A methodology based on the state's OEA county-distribution methodology was used to develop population and employment forecasts for each of the cities in Sherman County. A weighted average growth rate was calculated for each jurisdiction (weighting recent growth more heavily than past growth) and combined 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. Population projections for Sherman County are summarized in Table 5-2.

Table 5-2
SHERMAN COUNTY POPULATION PROJECTIONS

Year	Population	Average Annual Growth Rate	Total Growth
1996*	1900	----	---
2000*	1934	0.45%	1.8%
2005	1974	0.41%	2.06%
2010	2020	0.47%	2.3%
2015	2068	0.47%	2.4%
2020	2116	0.46%	2.3%
1996 to 2020	+216	0.47%	11.4%

Source: 1997 estimates developed by Portland State University Center for Population Research and Census; forecasts developed by State of Oregon Office of Economic Analysis.
** Actual Census data*

Using this methodology, Sherman County is expected to experience a population gain of 216 people during the next 20 years. This represents an increase of over 11 percent from the 1996 estimate of 1,900 residents to an estimated 2116 residents in the year 2020.

The majority of expected population growth between 1996 and 2020 will probably occur within the cities of Sherman County. The cities should receive 130 of new residents, representing 60 percent of all new residents. Rufus is forecast to receive 33 new residents, Wasco 44 new residents, Moro 33 new residents, and Grass Valley is forecast to receive 20 new residents.

TABLE 5-2a
SHERMAN COUNTY POPULATION PROJECTIONS FOR CITIES

	1990	1996	Forecast using OEA Projections		Proportional distribution to cities		Net Increase
			%	Expected population	2000	2020	
Sherman County	1918	1900	11.35	2116	100.00	2116	216
Rufus	295	290			15.26	323	33
Wasco	374	390			20.53	434	44
Moro	292	295			15.53	328	33
Grass Valley	160	180			9.47	200	20
Unincorporated	797	745			39.21	830	85
Total		1900			100.00	2116	216

Source: 1996 estimates developed by Portland State University Center for Population Research and Census; forecasts for County developed by State of Oregon Office of Economic Analysis, Proportional distribution to cities calculated by Sherman County.

POTENTIAL DEVELOPMENT IMPACT

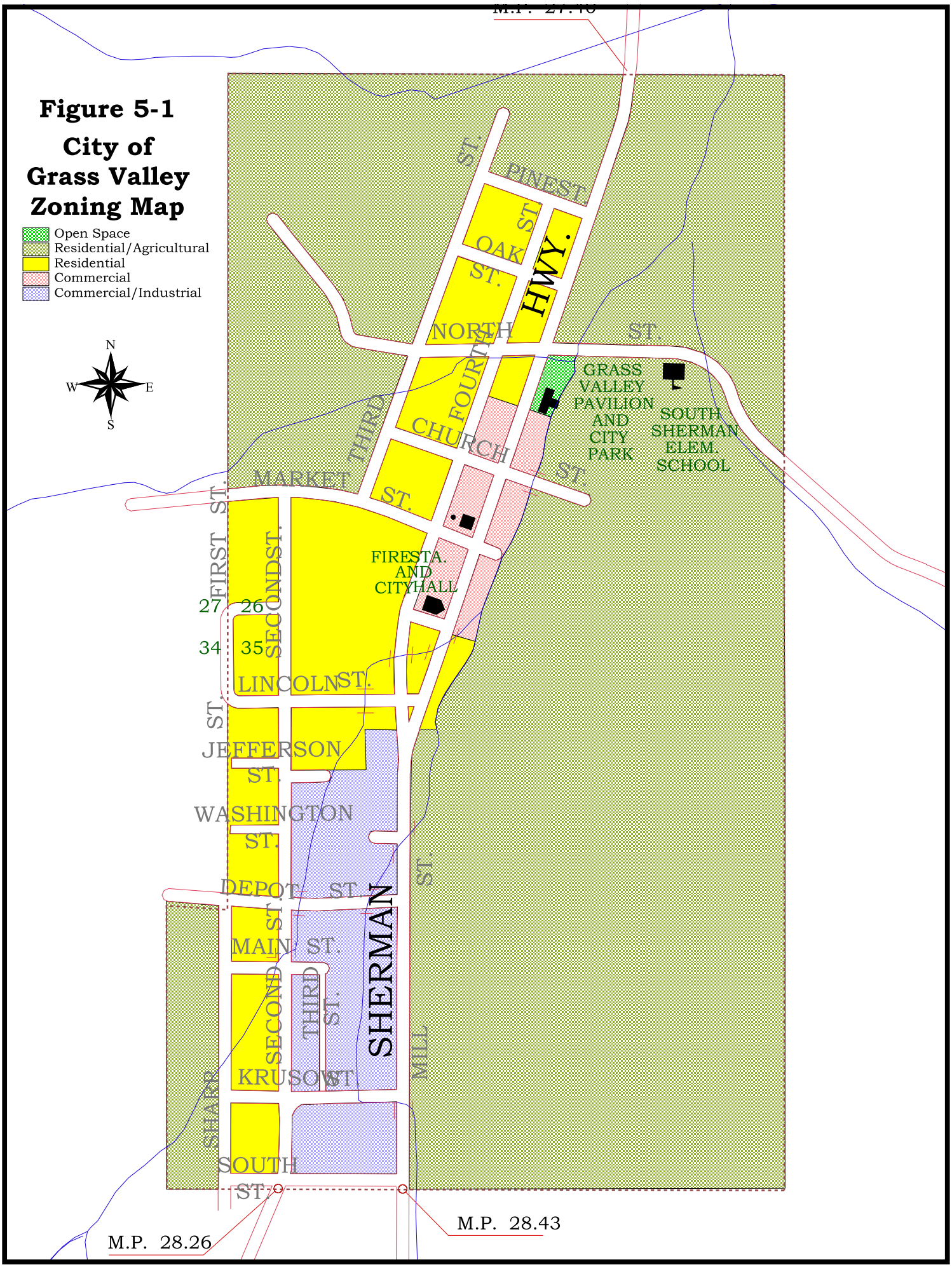
Within Sherman County borders there are approximately 190 acres of land zoned for Commercial use and, 91 acres of land zoned for Industrial use. This land is within the individual city limits or located in the Biggs Junction, Commercial Service area and the Kent unincorporated community as indicated in Table 5-3. Land outside of the cities and the unincorporated communities of Biggs Junction and Kent are all zoned F-1, Exclusive Farm use (Figures 5-1 to 5-4).

TABLE 5-3
POTENTIAL DEVELOPMENT IMPACT

	Commercial Acreage		Residential Acreage		Industrial Acreage	
Designated Area	**Net area**	**Vacant**	**Existing**	**Vacant**	**Net area**	**Vacant**
County	10 acres	50%	0 acres	NA	0 acres	NA
Biggs	25 acres		None	None		
Kent					None	None
Rufus	60 acres	(15ac.) 25%	540 acres	50%	15 acres	100%
Wasco	95 acres	20%	480 acres	25%	65 acres	95%
Moro					11 acres	100%
Grass Valley						

Figure 5-1
City of Grass Valley Zoning Map

- Open Space
- Residential/Agricultural
- Residential
- Commercial
- Commercial/Industrial



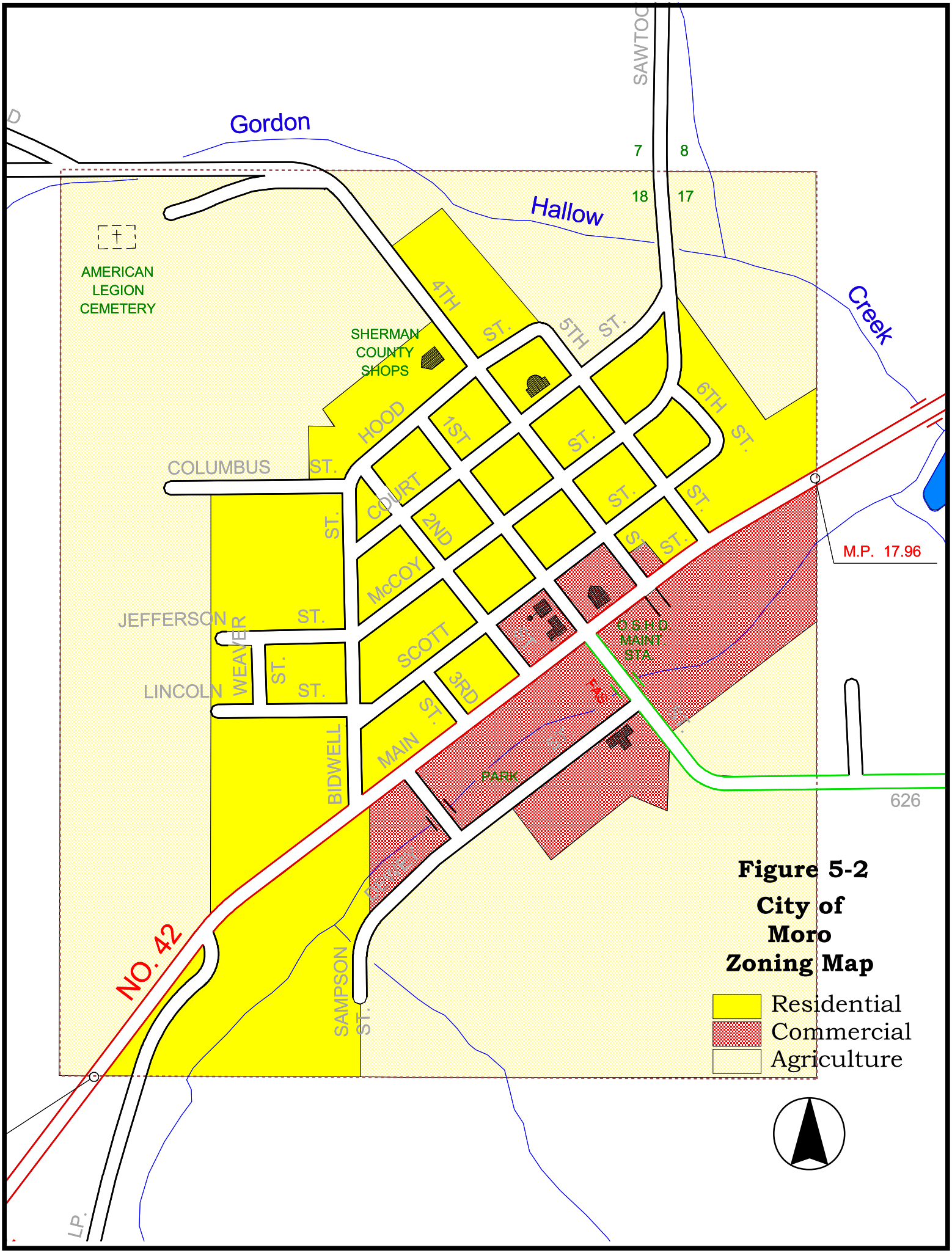

Gordon
Hallow
Creek
SAWTOOTH
7
8
18
17
AMERICAN LEGION CEMETERY
SHERMAN COUNTY SHOPS
4TH ST.
5TH ST.
6TH ST.
HOOD
1ST
COURT
2ND
McCOY
SCOTT
3RD
MAIN
BIDWELL
WEAVER
COLUMBUS ST.
JEFFERSON ST.
LINCOLN ST.
ST.
M.P. 17.96
O.S.H.D. MAINT. STA.
PARK
626
NO. 42
SAMPSON ST.
LP.
Figure 5-2
City of Moro
Zoning Map
Residential
Commercial
Agriculture

Figure 5-3
City of Rufus
Sherman County, Oregon
Existing Zoning

- Residential R-5
- Residential R-10
- Residential/Agricultural
- Commercial
- Industrial
- Open Space

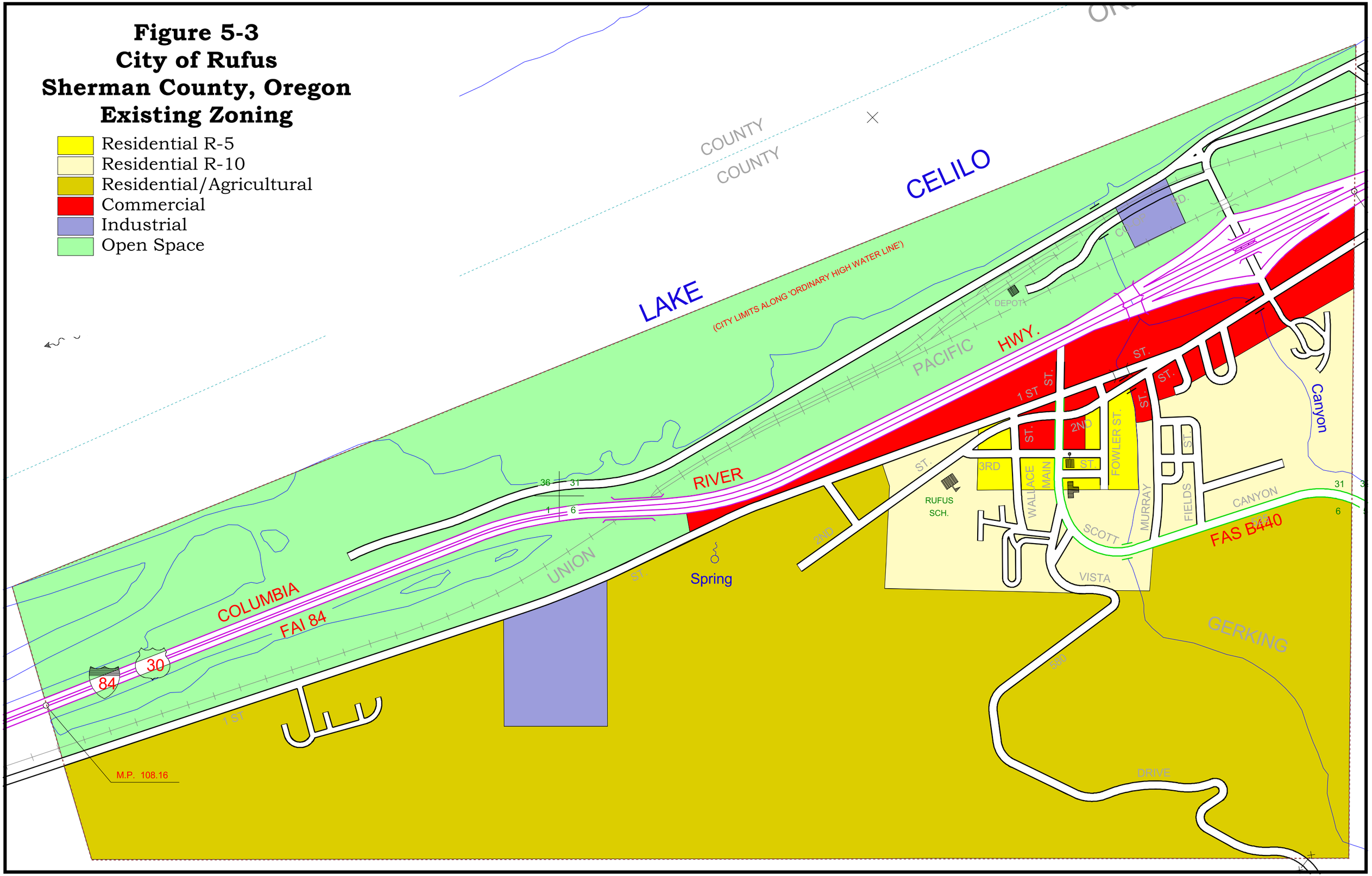


Figure 5-4
City of Wasco
Sherman County, Oregon
Existing Zoning

Zoning District

- R-1
- R-2
- C-1
- M-1
- Open Space/Public Facility
- A-1
- City Boundary

N
W E
S

M.P. -0.84
Sewage Disposal
NO. 300
SCOTT
525
YATES ST.
JOHN ST.
DAY ST.
SANDOK ST.
DESCHUTES ST.
WILSON
COLUMBIA ST.
CHURCH
BARNETT ST.
WASCO GRADE SCHOOL
WY.
NO. 301
ARMSWORTHY ST.
HILDERBRAND
658
FULTON PARK
ST.
WILSON
DAVIS
MILL ST.
BIGGS
ELLIS
SCOTT ST.
573
HARRISON ST.
McPHERSON
PEMBERTON
CLARK
DUNLAP ST.
WASCO-
HWY.
M.P. 15.07
M.P. 0.58

There are approximately 592 existing residential farm units in the unincorporated area and additional housing available in each of the cities. Vacant commercial/Industrial properties exist in each of the cities as indicated in Table 5-3.

TRAFFIC VOLUMES

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

Historic

Before projecting future traffic growth, it is important to examine past growth trends on the Sherman County roadway system. Historic data are only available for the state highway system in Sherman County; however, these roadways carry far more traffic than any other streets in the county. ODOT collects traffic count data on the state highways (rural and urban sections) every year at the same locations.

Historical growth trends on the state highways in Sherman County were established using the average daily traffic (ADT) volume information presented in the ODOT Traffic Volume Tables for the years 1978 through 1998. The ADT volumes were obtained for each of these years at several locations along each highway. Using a linear regression trend line analysis of the average ADT volumes between 1978 and 1998, an average annual growth rate was determined. Table 5-4 summarizes the state highway historic average growth rates based on the trend line analysis.

Over the past 20 years, traffic levels have grown throughout most of Sherman County. Growth on the rural sections of I-84 in Sherman County has ranged between 2.8 and 3.1 percent per year. Traffic volumes on the rural sections of US 97 have been growing in the range of 2.8 percent per year between the Oregon State line and Moro to as much as 6.3 percent per year between Grass Valley and the Wasco County line. The large growth along the southern section of US 97 south of Grass Valley may be due to increased truck traffic through the area and the moderate growth of the local population.

Rural sections of OR 206 have experienced growth ranging from 1.1 percent per year between Wasco and the Sherman/Gilliam County line and a substantial growth rate of 4.1 percent per year between the Wasco/Sherman County line and Wasco. The substantial growth on this western section of 206 may be a result of changing life styles in the region. Greater numbers of people are relying on The Dalles for goods that are no longer available locally as local businesses are reducing their operations or closing altogether

and many more people are working in The Dalles. The rural section of OR 216 has experienced a negative growth trend over the past 20 years, averaging -2.2 percent per year. This is probably the result of decreasing population in the area.

In general, historic traffic volume growth on the rural sections of the state highways exceeded the 20-year historic population growth in Sherman County. Although Sherman County has experienced population gains during this decade (0.17 percent per year since 1990), during the 16-year period between 1980 and 1996, Sherman County population declined at about -0.83 percent per year. While population declined over the 20-year period, rural traffic volumes grew from 1.1 percent per year along the eastern section of OR 206 to 4.2 percent per year along the southern section of US 97. This relationship reflects the modern trend toward an increase in per capita vehicle miles traveled and the increase in commercial and tourist traffic.

No historic traffic volumes for the county roads are available. Without historic data, growth trends on the county road system cannot be observed.

TABLE 5-4
HISTORIC TRAFFIC GROWTH RATES ON STATE HIGHWAYS

Highway Section	Milepost	AAGR[1] 1978-1998	Total Growth 1978-1998
I-84 (Columbia River Hwy #2			
Rural- Wasco/Sherman Co. line to Biggs Jct.	97.44 - 104.86	2.5%	62.5%
Rural- Biggs Jct. to Sherman/Gilliam Co. line	104.86 - 114.55	2.2%	55.0%
US 97 (Sherman Hwy #42)			
Rural- OR State line to Moro 18.39 mi	-0.42 - 17.96	2.2%	55.8%
Urban-Moro 0.92 mi	17.96 - 18.88	1.5%	34.5%
Rural- Moro to Grass Valley 8.52 mi	18.88 - 27.4	2.4%	61.3%
Urban- Grass Valley 1.04 mi	27.40- 28.44	2.4%	60.8%
Rural- Grass Valley to Wasco Co. 21.4 mi	28.44 - 48.81	4.2%	125.0%
OR 206 (Wasco-Heppner Hwy #300)			
Rural- Wasco to Morrow Co. 16.92 mi	-1.97 - 14.95	1.1%	25.3%
OR 206 (Celilo-Wasco Hwy #301)			
Rural- Wasco/ Sherman Co. to Wasco 15.47 mi	2.92 - 15.57	4.1%	122.0%
OR 216 (Sherars Bridge Highway #290)			
Rural- Wasco Co. to Grass Valley 20.12 mi	8.3-28.42	-2.2%	-36.0%

Source: 1999 ODOT Traffic Volume Tables; information compiled by Debi Kirac.
1. AAGR- Average Annual Compound Growth Rate

Forecasting Methodology

The forecasting methodology was based on the available existing and historical traffic data and population growth trends. The traffic forecast for the state highway system in Sherman County was

performed using *a Level 1 –Trending Forecast*[3] analysis. This methodology assumes that traffic demand on the state highways will grow over the 20-year planning period according to the greater of the linear 20-year historical traffic growth trend line rate or the forecast county population growth rate. State highway locations that have displayed increasing 20-year historical traffic growth are assumed to continue to grow according to the 20-year historical linear trend line growth rate. Locations displaying negative historical traffic growth are assumed to grow at a rate equivalent to the forecast population growth rate within the county. For any of these highway locations near urban areas, forecast urban population growth will be considered as well. To confirm that use of the historical traffic growth linear trend line in the Trending Forecast analysis was the best projection methodology for most rural highway locations, comparisons were made with the historical and projected population growth for the county.

Comparisons show that historical traffic growth trend line rates on all but one of the rural sections of the five state highways in the county are higher than the 20-year historical and 20-year forecast population growth rates for the county which are -0.16 and 0.45 percent per year, respectively. The rural section of OR 216 from Grass Valley to the Wasco/Sherman County line was the only section of roadway that displayed a negative 20-year traffic growth trend. In this case, the historical growth trend is assumed to better reflect expected future traffic growth along this rural section. All other rural highway sections in the county averaged traffic growth rates ranging from 1.1 to 4.2 percent per year; well above 20-year forecast population growth rates.

As appropriate, the future traffic growth rate forecast along OR 216 (State Highway # 290) that has displayed a negative historical growth trend is assumed to grow at an average annual compound rate equivalent to the 20-year forecast population growth rate in Sherman County of 0.45 percent per year. All other rural highway sections are forecast to continue to grow according to their associated 20-year historical traffic growth trend line.

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.

Future Traffic Volumes

Using the same linear regression analysis used to calculate the historic growth rate of traffic, forecasts were generated for the years 1999 through 2019 for all rural highway sections except OR 216 where the forecast County population growth rate of 0.45% was used to forecast traffic growth. Future 2019

[3] ODOT *Transportation System Planning Guidelines*, August 1995, p. 29.

ADT volumes are shown in Table 5-5. Rural highway traffic volumes are expected to range in growth from 8.9 percent along OR 206 between the Wasco and the Sherman /Gilliam County line and to 70.2 percent along US 97 between Grass Valley and the Sherman/Wasco county line. Urban highway growth is expected to range from 31.2 percent in Moro to 53.0 percent in Grass Valley.

HIGHWAY SYSTEM CAPACITY

Both existing year 1999 and future year 2019 level-of-service analyses were performed on the rural sections of state highways in Sherman County. The future year volumes were generated in accordance with the forecasting procedures outlined previously. Analyses were conducted for the same rural highway locations and in the same manner as outlined in Chapter 4 (*Current Transportation Conditions*).

Rural Roadway Operations

The traffic operation of mainstream traffic along the rural highway sections was determined using the 1994 Highway Capacity Manual. This software is based on the *1994 Highway Capacity Manual*, Special Report 209, published by the Transportation Research Board. Analysis of a rural two-lane highway takes into account the magnitude, type, and directional distribution of traffic as well as roadway features such as the percentage of no passing zones, general terrain, and lane and shoulder widths.

For each of the five rural highway segments in Sherman County, the peak hour traffic was assumed to represent 10 percent of the 24-hour ADT volume forecast through the procedures outlined in this chapter. Volumes were increased by 20 percent to represent worst-case peak summer month operations and a 60/40 directional split was assumed.

Traffic operations on the rural sections of the highway were analyzed for a typical peak hour condition. The resulting level of service for each highway segment is shown in Table 5-6. All rural highway segments are expected to continue to operate at LOS A.

TABLE 5-5
FUTURE FORECAST TRAFFIC GROWTH RATES ON STATE HIGHWAYS

Highway Section	Milepost	1999 ADT (vehicles/day)	2019 ADT (vehicles/day)	Total Growth 1998-2019
I-84 (Columbia River Hwy #2)				
Rural- Wasco Co. line to Biggs Jct.	97.44 - 104.86	13,000	19,400	49.2%
Rural- Biggs Jct. to Gilliam Co. line	104.86 - 114.5	9,766	15,800	61.8%
US 97 (Sherman Hwy #42)				
Rural- OR State line to Moro	-0.42 - 17.96	3,583	5,283	47.4%
Urban-Moro	17.96 - 18.88	2,667	3,500	31.2%
Rural- Moro to Grass Valley	18.88 - 27.4	2,500	3,500	40.0%
Urban- Grass Valley	27.40 - 28.44	2,300	3,520	53.0%
Rural- Grass Valley to Wasco Co.	28.44 - 48.81	2,066	3,516	70.2%
OR 206 (Wasco-Heppner Hwy #300)				
Rural- Wasco to Morrow Co.	-1.97 - 14.95	604	658	8.9%
OR 206 (Celilo-Wasco Hwy #301)				
Rural- Wasco Co. line to Wasco	2.92 - 15.57	774	1,445	86.7%
OR 216 (Sherars Bridge Hwy #290)				
Rural- Wasco Co. to Grass Valley Trending forecast analysis	8.3 - 28.42	94 94	94 136	0.0% 0.45%

Source: 1999 ODOT Traffic Volume Tables, 2019 future forecasts: information compiled by Debi Kirac.

Freeway Operations

Analysis of freeway operations is based on traffic volumes and composition (i.e., percent trucks), lane widths, lateral clearance between the edge of the travel lane and the nearest roadside or median obstacle or object influencing traffic behavior, and driver population (i.e., regular and familiar users of the facility).

Freeway operations were analyzed along I-84 east of Rufus near ODOT's automatic traffic recorder at MP 148.5. This segment of the freeway was chosen to represent operations within Sherman County due to the rural character of the freeway and the high percentage of truck traffic which produce a worst-case freeway analysis. Future 2019 freeway operations were analyzed using 2019 ADT volumes representing average daily conditions, and using the same 2019 ADT volumes, increased by 23. Peak hour traffic was assumed to represent ten percent of the 24-hour ADT volumes used and the directional split was assumed to be 60/40.

Table 5-6
SUMMARY OF OPERATIONS ON TWO-LANE HIGHWAYS

Location	1998 LOS	2018 LOS
US 97 between Biggs Junction and Moro	A	A
US 97 between Moro and Sherman/Wasco Co. line	A	A
OR 216 between Grass Valley and Sherman/Wasco Co. line	A	A
OR 206 between Sherman/Gilliam Co. line and Wasco	A	A
OR 206 between Wasco and Sherman/Wasco Co. line	A	A

The resulting freeway LOS for average and peak summer traffic levels, under the assumptions outlined above, was LOS A for 1999. Under average 2019 traffic levels the freeway would continue to operate at LOS A. Overall, future 2019 freeway operations are expected to continue to operate very well throughout Sherman County.

Operations at Intersections

Traffic operations were determined at intersections along the critical urban highway sections using the *1994 Highway Capacity Manual*. Since all intersecting streets and driveways are controlled by STOP signs in these areas, the analysis was performed for unsignalized intersections.

Traffic operations were again analyzed for two intersections located along the critical urban sections of the state highways: US 97 and Fourth Street in Moro and OR 19 and North High School Loop Road in Moro. The analysis was based on a peak hour two-way traffic volume of roughly ten percent of the ADT. Also, a 60/40 directional split was used to reflect the distribution of traffic on the highways during the peak hour. Volumes approaching US 97 at Fourth Street in Moro were assumed to equal those along the highway representing a worst-case analysis.

Under these assumptions, the highway intersections are expected to continue to operate at an overall LOS A under 2019 peak summer traffic volumes. Selected individual movements are expected to just cross the threshold to LOS B operations, which still constitute very good traffic operations. The results indicate that all other lower-volume roads or driveways accessing any rural or urban portion of the highways are expected to operate at LOS A as well in 2019.

Capacity Issues

Overall freeway, two-lane rural highway, and unsignalized intersection operations in Sherman County are expected to continue to operate at LOS A or B under worst-case future 2019 peak summer traffic

volumes. This indicates that there are no identified capacity constraints or issues within the county including the urban areas of Moro and Grass Valley.

CHAPTER 6
IMPROVEMENT OPTIONS ANALYSIS

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

IMPROVEMENT OPTIONS

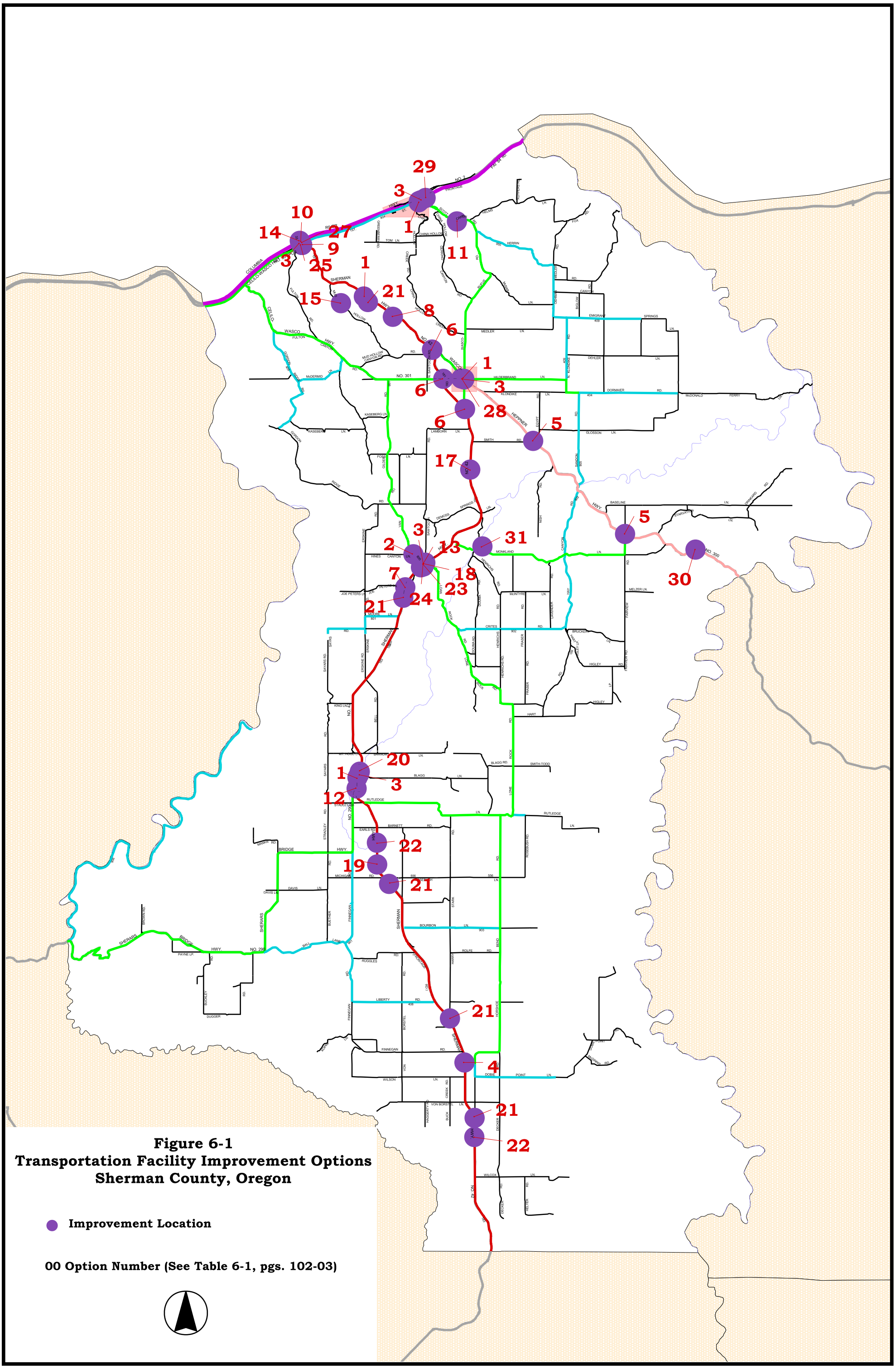
Twenty transportation system improvement options were developed to address specific deficiencies, safety issues, access or concerns. The proposed transportation system improvements recommended for the Sherman County TSP includes both state highway and county road projects and are shown on Figure 6-1. The four incorporated cities in Sherman County have participated in the TSP process and have helped to identify all of the county-wide projects as well as projects specific to their own jurisdictions.

This section of the TSP describes the individual improvements and their associated costs. Projects identified in the TSP are broken down into four categories based on the purpose of the improvement. The five categories are Enhancement (EN); Modernization (MO); Maintenance (MA); Operations (OP); and Safety (ST).

As part of the county's 5-year working road plan, these projects have already been evaluated and assessed as necessary. Therefore, these projects are not evaluated in this chapter, but are included in the county's 5-year road plan, which is summarized in Chapter 7 of this TSP.

The US 97 Corridor Plan and The Biggs Junction Refinement Plan described in Technical Memorandum 1 were also reviewed by the County by stakeholders interested in transportation issues in Sherman County. Both documents and the implementation of the recommendations in the plans are supported by the County Court.

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


29
3
1
10
14
27
9
3
25
1
SHERMAN
15
21
8
6
1
3
6
28
6
5
17
3
2
13
31
5
7
18
23
24
21
30
20
1
3
12
22
19
21
21
4
21
22
Figure 6-1
Transportation Facility Improvement Options
Sherman County, Oregon
Improvement Location
00 Option Number (See Table 6-1, pgs. 102-03)

EVALUATION CRITERIA

Each improvement option was evaluated with regard to impacts to traffic; safety; environmental factors, such as air quality, noise, and water quality; and socioeconomic and land use impacts, such as right-of-way requirements and impacts on adjacent lands. A final factor in the evaluation of the potential transportation improvements was cost. Costs were estimated in 2001 dollars based on preliminary assessments for each potential transportation system improvement. Final review of each project resulted in a recommendation of whether the project should be implemented.

Evaluation of Improvement Options

Through the transportation analysis and input provided from the public involvement program, several potential improvement projects were identified. These options ranged from major highway realignment to minor intersection traffic control modifications. They are not listed below in order of priority but are included in the order that they were received in response to the road survey and subsequent meetings.

Option 1. Implement Transportation Demand Management (TDM) Strategies (EN, OP)

Overview: One of the goals of the Oregon Transportation Planning Rule (TPR) is to reduce the reliance on the automobile. The TPR recommends that counties should evaluate TDM measures as part of their Transportation System Plans. These strategies are designed to change the demand on the transportation system by providing facilities for other modes of transportation, implementing carpooling programs, and developing other transportation measures within the community, such as staggering work schedules at local businesses. These types of TDM strategies may be more effective in a large urban city, but some strategies can still be useful in the rural and urban areas of Sherman County.

There is one type of TDM measure that would be useful in Sherman County: development of facilities for alternative modes of transportation. This would include paved shoulders and paths, sidewalks, and bike lanes, which would handle pedestrians and bicyclists. All future street improvement projects in the rural areas of Sherman County, whether they involve new roadways or a retrofit of an existing roadway, should include the addition of 2- to 6-foot paved shoulders, depending on the amount of traffic on the roadway. This would allow pedestrians and bicyclists to travel safely on the road. All future street improvement projects in the urban areas of the cities of Sherman County should include a pedestrian and bicycle facilities in locations where auto/pedestrian/bicycle traffic volumes warrant.

Option 1A- Design and install multi-purpose path systems through all four cities:

Impacts: Sherman County has identified a need to improve pedestrian and bicycle connectivity in and near the cities. To support this goal, a multi-use path design needs to be developed to accommodate bicycle, pedestrian, and other users (e.g., roller-bladers). Providing adequate facilities for pedestrians and bicyclists increases the livability of rural and urban areas of the county, and improves driver, pedestrian, and bicycle safety.

Costs: The costs for several types of facilities, which promote walking and biking in the county are summarized below.

Multi-Use Paths – A 10-foot wide multi-use path would cost around $16 per linear foot. This includes 2 inches of asphalt over 4 inches of aggregate.

Concrete Sidewalks – The estimated cost to install new sidewalks on one side of an existing street is around $25 per linear foot. This includes a 5-foot wide walkway composed of 4 inches of concrete over 2 inches of aggregate.

These costs are for stand-alone improvements; the costs can be reduced when they are included as needed in roadway improvement projects throughout Sherman County.

Recommendation: Implementing TDM strategy 1A would provide needed facilities for pedestrians and bicyclists within and around the cities and rural service centers, increase the safety of the roadway system, and enhance the quality of life in Sherman County. Therefore, TDM strategy 1A summarized above is recommended.

Option 1B- Design and implement Bike path following north/south along US 97 utilizing side alternative roads where feasible:

Impacts: Providing adequate facilities for pedestrians and bicyclists increases the livability of rural and urban areas of the county, and improves driver, pedestrian, and bicycle safety.

Cost: The costs for several types of facilities, which promote walking and biking in the county are summarized below.

Paved Shoulders – Shoulders constructed along both sides of a road that are 4 feet in width would cost around $25 per linear foot of road. This would include 4 inches of asphalt and 9-inches of aggregate.

Bike Lanes – The cost to install bike lanes on both sides of an existing road is around $45 per linear foot. This cost includes widening the roadway by 5 feet on both sides, using a fill composed of 4 inches of asphalt over 9 inches of aggregate, and placement of an 8-inch painted stripe.

These costs are for stand-alone improvements; the costs can be reduced when they are included as needed in roadway improvement projects throughout Sherman County.

Recommendation: Implementing TDM strategy 1B would provide needed facilities for pedestrians and bicyclists, increase the safety of the roadway system, and enhance the quality of life in Sherman County. Therefore, TDM strategy 1B summarized above is recommended.

Option 2. Improve roadway alignment and grade on Van Gilder Road leaving the City of Moro. (ST)

Overview: As you leave the city of Moro and go past the cemetery heading west, Van Gilder Road curves to the right and Harris Road comes in from the west. Traffic speeds within most of this highway section are 35 mph and involve limited sight distance. The bank along this area needs to be lowered so people going straight on Harris Road can see on-coming traffic. The bank along the opposite side is also in need of reduction for people coming off of the hill on Harris Road onto Van Gilder Road.

As this road is not on the state highway system, no ADT volumes have been measured historically. Because of concern about the amount of traffic on this road brought up by citizens at several meetings for the US 97 Corridor Study, ODOT did measure ADT in 1998 and found it to be 288 vehicles per day.

Impacts: Roadway improvements along Van Gilder Road would improve traffic operations and safety along a stretch of road that is receiving substantial traffic as the major access route for people leaving the city of Moro and Grass Valley and southern Sherman County to get to The Dalles. Expected delays to motorists would likely be minimal due to construction of this project.

Cost: Based on the study conducted to date, the Sherman County Road Department has estimated that the cost to reduce the bank along this road section would be approximately $30,000 and has included the project in the county 5-year plan for the year 2004.

Recommendation: Completion of this improvement project would support improved traffic operations for motorists traveling to The Dalles and locally. This project is recommended for inclusion in the TSP as a medium priority project estimated for construction before the year 2006.

Option 3. Improve US 97, OR 206 Spur, I-84 Frontage Road, and OR 206 speed reduction measures at entry's to all four cities through signage and increased enforcement. (OP)

Overview: The increased traffic on US 97 over the last decade has created conflicts with local traffic entering and crossing the road. In addition truck traffic on I-84 Frontage Road (Biggs-Rufus Highway) entering the city of Rufus from the Biggs Junction area is braking and creating conflicts for residents in their area. Similar problems are occurring in Wasco where OR 206 enters into the city and for residents along US 97 in Moro and Grass Valley. These conflicts are due to the speed of vehicles and to noise factors they incur as they enter and cross through the small rural cities.

Residents have asked that measures be enacted to relieve the problems of vehicles speeding through town and the noise that braking creates. Signs have been posted but the response of the drivers is often too late and they are in town before they are effectively slowed down to be compatible with the local traffic. Consequently they are creating conflicts within the towns. The cities of Wasco, Moro and Grass Valley also accommodate substantial agricultural traffic. The slow moving vehicles, bringing grain or machinery into town to be worked on often create congestion that is impacted by increased traffic.

Impacts: Signage located further from the towns and warnings of conflicts due to crossing traffic, pedestrian use of the road and slower moving vehicles in the town should assist the residents who are being impacted by the increased usage of the roads by large trucks and other through traffic.

All signage directed towards motorist must meet guidelines outlined in ODOT's *Sign Policy and Guidelines for the State Highway System.* In addition, increased enforcement measures would ensure that more drivers respect the situation and take the necessary precautionary measures that are needed when they are passing through small rural communities.

Additional traffic enforcement within the cities may exceed the existing resources of the Sheriff's Department

Cost: Additional study of the specific locations of existing signs and roadway conditions is needed to determine how to best address the issue. The cost to inventory and analyze the adequacy of existing sign locations would be approximately $2,500. The cost to make/move and install additional signage would be approximately $500 per sign. The cost of additional traffic enforcement officer, car and support services is estimated at $60,000/year.

Recommendation: Study the existing location of existing highway signage against ODOT's *Sign Policy and Guidelines for the State Highway System* to determine adequacy of existing highway signage. Install additional highway signs or move existing signs to comply with adopted State policies. And evaluate the feasibility of adding traffic enforcement officer and support resources to the Sheriff's Department.

This improvement is recommended as a long-term project in the TSP.

Option 4. Implement a no-passing zone in the unincorporated district of Kent. (OP)

Overview: Although ODOT's accident database does not reflect accidents occurring at any greater rates along this section of roadway during the three-year period from 1997 through 1999, residents have reported conflicts with traffic attempting to pass vehicles along this stretch of the road with vehicles entering and exiting the highway. The area is an unincorporated community with its own post office, granary and restaurant. Surrounding area residents frequently use the intersection. The area should be a no-passing zone.

Impacts: Restricting passing in Kent would prevent conflicts and inform drivers that the area they are entering has increased usage due to the local services.

Cost: Cost to re-paint this section of road and post traffic control signs would be minimal.

Recommendation: Establish a no-passing zone through Kent.

This improvement is recommended as a short-term project in the TSP.

Option 5. Improve Monkland/Fairview Road intersection sightline visibility on OR 206 (OP, ST)

Overview: This road is the outlet for traffic using the shortcut from US 97 to OR 206 going east. Motorists use Monkland Road to shorten the trip by approximately 15 miles and completely by-pass the City of Wasco. The road surface on the last few miles of Monkland Road is gravel so travelers turn left off of Monkland onto Fairview for a half-mile to access OR 206. Visibility at this intersection is poor especially during the early morning when fog can often limit the sight distance on OR 206.

The stretch of road from Wasco to Hay Canyon has a relatively high incidence of crashes (1.19 to 1.50 accidents per million miles traveled) as indicated by ODOT's crash data analysis for 1997 to 1999 and preliminary information from the 2000 & 2001 data. Local residents confirm this information and further support it by their first hand experience. The placement of a warning light at an appropriate distance from the Hay Canyon junction may be warranted. A warrant study of this intersection is recommended. Additional improvements at the Hay Canyon junction could include a solid yellow line to restrict passing and possibly a right turn lane for eastbound traffic on OR 206 and a left turn lane for westbound traffic wishing to enter Fairview from OR 206.

Impacts: Area motorist would benefit from measures designed to improve visibility or sightline distances in this vicinity. A yellow flashing caution light has been suggested to provide a warning to traveling motorist especially on foggy mornings, other measures as determined by ODOT would also need to be identified.

According to the *Manual on Uniform Traffic Control Devices* (MUTCD) section 4E-1, intersection control beacons are intended for use at intersections where traffic or physical conditions do not justify conventional traffic signals but where high accident rates indicate a special hazard. Traffic volumes at the intersection would not pass signal warrants, but records indicate that there is a high incidence of crashes that have occurred on this segment of the road over the three-year period from 1997 through 1999. Local residents have indicated that they have experienced many "close calls" and some accidents may have only been reported locally.

A flashing beacon would improve overall intersection recognition by drivers. This would be especially helpful during periods of limited visibility due to fog or heavy rain. There are no foreseeable negative impacts associated with this type of control device at this location.

Costs: Further study by ODOT would be the initial cost and would be added to when the necessary implementation mechanisms are put into place. The cost to install one advance intersection guide sign is approximately $500. Installation of a warning beacon atop of the guide sign is approximately $3,000.

ODOT generated a cost estimates for installation plans for a warning beacon using a 40-foot mast arm in 1998. The cost estimate was increased by 5 percent per year to reflect 2001 dollars. The plan calls for installing a pole and 40-foot mast arm to attach a beacon at a cost of $7,060. Power costs were not figured into the cost estimates. ODOT will have the final authority to determine which type of installation (pole or mast arm) occurs.

Recommendation: A study by ODOT on the necessary safety measures at this intersection should be conducted to determine what could be done to improve visibility and safety at this intersection. Based on the findings of the study ODOT should take appropriate action to implement the recommendations of the study.

Option 6- Improve safety measures on all three US 97 exits to Wasco. (ST)

Option 6A- Provide street lighting for all three exits to Wasco:

Overview: The three exits to Wasco off of US 97 are not illuminated and all difficult to find at night. To further complicate the matter the road curves both coming from the south and after the north exit. Motorists see the exit signs but are unable to easily see their location. Consequently motorist slow down in the travel lane trying to find the exits causing the traffic behind them to be impacted. The existing situation could be addressed through the installation of luminaries at the junctions of all three exists to Wasco.

Impacts: There are no foreseeable negative traffic operations impacts associated with this improvement option. There would be additional costs associated with the installation of the luminaries, electricity to power them, and routine maintenance.

Cost: No cost estimates were completed for this option.

Recommendation: It is recommended that ODOT install the lighting at the intersections.

Option 6B- Redesign south exit to improve the deceleration lane off of US 97:

Overview: The south exit is by far the worst of the three Wasco exits. The existing design of the exit has a very short deceleration lane for northbound traffic before traffic is required to turn onto the road heading into Wasco.

Motorist coming from the south and trying to exit US 97 into the City of Wasco, or to continue through Wasco and access OR 206 or Scott Canyon Road experience difficulty even in the daylight hours. The exit has an extremely short deceleration lane and the lane must be accessed just as the driver is negotiating the curve that exists before the exit. Traffic currently is impacted negatively when negotiating the turn and accommodating exiting motorist whom are forced to slow down in the travel lane.

Impacts: There are no foreseeable negative traffic operations impacts associated with this improvement option and many benefits. Traffic currently is impacted negatively when negotiating the turn and accommodating exiting motorist whom are forced to slow down in the travel lane.

Cost: No cost estimates were completed for this option. ODOT needs to determine the best measures to implement here and evaluate the cost.

Recommendation: It is recommended that ODOT conduct a refinement study to determine the measures that need to be taken to improve the traffic turn maneuvers at this exit. As traffic continues to increase on US 97 this area is likely to become a greater problem. It would be beneficial to begin to address the problem before it becomes critical.

Option 7. Investigate High School Loop road options for improvements for the North and South Entrances (OP, ST)

Overview: Although this area receives substantial use with ADT rates at 2500, the accidents per million vehicle miles traveled do not indicate a serious problem. When High School events are conducted however congestion occurs at both the north and south entrance to the High School. Additionally visibility is impacted at the south entrance because of the angle of the intersection of High School Loop road and US 97. The road comes in at a 45 degree angle and people have difficulty turning around backwards to see on-coming traffic from the north. Local improvements creating an access a few hundred feet to the north have provided a third access point for the High School with an

intersection at ninety degrees. This road as well as the north and south entrances are in use at all times.

The community has enhanced the High School athletic fields constructing a new ball field south of the school site to provide a better site for the students and observers. They are also working towards making improvements to the football field and track at the High School site. These improvements are necessary for the school to remain competitive and to be able to continue to hold sporting events that are crucial to the fabric of the community. Volunteer efforts and donated materials and equipment completed most of these improvements. Several small grants and financial donations were also received but no school money was involved in the improvements to the facility.

Residents and motorist complain that near misses are frequent at both the north and south entrances and have requested that a turn lane be provided at the north entrance to provide a safe pocket for turning traffic. Motorists have been observed taking undue risks as they maneuver turns into and out of the school campus during school hours or when events are being conducted at the school.

In addition to the need to provide a turn lane at the north entrance, other suggestions to improve the situation have included rerouting the internal circulation of the High School. This rerouting would focus the school traffic in two directions; the first would be to create a new access central to the existing entrances and to then close the existing north and south entrances. The closure of the multiple access points off of Highway 97 would mean that an additional access point would need to be provided. This additional access has been suggested to go through the city of Moro on Dewey Street in front of the Mid-Columbia Producers main grain elevators.

Local residents have opposed the access to the high school via Dewey Street stating that they do not wish to have traffic impacting the town and the elevator traffic. Financing of the internal rerouting of the school roads has been looked into by the school but is not financially feasible for the School district. Any changes to the circulation patterns of the existing school will need to address the local resident opposition and include funding provisions for construction options.

Impacts: Any required construction at this project could probably be done without restricting traffic operations on the highway and done in the summer months to reroute internal circulation when the least amount of impact would be felt by local users.

Cost: A detailed cost estimate was not prepared as part of the TSP. The cost could vary greatly based on the final design, location, and materials used.

Recommendation: It is recommended that the ODOT Safety Analysis Unit (SAU) conduct a more detailed safety analysis of these highway intersections. Implementation of this project should be tied to a recommendation from the SAU or to development of an accident concern along the highway.

Option 8. Improve Fields Corner and US 97 alignment and grade. (OP, ST)

Overview: Fields corner has the highest incidents of motor vehicle crashes in the county and one of the highest on US 97. ODOT has investigated the need to make revisions to the alignment and grade at this corner and currently has included the project in the 2001-2003 STIP as part of the Biggs to Wasco US Highway 97 pavement preservation project. This project is scheduled for construction in 2003.

Impacts: Delays of up to 20 minutes can be expected. Correction of the curve will reduce the number of crashes at this location.

Cost: The Fields Curve Correction has been incorporated into a larger pavement preservation project. The total cost of the Biggs to Wasco Project is $3,470,000. Part of that cost includes the curve correction itself.

Recommendation: Implement the Fields Curve Correction as part of the Biggs to Wasco Pavement Preservation Project in FY 2003 as part of the adopted STIP

Option 9. Complete a speed zone study on US 97 traveling north into the Biggs Junction area to determine necessary safety measures at US 97 and OR 206 Spur/I-84 Frontage Road intersection. (ST)

Overview: Motor vehicles traveling north on US 97 entering the Biggs Junction area are frequently proceeding too fast for the conditions and are often confused about the traffic patterns that are moving through the area. Upon completion of the access management improvement in Biggs Junction in 2003, a speed study should be conducted to evaluate the safety of the posted speed limit on US 97.

Impacts: This option could result in a change in the posted speed on US 97 through Biggs Junction. This will have a negligible effect on the overall operation of the highway and may improve highway safety.

Cost: $5,000.

Recommendation: Implementation this option is recommended for the short term but after completion of the Biggs Junction access improvements.

Option 10. Implement access management strategies defined in the Biggs Junction Refinement Plan (OP, ST, MO)

Overview: ODOT initiated the Biggs Junction Refinement Plan during the spring of 2000. The purpose of the study was to guide the management and development of state transportation facilities at Biggs Junction and to develop short and long-term access management strategies that will provide for the safe and efficient movement of people and goods within and through Biggs Junction.

ODOT staff, local agencies, property owners and businesses have worked diligently to develop the Refinement Plan in order to address traffic impact problems experienced in the Biggs Junction area. The Plan was completed in February 2001 and implementations of many of the access management measures in the plan are scheduled for completion in the STIP for the year 2003.

Impacts: The suggested measures in the Refinement plan will have a positive effect on traffic flow in Biggs Junction and will reduce unlawful on-street parking that frequently occurs. Construction impact parking on a temporary basis and will most probably cause a temporary hardship for some of the businesses.

Cost: $251,000 has been allocated to complete the project.

Recommendation: Implementation the recommended alternative in the Biggs Junction Refinement Plan in FY 2003/2004.

Option 11. Widen Scott Canyon Road and install signage to require special permits to haul large loads. This permitting should be handled through the statewide permit system. (OP, ST)

Overview: There is concern that large long-haul truck traffic is routinely using Scott Canyon Road to by-pass the Biggs Junction area. Traffic heading south on US 97 from I-84 and traffic heading east on I-84 from US 97 use the area as a short cut to avoid congestion at Biggs Junction. The road does not have the ability to accommodate large long-haul truck traffic, the base is inadequate and the curves are too sharp for large trucks to maneuver safely. Some of this increased traffic may be due to the recent

construction occurring on the US 97 Bridge and the congestion in that area that occurred because of that activity.

The County Road Department proposes to rebuild the road in its five to ten year plan. These improvements would include widening and some minor straightening but do not include rebuilding the base of the road. Continued truck traffic on this road could necessitate additional improvements. The ADT measurements for this road in 1998 showed that the road has 388 users for the first few miles leaving Rufus and increases to 401ADT as traffic gets closer to Wasco. Monitoring of the situation to determine if the larger long-haul vehicles are continuing to use this area as a short cut would provide the information necessary to determine if measures are needed to restrict traffic in this corridor. A study to determine if a permitting process could be enacted with out impacting the local grain growers who use the road needs to be completed. The study would need to determine if the state should require that permits be obtained for truck usage of the road.

Impacts: Impacts would be dependent on the outcome of the increased monitoring and study conducted to determine the necessary measures needed to ensure that any increased usage does not over tax the road and the county's ability to pay for additional improvements as a result of the excessive usage.

Cost: The road has been divided into 2 segments and estimates to the cost of rebuilding and widening the road were made by the county Roadmaster. Segment One improvements are estimated to be $250,000 and Segment Two improvements are estimated to be $500,000. Additional cost for the monitoring and study of the road usage would be minimal and could be done as part of the next phase of the TSP.

Recommendation: The recommendation for this option would be to monitor the traffic on this road and complete a study before the road department plans for this road are undertaken. The Sherman County Road Plan proposes to rebuild the road in two segments during the next 5-10 year span.

Option 12. Move Guardrail back and widen Church Street access to US 97 for snowplow accessibility in Grass Valley. (MA)

Overview: The Guard rail at the intersection of Church Street and US 97 interferes with the operation of the snowplow and needs to be moved back to ensure that adequate snow can be removed from the intersection during winter months.

Impacts: This project would positively impact winter travel along this section of the road for both local and traveling motorist. The area cannot be adequately snow plowed and creates an unsafe position.

Cost: Cost for the relocation of the guardrail would be approximately $3,000

Recommendation: It is recommended that this Option be considered for improvement within the next five years.

Option 13. Pave Second Street in Moro from US 97 to bridge in front of handicap accessible restroom to make the restroom accessible by vehicle per ADA standard requirements. (MO)

Overview: The Sherman County Historical Society has requested that additional paving be provided on Second Street where it connects US 97 to the Moro city park and museum. They have approached the city council and ask that the work be done during the summer of 2002 when ODOT is scheduled to do the reconstruction of US 97from Wasco through Moro. The society has asked that a hard surface of either grindings rolled and oiled or a 2" to 4" mat of asphalt be placed from the ditch bank to US 97. There is an existing handicap accessible restroom available to the public but the road in front of it is gravel, which makes wheel chair access difficult.

Impacts There are no rest areas along US 97 and this restroom is one of the few public restrooms that are available to people traveling on the highway. Expanding the use of the facility for handicap accessibility will help more people to access the facility. Construction of this section of road would have a minimal impact as it could be accomplished at the same time as the reconstruction of US 97 through Moro in 2002.

Cost: $50,000. Improvements to this road may be eligible for Community Development Block Grant (CDBG) dollars through the American Disabilities Act (ADA).

Recommendation: Seek additional local, state and/or federal funds to improve 2nd Street between the ditch and US 97 while work is occurring on US 97 through Moro in 2002.

Option 14. Install variable message sign (Reader Board) on Highway 97 at Biggs to indicate the road conditions going south. (OP, ST)

Overview: Residents in Sherman County have often encountered motorist in the winter months that have been surprised by the road conditions on US 97. The elevation in Moro and the flat open wind swept area between Moro and Grass Valley often have morning fog and elevated temperatures that create icy conditions on the road. The condition is often temporary but creates a hazard especially in the morning hours. This is supported by the crash analysis data that has being collected by the Lower John Day Safety Officer for 2000-2001 that shows substantially more incidents in the morning hours in the winter months than in the summer.

A Reader Board placed in Biggs Junction heading south on US 97 would alert motorist to conditions going south and could prevent a substantial number of crashes.

Impacts: Increased safety on US 97.

Cost: $80,000.

Recommendation: Install during winter months a portable variable message sign at Biggs Junction for southbound traffic informing motorist of current road conditions.

Option 15. Make improvements to Mud Hollow Bridge within the next year and list the bridge for replacement after the repairs are completed. (ST)

Overview: Sherman County bridge #55C010, on Mud Hollow Road has serious structural issues that need to be addressed immediately. Mud Hollow Road is a designated school bus route. The present situation leaves Bent 1 exposed and vulnerable to more scouring, which could lead to a partial failure of the masonry abutment and reduced bearing support of the deck above the NE corner of the bridge. The following is recommended:

Fill the scour hole and direct high flows away from that corner of the bridge. This can be done by properly placing riprap at that location. At a minimum this repair should be made this year during the upcoming in water work period.

Rebuild the masonry where the wing wall joins the abutment. This could probably be done with enforced concrete rather than masonry.

It is suggested that this structure be listed for replacement, even after the repairs are made.

Impacts: This option is an immediate safety concern and should be undertaken within the next year. If repairs are not made the bridge will need to be restricted to heavy vehicles and school buses. Impacts during construction are unavoidable and will effect local traffic on Mud Hollow road. The road is not a major collector so traffic impacts should be minimal.

Cost: $50,000. Actual cost will have to be determined upon further inspection.

Recommendation: The project is recommended for immediate short-term action and also for long term replacement of the bridge.

Option 16. Install signs on US 97 at the north and south turn-off to Wasco giving direction to historic Wasco. (OP)

Overview: The city of Wasco was established in the later part of the 19th Century and contains a large number of commercial and residential buildings that date back to that period. The city also lies along the Oregon Trail as it went from the McDonald crossing of the John Day River to present day Biggs Junction. And the State has designated US 97 just west of the city a state scenic byway – Journey through Time. The city would like to capitalize on its location adjacent to the Oregon Trail and the state scenic byway as an economic development tool to attract visitors to the region.

Impacts: This option would provide travelers on the Journey through Time Route additional information about historic sights and places as they travel along the scenic byway. It would also help the economy of the city of Wasco by attracting tourist to the community who would of otherwise not have stopped. This option also has the potential promoting restoration of historic structures in the city as tourist activity increases.

Cost: Approximately $500 for new signs at all three entrances to Wasco.

Recommendation: This option is recommended for immediate short-term action.

Option 17. Establish a turnout at Milepost 13 for a panoramic viewpoint. (EN)

Overview: The State has designated US 97 as a state scenic byway – Journey through Time. One of the significant attributes of the scenic byway is the magnificent vista of the Cascade Range and Mount Hood and Mount Adams to the west, and the rolling wheat fields to the east on the Columbia Plateau. Oftentimes the views are spectacular and the landscape can be seen for hundreds of miles in all directions. Unfortunately, along the scenic byway there are few, if any safe locations to stop and experience these magnificent views. The paved shoulders are narrow and the gravel shoulders are too soft to support a vehicle. Added to this is the fact that US 97 is also designated as a statewide freight route and a significant number of large freight trucks travel its length through Sherman County.

Impacts: Individually, and taken together, the above factors prevent travelers on the scenic byway from safely stopping and enjoying the spectacular views offered. Providing a turnout so travelers on the scenic byway can take in the views of the Cascade Range and Columbia Plateau at a location that affords safe egress and access to the highway would greatly benefit motorist on the scenic byway.

Cost: A specific design for the view point turnout has not been designed. Cost could range from as little as $2,000 for a widened gravel shoulder to $150,000 for a paved turnout of adequate size to accommodate several parked vehicles at a time.

Recommendation: It is recommended that this Option be considered for improvement within the next five to ten years.

Option 18. Prepare and implement a streetscape master plan for US 97 through Moro that includes traffic calming measures, such as curb extensions at intersections, landscaping, street furniture, and special pavement treatment. (EN, ST, OP)

Overview: US 97 is the "Main Street" for the city. Almost all of the commercial services in the community are located adjacent to the highway. Over the years, most of the curbs and sidewalks have fallen into disrepair. Some buildings have been abandoned or demolished and there is very little landscaping adjacent to the highway. The State has designated US 97 as a state scenic byway – Journey through Time. The state has also designated US 97 as a statewide freight route and a significant number of large freight trucks travel through Moro on a daily basis.

As part of the US 97 Wasco to Moro pavement preservation project scheduled by the Oregon Department of Transportation for 2002, much of the existing curbs and/or sidewalks along US 97 will

be replaced. Also, curb extensions will be constructed at several key locations to provide safer pedestrian crossings of the highway and hopefully slow traffic on the highway.

To preserve US 97 as the "Main Street" for Moro, positive action in the way of building preservation and maintenance in conjunction with improvements to the streetscape need to be made.

Impacts: These improvements could capitalize on the tourist traffic on the scenic byway and minimize the disruptive effects of large trucks on the community. The improvements would encourage continued use of US 97 as the "Main Street" for Moro and provide an incentive for reinvestment. It would also provide a more pedestrian friendly environment for users of the commercial services located along the highway.

Cost: Until a plan is prepared, the costs associated with this option are unknown. The public in general and the adjacent property owners would most likely share the costs for this option. Most if not all of the curb and sidewalk improvements will be installed by 2002 as part of the state highway preservation project.

Recommendation: The curb and sidewalk improvements will be made in 2002. The development of a streetscape plan for US 97 is recommended to be completed in the short-term, or next 5-years. Landscaping along the highway should also occur during this same timeframe once the streetscape plan is complete. Improvements to private property and the buildings will occur in conjunction with economic renewal of the commercial area over the next 5-10 years.

Option 19. Establish a turnout and mountain identifier at Milepost 32 for a panoramic viewpoint. (EN)

Overview: The State has designated US 97 as a state scenic byway – Journey through Time. One of the significant attributes of the scenic byway is the magnificent vista of the Cascade Range and Mount Hood and Mount Adams to the west, and the rolling wheat fields to the east on the Columbia Plateau. Oftentimes the views are spectacular and the landscape can be seen for hundreds of miles in all directions. Unfortunately, along the scenic byway there are few, if any safe locations to stop and experience these magnificent views. The paved shoulders are narrow and the gravel shoulders are too soft to support a vehicle. Added to this is the fact that US 97 is also designated as a statewide freight route and a significant number of large freight trucks travel its length through Sherman County.

Impacts: Individually, and taken together, the above factors prevent travelers on the scenic byway from safely stopping and enjoying the spectacular views offered. Providing a turnout so travelers on the scenic byway can take in the views of the Cascade Range and Columbia Plateau at a location that affords safe egress and access to the highway would greatly benefit motorist on the scenic byway.

Cost: A specific design for the view point turnout has not been designed. Cost could range from as little as $2,000 for a widened gravel shoulder to $150,000 for a paved turnout of adequate size to accommodate several parked vehicles at a time.

Recommendation: It is recommended that this Option be considered for improvement within the next five to ten years.

Option 20. Prepare and implement a streetscape master plan for US 97 through Grass Valley that includes traffic calming measures, such as curb extensions at intersections, landscaping, street furniture, and special pavement treatment. (EN, ST, OP)

Overview: US 97 is the "Main Street" for the city. Almost all of the commercial services in the community are located adjacent to the highway. Over the years, some buildings have been abandoned or demolished and there is very little landscaping adjacent to the highway. The State has designated US 97 as a state scenic byway – Journey through Time. The state has also designated US 97 as a statewide freight route and a significant number of large freight trucks travel through Grass Valley on a daily basis.

As part of a US 97 pavement preservation project in 1999, the Oregon Department of Transportation replaced most of the existing curbs and/or sidewalks along US 97. Also, one curb extension was constructed at the school pedestrian crossing. Unfortunately, the resulting streetscape has not effected the speeds of vehicles through the city and speeding continues to be a frequently heard complaint from city residents.

To preserve US 97 as the "Main Street" for Grass Valley, positive action in the way of building preservation and maintenance in conjunction with improvements to the streetscape need to be made.

Impacts: These improvements could capitalize on the tourist traffic on the scenic byway and minimize the disruptive effects of large trucks on the community. The improvements would encourage continued use of US 97 as the "Main Street" for Grass Valley and provide an incentive for

reinvestment. It would also provide a more pedestrian friendly environment for users of the commercial services located along the highway.

Cost: Until a plan is prepared, the costs associated with this option are unknown. The costs for this option would most likely be shared by the public in general and the adjacent property owners. Some of the curb and sidewalk improvements needed were installed in 1999 as part of the state highway preservation project.

Recommendation: The development of a streetscape plan for US 97 is recommended to be completed in the short-term, or next 5-years. Landscaping along the highway should also occur during this same timeframe once the streetscape plan is complete. Improvements to private property and the buildings will occur in conjunction with economic renewal of the commercial area over the next 5-10 years.

Option 21. Install rumble strips along sections of US 97 at known locations of vehicle crashes that result from vehicles leaving the road. (ST)

Overview: Reviewing crash data from 1993 to present, a vast majority of the crashes on state highways involve single vehicles that leave the road. The crash reports indicate that the primary cause was driver error. There are a number of factors that play into "driver error", including driver fatigue. The crash data tends to indicate that in a majority of crashes, the driver, as a result of fatigue, failed to stay in the travel lane and left the pavement after crossing the exist paved shoulder. Once off the pavement, the vehicle encountered the soft cinder shoulders that make-up the outside edge of the highway. At that point the driver became aware of their situation resulting in one of several possibilities, including but not limited to:

The driver was able to maintain control of the vehicle and bring it to a safe stop within the cinder shoulder portion of the highway resulting in no property damage or injury.
The driver was unable to maintain control of the vehicle and crashed into a fixed object resulting in property damage, injury and or fatality.
The driver was unable to maintain control of the vehicle and the vehicle rolled-over within the shoulder resulting in property damage, injury and or fatality.
The driver was unable to maintain control of the vehicle, over-corrected trying to bring the vehicle back on to the highway and either rolled the vehicle or left the highway crossing the opposing travel lane resulting in property damage, injury and or fatality.

Impacts: After evaluating crash data, and talking to emergency response personnel, the installation of rumble strips along the fog line at key locations could help reduce significantly the single vehicle crash that result from driver error-fatigue.

Cost: Cost of this option has not been determined at this time.

Recommendation: Incorporate as part of all future State preservation, modernization, enhancement, and/or safety projects in the Statewide Transportation Improvement Program the installation of rumble strips on all state highways. Because most of US 97 has recently been repaved and the next scheduled pavement preservation projects will not be for 12-15 years, it is recommended that the state incorporate into their annual maintenance budget to install in the near term (1-5 years) rumble strips on US 97 at the following mileposts:

5.0 – 7.5
19.0 – 22.0
31.5 – 34.0
37.5 – 39.0
42.5 – 44.5

Option 22. Construct two passing/climbing lanes on US 97 south of Grass Valley at Mileposts 30.20 – 31.80 and 44.00 – 45.50. (MO, ST, OP)

Overview: US 97 is designated in the adopted Oregon Highway Plan as a statewide freight route and carries the second highest volume of north-south freight traffic in the State. Over the past ten years, the percentage of large trucks as part of the vehicle mix on the highway has increased to over 25%. Consequently, it is not uncommon to find two or more large freight trucks in a row moving down the highway. Because of the geometry of the highway and the vehicular speed required to pass a platoon of large trucks, safe passing opportunities have been severely restricted. This problem is compounded at night due to poor illumination of the roadway. As a result, motorists are either forced to make unsafe passing moves or stay behind slower moving large trucks for an unacceptable period of time.

Impacts: Providing additional passing lanes south of Grass Valley, motorist will be able to safely pass platoons of large trucks. This will reduce driver frustration and conflicts between different classes of highway users resulting in safer and smoother flow of traffic.

Cost: $1.5 million per passing lane for a total of $3 million if no additional right-of-way is required.

Recommendation: It is recommended that this Option be considered for improvement within the next five to ten years.

Option 23. Improve Dewey Street in Moro to enable it to adequately service adjacent businesses and public facilities. (MO, OP)

Overview: Dewey Street runs parallel to US 97 east of the highway between First Street on the north and Simpson Street on the south. Dewey Street provides access to the Moro City Hall, Sherman County Museum, Sherman County Fire and Emergency Services Station, and the Mid-Columbia Grain Elevators. Recently it has been decided that a proposed senior center for Sherman County will also be located on Dewey Street adjacent to the Sherman County Museum and City Park.

At the present time, Dewey Street has a chip seal service approximately 24 feet in width. There are no curbs or sidewalks providing pedestrian access to adjacent uses. With the increased location of civic/public uses along the street, the need to accommodate large grain trucks delivering product to the elevators, and preserve adequate access for emergency services, the City has identified as a need to improve Dewey Street to Collector standards. This will include reconstructing the road base to accommodate vehicle loads, provide an asphalt surface to the road, and manage drainage using curb and storm drainage facilities, and sidewalks for pedestrian use.

Impacts: This option will improve access to public facilities and services located on Dewey Street. Dewey Street will be better able to accommodate an increase in type and purpose of trips while reducing conflicts between auto, truck, bicycle and pedestrian traffic through design.

Cost: Without design drawings, it is difficult to estimate the cost to reconstruct and improve Dewey Street from First Street to Simpson Street. A very preliminary cost to implement this option is $50,000.

Recommendation: This option is recommended for immediate short-term action.

Option 24. Inspect and make necessary repairs to Moore Lane Bridge. (OP)

Overview: Moore Lane provides access to Dewey Street from US 97. Moore Lane is used by emergency vehicles when responding to incidents south of Moro, and by grain trucks accessing the elevators at Moro. Moore Lane provides a second means of access/egress that is critical for

emergency services. To reach Dewey Street via Moore Lane, a bridge was constructed across Barnum Creek. The bridge was constructed approximately 50 years ago and consists of a single travel lane. Over the years, the surface of the bridge has been resurfaced a number of time. Recently, the bridge appears to have developed a "sag" that may indicate underlying structural problems with the bridge. In addition, given the amount and nature of the traffic on Moore Lane, the bridge has become functionally deficient.

Impacts: Should the Moore Lane bridge become weight restricted all grain trucks accessing the elevators on Dewey Street would have to enter and exit via First Street. This would create significant operation limitations on the grain elevator given the turning radius of the grain trucks and the limited space available to turn around. A weight restriction on Moore Lane Bridge would also restrict the use of Moore Lane by emergency vehicles resulting in longer response time. And should the bridge become condemned, Moro City Hall, Sherman County Emergency Services, Sherman County Museum, the grain elevator, and future senior center would be left with only one means of access. This would significantly effect the operations of all the above uses.

Cost: Cost of this option has not been determined at this time.

Recommendation: It is recommended that this Option be considered for improvement within the next five to ten years.

Option 25. Construct a Kiosk at Biggs Junction to provide travel information regarding points of interest along the Journey through Time Scenic Byway. (EN)

Overview: Biggs Junction is the northern gateway for the Journey through Time Scenic Byway. Currently there is no facility to provide traveler information regarding points of interest along the scenic byway, location of public facilities, services, history of the area, and other items that would make travel along the scenic byway more enjoyable and informative. The location of an informational kiosk at a prominent location in Biggs Junction would provide the traveler with just such information. The kiosk could also be used to help promote tourism in Sherman County and encourage travelers to stay and explore the history of the area.

Impacts: No negative impacts have been identified with this option.

Cost: $15,000

Recommendation: This option is recommended for immediate short-term action.

Option 26. Increase Trucking Inspections both for vehicle safety, weight limits and operation. (ST)

Option 26A. Provide State training of local law enforcement officials to enable increased inspections of trucks for vehicle safety and weight limits:

Overview: Over the past 10 years there has been a steady increase in the number of large trucks operating on state and county roads in Sherman County. At the same time, due to budgetary constraints, the state has not been able to keep pace with this growth so the number of trucks being inspected for safety and the number of trucks weighted have gone down as a percentage of the total truck traffic. To assist the state in providing for safe and legal truck operations on state highways, the Oregon Department of Transportation is partnering with local jurisdictions for those services.

The state offers on an on-going basis training and certification of local law enforcement officials on truck safety inspections and operation of weigh scales. To offset the cost of this operation to local governments, the state will pay the local jurisdiction for each truck inspected.

Impacts: County law enforcement officers will get training and certified to inspect trucks within Sherman County. The level of compliance with vehicle safety requirements could be positively impacted resulting in increased safety on Sherman County roads and highways. The county would be reimbursed by the state for each vehicle inspection made. This could offset any additional cost to the county for law enforcement resources being used for this purpose. It would also eliminate the need for local law enforcement officials to call the Oregon State Police in The Dalles when an unsafe vehicle is discovered during a routine police stop for other reasons.

Cost: Unknown at this time.

Recommendation: This option is recommended for immediate short-term action.

Option 26B. Increased enforcement of speed limits:

Overview: During the past year there have been increased complaints from Sherman County motorist of large trucks exceeding the posted speed limit on state highways. In some instances, the speed of the trucks combined with the road conditions has resulted in what is felt to be reckless and unsafe driving.

To counter this growing problem, it has been recommended that Sherman County Sheriffs Department allocates sufficient resources manage effectively this growing threat.

Impacts: Increased traffic enforcement may not be possible given the existing staffing level of the Sheriffs Department. To implement this option may require the hiring of a part or full-time traffic enforcement officer.

Cost: $20 – 30,000 per year

Recommendation: This option is recommended for immediate short-term action.

Option 27. Reconstruct the US 97/I-84 interchange. (MO, OP)

Overview: The interchange of US 97 and I-84 at Biggs Junction has been identified as being functionally deficient, not meeting current design standards. Since its original construction, the length and volume of trucks using this interchange has increased to the point that the interchange has become a bottleneck to traffic resulting in unacceptable congestion. In addition, the current configuration of trucks and existing geometry of the interchange does not allow for trucks to stay in their correct lane when making either right or left turns. Consequently there has been an increase in crashes between trucks and other vehicles and fixed objects.

Finally, the only access to the port facility at Biggs is via the westbound on-ramp to I-84. This results in vehicles accelerating on the westbound ramp to merge with traffic on the interstate to brake from trucks entering and leaving the port facility. In addition, vehicles leaving the port must travel up to on-ramp to access US 97.

Impacts: Reconstructing the US 97/I-84 interchange to current design standards would eliminate many, if not all of the existing conflicts with the interchange and the entrance to the port, and provide sufficient operational area to eliminate existing conflicts between vehicles at US 97 and the on and off-ramps, and reduce congestion at the interchange.

Cost: $15,000,000

Recommendation: This option is recommended to be implemented in the next 5-10 years.

Option 28. Repair and or replace the Armsworthy Bridge across Spanish Hollow on OR 206 (SH 301). (MO, ST)

Overview: The existing bridge is functionally deficient, lacking sufficient width for bike lanes and has no sidewalks. The bridge is adjacent to the City Park and gets quite a bit of pedestrian and bicycle traffic. Both cyclist and pedestrians are required to use the travel lane to cross Spanish Hollow Creek putting them in conflict with vehicles on the road.

Impacts: This option would allow for the modernization of the bridge to accommodate autos, bikes and pedestrians safely in their own designated space.

Cost: $150,000

Recommendation: This option is recommended to be implemented in the next 5-10 years.

Option 29. Replace the bridges on the Biggs-Rufus Highway (I-84 Frontage Road) at Gerking Creek and Scott Canyon Creek. (MO)

Overview: The bridges on the Biggs-Rufus Highway (I-84 Frontage Road) were built back in the 1930s and are functionally deficient. Both bridges are narrow and only have sufficient room for 2 travel lanes. An adequate shoulder for emergency parking and use by cyclists is lacking. In addition there are no pedestrian accommodation on the bridges. Both Scott Canyon and Gerking Creeks are subject to flash flooding and significant storm water runoff during the winter months. Both bridges experience a regular build-up of debris under and around the structures that pose a significant threat.

Impacts: Replacement of the two bridges would bring them up to current standards to accommodate all users, autos, bikes and pedestrians. The bridges could also be designed to accommodate historic storm water runoff and runoff from major storm events so that the existing threat to the bridges could be eliminated. The replacement of the two bridges would reduce the need for ODOT maintenance crews from having to remove debris from the creek channels on an annual basis, would protect the existing road bed, and prevent storm water runoff from leaving the creek channels and flooding adjacent developed properties.

Cost: $50,000 per bridge for a total of $100,000

Recommendation: This option is recommended for immediate short-term action.

Option 30. OR 206 Cottonwood Grade Curve Corrections. (MO, OP)

Overview: OR 206 is a significant farm-to-market route for local agricultural commodities. The highway as it climbs out of the John Day drainage in Sherman County has a number of curves that do not meet current highway design standards.

Impacts: The substandard curves on OR 206 result in unnecessary slowing of large vehicles in order to safely negotiate the curves.

Cost: TBD

Recommendation: Bring the curves on OR 206 up to current highway design standards as part of a future year STIP project.

Option 31. Monkland Road Curve Corrections. (MO, OP)

Overview: Monkland Road is designated a rural major collector connecting US 97 with OR 206. The curves on Monkland Road are located in a rural high-speed section of roadway.

Impacts: The location of the curves in a rural high-speed section of roadway results in significant slowing of vehicles on a major roadway facility.

Cost: TBD

Recommendation: Bring the existing curves on Monkland Road up to current design standards for a rural major collector facility in conjunction with future projects on Monkland Road.

Option 32. Rufus Industrial Park Access. (OP)

Overview: Rufus is in the process of developing and marketing industrial property at the current site of the city's sewage treatment ponds. As the property develops, adequate access to the property will be critical to its success.

Impacts: As the industrial park develops, there will be an increase in the volume of vehicles entering and leaving the site. To accommodate the increase in left turn movements from the I-84 Frontage

Road into the site without restricting westbound through traffic, a left turn lane may need to be installed.

Cost: $150,000

Recommendation: Construct a left turn lane at the entrance to the Rufus Industrial Park when warranted.

Option 33. Wasco Downtown Specific Plan. (PL)

Overview: The Wasco downtown has many historic buildings situated on a major access route to the historic Oregon Trail crossing of the John Day River. The downtown is also bisected by OR 206, which connects the historic downtown with US 97 and the Journey through Time Scenic Byway. The historic downtown is in need of additional planning to identify enhancements that will improve pedestrian circulation within the area.

Impacts: Assist in the comprehensive planning of Wasco's historic downtown and identification of improvements that will enhance pedestrian circulation.

Cost: $50,000

Recommendation: Seek funding through the Transportation Growth Management Program or other appropriate programs to prepare a specific plan for the downtown area.

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 Sherman County area.

TABLE 6-1
Transportation Improvement Options: Recommendation Summary

Sherman County Improvement Options	Recommendation	Priority
1. Implement Transportation Demand Management Strategies. (EN, OP)		
a. Install pedestrian/bicycle improvements in all four cities as shown in Figures 7-3 through 7-6. (EN)	Implement	3
b. Implement as system of bike routes as shown in Figure 7-8. (EN)	Implement	3
2. Improve roadway alignment on Van Gilder Road leaving Moro. (ST)	Implement (2003)	1
3. Improve US 97 and OR 206 Spur/I-84 Frontage Road speed reduction measures for entry's into all four cities throughout county. (OP)	Implement	3
4. Implement a no-passing zone in the unincorporated district of Kent on Highway 97. (OP)	Implement	1
5. Perform study to determine best measure to improve Monkland/Fairview intersection visibility problems on Highway 206. (OP, ST)	Implement	2
6. Improve safety on all three Highway 97 exits to Wasco. (ST)		
a. Provide street lighting at all exits to Wasco	Implement	2
b. Redesign south exit to improve the deceleration lane.	Implement	2
7. Investigate High School Loop road options for improvements (ST)	Implemented (2002)	1
8. Improve Fields Corner and Highway 97 alignment and grade. (ST)	Implemented (STIP-2004)	1
9. Complete Speed zone study on US 97 traveling north into Biggs Junction to determine necessary safety measures at US 97 & Hwy 30 intersection. (ST)	Implement	2
10. Implement access management strategies defined in the Biggs Junction Refinement Plan. (OP, ST, EN)	Implement (STIP-2004)	1
11. Widen Scott Canyon Road and install signage to require special permit to haul large loads through statewide permit system. (OP)	No Action	
12. Move Guardrail back and widen Church Street access to Highway 97 for snowplow accessibility in Grass Valley. (MA)	Implemented (2003)	1
13. Pave 2nd Street in Moro from US 97 to bridge in front of handicap accessible restrooms to make them further accessible by vehicle per ADA standards. (MO)	Implemented (2002)	1
14. Install warning signs on Highway 97 at Biggs to indicate road conditions going south (reader board) (OP)	Implement	1
15. Make improvements to Mud Hollow Bridge. (ST)	Implemented (2002)	1
16. Install signs on US 97 at the north and south turn-off to Wasco giving direction to historic Wasco. (OP)	Implement	1
17. Establish a turnout at Milepost 13 for a panoramic viewpoint. (EN)	Implement	2
18. Prepare and implement a streetscape master plan for US 97 through Moro that includes traffic calming measures, such as curb extensions at intersections, landscaping, street furniture, and special pavement treatment. (MO, OP, ST)	Implemented (STIP-2002)	1
19. Establish a turnout and mountain identifier at Milepost 32 for a panoramic viewpoint. (EN)	Implement	2
20. Prepare and implement a streetscape master plan for US 97 through Grass Valley that includes traffic calming measures, such as curb extensions at intersections, landscaping, street furniture, and special pavement treatment. (MO, OP, ST)	Implemented (STIP-2000)	1
21. Install rumble strips along sections of US 97 at known locations of vehicle crashes that result from vehicles leaving the road. (ST)	Implement	1
22. Construct two passing/climbing lanes on US 97 south of Grass Valley at Mileposts 30.20– 31.80 and 44.00 – 45.50. (MO, OP, ST)	Implement	2
23. Improve Dewey Street in Moro to enable it to adequately service adjacent businesses and public facilities. (MO, OP)	Implement	1
24. Inspect and make necessary repairs to Moore Ln. Bridge (OP)	Implemented (OTIA-2003)	1
25. Construct an information kiosk at Biggs Junction (EN)	Implement	1
26. Increase truck inspection for vehicle safety, weight and speed	No Action	
a. Provide state training for local law enforcement officials (ST)	Implement	1

TABLE 6-1 (Cont.)
Transportation Improvement Options: Recommendation Summary

Sherman County Improvement Options	Recommendation	Priority
b. Increase enforcement of speed limits (ST, OP)	Implement	1
27. Reconstruct the US 97/I-84 Interchange (MO, OP)	Implement	2
28. Repair and/or replace bridge on Armsworthy at Spanish Hollow Creek. (MO,ST)	Implement	2
29. Replace bridges on Biggs-Rufus Hwy. At Scott Canyon and Gerking Creeks (MO)	Implement	1
30. OR 206 Cottonwood Grade Curve Corrections. (MO, OP)	Implement	2
31. Monkland Road Curve Corrections (MO, OP)	Implement	1
32. WB Left Turn Lane on I-84 Frontage Rd. @ Rufus Industrial Park (OP)	Implement	2
33. Wasco Downtown Specific Plan (PL)	Implement	1

ST - Safety; PR - Preservation; MA – Maintenance; PL - Planning
MO – Modernization; OP - Operational; EN - Enhancement

CHAPTER 7
TRANSPORTATION SYSTEM PLAN

The purpose of this chapter is to provide detailed operational plans for each of the transportation systems within Sherman County and the Cities of Rufus, Wasco, Moro and Grass Valley. Components of the TSP include roadway standards, access management recommendations, transportation demand management measures, modal plans, and a system plan implementation program.

The Sherman County TSP covers all the transportation modes that exist and are interconnected throughout the county and within the jurisdictions of the four cities of Rufus, Wasco, Moro and Grass Valley. Areas within a city's urban growth boundary (UGB), where the County has jurisdiction over a specific roadway or bridge, would require coordination as necessary between the County and cities on potential transportation improvement projects.

RECOMMENDED RURAL ROADWAY STANDARDS

The development of the Sherman County TSP provides the County with an opportunity to review and revise roadway design standards to more closely fit with the functional roadway classification, and the goals and objectives of the TSP.

Sherman County

The recommended roadway standards and classification are shown graphically in Figure 7-1 and 7-2, and summarized in Table 7-1. Rural road standards should be applied to the areas outside of the incorporated cities and modified urban standards should apply inside the cities incorporated boundaries.

The recommended roadway widths for the three different roadway classifications include shoulders sufficiently wide to accommodate safe bicycle and pedestrian travel. Recommended shoulder widths are based on the guidelines outlined in AASHTO's *Policy on Geometric Design of Highways and Streets* as summarized in Table 7-2. In areas where traffic volumes warrant only 2-foot shoulders, the County may increase shoulder width to 4 feet to accommodate bicycle and/or pedestrian traffic if there is the potential for conflicts between roadway users. Expected 20-year traffic volumes in Sherman County do not warrant shoulder widths in excess of four feet. However, the county may increase

shoulder width to better accommodate pedestrian and bicycle use if there is the potential for conflicts between roadway users.

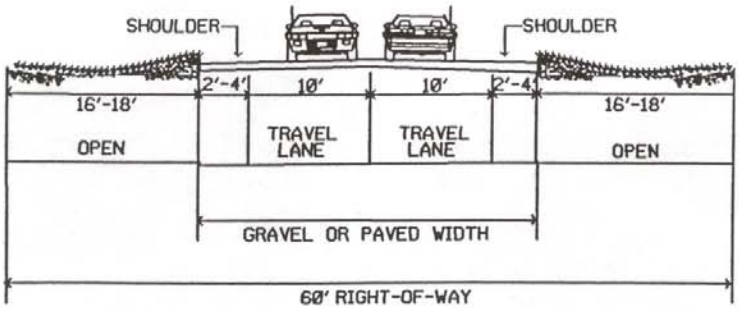
TABLE 7-1
RECOMMENDED RURAL ROADWAY DESIGN STANDARDS- SHERMAN COUNTY

		Roadway		Shoulder	
	Right-of-Way	**Width[1]**	**Surface**	**Width[2]**	**Surface**
Arterial Street[1]	80-120 ft	32-40[3] ft	Paved	4-8 ft	Paved
Collector Street	60-80 ft	24-32[4] ft	Paved/gravel	2-4 ft	Paved/gravel
Local Street	60 ft	20-24[4] ft	Paved/gravel	2-4 ft	Paved/gravel
Radius for cul-de-sac	50 ft	40 ft	Paved/gravel	2-4 ft	Paved/gravel

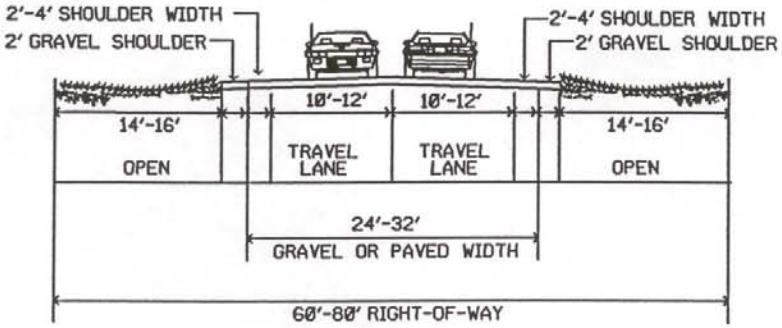
ODOT has overall jurisdiction regarding pavement width and roadway design of state highways
Shoulder width is included in pavement width.
Pavement width can vary to accommodate passing lanes and or left-turn refuge lanes.
Pavement width can vary depending on ADT and need for left-turn lanes.

The Bicycle System Plan, defined later in this chapter identifies which roads in the county are to be designated as bike routes. Figures 7-7 and 7-8 locate the substandard shoulder areas and provide a mapped bike plan for the county respectively.

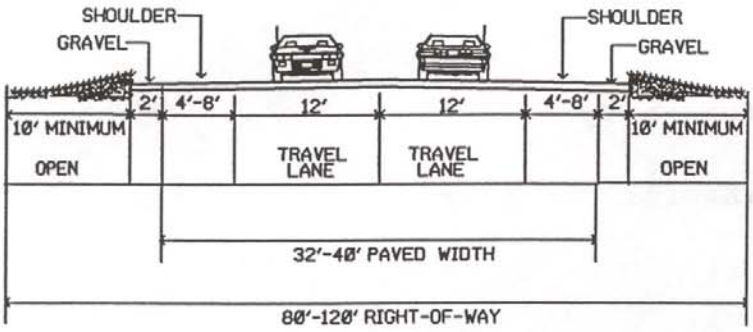
The recommended widths reflect the majority of roadways in existence in the county and are expected to adequately serve forecast future traffic demands within the county. ODOT has jurisdiction over all state highways (arterials) in the county and will ensure that all highway projects are designed in accordance with ODOT highway design standards. At the discretion of county staff, Sherman County may choose to deviate from the recommended design standards for those roadways under county control.



Local Roads



Collector Roads



Arterial Roads

FIGURE 7-1

Rural Street Standards
Local, Collector and Arterial

Figure 7-2
Adopted Functional Classification of Roads
Sherman County, Oregon

Interstate
Principal Arterial
Minor Arterial
Rural Major Collector
Minor Collector
Local Street

2 0 2 4 Miles

Table 7-2
RECOMMENDED SHOULDER WIDTHS ON RURAL ROADS

Road Use	Local Streets	Major and Minor Collectors	Arterial Streets
ADT under 400	2 ft	2 ft	4 ft
ADT over 400 and DHV* under 100	2 ft	4 ft	6 ft
DHV 100-200	4 ft	6 ft	6 ft
DHV 200-400	6 ft	8 ft	8 ft
DHV over 400	8 ft	8 ft	8 ft

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

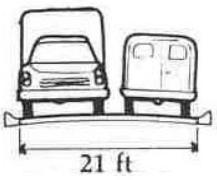
City of Rufus, Wasco, Moro and Grass Valley

Because of the essentially rural nature of the cities, street design standards for the cities within Sherman County have been developed in cooperation with the cities based upon ADT, storm drainage, type and density of development, fiscal constraints, and community character and will be discussed below. The cities essentially have only collector and local streets except where US 97 bisect Moro and Grass Valley and Highways 216 and 206 travel through Wasco and Grass Valley. Existing and recommended street widths are depicted on the maps in Figures 7-3, 7-4, 7-5, and 7-6.

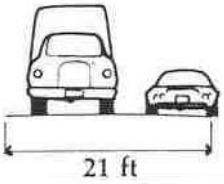
Rural Local Roadways

Local roadways are primarily intended to serve abutting lands and local access needs of neighborhoods. The recommended standard for a rural local roadway is a 20- to 24-foot roadway within a 50-foot right-of-way, as shown in Figure 7-1. The width of the roadway and right-of-way is determined by the width of the shoulder, assuming two 10 to 12 foot travel lanes. The roadway surface could be paved, but most local roadways in Sherman County are currently gravel. The recommended standard also does not call for the use of sidewalks but there is adequate space within the right-of-way to accommodate sidewalks in areas where there is

Recommended Street Standards For Rufus



Type A



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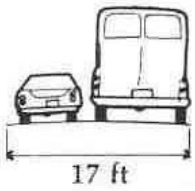

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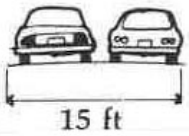

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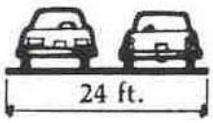

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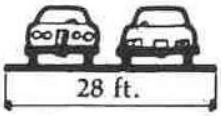

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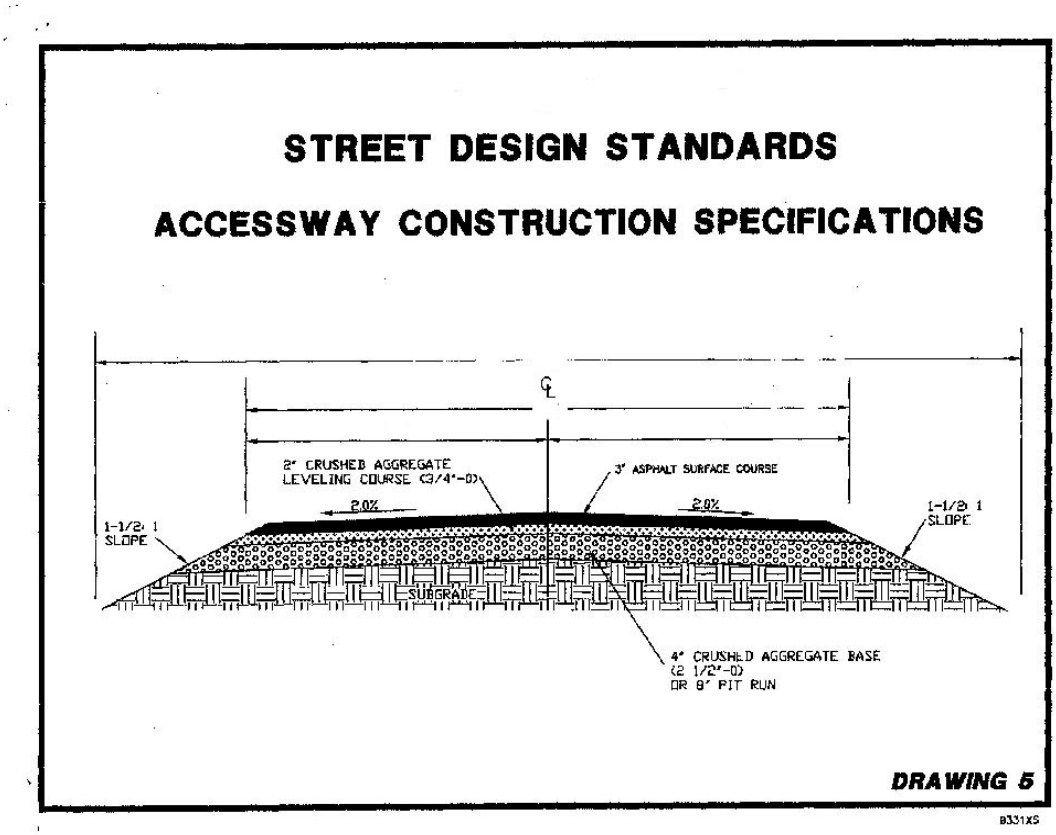
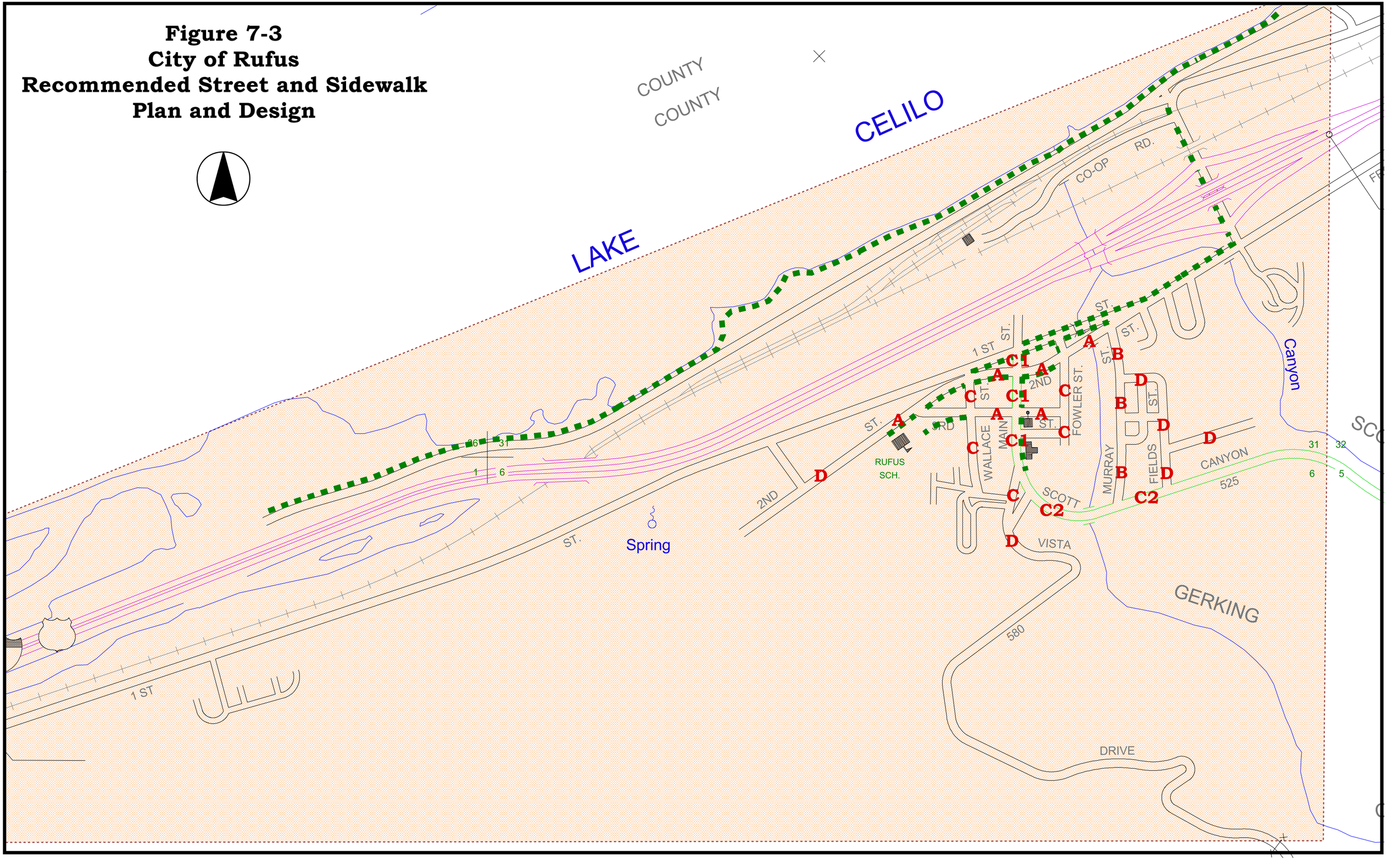
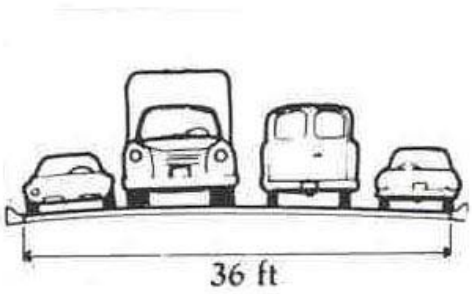


Figure 7-3

Figure 7-3
City of Rufus
Recommended Street and Sidewalk Plan and Design



Recommended Street Standards
For
City of Wasco



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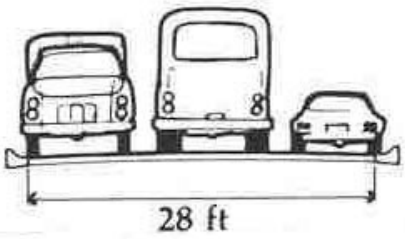

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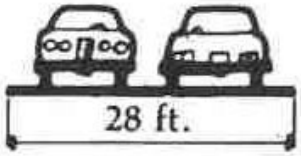

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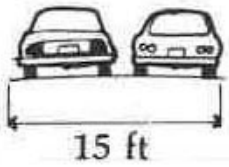

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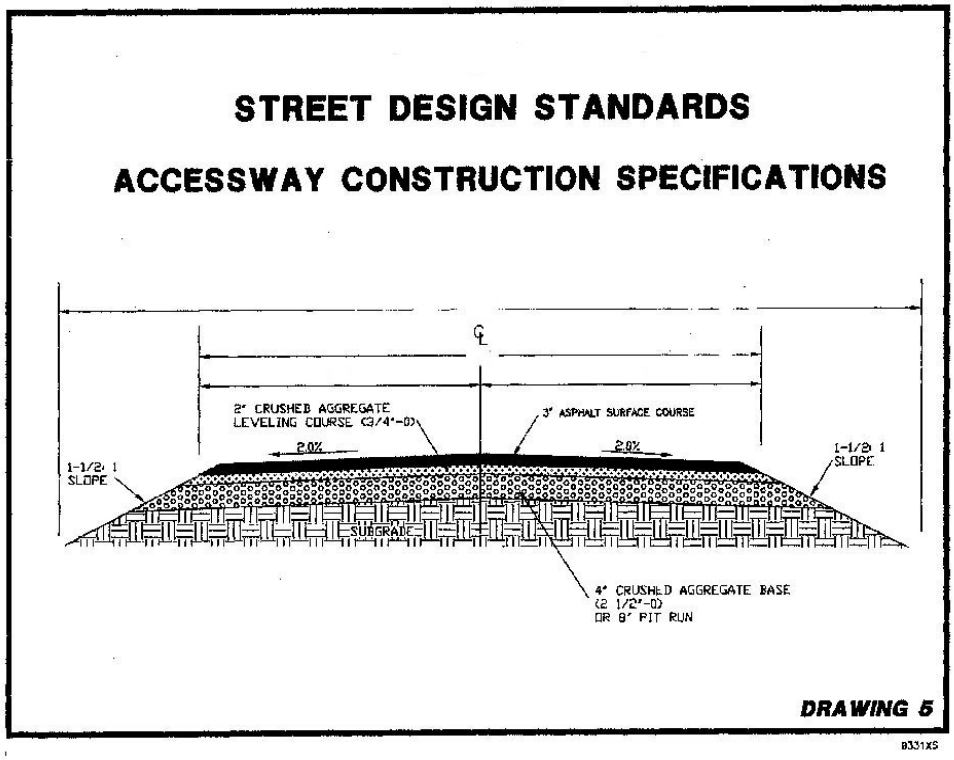


Figure 7-4

Figure 7-4
City of Wasco
Sherman County, Oregon
Street Improvement Plan

Sewage Disposal Lagoons

NO. 300

WASCO-

YATES ST.

JOHN DAY ST.

SANDON ST.

WILSON ST.

DESCHUTES ST.

COLUMBIA ST.

BARNETT ST.

CHURCH ST.

ARMSWORTHY ST.

FULTON PARK

WILSON ST.

DAVIS

ELLIS

HARRISON ST.

BIGGS

CLARK

McPHERSON

FAS

WASCO SCHOOL

OLD WASCO-

MILL ST.

SCOOT ST.

WASCO- HEPPNER

M.P. 15.07

M.P. 0.58

5 4 HWY. NO. 301 4 3 HEPP

8 9 FAP 31 9 10 65

Figure 7-4
City of Wasco
Sherman County, Oregon
Sidewalk Improvement Plan

Sewage Disposal Lagoons

NO. 300

WASCO-

YATES ST.

SANDON

JOHN DAY

ST.

ST.

FAS

DESCHUTES

WILSON ST.

COLUMBIA

WASCO SCHOOL

BARNETT

CHURCH

ARMSWORTHY

FAS

FAS

.O- WASCO 5 4 HWY. NO. 301

8 9 FAP 31

M.P. 15.07

FULTON

PARK

OLD WASCO- 4 3 HEPP

9 10 65

WILSON

DAVIS

MILL

SCOOT ST.

FAS

ELLIS

HARRISON

BIGGS

CLARK

McPHERSON

N

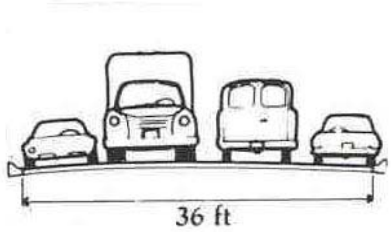
W E

S

WASCO- HEPPNER

M.P. 0.58

Recommended Street Standards
For Moro



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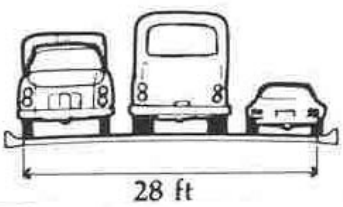

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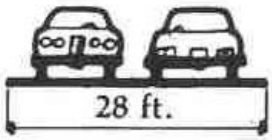

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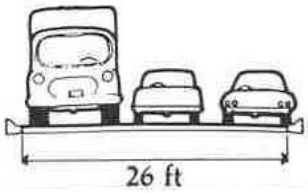

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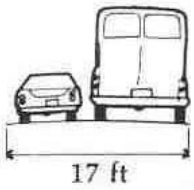

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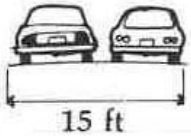

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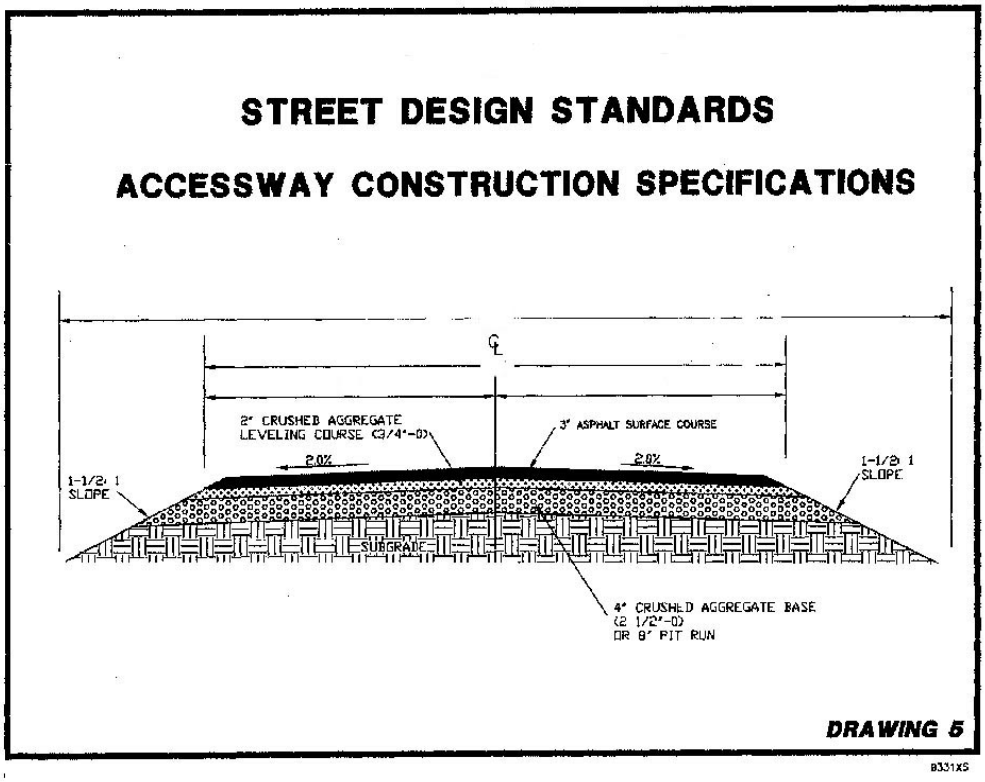


Figure 7-5

Hallow

SHERMAN COUNTY SHOPS

4TH ST.

5TH ST.

6TH ST.

HOOD

1ST

2ND

COURT

McCOY

SCOTT

3RD

MAIN ST.

BIDWELL

WEAVER

ST.

COLUMBUS ST.

O.S.H.D. MAINT. STA.

FAS

PARK

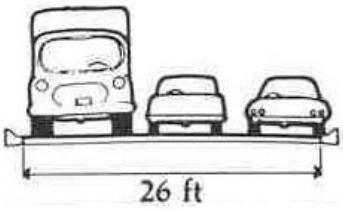
DEWEY

SAMPSON ST.

Figure 7-5
City of Moro
Sherman County, Oregon
Street and Sidewalk Improvement Plan

Existing Sidewalk
Proposed Sidewalk
Proposed Multi-Purpose Path

Recommended Street Standards
For
Grass Valley



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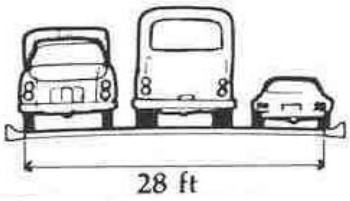

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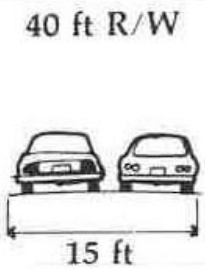

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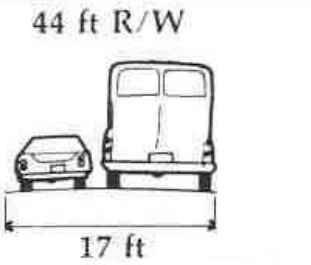

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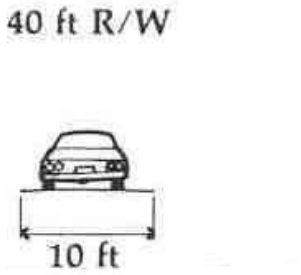

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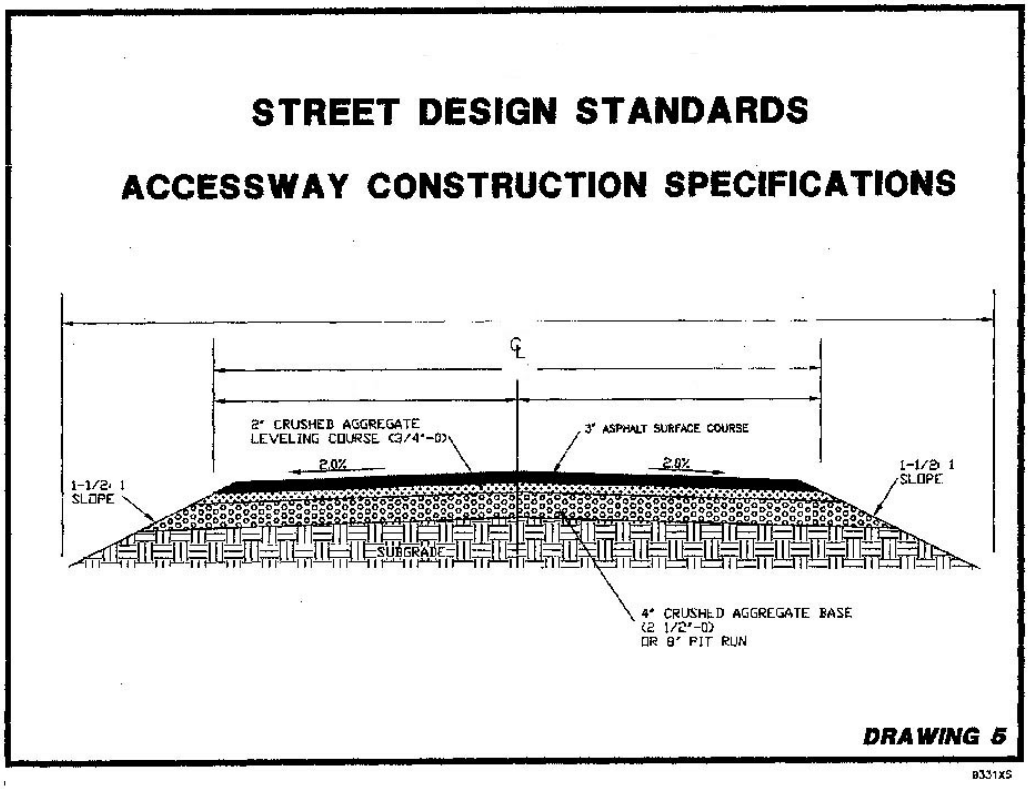


Figure 7-6

M.P. 27.40

ST. (Without curbs)

HWY.

PINE ST.

OAK ST.

NORTH

3RD ST.

CHURCH

2ND ST.

MARKET ST.

BRYAN ST.

LINCOLN ST.

NORTH ST.

MAIN ST.

2ND ST.

4TH ST.

CHURCH ST.

1ST ST.

SOUTH ST.

SHERMAN HWY. NO. 290

GRASS VALLEY PAVILION AND CITY PARK

SOUTH SHERMAN SCHOOL

FIRE STA.

FAS

27 26 34 35

97

M.P. 28.26

M.P. 28.43

Figure 7-6
City of Grass Valley
Sherman County, Oregon
Street and Sidewalk Improvement Plan

sufficient pedestrian traffic or ADTs are high enough to warrant vehicular/pedestrian separation. Curb and gutter are not recommended as part of the standard.

The narrower roadways and travel lanes generally improve residential aesthetics, and discourage speeding. They also reduce right-of-way needs, construction cost, stormwater run-off, and vegetation clearance. Anticipated traffic volumes, as shown in Table 7-2 determine the width of the shoulder. It is expected that on rural local roadways, parking will be off-pavement.

Rural Collector Roadways

Collector roadways are primarily intended to serve regional travel demand that has its beginning and ending destinations within the County. As a secondary function, collector roadways may also provide access to abutting rural lands and abutting neighborhoods. Depending on traffic volumes, collector roadways can be classified as minor or major. Figure 7-1 shows a cross section with a 60-foot right-of-way and a 24- to 32-foot paved width. This right-of-way and pavement width allows for two ten-foot travel lanes and two to four-foot shoulders for minor collectors and two 12-foot travel lanes and two to four-foot shoulders for major collectors. Anticipated traffic volumes, as shown in Table 7-2 determine the width of the shoulder. It is expected that on rural collector roadways, parking will be off-pavement. The roadway surface may be paved or gravel depending on ADT. Many of the collector roadways in Sherman County have low traffic volumes that allow them to function efficiently with a gravel surface.

Rural Arterial Roadways

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

Figure 7-1 shows a cross section with an 80- to 120-foot right-of-way and a 32- to 40-foot paved width for rural arterial roads. This width allows two 12-foot travel lanes and four to eight-foot shoulders. The width of the paved roadway and right-of-way is determined by the width of the shoulder and whether or not here are passing lanes. Anticipated traffic volumes, as shown in Table 7-2 determine the width of the shoulder. No on-roadway parking is allowed on arterial roadways, except in case of emergencies.

BIKE FACILITIES

For the most part, rural low volume roadways do not require separate bikeway facilities. Bicyclists can be accommodated on a shared roadway or on a paved shoulder, depending on traffic volumes. Low volume roadways where motorists can safely pass a bicyclist due to the low likelihood of encountering an oncoming vehicle support shared roadway use. Higher vehicular and/or bicycle volume roadways may be better served by shoulder bikeways. Shoulder width requirements are found in the Oregon Bicycle and Pedestrian Plan. To accommodate bicycles on the roadway, in rural area (on arterials and high volume major collectors) the minimum paved width of the shoulder needs to be 4 feet, 6 feet is desirable. In urban areas, inside urban growth areas, the minimum shoulder with is 6 feet with 8 feet being desirable. If the roadway has a curb, then a striped bike lane a minimum of 5 feet in width needs to be provided. In areas with high bicycle use, a pathway should be considered, preferably located on both sides of the roadway, separated from the roadway by at least five feet of greenbelt or drainage ditch.

SIDEWALKS

Rural roadways generally do not require separate pedestrian facilities. Pedestrians can typically be accommodated on the shoulder of the roadway. In areas with high pedestrian activity, a separated pathway should be considered. Key areas where sidewalks can or have been located for the four cities in Sherman County are identified on Figures 7-3, 7-4, 7-5 and 7-6.

ACCESS MANAGEMENT

Access management is an important tool for maintaining a transportation system. Too many access points along arterial roadways lead to an increased number of potential conflict points between vehicles entering and exiting driveways, and through vehicles on the arterial streets. This not only leads to increased vehicle delay and congestion on the arterial, but also leads to an increased risk of vehicular crashes. Research has clearly shown a direct correlation between the number of access points and collision rates. Experience throughout the United States has also shown that a well-managed access plan for a street system can minimize local cost for transportation improvements needed to provide additional capacity and/or access improvements along unmanaged roadways. Therefore, it is essential that all levels of government maintain the efficiency of existing arterial streets through better access management.

The Transportation Planning Rule (TPR) defines access management as measures regulating access to streets, roads and highways from public roads and private driveways and requires that new connections to arterials and state highways be consistent with designated access management categories. As areas of Sherman County continue to develop, the arterial/collector/local street system will become more heavily used and relied upon for a variety of travel needs. This is especially true for segments of roadway near the urbanizing edges of cities. As such, it will become increasingly important to manage access on the existing and future arterial/collector street system as new development occurs.

One objective of the Sherman County TSP is to develop an access management policy that maintains and enhances the integrity (capacity, safety, and level-of-service) of the County road network. Too many access points along a street can contribute to a deterioration of its safety, and on some streets, can interfere with efficient traffic flow.

Access Management Techniques

The number of access points to an arterial can be regulated through a variety of techniques including, but not limited to:

- Restricting spacing between access points (driveways) based on the classification of the roadway (arterial, collector, and local), the type (intensity) of development and the speed/volume of traffic on the roadway segment. This will control conflicts associated with left turn movements.
- Sharing of access points between adjacent properties.
- Providing access via adjacent collector or local roadways where possible.
- Providing service drives to prevent spillover of vehicle queues onto the adjoining roadways.
- Providing acceleration, deceleration, and right turn 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.
- 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 roadways for access purposes, parking and loading at the local and minor collector level. Tables 7-3 to 7- 6 describe recommended general access management guidelines by roadway functional classification.

Table 7-3
Access Management Spacing Standards for Statewide Highways
US Highway 97
①②
(Measurement is in Feet)*

Posted Speed③	Rural		Urban			
	Expressway **	Other	Expressway **	Other	UBA	STA
≥55	5280	1320	2640	1320		
50	5280	1100	2640	1100		
40 & 45	5280	990	2640	990		
30 & 35		770		770	720	④
≤25		550		550	520	④

Table 13 from the 1999 Oregon Highway Plan.
NOTE: The numbers in circles (②) refer to explanatory notes that follow tables.
**Measurement of the approach road spacing is from center to center on the same side of the roadway.*
***Spacing for Expressway at-grade intersections only. See Table 12 for interchange spacing.*

Table 7-4
Access Management Spacing Standards for Regional Highways
OR 206 (Wasco-Heppner Highway) ①②
(Measurement is in Feet)*

Posted Speed③	Rural		Urban			
	Expressway **	Other	Expressway **	Other	UBA	STA
≥55	5280	990	2640	990		
50	5280	830	2640	830		
40 & 45	5280	750	2640	750		
30 & 35		600		600	425	④
≤25		450		450	350	④

Table 14 from the 1999 Oregon Highway Plan, Appendix C.
NOTE: The numbers in circles (②) refer to explanatory notes that follow tables.
** Measurement of the approach road spacing is from center to center on the same side of the roadway.*
***Spacing for Expressway at-grade intersections only. See Table 12 for interchange spacing.*

Table 7-5
Access Management Spacing Standards for District Highways
OR 216 (Sherars Bridge Highway)
OR 206 (Celilo-Wasco Highway)
①②
(Measurement is in Feet)*

Posted Speed③	Rural		Urban			
	Expressway **	Other	Expressway **	Other	UBA	STA
≥55	5280	700	2640	700		
50	5280	550	2640	550		
40 & 45	5280	500	2640	500		
30 & 35		400		400	350	④
≤25		400		400	350	④

Table 15 from the 1999 Oregon Highway Plan, Appendix C
NOTE: The numbers in circles (②) refer to explanatory notes that follow tables.
** Measurement of the approach road spacing is from center to center on the same side of the roadway.*
***Spacing for Expressway at-grade intersections only. See Table 12 for interchange spacing.*

Notes on Tables 7-3, 7-4 and 7-5:

Where a right of access exists, access will be allowed to a property at less than the designated spacing standard only if that property does not have reasonable access and the designated spacing cannot be accomplished. If possible, other options should be considered such as joint access.

Where the right of access exists, the number of approach roads (driveways) to a single property shall be limited to one, even when the property frontage exceeds the spacing standards. More than one approach road may be considered if, in the judgment of the Region Access Management Engineer, additional approach roads are necessary to accommodate and service the traffic to a property, and additional approach roads will not interfere with driver expectancy and the safety of the through traffic on the highway.

Approach roads shall be located where they do not create undue interference or hazard to the free movement of normal highway or pedestrian traffic. Locations on sharp curves, steep grades, areas of restricted sight distance or at points which interfere with the placement and proper functioning of traffic control signs, signals, lighting or other devices that affect traffic operation will not be permitted.

If a property becomes landlocked (no reasonable access exists) because an approach road cannot be safely constructed and operated, and all other alternatives have been explored and rejected, ODOT might be required to purchase the property. (Note: If a hardship is self-inflicted, such as by partitioning or subdividing a property, ODOT does not have responsibility for purchasing the property.)

(Note ① has precedence over notes ②, ③ and ④.)

② These standards are for unsignalized access points only. Signal spacing standards supersede spacing standards for approaches.

③ Posted (or Desirable) Speed: Posted speed can only be adjusted (up or down) after a speed study is conducted and that study determines the correct posted speed to be different than the current posted speed. In cases where actual speeds are suspected to be much higher than posted speeds, ODOT reserves the right to adjust the access spacing accordingly. A determination can be made to go to longer spacing standards as appropriate for a higher speed. A speed study will need to be conducted to determine the correct speed.

④ Minimum spacing for public road approaches is either the existing city block spacing or the city block spacing as identified in the local comprehensive plan. Public road connections are preferred over private driveways, and in STAs driveways are discouraged. However, where driveways are allowed and where land use patterns permit, the minimum spacing for driveways is 175 feet (55 meters) or mid-block if the current city block spacing is less than 350 feet (110 meters).

TABLE 7-6
RURAL ROADWAY ACCESS MANAGEMENT STANDARDS

Functional Classification	Access Category	Urban/ Rural	Intersection				Signal Spacing	Median Control
			Public Road		Private Drive			
			Type	Spacing	Type	Spacing		
Collector	NA	R	At grade	¼ Mi.	Lt./Rt. Turns	1,200 ft	NA	NA
Local Street	NA	R	At grade	200-400 ft	Lt./Rt. Turns	Vary	NA	NA

It should be noted that existing developments and legal accesses on the transportation network would not be affected by the recommended access management standards until one or more of the following actions is taken:

- Either a land use action is proposed,
- A safety or capacity deficiency is identified that requires specific mitigation,
- A specific access management strategy/plan is developed,
- Redevelopment of existing properties along the highway occurs, or
- A major construction project is begun on the street.

Application

These access management guidelines 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 I-84 and US 97, OR 206, and OR 216 in Sherman County. The 1999 *Oregon Highway Plan (OHP)* specifies an access management classification system for state facilities and is implemented through Oregon Administrative Rule 734.051 (OAR 51). Tables 7-3 through 7-5 give the access management guidelines as shown on Tables 14 - 16 in Appendix C of the OHP. Future developments on state highways (zone changes, comprehensive plan amendments, redevelopment, and/or new development) will be required to meet the 1999 OHP mobility standard as measured using a volume to capacity ratio and the Access Management Standards defined in OAR 51. Sherman County follows ODOT's designation of state highways as arterial roadways within the county, and should therefore follow the access management categories for these facilities as outlined in the Oregon Highway Plan and OAR 51. This section of the Transportation System Plan describes the state highway access categories and specific roadway segments where special access areas may apply.

Future developments on state highways (zone changes, comprehensive plan amendments, redevelopment, and/or new development) will be required to meet the 1999 Oregon Highway Plan Mobility Standard (V/C ratio) and Access Management standards in OAR 51. Spacing guidelines are measured (centerline-to-centerline) between either existing private or public access points on both sides of the roadway and to either side of the proposed access point. Additional property frontage along the state highway does not guarantee that additional approach roads will be allowed.

Proposed land use actions that do not comply with the designated access spacing policy will be required to apply for an access variance from Sherman County and/or deviation from the spacing standards from ODOT. In addition, according to the 1999 OHP, the impact of traffic generation from proposed land uses must not diminish established mobility (as measured using a v/c ratio) standards. Table 7-7 below summarizes the mobility standards for all categories of state highways outside the Portland Metro Area.

Interstate highways (I-84) must maintain a V/C ratio of 0.70 within urban and rural areas along the highways influence area. Highways of statewide importance (US 97) must maintain V/C ratio of 0.70 within urban and rural areas along the highways influence area. Highways of regional importance (OR 206, Wasco-Heppner Highway) must maintain V/C ratio of 0.80 to 0.75 within urban areas, depending on speed, 0.75 in unincorporated communities, 0.70 in rural areas along the highways influence area. Highways of district importance (OR 216, Sherars Bridge Highway and OR 206,

Celilo-Wasco Highway) must maintain V/C ratio of 0.85 to 0.80 within urban areas, depending on speed, 0.80 in unincorporated communities, 0.75 in rural areas along the highways influence area.

The existing legal driveway connections, traffic intersection spacing, and other accesses to the state highway system are not required to meet the spacing standards of the assigned category immediately upon adoption of this access management plan. However, existing permitted connections not conforming to the design goals and objectives of the roadway classification will be upgraded as circumstances permit and during redevelopment. At any time, an approach road may need to be modified due to a safety problem or a capacity issue that exists or becomes apparent. By statute, ODOT is required to ensure that all safety and capacity issues are addressed.

Table 7-7[1]
Maximum Volume to Capacity Ratios for Peak Hour Operating Conditions Through a Planning Horizon for State Highway Sections Located Outside the Portland Metropolitan Area Urban Growth Boundary

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

Table 6 from the 1999 Oregon highway Plan

Table 6 Notes:

Interstates and Expressways shall not be identified as Special Transportation Areas (STAs).

For the purposes of this policy, the peak hour shall be the 30th highest annual hour. This approximates weekday peak hour traffic in larger urban areas.

For the purposes of Policy 1F and Table 6, the MPO category includes areas within the planning boundaries of the Eugene/Springfield, Medford and Salem/Keizer Metropolitan Planning Organizations, and any other MPO areas that are designated after the adoption of this plan.

An approach (access) permit may be issued by ODOT and Sherman County for a single connection to a property that cannot be accessed in a manner that is consistent with the spacing standards identified above. These conditions typically apply to properties that either have no reasonable alternate access or cannot obtain reasonable alternate access to the public road system. The permit would carry a condition that the access may be closed at such time that reasonable access becomes available to a local public street. In addition, approval of the permit might require specific improvements to ensure safety and managed access.

The OHP provides more than one appropriate access management classification for highways based upon their classification. To be consistent with the OHP and OAR 51, the Sherman County TSP recommends the county adopt the State's access management policies and standards as set forth in the OHP and OAR 51.

MODAL PLANS

The Sherman County 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 Sherman County during the next 20 years assuming the growth projections discussed in Chapter 5. The changes in land use patterns and growth of the population will guide the timing for individual improvements in future years. Specific projects and improvement schedules may need to be adjusted depending on where growth occurs within Sherman County.

Roadway System Plan

The Sherman County roadway system plans encompass the entire roadway and bridge projects identified to date by Sherman County and ODOT over the 20-year planning horizon. It provides a consolidated list of the many projects that have been identified by various sources. The five primary sources of identified roadway and bridge projects include:

- Sherman county's five-year working road and bridge maintenance plan,
- ODOT's final 2000-2003 Statewide Transportation Improvement Program (STIP),

- Input from the Sherman County TSP public involvement process
- US 97 Corridor Plan draft December 1998
- Biggs Junction Refinement Plan completed February 2001

The projects identified in Sherman County's road plan are considered necessary routine maintenance needs based on field observations by county staff; therefore, they were not evaluated through the TSP public involvement process for implementation. Projects identified under ODOT's STIP are already state funded and scheduled to take place over the next four-year planning horizon, and are included in the 20-year transportation project list. The STIP is updated every two years. ODOT is currently in the process of developing a STIP that will cover the years 2002-2005.

Projects identified through the TSP public involvement process were evaluated in Chapter 6 (Improvement Option Analysis) and recommended for implementation and inclusion in the county's 20-year transportation project list.

Recommended TSP projects are prioritized for short-term (0-5 years), intermediate-term (5-10 years), or long-term (10-20 years) implementation in this Chapter. Projects from the US 97 Corridor Plan are identified in the needs list from that document and the Biggs Refinement Plan are described by reference. These last two plans are not prioritized. The following sections outline the identified projects under the five sources listed above. Where available, cost estimates are provided.

Sherman County Five Year Working Road Plan

Sherman County has developed a five–year working roadway improvement plan to identify priority projects that the county would like to accomplish from 2002 to 2007. These projects represent Sherman County's routine maintenance needs, and were not evaluated through the TSP public involvement process for implementation. The county clearly understands the impact that available funding and resources may have on accomplishing these projects. Inclusion of a project in this list does not guarantee completion within the five-year planning horizon. Based on periodic review, the county may add or delete projects from their "working" list as other higher priority projects are identified. A key component of the Sherman County road plan is flexibility. The road department routinely adapts its work schedule to changing priorities. Therefore, estimated completion dates of particular projects have not been determined.

The road plan includes pavement rehabilitation and bridge maintenance projects. Table 7-8 summarizes the identified roadway projects with a short description of the project location, description, and cost estimate. The projects are not listed in any particular order. Projects included in

Sherman County's road plan do not constitute capital improvements where money needs to be raised to pay for the project. The projects are funded by the county's annual budget for roadway improvements and are therefore not included in the county's 20-year transportation project list presented later in this chapter.

The County Roadmaster estimated project costs for the improvements. These unit costs include a 40 percent contingency per ODOT guidelines. The total cost to make all of the improvements over the next twenty years is approximately $4.5 million. It is expected that the County would not be able to fund all of the project cost, and may wish to investigate the possibility of competing for federal matching funds.

The committee that was set up to work with the Road department and develop the Five-year plan identified all of the projects in the 0-5 year plan project list. The County Roadmaster identified additional projects in the 5-10 year category and the 10-20 year category. He based these estimates on past maintenance schedules, present traffic patterns on the roadways and a reasonable repetition of maintenance needs.

Table 7-8
Sherman County Road Department
PROPOSED COMPREHENSIVE FIVE YEAR PLAN - 2002-2007

Road	Location	Description of Project	Estimated Cost
Rebuild - Preservation			
Erskine Road	Harris's to Gordon Ridge	Rebuild 1 mile segment	$35,000
Crites	LoneRock to Lavender Rd	Rebuild 2.7 mile segment	$85,000
Hay Canyon	Crities to Higgley	Rebuild 1 mile segment	$30,000
Klondike Road	R Hayes east	Rebuild 0.5 mile segment	$20,000
Hart Road	Sabey's to Higley Loop Rd	Rebuild 1 mile segment	$35,000
Rebuild - Operational			
Van Gilder Road	Van Gilder & Harris Cyn.	Increase visibility at intersection	$30,000
Roadway Basing Projects - Enhancements			
Crities	LoneRock to Lavender Rd	Base to Pavement Stradly	$275,000
Hay Canyon	Crities to Higgley	Base to Pavement Stradly	$100,000
Monkland Rd Seg.1	Hwy. 97 to Hay Canyon	Base widening project	$150,000
Monkland Rd Seg.2	Hwy. 97 to Hay Canyon	Base widening project	$150,000
Chip Seal Projects - Preservation			
Crities	LoneRock to Lavender Rd	4 lift chip seal	$55,000
Hay Canyon	Crities to Higgley	4 lift chip seal	$20,000
Monkland Rd Seg.1	Hwy. 97 to Hay Canyon	4 foot widen and 3 lift chip seal	$50,000
Monkland Rd Seg.2	Hwy. 97 to Hay Canyon	4 foot widen and 3 lift chip seal	$50,000
Ball Road	Hwy. 206 to Finnigan Rd	2 lift chip seal	$35,000
Horseshoe Bend	Bourbon to Kent	2 lift chip seal	$70,000
Scott Canyon Rd	Wasco to Rufus	2 lift chip seal	$100,000
Lone Rock	5.5 mile segment	2 lift chip seal	$52,000
Bridge Work - Enhancement			
Hay Canyon Road	Btwn Harmony & Higgley	Widen & extend	$7,000
TOTAL FIVE YEAR PROJECT COST			**$1,404,000**

Table 7-9
Proposed Comprehensive Five to Ten Year Plan 2007-2012

Road	Location	Description of Project	Estimated Cost
Rebuild - Preservation			
Finnigan Rd	Hwy. 216 to Ball Rd	Base & Pave	$360,000
Monkland RD	Fairview to Hwy. 206	Rebuild & pave	$225,000
Scott Cyn Rd Seg.1	Wasco to Rufus	Widen & straighten	$250,000
Scott Cyn Rd Seg.2	Wasco to Rufus	Widen & straighten	$500,000
Monkland Rd Seg.1	Hwy. 97 to Hay Canyon	Install guardrail @ GR. Valley	$243,950
Monkland Rd Seg.2	Hwy. 97 to Hay Canyon	Install guardrail @ Hay Canyon	
Chip Seal Projects - Preservation			
Henricks	Monkland to McIntyre	2 lift chip seal	$25,000
High School Loop	Moro Hwy. 97 to 97	2 lift chip seal	$20,000
Hildebrand Lane	Wasco to Klondike	2 lift chip seal	$40,000
Horseshoe Bend Rd	10 mile segment	2 lift chip seal	$60,000
Klondike	Klondike to Web fast	2 lift chip seal	$40,000
Emigrant Springs	Oehman Rd to Rayburn	2 lift chip seal	$35,000
Oehman	Medler Ln to Herion Rd	2 lift chip seal	$23,000
Gerkling Cyn	Scott Cyn to Tom Ln	2 lift chip seal	$13,000
Tom Lane	Gerkling to China Hollow	2 lift chip seal	$18,000
China Hollow	Tom Ln to Green Berry	2 lift chip seal	$65,000
Mud Hollow	US 97 southward	2 lift chip seal	$11,000
North Saw Tooth	US 97 to Wasco Cemetery	2 lift chip seal	$6,000
Wasco Loop	US 97 to Wasco	2 lift chip seal	$14,000
McDermid Estate	Hwy. 206 to lower Gordon Ridge	2 lift chip seal	$30,000
Van Gilder	Hwy. 206 to Moro	2 lift chip seal	$80,000
Erskine Rd	Moore Ln to Powells	2 lift chip seal	$12,000
Sayrs Rd	Erskine to south of Olsens	2 lift chip seal	$15,000
TOTAL PRESERVATION PROJECT COST			**$2,085,950**
Bridge Work - Preservation (5-20 yrs)			
Scott Cyn Rd Seg.1	Rufus to Wasco	Retaining Wall	$25,000
Scott Cyn Rd Seg.2	Rufus to Wasco	Retaining Wall	$35,000
Bridge Work - Enhancement (5-20 yrs)			
Blagg Rd	Grass Valley Canyon	New Bridge	$55,000
McDermid Estate	East end	New Bridge	$50,000
Bridge Work - Operational (5-20 yrs)			
Upper DeMoss	Above Sub-station	Widen	$10,000
Saw Tooth	Intersection DeMoss/ Saw Tooth	Widen	$15,000
TOTAL BRIDGE COST			**$190,000**
TOTAL 5 TO 10 YEAR PROJECT COST			**$2,275,950**

Table 7-10
Proposed Comprehensive Ten to Twenty Year Plan 2012 - 2022

Road	Location	Description of Project	Estimated
Chip Seal Projects - Preservation			**Cost**
Monkland Road	US 97 to Hwy. 206	2 lift chip seal	$77,000
Fairview	Hwy. 206 to Monkland	2 lift chip seal	$9,000
Rutledge	Hwy. 206 to Smith Todd Rd	2 lift chip seal	$75,000
Liberty Ln	US 97 to Finnigan	2 lift chip seal	$35,000
Scott Canyon	Wasco to Rufus	2 lift chip seal	$100,000
Helms Springs	Scott Cyn up Helm Springs	2 lift chip seal	$5,000
Dobie Point Rd	US 97 passed Decker Rd	2 lift chip seal	$38,000
Wilcox Rd	US 97 to Decker Rd	2 lift chip seal	$11,000
Horseshoe Bend	Sego North end	2 lift chip seal	$42,000
Lone Rock	US 97 to	2 lift chip seal	$120,000
Crites	Lone Rock to Hay Canyon	2 lift chip seal	$40,000
Hay Canyon	Hwy. 206 to Higley	2 lift chip seal	$68,000
North Klondike	Elevator to Emigrant Springs	2 lift chip seal	$35,000
Herion Rd	Scott Cyn to Oehman	2 lift chip seal	$39,000
Sander	Hwy. 206 to Hay Canyon	2 lift chip seal	$41,000
Gordon Ridge	Hwy. 206 to Kaseberg Lane	2 lift chip seal	$55,000
Moore Lane	US 97 to Erskine	2 lift chip seal	$14,000
Finnigan	US 97 to Hwy. 216	2 lift chip seal	$57,000
Ball Rd	Hwy. 216 to Finnigan	2 lift chip seal	$35,000
TOTAL 10 -20 YEAR PROJECT COST			**$896,000**
TOTAL ALL PROJECTS COST			**$4,505,950**

Note: Cost estimates were prepared by the County Road Department as part of the Sherman County Five Year

Statewide Transportation Improvement Program (STIP) Projects

The Oregon Department of Transportation has a comprehensive transportation improvement and maintenance program encompassing 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, their construction year, and estimated cost.

The final 2002-2005 STIP, identified two major highway improvements in Sherman County as listed below.

- US 97 Biggs – Wasco: The nearly 10-mile segment of US 97 between Biggs Junction to Wasco (Milepost -0.42 - 8.82) is programmed to receive a pavement preservation inlay and overlay. Construction is scheduled to begin in federal fiscal year 2003 at an estimated cost of $4.0 million. This project also includes reconstruction of a curve at Fields, approximately MP 6. The segment of US 97 between Biggs Junction and Wasco (Milepost) has been approved to receive a regrading

and repaving project to correct the super elevation of this section of the road where a substantial number of accidents have occurred.

In addition to the two projects above two additional projects have been added to the STIP by amendments. These projects are:

- Biggs Access Management Plan Implementation: As a result of the recent completion of Phase 1 of a Refinement Plan for Biggs Junction, the Oregon Transportation Commission allocated $251,000 for access management improvements that includes curb, sidewalks, and intersection geometric corrections to accommodate large vehicles. Construction is scheduled to begin in federal fiscal year 2003.

- Biggs Rapids Bridge Navigation Lights: Federal National Highway System (NHS) funds were approved to implement this project. The current STIP was amended on April 11, 2001 and construction is scheduled to begin during the current STIP program at an estimated cost of $220,500.

In previous STIPs there were three Sherman County Projects; one highway project and one marketing project for the Journey through Time tourism marketing efforts.

- US 97 Grass Valley – Shaniko: The 29-mile segment of US 97 between Shaniko to Grass Valley (Milepost 27 - 56) received a pavement preservation overlay cost of over $4 million.

- Journey through Time route through Sherman, Gilliam, Wheeler and Grant counties. The project consisted of implementing marketing measures to advertise the Journey through Time event and was completed in 1999 for an estimated $20,963.

- US 97 Wasco – Moro: The 10-mile segment of US 97 from the North entrance to Wasco to High School Loop Road in Moro. The project also included curb extensions at intersections and sidewalk improvements in Moro.

The history of projects completed in Sherman County through the STIP process is summarized in Table 7-11. This information is taken from the US 97 Draft Corridor Plan and provides recognition of the historic transportation needs of the region on US 97. The Decision Matrix utilized in the process for developing the Corridor plan identifies the criteria that were used and is included in Appendix G.

Table 7-11
US Highway 97 Corridor Plan Biggs Junction to Sherman County Line
Project History 1921- 1985

Project #	Project Name	BMP	EMP	Year	Type of Project	Notes
7V-089	Biggs-Mud Hollow Rd.	0	2	1961	Grading/Paving/Structure	
8V-240	Biggs-Shaniko	0	61	1965	Flood Repair	
8V-216	Biggs Jct.-Moro Uxing	0	8.82	1965	Grading/Paving	
5C-25-19	Wasco-Biggs	0.39	9.5	1923	Grading/Structure	
8V-438	N.Unit Thornberry Was	5	6.1	1966	Grading/Paving	
11V-079	Thornberry-Lambert	6.1	13.45	1972	Grading/Paving/Structure/Sign	Wasco Bypass Constructed
5C-25-20	Wasco-Moro	9.5	17.1	1921	Grading	
5C-21-10	Clark St. (Wasco)	9.5	9.5	1923	Surfacing	
1V-215	Wasco Grade Xing.	9.5	9.5	1936	Railroad Signs	
21V102	Reg4 Pave/Preservation	13.3	18	1988	Paving	
7V-311	S. Unit Wasco-Moro	13.5	18.74	1963	Grading/Paving/Structure	Climbing Lanes Added
8V-216	Biggs Jct.-Moro Uxing	15.1	18.07	1965	Grading/Paving	
1V-003	DeMoss Springs-G.V.	15.2	28.43	1929	Grading/Surfacing/Oiling.	
16V-185	Moro-Grass Valley	18.6	29.5	1983	Grading/Paving	Climbing lanes added
5V-256	Moro-Grass Valley	18.6	27.3	1955	Grading/Paving	Climbing lanes added
6V-405 A/B	Moro-Grass Valley	19.6	21	1960	Paving	
4V-445	Moro Uxing.	20.8	20.8	1953	Grading/Oiling/Structure	
6V-405	Moro-Grass Valley	27.2	27.93	1960	Paving	
14V-388	Grass Valley-Shaniko	27.2	56.57	1979	Oiling	
8V-240	Biggs-Shaniko	27.4	59.9	1965	Flood Repair	
14V-388	Grass Valley-Shaniko	27.4	59.9	1979	Oiling	
31V-107	Grass Valley-Shaniko	27.4	55.91	1999	Grading/Paving/Signing	
5V-075	G.V(Church/Bryan St.)	27.8	27.93	1954	Paving	
5V-553	N. Unit G.V.-Kent	28.1	33.8	1957	Grading/Paving	
1V-128	Grass Valley-Kent	28.4	41.1	1923	Grading/Surfacing	
6V-346	S. Unit G.V.-Kent	33.8	40.72	1959	Grading/Paving	Climbing lanes added
7V-200	N. Unit Kent-Shaniko	40.7	43.8	1962	Paving	
1V-127	Kent-Wasco Co. Line	41.1	48.9	1923	Grading/Surfacing	
8V-095	Wilcox	43.8	47	1964	Paving	
20V-085	S Unit Kent-Shaniko	46.6	56.6		Paving	
1V-183	S.Unit Kent-Wasco Co.	47	48.9	1931	Grading/Surfacing/Oiling.	

A review of this project list illustrates that normal maintenance and repairs have been completed on US 97 but that little modernization has occurred. One by-pass and four climbing lanes have been added in 64 years but no further modernization has occurred. A substantial increase in the traffic volume has occurred on the US 97 corridor over the last 20 years as seen on table 7-12 below. The accident rate on the roadway, as provided by the Highway Safety officer in Table 7-13 demonstrates that, there are several areas where crashes are occurring on a regular basis. These areas need further attention and modernization to make them safe. Shoulder widening and rumble strips have been suggested as a means to make these stretches of road safer. Further discussion is provided under " Other Roadway and Bridge Improvement Projects" below.

Table 7-12
TRAFFIC VOLUME TRENDS - US 97 North Corridor
Automatic Recorder 28-001 at Mile Post 17.36

1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020
			1719	2197	2457	2752	3082	3452	3866	4330

Table 7-13
Sherman County Motor Vehicle Crash Report 2000-2001

DATE	HOUR	LOCATION	TYPE OF INCIDENT	ACTION	# of PATIENTS	PERSONS INVOLVED
Hwy. 97						
02-Jan-00	2243	MP 43 / Hwy 97	MVC rollover	Non-injury		
03-Jan-00	328	MP 32 / Hwy 97	MVC rollover	Transport	3 /1 DOA	
15-Jan-00	1000	MP 19 / Hwy 97	MVC rollover	Transport	3	
17-Jan-00	1625	MP 35 / Hwy 97	MVC rollover Semi-truck	Transport	1	
21-Jan-00	1024	MP 23 / Hwy 97	MVC	Transport/ Airlife	1	
23-Jan-00	1832	MP 12.5/ Hwy 206	MVC	Non-injury		
24-Jan-00	943	MP 9 / Hwy 97	MVC	Non-injury		
29-Jan-00	805	MP 24 Hwy 97	MVC rollover Semi	Non-injury		
31-Jan-00	1150	MP 3 / Hwy 97	MVC	Transport	1	
05-Feb-00	1800	MP 48.5 / Hwy 97	MVC rollover	Non-injury		
10-Mar-00	1340	MP 45/ Hwy 97	MVC rollover	Transport	1	
03-May-00	1527	MP 12 / Hwy 97	MVC rollover	Transport	2	
18-May-00	25	MP 48 / Hwy 97	MVC	Non-injury		
27-May-00	1710	MP 6 / Hwy 97	Motorcycle Crash	Transport	1	
03-Jun-00	2215	014 Hwy 97/ Wasco	MVC rollover	Transport	1	
08-Jun-00	810	Biggs Jct./Hwy 97-1-84	MVC	Transport	1	
15-Jun-00	1340	MP 46.9 / Hwy 97	MVC - Semi- truck	Transport	1	
27-Jun-00	1215	Biggs Jct./Hwy 97-1-84	MVC	Non-injury	1	
06-Aug-00	338	MP 33/ Hwy 97	MVC rollover	Transport	1	
22-Aug-00	1345	014 Hwy 97 - Wasco	2 vehicle crash	Transport	1	
27-Aug-00	1025	MP 48 / Hwy 97	MVC rollover	Non-injury		
30-Aug-00	1850	MP 6 / Hwy 97	MVC rollover Semi	Transport	1	
16-Oct-00	515	MP 4 / Hwy 97	2 vehicle crash	Transport	I	
04-Nov-00	45	MP 22.7/ Hwy 97	2 vehicle crash	Transport	4 /1 DOA	
23-Nov-00	1030	MP 35 / Hwy 97	MVC rollover	Transport	2	
01-Dec-00	718	MP 31.5 / Hwy 97	MVC rollover	Transport	2	
02-Dec-00	618	MP 30 / Hwy 97	MVC rollover	Transport	7	
02-Dec-00	618	MP 31.5 / Hwy 97	MVC rollover Semi	Transport	I	
02-Dec-00	640	MP 32 / Hwy 97	MVC	Non-injury	2	
14-Dec-00	2136	MP 51 / Hwy 97	MVC rollover	Transport	2	
16-Dec-00	935	MP 44.5 / Hwy 97	MVC rollover	Transport	I	
20-Dec-00	2305	MP 35 Hwy 97	MVC rollover	Non-injury		
25-Dec-00	1320	Biggs Jct./Hwy 97-1-84	MVC	Non-injury	I	
28-Dec-00	804	MP 54.5 / Hwy 97	MVC rollover	Transport	I	
31-Dec-00	553	MP 30 / Hwy 97	MVC rollover	Transport	3	
02-Jan-01	220	MP 23.3 / Hwy 97	MVC rollover (icy & fog)	transport	2	3
02-Jan-01	2034	MP 29.9 / Hwy 97	MVC rollover semi (fog)	Non-injury		I

Table 7-13 (Cont.)
Sherman County Motor Vehicle Crash Report 2000-2001

DATE	HOUR	LOCATION	TYPE OF INCIDENT	ACTION	# of PATIENTS	PERSONS INVOLVED
Hwy. 97						
20-Jan-01	800	MP 8 / Hwy 97	MVC rollover	transport	3	
22-Jan-01	802	MP 24.8 / Hwy 97	MVC	non-injury		I
22-Jan-01	1829	MP 23 / Hwy 97	MVC	non-injury		2
26-Jan-01	2141	Moro /Hwy 97	MVC / Hit & Run	non-injury		2
09-Feb-01	1045	MP 20 /Hwy 97	MVC (ice & snow)	non-injury		3
10-Feb-01	1255	MP 22 /Hwy 97	MVC Rollover (ice & snow)	transport	1	3
17-Feb-01	1005	MP 29 /Hwy 97	MVC Rollover	transport	1	4
I-84						
30-Jan-00	1757	M P 114 1-84	2 vehicle Crash	Non-injury		
06-Jun-00	810	Biggs Jct./Hwy 97-1-84	MVC	Transport	1	
21-Jul-00	1815	MP 115 1-84	Van vs. Deer	Non-injury	1	
06-Oct-00	1118	MP 114.5 /1-84	2 vehicle Crash	Transport	3	
21-Oct-00	1813	MP 114 /1-84	MVC	Transport	2	
23-Nov-00	1230	MP 114 /1-84	MVC	Transport	2	
24-Nov-00	130	MP 114 /1-84	2 vehicle crash	Non-injury		
06-Pec-00	513	MP 114 /1-84	MVC	Transport	I	
14-Dec-00	1433	MP 114 /1-84	MVC	Transport	I	
12-Dec-00	334	MP 113 1-84	MVC	Transport	I	
13-Jan-01	2040	1-84 / MP 119 eastbound	MVC	non-injury		3
16-Apr-01	1218	1-84 / MP 104	2-MVC (on exit ramp)	transport	1	4
29-Jan-01	802	Hwy 84 / MP 110	MVC Rollover (ice & snow)	transport	8 -1 DOA	13
Hwy 206						
23-Jan-00	1832	MP 12.5 / Hwy 206	MVC	Non-injury		
23-Mar-00	1145	MP 12 / Hwy 206	MVC	Transport	1	
06-Oct-00	1543	MP 3 Hwy 206 (Fulton)	Motorcycle Crash	Transport	1	
20-Jan-01	815	HWY 206 (Locust Grove)	MVC rollover	self-transport		2
10-Feb-01	AM	Hwy 206 / Wasco	MVC (ice & snow	Non-injury		2
07-Mar-01	850	Hwy 206 MP 14 (CW)	2 Vehicle Collision	non-injury		2
04-May-01	1840	Fulton Canyon MP 5	MVC (ETOH)	non-injury		I

SHERMAN COUNTY TRANSPORTATION SYSTEM PLAN

Out of the TSP process several mechanisms were used to try and make sure that as many projects as possible could be identified for the TSP. The suggested projects from the two committees that worked on the TSP; the Technical Advisor Committee and the Citizen's Advisory Committee are listed in Table 7-14 below and further identified in Chapter 6. The Committees launched a road survey to garner citizen input beyond the scope of the public meetings and worked at 4 public meetings to put

the following list of projects of concern to the community together for this plan. These projects are defined in Chapter 6 and included here to incorporate it into the plan recommendations.

TABLE 7-14
SHERMAN COUNTY TRANSPORTATION SYSTEM PLAN
RECOMMENDED IMPROVEMENT PROJECTS

Option	Impacts:	Cost	Recommendation
1. Implement Transportation Demand Management Strategies. (EN, OP)			
a. Design and install multi-purpose path systems through all four cities. (EN)	Construction by cities. Bike/Ped grants available.		a. 10-20 years
b. Design and implement Bike path following north/south along US 97 utilizing side alternative roads where feasible. (EN)	Design & construction cost from ODOT. Bike/Ped grants available.		b. 10-20 years
2. Improve roadway grade on Van Gilder Road leaving Moro. (ST)	Regrade slope banks	$30,000	5-10 years
3. Improve US 97, OR 206 Spur, I-84 Frontage Road and OR 206 speed reduction measures for entry's into all four cities (OP)	8 signs @ $500 each Add additional traffic control officer	$4,000 $60,000/yr	0-5 years 5-10 years
4. Implement no-passing zone in district of Kent on Highway 97. (OP)	One mile of yellow paint line and labor.	$3,000	0-5 years
5. Perform study to determine best measure to improve Monkland/Fairview intersection visibility problems on Highway 206. (MO, ST)	2 quide signs @ $500 each with 2 warning beacons @ $3,000	$7,000	5-10 years
6. Improve safety on all three Highway 97 exits to Wasco. (ST)			
a. Investigate additional lighting for intersections at all exits to Wasco	Minimum of 2 streetlights at 3 exits	$30,000	0-5 years
b. Redesign Southern entrance to expand deceleration lane.	Design & Construction cost from ODOT	$25,000	5-10 years
7. Investigate High School Loop road options for improvements (OP, ST)	South – realignment North – left turn lane	$300,000	10-20 yrs.
8. Improve Fields Corner and Highway 97 alignment and grade. (OP, ST)	Re-grade & pave corner	$800,000	***Complete 2004***
9. Implement necessary safety measures at US 97 & OR 206 Spur intersection. (ST)	Safety Study	$5,000	0-5 yrs.
10. Implement Biggs Junction Refinement Plan improvements. (OP, ST, MO)	Curbs, Left turn pockets	$251,000	***Complete 2004***
11. Widen Scott Canyon Road. Install signage to require permit through statewide permit system. (OP)	rebuilding and widening the road in 2 segments	$750,000	0-10 years
12. Move Guardrail back and widen Church St. access to Highway 97 in Grass Valley. (MA)	Improve snow removal	$3,000	0-5 years
13. Pave 2nd Street in Moro from US 97 to bridge in front of restrooms to bring them up to ADA standards. (MO)	Provide all weather surfaces to public facilities.	$50,000	***Completed 2002***
14. Install warning signs on Highway 97 at Biggs & Moro indicating road conditions going south (reader board) (OP)	Provide warning to motorist of road conditions	$80,000	0-5 years
15. Make improvements to Mud Hollow Bridge within the next year and list the bridge for replacement after repairs are complete. (ST)	Repair bridge before failure	$50,000	*Completed 2002*
16. Install signs on US 97 giving directions to historic Wasco. (OP)	Enhance tourism opportunities	$5,000	0-5 yrs.

TABLE 7-14 (Cont.)
SHERMAN COUNTY TRANSPORTATION SYSTEM PLAN
RECOMMENDED IMPROVEMENT PROJECTS

Option	Impacts:	Cost	Recommendation
17. Establish vista turnout at Milepost 13 (EN)	Enhance viewing opportunities along scenic byway	$150,000	5-10 yrs.
18. Implement streetscape and traffic calming measures in Moro. (EN)	Enhance community livability	$300,000	***Completed 2002***
19. Establish vista turnout at Milepost 32 (EN)	Enhance viewing opportunities along scenic byway	$150,000	5-10 yrs.
20. Implement streetscape and traffic calming measures in Grass Valley (EN)	Enhance community livability	$300,000	***Completed 2000***
21. Install rumble strips along identified high crash segments of US 97 (ST)	Reduce the number of single auto crashes		0-5 yrs.
22. Construct two passing lanes south of Grass Valley (MO)	Increase safe passing opportunities	$3,000,000	5-10 yrs.
23. Improve Dewey Street in Moro to collector street standards. (MO)	Improved access to public facilities	$50,000	0-5 yrs.
24. Inspect and make repairs as necessary to Moore Ln. bridge in Moro (OP)	Maintain second access to public facilities		***Completed 2003***
25. Construct information kiosk at Biggs Junction (EN)	Provide motorist information regarding points of interest	$15,000	0-5 yrs.
26. Increase truck inspections both for vehicle safety, weight limits and operation. (OP, ST)			
a. Provide training to local law enforcement officials to enable increased inspection of vehicles	Increased motorist safety		0-5 yrs.
b. Increased enforcement of speed limits	Increased motorist safety	$30,000 per year	0-5 yrs.
27. Reconstruct US 97/I-84 interchange at Biggs Junction (MO)	Improved highway operation and safety	$15,000,000	5-10 yrs.
28. Repair and/or replace the OR 206 bridge at Spanish Hollow Creek in Wasco (MO, ST)	Improved mobility for all users.	$150,000	5-10 yrs.
29. Replace bridges across Scott Canyon and Gerking Creeks in Rufus. (MO)	Protection of highway from flooding	$100,000	0-5 yrs.
30. OR 206 Cottonwood Grade Curve Corrections. (MO)	Improve operation of highway for freight.		
31. Monkland Road Curve Corrections (MO)	Improved operation and safety		
32. Left Turn Lane Rufus Industrial Park (OP)	Improve operations	$150,000	0-5 yrs.
33. Wasco Downtown Specific Plan (PL)	Improve Ped. Circulation	$50,000	0-5 yrs.

Note: Cost varies depending on which options are chosen for certain projects.
. Source: Chapter 6, Sherman County TSP

ST - Safety; PR - Preservation; OP - Operational; EN - Enhancement; MO – Modernization
PL - Planning

Out of the work done on the US 97 Corridor Plan a list of projects was generated that need to be incorporated into the Sherman County TSP. These projects are outlined in Table 7-15 below. Some of the projects are duplicates of projects on the STIP list or from the County TSP project list above

and are starred in the left-hand column to indicate the duplication of the projects. They are included here to reference the recognition of the need for the project.

Table 7-15
US 97 Corridor Plan Biggs to Wasco County Line - 20 Year Needs List

CATEGORY	#	PROJECT NAME	PROJECT DESCRIPTION	BMP	EMP	COST EST.	
Bike/Ped							
	42	US 97 4th - Bidwell St.	Curbs, sidewalks, ada ramps, drainage	18.13	18.43	$120,000	***Completed***
				Sum Of Bike/Ped:			**$120,000**
Bridge							
	4	Mud Spring Creek #8601	Rehab or widen	88.04	88.04	$40,000	***Completed***
	42	Spanish Hollow Creek #8894	Rail Upgrade	2.48	2.48	$37,000	
	42	Spanish Hollow Creek #8893	Rail Upgrade	2.37	2.37	$29,000	
	42	Spanish Hollow Creek #8895	Deck Overlay, Rail Upgrade	3.11	3.11	$196,000	
	42	Spanish Hollow Creek #8896	Deck Overlay, Rail Upgrade	3.25	3.25	$295,000	
	42	Gordon Hollow Creek #00842A	Replace	14.91	14.91	$95,000	
	42	Slaughterhouse Creek #817	Modify Substructure (Caps)	19.62	19.62	$50,000	
	42	Spanish Hollow Creek #8855	Deck Overlay, Rail Upgrade	0.39	0.39	$316,000	
				Sum of Bridge:			**$1,058,000**
Modernization							
*	42	US 97 @ Fields	Curve Correction	4	6	$800,000	***Complete 2004***
				Sum Of Modernization:			**$800,000**
Operations							
*	42	Biggs Junction	Access Management	0	0.39	$251,000	***Complete 2004***
	42	Moro	Traffic Claming	18.13	18.43	$350,000	***Completed***
*	42	US 97@High School Loop Road	Left Turn Lane	18.74	18.74	$150,000	
*	42	Sherman High School	Intersection Improvement	19.56	19.56	$150,000	
				Sum Of Operations:			**$901,000**
Safety							
				Sum Of Safety:			**$0**
				Grand Total:			**$2,778,000**

Other Roadway and Bridge Improvement Projects

In addition to the projects identified in the five-year plan, the STIP projects, and the US 97 Corridor Plan list above, two additional roadway improvement projects have been identified in Sherman County that also needs attention. The first project was identified in discussions with the Lower John Day

Safety Officer located in Moro and the ODOT planner and did not get included in the five year project plans nor in the TSP options.

The Highway accident rate along the southern portion of US 97 is excessive for the ADTs that occur in this area. The shoulder widths in this area are limited and rollovers occur because of people drifting off of the road. In these areas the implementation of rumble strips would aid drivers in staying alert and warn them of the narrow roadway. Some of these rumble strips could also require additional shoulder widening in order to enable construction of the strips. Crash statistic collected over the last two years as recorded by the safety officer from ambulance runs are identified in Table 7-11. The locations are listed by milepost and these areas are indicated for further study to determine the construction of the necessary improvements to address the problem. The Safety Officer recommendation would be to widen shoulders and install rumble strips at key locations between Milepost 19 to 36 and 43 to 51.

The second project that was not brought out in the TSP process but has been brought to attention through discussions with Mid-Columbia Producers and the County Judge is in regards to the Biggs Grain Terminal access. No plans exist to modernize the northbound I-84 access lane at Biggs even though it does not meet ODOT standards and is one of the few remaining 2-way access points in the state off of a major freeway. The STIP does not list improvements to this ramp and the draft US 97 corridor plan decision matrix describes the access to the Biggs Grain Terminals as an objective but improvements to this interchange are not listed in the 20-year needs list. The increased traffic on US 97 and on I-84 should warrant redesign of this ramp especially when viewed in light of the large grain vehicles that have difficulty maneuvering the ramp and the fact that large commercial freight trucks make up over 50% of the traffic in Biggs junction.

These two project are not listed in any of the modal plans described above and are not included in the county-specific projects listed in Table 7-8 and identified in Figure 7-2, but should still be given consideration in future investigation of state-wide and Sherman County transportation issues.

Pedestrian & Bicycle System Plan

In rural areas, it is typical to accommodate pedestrians and bicycles on roadway shoulders. Currently, many of the shoulders on both county roads and state highways in Sherman County can not safely accommodate pedestrians and bicycles. Therefore, when Sherman County's roads and the state highways are paved, repaved, or reconstructed, shoulders should be widened to meet the standards shown in Figure 7-1. New roads should be constructed with adequate shoulders as outlined in Table

7-2. Substandard shoulders on state highways in Sherman County are identified in Table 7-16 and mapped in Figure 7-2.

Table 7-16
Substandard Shoulders for Bikes & Pedestrians

Route	Begin MP	End MP	Distance
US 97	-0.43	2.00	2.43
US 97	18.43	18.68	0.25
US 97	26.19	26.38	0.19
US 97	27.90	34.41	6.51
OR 216	8.35	28.42	20.07
OR 206	-1.97	14.99	16.96
OR 206	2.84	2.97	0.13
OR 206	7.05	14.06	7.01
OR 206	14.84	15.35	0.51
OR 206	6.39	7.46	1.07
Total			**55.13**

In addition to accommodating pedestrians and bicyclists, shoulders also protect the roadway edge from raveling and increase safety for motorists. Costs for shoulder additions are approximately $2 per square foot.

Pedestrian System Plan

Multi-use paths are popular in rural areas, especially when they provide a viable alternative to a busy highway. Although no paved separated paths are found in Sherman County at this time, the cities in Sherman County are planning to develop multi-use paths within their city boundaries. These projects will benefit pedestrians and bicyclist in and around the cities by interconnecting areas of activity within the cities with the proposed bicycle plan along US 97.

Multi-use paths should follow the design standards of the *Oregon Pedestrian and Bicycle Plan (1995)*. Recommendations for Pedestrian facilities on the urban sections of Sherman County's roads are provided for in Figures 7-2 County; 7-3 City of Rufus; 7-4 City of Wasco; 7-5 City of Moro & 7-6 City of Grass Valley.

State law provides guidelines requiring the provision of bikeways and sidewalks. Oregon Revised Statute (ORS) 366.514 *Use of Highway Fund for Footpaths and Bicycle Trails* requires the inclusion of bikeways and walkways, including curb cuts or ramps, whenever highways, roads, and streets are constructed, reconstructed, or relocated. The provisions indicate three situations where exemptions are allowed: (1) where sparsity of population indicates no need or probable use, (2) where safety would

be jeopardized, and (3) if the cost is excessively disproportionate to the need or probable use. ODOT's interpretation of this statute is provided in the *1995 Oregon Bicycle and Pedestrian Plan*, and provides greater detail on issues such as exemptions. The Cities of Rufus, Wasco, Moro and Grass Valley have expressed a desire to implement the development of their pedestrian systems.

Bicycle System Plan

At present, bicyclists in Sherman County share the roadway with motorists on most of the county roads. Many of the shoulders on both the county roads and state highways are inadequate for accommodating bicyclists as indicated in Table 7-14. These shoulders are also needed to accommodate pedestrians, as mentioned above. Therefore, as Sherman County's roads and the state highways are developed, repaved, or reconstructed, shoulders should be widened to meet the standards shown in Figure 7-1. New roads should be constructed with adequate shoulders and existing roads should be widened in the areas shown to have inadequate shoulder widths.

Alternate bicycle routes in the county are identified on Figure 7-8 and show routes along US 97, OR 206 and OR 216. The map in Figure 7-8 identifies bikeable shoulder and areas where signage is requested to identify alternate bike routes using smaller county roads. The suggested county roads follow a rational route traveling in the same direction as the major highways yet offer less traffic on reasonably similar streets.

Transportation Demand Management Plan

Through transportation demand management (TDM), peak travel demands can be reduced or spread to more efficiently uses 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 Sherman County, where traffic volumes are low and the population and employment is small, implementing TDM strategies is not practical in most cases. However, the pedestrian and bicycle improvements recommended earlier in this chapter are also considered TDM strategies. By providing these facilities, Sherman County is encouraging people to travel by other modes than the automobile. In rural communities, TDM strategies include providing mobility options.

Figure 7-8
Bicycle Plan
Sherman County, Oregon

Bicycle Facility

- Bike Substandard Shoulder Width
- County Bike Route
- Highway Shoulder Bike Lane

2 0 2 4 Miles

Because intercity commuting is a factor in Sherman County, residents who live in one city and work in other cities should be encouraged to carpool with a fellow coworker or someone who works in the same area. Sherman County should consider creating a rideshare program, 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

The Oregon Transportation Plan indicates that intercity passenger service should be available for an incorporated city or group of cities within five miles of one another having a combined population of over 2,500 and located 20 miles or more from the nearest Oregon city with a larger population and economy. Services should allow a round trip to be made within a day.
Sherman County does not meet these requirements nor does it appear needed or economically feasible to provide intercity transit within the county. However, if in the future Sherman County identifies a need or desire to begin such service, state support is usually necessary to get this kind of service started. For regular intercity service to have a chance of success, it must attract riders from the general public, not just the elderly. Ideally it should connect with Greyhound service. Further, it must run at regularly scheduled times so that people may depend on the service.

The Mid-Columbia Bus Company operates home-to-school bus service for the school district. Mid-Columbia also operates charter bus service within the county and much of Oregon to various destinations including Seattle, Washington. Mid-Columbia operates charter buses out of Moro and Biggs. This service is targeted to adult passengers and serves the entire County. This type of recreational service appears well suited for many of the seniors in Sherman County and should remain in effect.

Demand responsive, otherwise referred to as “dial-a-ride,” transit is available also in Sherman County. The county operates two handicapped-access vans and a 12-passenger van. This volunteer program is provided as a special transportation service primarily for seniors. The County has a transit coordinator that works in cooperation with Sherman County and the Mid-Columbia Council of Governments who manage the provision of the service.

Sherman County is not scheduled to receive any new modified vans in next 5-year plan time frame but may need one in the 5 to 10 year time frames. The vans will be purchased with funds allocated within ODOT’s final 1998-2001 STIP for the *elderly and persons with disabilities program*.

Rail Service Plan

The Union Pacific Railroad maintains a rail line along the I-84 corridor throughout Sherman County with a spur that extends to the Mid-Columbia Producers elevator site. This freight operation represents the extent of rail service in Sherman County and consists of a 25-car capacity loading facility operated by Mid-Columbia Producers for grain export. MCP operates elevators at the rail service area and on the river at Biggs. Sherman County supports maintaining this service within the county.

Future rail expansion is not currently being planned within the county. However, Sherman County has had several requests to develop quarry sites within the vicinity of the Biggs Junction port. The area above Biggs has several quarry sites listed in the county's Goal 5 Inventory that are identified as quarry sites and could support rock export via rail along the I-84 corridor. The Biggs area has an existing spur line from the I-84 line being utilized by MCP Producers at this time. Findings from the *Port of Arlington Expansion Study* indicate that Portland metropolitan rock demand far exceeds supply and recommends in the Gilliam County TSP that the Port of Arlington pursue expansion for the export of rock. The Biggs Junction area could take advantage of the same situation and develop into a viable source of rock production for the state.

The single biggest drawback to development or expansion of this activity is the accessibility of the area off of US 97 and I-84. The only access to this area is via a two-way ramp shared by these facilities that is utilized to exit off of US 97 and as the northbound access ramp to I-84. Further discussion of this issue is addresses in the water transportation discussion below and in the "Other Roadway and Bridge Improvement Projects" paragraph above.

Air Service Plan

Sherman County is served by one airport located in Wasco. The Wasco Airport is owned by the state and operates for private and agriculture use only. If needed, the airport property could support development of additional land facilities however; there are no plans to further develop the airport at this time.

Sherman County recognizes the importance, existing and future, of maintaining this airport facility. According to *Sherman County's Comprehensive Plan*, the county will follow policies to "...protect this airport from hazards to navigation and to otherwise encourage the development of adjacent lands and facilities in a manner conducive to increased utilization."

The nearest passenger-use airports are located in Portland and Pendleton. Passenger service in Pendleton includes approximately 15 scheduled flights per day by Horizon Airlines, with flights to Portland and Seattle. However, the Portland International Airport, located about 140 miles to the west of Arlington, probably serves most passenger air travel needs of Sherman County residents.

Pipeline Service Plan

Two natural gas pipelines maintained by Pacific Gas Transmission traverse the central portion of Sherman County. Although the pipelines do not currently serve the county, future natural gas service within the county has been discussed. Although a substation location has not been addressed, the pipeline is closest to Kent; located about three miles north of the unincorporated community. Large commercial operations and Port operations within the Biggs area could support future development of pipeline access.

Water Transportation Plan

Water transportation in Sherman County is concentrated in the Biggs area but could also be considered along the waterfront in the Rufus area. There are river cargo operations in Biggs presently, which are managed by Mid-Columbia Producers who handle most of the grain export in the region. A study to determine the feasibility of developing a Special District for a port facility in the Biggs area was completed in 1993. There was interest in forming a port district to expand the existing operations to include a container unloading facility and expansion of the existing loading facilities. Due to the lack of any viable industrial uses at the time the plan was never followed through on. The current facility is able to meet the current demands for services of the local grain producers.

Cargo Operations

The Port in Biggs Junction is presently engaged in grain export only; receiving grain from area farmers in Sherman County and exporting the grain via train and barge to Portland with final destinations overseas. Port facilities consist of a single grain elevator with one leg (or loading conveyor) and a one barge capacity dolphin on the river to moor barges awaiting loading. Currently MCP has the capacity to load two barges a day with a capacity of 120,000 bushels each or 240,000 bushels per day.

The export of grain is critical to Sherman County's largely agriculture-based economy. The County is a leading grain producer in the state. The only cargo, historically and currently, exported from Biggs is grain. No cargo has been imported to Biggs by water. Exported grain from Biggs travels via barge

to Portland for export internationally. Demand on the Port facility varies throughout the year during and around the harvest season.

Expansion of cargo operations within the Port facility other than grain transport appears limited at this time. The developable area available to support additional cargo operations (about 5 acres adjacent to the grain elevator) has marginal capacity to support additional functions and is hampered by the hazardous 2-way access ramp used to exit the port facility and access the northbound I-84 lanes.

No plans exist to modernize the I-84 access lanes even though it does not meet ODOT standards and is one of the few remaining 2-way access points in the state. The STIP does not list improvements to this ramp and the draft US 97 corridor plan decision matrix describes the access to the Biggs Grain Terminals as an objective but improvements to this interchange are not listed in the 20-year needs list. The increased traffic on US 97 and on I-84 should warrant redesign of this ramp especially when viewed in light of the large grain vehicles that have difficulty maneuvering the ramp and the fact that large commercial freight trucks make up over 50% of the traffic in Biggs junction.

TRANSPORTATION SYSTEM PLAN IMPLEMENTATION PROGRAM

Implementation of the Sherman County Transportation System Plan will require changes to both the County comprehensive plan and zoning code and preparation of a 20-Year Capital Improvement Plan. These actions will enable Sherman County to address both existing and emerging transportation issues throughout the county in a timely and cost effective manner. This implementation program is focused on providing Sherman County with the tools to amend the comprehensive plan and zoning ordinance to conform with the Oregon Transportation Planning Rule and to fund and schedule transportation system improvements.

One part of the implementation program is the formulation of a 20-year transportation project list. The purpose of the project list is to detail what transportation system improvements will be needed as Sherman County grows and to provide a process to fund and schedule the identified transportation system improvements. It is expected that the 20-year transportation project list can be integrated into the existing County Needs and Issues Inventory; the ODOT STIP, and the Needs and Issues inventories of the various cities in Sherman County involved in related projects. This integration is important since the Transportation System Plan proposes that these governmental agencies will fund some of the transportation improvement projects.

Model policy and ordinance language that conforms to the requirements of the Transportation Planning Rule are to be developed in phase two of the Transportation System Plan. The proposed ordinance amendments will require approval by the County Commissioners and the Councils of all four cities.

20-Year Transportation Project list

The 20-year transportation project list is shown with the following priorities:

- High Priority (next 0 to 5 years)
- Medium Priority (5 to 10 years)
- Low Priority (10 to 20 years)

These priorities are based on current need, the relationship between transportation service needs and the expected growth of the county, and a reasonable balance of near and long-term expenditures. The following schedule indicates priorities and may be modified to reflect the availability of finances or the actual growth in population and employment.

The 20-year transportation project list is summarized in Table 7-17. The estimated cost of each project is shown in 2001 dollars. These costs include design, construction, and some contingency costs. They are preliminary estimates and do not include right-of-way acquisition, water or sewer facilities, or detailed intersection design.

Table 7-17
Prioritized 20-Year Transportation Project List
Sherman County Transportation System Plan

		Estimated Cost Allocation		
Links	**Project Number/Description**	**County**	**State**	**Total**
	High Priority (2001-2006)			
	1b. Design and implement Bike path along US 97	$15,000	$150,000	$165,000
****	2. Improve roadway grade on Van Gilder Road	$30,000		$30,000
	3. Placement of warning signs on US 97 at cities/enforcement	$60,000	$4,000	$64,000
	4. Implement no-passing zone in Kent		$3,000	$3,000
	6a. Lighting for intersections at Wasco exits		$30,000	$30,000
*	8. Improve Fields Corner at Highway 97		$800,000	$800,000
	9. Safety measures at Hwy 30 intersection & US 97.		$5,000	$5,000
*	10. Biggs Junction Refinement Plan improvements.		$251,000	$251,000
	11. Widen Scott Canyon Road & install signage	$750,000		$750,000
*	13. Pave 2nd Street in Moro from US 97	$50,000		$50,000
	14. Install warning signs on Hwy 97 at Biggs & Moro		$80,000	$80,000
****	15. Mud Hollow Bridge	$50,000		$50,000
	Subtotal High Priority Projects	**$955,000**	**$1,323,000**	**$2,278,000**
	Medium Priority (2007-2012)			
	1a. Install multi-purpose paths in all four cities			
	5. Improve Monkland/Fairview intersection on Hwy 206		$7,000	$7,000
	6b. Redesign Southern Wasco entrance		$25,000	$25,000
**	7a. High School Loop road North entrance		$150,000	$150,000
	12. Move Guardrail back/widen Church St. Entrance	$3,000		$3,000
	Subtotal Medium Priority Projects	**$3,000**	**$182,000**	**$185,000**
	Low Priority (2013-2023)			
**	7b High School Loop road south entrance		$150,000	$150,000
	Subtotal Low Priority Projects			**$150,000**
	SHERMAN COUNTY TOTAL			**$2,613,000**
	* 2002-2005 STIP Project.			
	** US 97 Corridor Plan Project			
	*** Biggs Refinement Plan Project			
	**** Sherman County Five Year Plan			

CHAPTER 8
FUNDING OPTIONS AND FINANCIAL PLAN

The Transportation Planning Rule requires TSPs to include an evaluation of the funding environment for recommended improvements. This evaluation must include a listing of all recommended transportation improvement projects, estimated costs to implement those improvements, and a review of potential funding mechanisms. Sherman County's TSP identifies 15 specific capital improvement projects over the next 20 years. This section of this TSP provides an overview of some funding and financing options that may be available to Sherman County to fund these improvements.

Pressures from increasing growth throughout much of Oregon have created an environment of planned improvements that remain unfunded. Sherman County will need to work with its incorporated cities and ODOT to finance the proposed 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 and by the rate of traffic that occurs within the transportation corridor. This TSP assumes Sherman County will grow at the rate forecast by the State of Oregon Office of Economic Analysis over the next 20 years. If population growth exceeds this rate, the improvements may need to be accelerated. Slower than expected growth will relax the improvement schedule.

HISTORICAL STREET IMPROVEMENT FUNDING SOURCES

In Oregon, state, county, and city jurisdictions work together to coordinate transportation improvements. 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 represent the current revenue structure for transportation-related needs.

TABLE 8-1
Sources Of Road Revenues By Jurisdiction Level

	Jurisdiction Level			Statewide
Revenue Source	**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) comprise another 30 percent of all road-related revenue. The remaining sources of road-related revenues are generated locally, including 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 $0.24) per gallon, which together with the federal gas tax totals $0.424 per gallon.

Transportation Funding in Sherman County

Historically, sources of road revenues for Sherman County have included Federal Highway Trust Fund, state highway fund revenues, federal grants, earnings from the investment of the working fund balance, and other sources. Transportation revenues and expenditures for Sherman County are shown in Table 8-2 and Table 8-3.

Table 8-2
Sherman County Transportation-Related Revenues

	1997-1998	1998-1999	1999-2000	2000-2001
	Actual	Actual	Budget	Budget
Beginning Fund Balance	**$361,840**	**$232,939**	**$314,864**	**$564,201**
Resources				
Taxes	$592,615	$535,297	$662,048	$362,607
Investment Earnings	$17,247	$21,520	$32,538	$30,721
Charges/Fees/Services	$49,620	$45,225	$22,773	$17,375
Sale of Assets	$36,665	$37,310	$34,926	$14,370
Misc. Other Revenue	$17,405	$5,942	$13,045	$6,646
State Motor Vehicle Fund	$141,912	$145,560	$147,647	$142,735
County Allotment	$0	$168,514	$0	$144,180
Sale of Public Land	$2,323	$1,187	$1,346	$0
STP Funds	$0	$68,170	$147,489	$84,796
Federal Disbursements	$8,498	$0	$469	$477
Interfund Transfers	$0	$0	$0	$0
	$1,228,126	$1,261,664	$1,377,145	$1,368,108

Source: Sherman County.

As shown in Table 8-2, revenues have increased somewhat, from $1.2 million in 1997-1998 to an estimated $1.3 million in 2000-2001. Nearly $140,000 of the annual revenue comes from the State Highway Fund. In recent years, Sherman County has also benefited from resources from the County Allotment Fund, which distributes moneys to counties with the lowest resource-per-equivalent road-mile ratios. (See the description of the County Allotment Program below.)
As shown in Table 8-3, Sherman County has spent between $60,000 and $128,000 annually in capital improvements. The bulk of expenditures in the road fund are for personal services and materials and services relating to maintenance.

Table 8-3
Sherman County Transportation-Related Expenditures

	1997-1998	1998-1999	1999-2000	2000-2001
	Actual	Actual	Budget	Budget
Personal Services	$452,128	$593,478	$395,236	$409,891
Materials and Services	$415,558	$397,776	$345,271	$428,830
Capital Outlay	$127,519	$117,198	$57,438	$98,261
Other Requirements	$0	$0	$0	$0
Transfers	$0	$35,000	$15,000	$30,000
	$995,205	$1,143,452	$812,945	$966,982

Source: Sherman County.

The County also accounts for funds intended for the purchase of road improvement equipment in a Road Equipment Replacement Fund. Its revenues and expenditures are shown in Table 8-4. Its revenues are typically transfers from the general road fund.

Table 8-4
Sherman County Road Equipment Replacement Fund

	1997-1998	1998-1999	1999-2000	2000-2001
	Actual	**Actual**	**Budget**	**Budget**
Beginning Fund Balance	0	0	$0	$15,080.20
Resources				
Investment Earnings	0	0	$80.20	$844.96
Transfers	0	$35,000	$15,000	$30,000
		$35,000.00	$15,080.20	$45,925.16
Expenditures				
Road Equipment Purchase	0	35,000	0	0
Road Equipment Leases	0	0	0	0
	0	$35,000	0	0

Source: Sherman County.

Transportation Revenue Outlook in Sherman County

ODOT's policy section recommends certain assumptions in the preparation of transportation plans. In its Financial Assumptions document prepared in May 1998, ODOT projected the revenue of the State Highway Fund through year 2020. The estimates are based on not only the political climate, but also the economic structure and conditions, population and demographics, and patterns of land use. The latter is particularly important for state-imposed fees because of the goals in place under Oregon's TPR requiring a ten-percent reduction in per-capita vehicle miles of travel (VMT) in MPO planning areas by year 2015, and a 20-percent reduction by year 2025. This requirement will affect the 20-year revenue forecast from the fuel tax. ODOT recommends the following assumptions:

- Fuel tax will increase 1 cent per gallon per year (beginning in year 2002), with an additional 1 cent per gallon every fourth year;
- Vehicle registration fees would be increased by $10 per year in 2002, and by $15 per year in year 2012;
- Revenues will fall halfway between the revenue-level generated without TPR and the revenue level if TPR goals were fully met; and

- The revenues will be shared among the state, counties, and cities on a "50-30-20 percent" basis rather than the current "60.05-24.38-15.17 percent" basis;
- Inflation occurs at an average annual rate of 3.6 percent

Figure 8-1 shows the forecast in both 1999 dollar and inflation-deflated constant (1998) dollars. As highlighted by the constant-dollar data, the highway fund is expected to increase more slowly than inflation early in the planning horizon until fuel-tax and vehicle-registration fee increases occur in year 2002, then increase somewhat faster than inflation through year 2015, then (again) more slowly than inflation.

As the State Highway Fund is expected to remain a significant source of funding for Sherman County, the County is highly susceptible to changes in the State Highway Fund. The amount actually received from the State Highway Fund will depend on a number of factors, including the actual revenue generated by state gasoline taxes, vehicle registration fees, and other sources. It will also depend on the population growth in Sherman County because the distribution of state highway funds is based on an allocation formula that includes population.

With minor exceptions, the Oregon constitution, Article IX, Section 3a dedicates the highway revenues for the construction, improvement, maintenance, operation and use of public highways, road, streets and roadside rest areas. ORS 366.524 currently requires distribution of the funds as shown in the formula in Table 8-4 below.

Table 8-5
Oregon State Highway Fund Distribution formula 2001

Recipient	Percent	Basis for distribution
State	60.05%	
Cities	15.57%	Population (ORS 366.805)
Counties	24.38%	Vehicle Registration (ORS 366.530)

Based on the above distribution formula the total dollars actually coming into the region for the 1999-2000 fiscal year and from July 1, 2000 to June 01, 2001 are shown in Table 8-5. This information is taken from ODOT's web page showing the total Fund Apportionment for the state.

Table 8-6
ODOT Fund Apportionment, Distribution to Sherman County Cities/County.

Jurisdiction	Fiscal Year 1999-2000	July 1,2000 to June 1, 2001
Grass Valley	$8,175	$7,915
Moro	$15,025	$14,730
Rufus	$13,670	$13,165
Wasco	$18,455	$17,745
Sherman County	$147,650	$142735
	$202,974.00	$210,292.00

REVENUE SOURCES

In order to finance the recommended transportation system improvements requiring expenditure of capital resources, it may be necessary to consider a range of funding sources. Although the property tax has traditionally served as the primary revenue source for local governments, property tax revenue goes into general fund operations, and is typically not available for street improvements or maintenance. Despite this limitation, the use of alternative revenue funding has been a trend throughout Oregon as the full implementation of Measures 5 and 47. The alternative revenue sources described in this section may not all be appropriate in Sherman County. However, this overview is 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 source for local governments. However, property tax revenue goes into general fund operations, and is not typically available for street improvements or maintenance. The dependence of local governments on this revenue source is partly due 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 has a predictable value and appreciation to base taxes upon. This contrasts with 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 that 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 is changing 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 the county. If the non-debt tax rate exceeds the constitutional limit of $10 per $1,000 of assessed valuation, then all of the taxing districts' tax rates are reduced on a proportional basis. The proportional reduction in the tax rate is commonly referred to as compression of the tax rate.

Oregon voters passed measure 47, an initiative petition, 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 the lesser of the 1995-96 tax minus 10 percent, or the 1994-95 tax. It limits future annual property tax increases 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. Voters approved this revised tax measure in May 1997.

The League of Oregon Cities (LOC) estimated that direct revenue losses to local governments, including school districts, would total $467 million in fiscal year 1998, $553 million in 1999, and increase 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 increase 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.

System Development Charges

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

Local governments have the legal authority to charge property owners and/or developers fees for improving local public works infrastructure to meet the projected demand resulting from their developments. Charges are most often targeted toward improving community water, sewer, or transportation systems. In order to collect SDCs, cities and counties must have specific infrastructure plans in place that comply with state guidelines.

Typically, an SDC is collected when new building permits are issued. Transportation SDCs are 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 square footage for the type of business or industrial uses. SDC revenues would help fund the construction of transportation facilities necessitated by new development. A key legislative requirement for charging SDCs is the link between the need for the improvements and the developments being charged.

State Highway Fund

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. Like other Oregon counties, Sherman County 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 money 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. Sherman County may consider raising its local gas tax as a way to generate additional street improvement funds. However, with relatively few jurisdictions exercising this tax, an increase in the cost differential between gas purchased in Sherman County and gas purchased in neighboring counties may encourage drivers to seek less expensive fuel elsewhere. Any action will need to be supported by careful analysis to minimize the unintended consequences of such an action.

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 would allow Sherman County to impose a biannual registration fee for all passenger cars licensed within the county. Although both counties and special districts have this legal authority, vehicle registration fees have not been imposed by local jurisdictions. In order for a local vehicle registration fee program to be viable in Sherman 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 local government or property owners. Cities that use LIDs are required to have a local LID ordinance that provides a process for district formation and payback provisions.

Through the LID process, the cost of local improvements is generally spread out among a group of property owners within a specified area. The cost can be allocated based on property frontage or other methods such as 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 local government. 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

There are a variety of grant and loan programs available, most with specific requirements related to economic development or specific transportation issues, rather than for the general construction of new streets. Many programs require a match from the local jurisdiction as a condition of approval. Because grant and loan programs are subject to change as well as statewide competition, they should not be considered a secure long-term funding source for Sherman County. Most of the programs available for transportation projects are funded and administered through ODOT and/or the Oregon Economic Development Department (OEDD). Some programs that may be appropriate for Sherman County are described below. Appendix H provides a list of current 1998 program representatives for each of the grant and loan programs along with their phone numbers.

Bike-Pedestrian Grants

By law (ORS 366.514), all road street or highway construction or reconstruction projects must include facilities for pedestrians and bicyclists, with some exceptions. ODOT's Bike and Pedestrian Program administers two programs to assist in the development of walking and bicycling improvements: local grants, and Small-Scale Urban Projects. Cities and counties with projects on local streets are eligible for local grant funds. An 80 percent state/20 percent local match ratio is required. Eligible projects include curb extensions, pedestrian crossings and intersection improvements, widening shoulders and restriping existing roads for bike lanes. Projects on urban state highways with little or no right-of-way taking and few environmental impacts are eligible for Small-Scale Urban Project Funds. Both programs are limited to projects

costing up to $100,000. Projects that cost more than $100,000, require ROW acquisition, or generate environmental impacts should be submitted to ODOT for inclusion in the STIP.

Enhancement Program

This federally funded program earmarks $8 million annually for projects in Oregon. Projects must demonstrate a link to the intermodal transportation system, compatibility with approved plans, and local financial support. A 10.27 percent local match is required for eligibility. Each proposed project is evaluated against all other proposed projects in its region. Within the five Oregon regions, the funds are distributed on a formula based on population, vehicle miles traveled, number of vehicles registered and other transportation-related criteria. The solicitation for applications was mailed to cities and counties the last week of October 1998. Local jurisdictions have until January 1999 to complete and file their applications for funding available during the 2000-2003 fiscal years, which begin October 1999.

Highway Bridge Rehabilitation or Replacement Program

The Highway Bridge Rehabilitation or Replacement Program (HBRR) provides federal funding for the replacement and rehabilitation of bridges of all functional classifications. A portion of the HBRR funding is allocated for the improvement of bridges under local jurisdiction. A quantitative ranking system is applied to the proposed projects based on their sufficiency rating, cost factor, and load capacity. They are ranked against other projects statewide, and require state and local matches of 10 percent each. The HBRR includes the Local Bridge Inspection Program and the Bridge Load Rating Program.

Transportation Safety Grant Program

Managed by ODOT's Transportation Safety Section (TSS), this program's objective is to reduce the number of transportation-related accidents and fatalities by coordinating a number of statewide programs. These funds are intended to be used as seed money, funding a program for three years. Eligible programs include those relating to impaired driving, occupant protection, youth, pedestrians, speed, enforcement, and bicycle and motorcycle safety. Every year, TSS produces a Highway Safety Plan that identifies the major safety programs, suggests

countermeasures, and lists successful projects selected for funding, rather than granting funds through an application process.

Special Transportation Fund

The Special Transportation Fund (STF) awards funds to maintain, develop, and improve transportation services for people with disabilities and people over 60 years of age. Financed by a two-cent tax on each pack of cigarettes sold in the state, the annual distribution of funds is approximately $5 million. Three-quarters of these funds are distributed to mass transit districts, transportation districts, and, where no such districts exist, to counties, on a per-capita formula. The remaining funds are distributed on a discretionary basis.

County Allotment Program

The County Allotment Program distributes funds to counties on an annual basis; the funds distributed in this program are in addition to the regular disbursement of State Highway Fund resources. The program determines the amount of total revenue available for roads in each county and the number of road miles (but not lane miles) of collectors and arterials under each county's jurisdiction. Using these two benchmarks, a "resource-per-equivalent" ratio is calculated for each county. Resources from the $750,000 program are provided to the county with the lowest resource-per-equivalent road-mile ratio until they are funded to the level of the next-lowest county. The next-lowest county is then provided resources until they are funded to the level of the third-lowest county, and so on, until the fund is exhausted.

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 $7 million 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 or retention of primary employment; and
- Ability to provide local funds (50/50) to match grant.

The maximum amount of any grant under the program is $500,000. Local governments that 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 that supports commercial and industrial development and results 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 assure that funds will return to the State over time for reinvestment in local economic development infrastructure projects. Jurisdictions that have received SPWF funding for projects that include some type of transportation-related improvement include the Cities of Baker City, Bend, Cornelius, Forest Grove, Madras, Portland, Redmond, Reedsport, Toledo, Wilsonville, Woodburn, and Douglas County.

Oregon Transportation Infrastructure Bank

The Oregon Transportation Infrastructure Bank (OTIB) program is a revolving loan fund administered by ODOT to provide loans to local jurisdictions, including cities, counties, special districts, transit districts, tribal governments, ports, and state agencies. Eligible projects include construction of federal-aid highways, bridges, roads, streets, bikeways, pedestrian accesses, and right-of-way costs. Capital outlays such as buses, light-rail cars and lines, maintenance yards, and passenger facilities are also eligible.

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 projects for a four-year funding cycle, is updated each biennium. 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 TEA-21 Planning Requirements. The STIP must fulfill TEA-21 planning requirements for a staged, multi-year, statewide, intermodal program of transportation projects. Specific transportation projects are prioritized based on a review of the TEA-21 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 Sherman County'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 4. Sherman County, its incorporated cities and ODOT will need to communicate on a biennium 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.

ODOT also carries out some highway improvements as part of its ongoing highway maintenance program. Types of road construction projects that can be included within the ODOT maintenance programs are intersection realignments, additional turn lanes, and striping for bike lanes. Maintenance related ODOT field crews using state equipment usually conduct construction projects. The maintenance crews do not have the staff or specialized road equipment needed for large construction projects.

An ODOT funding technique that will likely have future application to Sherman County'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 or reduce the number of access points for future development along state highways.

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 funding 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 is a number of debt financing options available to Sherman County. 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 a 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 spread the burden of the costs of these improvements to more of the people who are likely to benefit from the improvements and lower immediate payments.

General Obligation Bonds

General obligation (GO) bonds 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 are typically used to make public improvement projects that will benefit the entire community.

State statutes require that the general obligation indebtedness of a jurisdiction not exceed three percent of the real market value of all taxable property in its boundary. 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, 47, and 50. Although each new bond must be voter approved, Measure 47 and 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, 47, and 50.

Bancroft Bonds

Under Oregon Statute, municipalities are allowed to issue Bancroft bonds, which pledge the city's full faith and credit to assessment bonds. The bonds become general obligations of the city but are paid with assessments. Historically, these bonds provided cities with the ability to pledge their 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, 47, and 50. As a result, since 1991, municipalities that were required to compress their tax rates have not used Bancroft bonds.

FUNDING REQUIREMENTS

Sherman County's TSP identifies capital improvements recommended during the next 20 years to address safety and access problems and to expand the transportation system to support a growing

population and economy. This TSP identifies nine projects, classified into three implementation phases:

High Priority: between 2001 to 2006;
Medium Priority: between 2006 and 2011; and
Low Priority: After 2011.

Estimated costs summarized by project and by implementation phase were presented previously in Chapter 7 in Table 7-11. The overall estimated project cost associated with Sherman County's 20-year transportation project list is over $4 million.

Thirteen of the projects have been classified as high-priority projects. This classification is attached to the projects that the county would like to see completed within five years of completion of this plan. An additional five projects are classified as medium-priority, scheduled for implementation between years 2006 and 2011. The last project is classified as low priority, intended for implementation between years 2011 and 2021. Two of the high-priority projects (the Fields corner improvements and the Biggs Refinement Plan) are on the STIP, to be financed through state and federal sources. Where the proposed projects improve safety or general traffic operations, they may be eligible for Transportation Safety Grants or Enhancement Funds. Further analysis will be required to evaluate the applicability of these programs for these proposed projects. Sherman County will need to continue to work with its incorporated cities and ODOT in order to implement this TSP.

APPENDIX A

TECHNICAL MEMORANDUM #1

REVIEW OF EXISTING PLANS AND POLICIES FOR SHERMAN COUNTY

The purpose of this memorandum is to review the existing plans and policies in Sherman County, in particular where they relate to transportation. Below are summarization of the plans that were reviewed.

SHERMAN COUNTY COMPREHENSIVE PLAN

The Sherman County Comprehensive Plan was adopted in 1979 and last updated in 1994.

The Plan provides an overview of land uses and jurisdictional responsibility in Sherman County. Much of the County lies in agriculture land uses. The cities of Rufus, Wasco, Moro and Grass Valley represent the County's primary population centers, accounting for approximately 60% of its population at the time of the Plan's 1994 revision. It was expected that most of the future growth 'in the county would occur in or adjacent to these cities and that they would represent 70-75% of the County's population in the future. Such a growth pattern is encouraged by the Comprehensive Plan in order to preserve agricultural land and provide for adequate levels of service.

The County has planning authority for unincorporated areas. However cities have a major role in implementing of the County Comprehensive Plan. Each city has adopted an Urban Growth Boundary conforming to its city boundary. Within these Urban Growth Boundaries there is an adequate supply of vacant land to accommodate projected future growth.

The Comprehensive Plan has a general introduction and definition of the plan and is then divided into sections addressing the Planning Process; the Planning Intent and Implementation of the Goals and Policies described in the Comprehensive Plan. The plan addresses citizen involvement, revisions, implementation, physical characteristics, social characteristics, housing and economics. Each section contains a set of findings, followed by Goals with specific policies for implementing those goals.

Sections with transportation planning relevance are described below.

Physical Characteristics Section XI

The plan emphasizes the physical resources and natural beauty of Sherman County as one of its strongest assets. This is further supported by the designation of segments of US 97 and OR 206 and 216 as Scenic Highways. Finding XI defines the areas listed as scenic and Goal V and Goal X provide related policies and mechanisms to continue to support those designations.

Social Characteristics Section XII

Findings I, VI & XII address the transportation issues under Social Characteristics of the Sherman County Comprehensive Plan. These findings establish that the county desires to conform to the Statewide planning goals relative to Goal 12 Transportation and that there are the necessary emergency response vehicles, mass transit opportunities and an airport in the county. The findings also state that the existing transportation system is adequate for current needs but it also identifies the need for improvements to the road system. Some of the improvements identified under the plan have been addressed by ODOT maintenance along Highway 97 from Shaniko to Grass Valley. Others still need to be addressed.

To further those findings the plan established procedures for implementation of the findings under Policy X, XI, XII, XIII, XIV, XV & XVII. These policies address the responsibilities of the County Road Department and ODOT. The Comprehensive plan states under policy X that maintenance of the county road system is the responsibility of Sherman County and should be provided to maintain the school bus routes and serve the greatest benefit to the greatest number of rural residents.

The remaining transportation policies under 'Social Characteristics' of the Comprehensive Plan address ODOT's four-year plan implementation, construction of new public roads, Rail service, the barge facility at Biggs and the Wasco State Airport.

Policy XI - request that ODOT direct funds for improvements to U.S. 97 between Erskine Road and Grass Valley and between Grass Valley and Kent. Maintenance improvements were completed by ODOT in this area in 1999 and the rest of U.S. 97 to Biggs is scheduled to be

complete within the next two years.

These maintenance improvements however do not address the needed safety improvements to the road that would require improving the road base, shoulders and providing rest areas and/or pull-outs for people to safely pull to the side of the road.

Policy XII - request that improvements to existing roads or new public roads be located whenever possible to avoid dividing existing farming units.

Policy XIII - addresses the Amtrak rail service along the Columbia River, asking that the service be expanded to include a linkage between rail service and the Bus services available at Biggs Junction. Amtrak has discontinued this service but the policy reflects the view of Sherman County residents to have that service returned and effectively linked to produce a more viable service to the region.

Policy XIV - addresses the desire in the county to see the barge facility at Biggs Junction be developed to allow for a greater diversity of use.

Policy XV - states that the county would like to see the existing state airport in Wasco retained within the state system and in state ownership until local authority deems it appropriate and ask that the airport be protected from incompatible land uses.

Policy XVII - ask that a wayside be constructed in the southern part of the county along U.S. 97 when ODOT funds become available.

Policy XVIII - the final policy to address transportation issues in the Comprehensive plan under social characteristics states that, " Roads developed into recreation facilities should be maintained at standards consistent with the resources carrying capacity and the facilities planned level of use. However, the county Court shall oppose the paving of the Bureau of Land Management access roads."

Economics - Section XIV

Transportation issues addressed under the Economic Section of the Sherman County

Comprehensive Plan are addressed under Findings III and Policy I. Finding III states that the recreation and Highway service sector growth in recent years is important in Biggs and the four cities of Sherman County. Improvements that enhance this industry need to be considered in the implementation of the TSP.

In addition Policy I states there is a need and desire to diversify the economic base of the County. The Biggs Junction region is seen as crucial to that diversification. The Plan addresses this by emphasizing the need to develop adequate barge and storage facilities in Biggs to accommodate the transfer of goods from one mode of transport to another (barge, railway and highway).

An amendment to the economic sub-section of the Comprehensive Plan was adopted in March of 1994. This amendment stated that the county had a desire to diversify the economic base of the County. It again clarifies that, "The greatest potential for diversification lies in (the stimulation of the development of transportation related industries in the Biggs Junction area) stimulating the development of industrial and public and private community and regional service facilities outside of but within reasonably close proximity to the existing urban growth and rural service centers (communities) boundaries located within the County. By locating these uses within reasonably close proximity to such boundaries residential and commercial uses can be contained within said boundaries. "

Energy - Section XV

Under Finding III the Plan denotes that solar and wind resources in the county are available in the county but, have not been developed in Sherman County. The recent trends in the region would indicate that these resources are now being considered for utilization and will need to be addressed in the TSP.

Policy IV under Energy supports Policy I under economics by again emphasizing that the county should, "Encourage the integration of rail, highway and barge transportation services and facilities at Biggs Junction."

Appendix - Capital Improvement Program

The Capital Improvement Program as outlined by the Sherman County Comprehensive Plan was

established over six years ago and needs to be updated. The TSP projects should be included in the Plan in order to integrate this plan with other goals for the county.

The Comprehensive Plan notes key planning issues facing Sherman County. Historically, growth in the County was tied to agriculture and agriculture served as its economic base. The Plan stresses the need for economic development and diversification to augment existing agricultural uses and encourage moderate growth. The towns of Rufus, Wasco, Moro & Grass Valley and the un-incorporated communities of Biggs Junction and Kent, have sufficient land to accommodate any proposed urban growth. Efforts are necessary to stabilize these towns from continued population loss.

County policy encourages conservation of the land resource and efforts to minimize erosion by wind or water. The Plan states that Sherman County has a high-quality environment but cites a need to minimize pollution, especially from non-point sources. It notes the risk of flash flooding in all streambeds, canyons, and gullies in the County.

The County's transportation system is at present adequate to handle the needs of the area and Current County policy involves periodic maintenance of county roads on a regular schedule. In addition to construction and maintenance of these County roads, Sherman County has traditionally maintained school bus routes, be they on public or private roads. The County hereby reaffirms these policies as being in the general public interest.

SHERMAN COUNTY ZONING AND LAND DEVELOPMENT ORDINANCE

The Sherman County Zoning and Land Development Ordinance was adopted in 1977 and amended in 1994. Land use zones include: Exclusive Farm Use F-1, General Residential R-1, General Commercial C-1, Light Industrial M-1, Agricultural Airport A-1, Significant Resource Combining, SR, Natural Hazard Combining NH, Rural Industrial R-I and Limited Use Combining LU zones. Below, sections with possible transportation planning relevance are described.

In the F-1 Exclusive Agriculture Zone the following sections pertain to transportation under Permitted Uses Sections 3.1 (2) (f) (g) and (h) allow for lanes within existing right-of-ways, reconstruction of existing roads and temporary roads. Under Conditional Uses Permitted Section

3.1 (3) (j) (k) (r) (t) (u) and (v) airports, new lanes, additional highway related facilities and reconstruction involving building removal are addressed. Construction of additional passing and travel lanes requiring additional right of way, improvement of public roads and highway related facilities requiring additional property or right of way, and reconstruction or modification of public roads involving the removal or displacement of buildings all require a Conditional Use permit.

No conditions are outlined for transportation in neither the Residential R-1 nor the Commercial C-1 zones. In the Light Industrial M-1 Zone, railroad trackage and related uses are an outright permitted use and the impacts of all uses need to address parking and access issues.

In the agricultural airport A-1 zone, special compliance requirements are delineated for the various airport transitional zones. There are use limitations to control the types of development and usage, including road access, glare, noise, public assembly and other regulations. All permitted and conditionally permitted uses must meet FAA regulations, Part 77.

In the Significant Resource zone SR, there are limitations and conditions on road construction within riparian areas, game areas, natural habitat areas, scenic areas and historic buildings and sites.

In the Natural Hazards NH combining zones, standards for road construction limit fill and water diversion and require plans and profiles for all proposed construction. Article 3, Section 3.7 (7) defines standards for road installation in the NH zone.

In the Rural Industrial R-I zone outright permitted uses for freight and/or transportation depot or hub are allowed but must meet the use limitations in Section 3.8 (4) dimensional standards (5) stream setbacks (6), site design (7) design and use criteria (8) and additional standards (9). Specifically all projects are required to meet Section 3.8 (9) (e) Assure that the proposed use is consistent or can be made consistent with the identified function, capacity and level of service of the transportation system in the area.

No conditions are outlined for transportation in the Limited Use Combining Zone LU zone.

Development Standards

Article 4 Supplementary Provisions, Section 4.3 defines off-street parking requirements for projects within the county for the R-1, C-1, or M-1 Zones. There are no parking requirements for other zones, and no other transportation related regulations under supplemental provisions.

Article 5 Conditional Uses generally defines the requirements for approval of Conditional Use permits, regardless of zoning. Section 5.2 describes the General Criteria. Paragraph (3) states that approvals or permits from other local, state or federal agencies are required prior to approval by the Planning Commission. Paragraph (5) states that no approval be granted for any use that would exceed public facility carrying capacity. These sections would apply to any transportation issue and would require that the county seek input from ODOT for any issue that involves transportation on State or Federal Highways.

Section 5.3, defines General conditions and states that the county may impose conditions necessary to avoid a detrimental impact on the general welfare and interest of the surrounding area to any project under conditional use permit review. Paragraphs (4), (5) & (6) of that section make reference to the authority of the Planning Commission to: increase street widths or require improvements to public street; require off-site conditions; designate vehicle access points, and routes and pedestrian and/or bike ways and limit signage and lighting. Under Section 5.4 the county may require additional information to be submitted in order to adequately review proposed plans.

Section 5.8 sets Standard to govern specific Conditional Use Permits and defines specific traffic related requirements to: Automobile Wrecking or junk yards (Paragraph 2); Dog Pounds (Paragraph 4); Home Occupations (Paragraph 5); Manufactured Home Parks (Paragraph 6); Multi-family Dwelling Complexes (Paragraph 8); Planned Unit or Cluster Development (Paragraph 9); Recreational Vehicle Parks (Paragraph 11) and Mineral or Aggregate Resources (Paragraph 14).

Article 5 Section 5.8 (18) defines specific requirements for Airports and related uses.

Article 6, Section 6.10 & 6.11 defines Exceptions for Public Street, Highway and public facility improvements. It includes provisions for the installation of additional lanes on highways existing as of July 1987, on highways where no new land parcels result or for temporary road or minor betterment of existing road within right-of-ways existing prior to July 1987.

Article 11 Design & Improvement Standards and Requirements, explains the process for creation of public and private streets. Section 11.8 specifies development standards for streets including minimum right of way and roadway widths, alignment, future road extensions, intersection angles, grades and curves, etc. Section 11.9 describes the procedures and 11.10 requires certain improvements to be installed at the expense of the subdivider, including public streets, sidewalks, and bicycle routes when appropriate to the extension of a system of bicycle routes. 11.10 allows for bonding to be in place in order to adequately assure completion of the required improvements.

APPENDIX B

MILES OF HIGHWAY IN SHERMAN COUNTY

HIGHWAY	BEG_MP	END_MP	TOTAL
I-84	99.85	114.79	14.94
US 97	-0.43	48.81	49.24
OR 216	8.3	28.42	20.12
OR 300	0	15.09	15.09
OR 301	2.92	15.1	12.18

US 97 Sherman County ATR Station 28-001 (MP 17.36)

Year	ADT	Max Day	Max Hour	10th Hour	20th Hour	30th Hour
1981	1727	173	13.8	12.2	11.5	11.3
1982	1676	178	13.9	12.5	11.9	11.6
1983	1702	180	13.2	12.3	11.7	11.4
1984	1769	155	14.5	11.9	11.5	11.3
1985	1719	163	13.4	12.1	11.5	11.3
1986	1732	153	13.3	12.1	11.6	11.3
1987	1839	156	14.1	11.9	11.5	11.2
1988	1911	154	13.7	12.3	11.7	11.3
1989	2116	178	22.8	13.1	12.6	12
1990	2197	154	13.3	12.2	11.5	11.2
1991	2245	153	17.2	13.1	12	11.6
1992	2359	150	12.8	11.9	11.1	11
1993	2382	169	19.3	12.8	12	11.7
1994	2406	164	14.2	11.8	11.2	11
1995	2457	157	12.7	11.6	11.4	11.1
1996	2354	152	13.8	12	11.5	11.1
1997	2394	164	14.5	12.5	11.8	11.5
1998	2433	153	15.6	12.6	12	11.6

US 97 Sherman County ATR Station 28-001 ADT by Month (1990-98)

Month	1990	1991	1992	1993	1994	1995	1996	1997	1998
Jan	1643	1596	1680	1463	1463	1743	1649	1707	1680
Feb	1673	1870	1893	1722	1722	1900	1864	1893	1917
Mar	2083	2047	2258	1912	1912	2300	2300	2112	2181
April	2229	2130	2420	2400	2400	2450	2302	2303	2384
May	2339	2348	2622	2592	2592	2524	2480	2479	2602
Jun	2605	2558	2804	2829	2829	2742	2850	2676	2741
Jul	2682	2721	2937	3016	3016	2861	2751	2973	3016
Aug	2692	2896	2957	3069	3069	3098	2885	2937	2949
Sept	2547	2666	2783	2818	2818	2861	2673	2751	2767
Oct	2274	2358	2479	2522	2522		2600	2486	2472
Nov	1925	1986	2011	2143	2143	2155	1948	2151	2178
Dec	1699	1784	1679	1942	1942	1896	1760	1916	2003

APPENDIX B

MILES OF HIGHWAY IN SHERMAN COUNTY

HIGHWAY	BEG_MP	END_MP	TOTAL
I-84	99.85	114.79	14.94
US 97	-0.43	48.81	49.24
OR 216	8.3	28.42	20.12
OR 300	0	15.09	15.09
OR 301	2.92	15.1	12.18

US 97 Sherman County ATR Station 28-001 (MP 17.36)

Year	ADT	Max Day	Max Hour	10th Hour	20th Hour	30th Hour
1981	1727	173	13.8	12.2	11.5	11.3
1982	1676	178	13.9	12.5	11.9	11.6
1983	1702	180	13.2	12.3	11.7	11.4
1984	1769	155	14.5	11.9	11.5	11.3
1985	1719	163	13.4	12.1	11.5	11.3
1986	1732	153	13.3	12.1	11.6	11.3
1987	1839	156	14.1	11.9	11.5	11.2
1988	1911	154	13.7	12.3	11.7	11.3
1989	2116	178	22.8	13.1	12.6	12
1990	2197	154	13.3	12.2	11.5	11.2
1991	2245	153	17.2	13.1	12	11.6
1992	2359	150	12.8	11.9	11.1	11
1993	2382	169	19.3	12.8	12	11.7
1994	2406	164	14.2	11.8	11.2	11
1995	2457	157	12.7	11.6	11.4	11.1
1996	2354	152	13.8	12	11.5	11.1
1997	2394	164	14.5	12.5	11.8	11.5
1998	2433	153	15.6	12.6	12	11.6

US 97 Sherman County ATR Station 28-001 ADT by Month (1990-98)

Month	1990	1991	1992	1993	1994	1995	1996	1997	1998
Jan	1643	1596	1680	1463	1463	1743	1649	1707	1680
Feb	1673	1870	1893	1722	1722	1900	1864	1893	1917
Mar	2083	2047	2258	1912	1912	2300	2300	2112	2181
April	2229	2130	2420	2400	2400	2450	2302	2303	2384
May	2339	2348	2622	2592	2592	2524	2480	2479	2602
Jun	2605	2558	2804	2829	2829	2742	2850	2676	2741
Jul	2682	2721	2937	3016	3016	2861	2751	2973	3016
Aug	2692	2896	2957	3069	3069	3098	2885	2937	2949
Sept	2547	2666	2783	2818	2818	2861	2673	2751	2767
Oct	2274	2358	2479	2522	2522		2600	2486	2472
Nov	1925	1986	2011	2143	2143	2155	1948	2151	2178
Dec	1699	1784	1679	1942	1942	1896	1760	1916	2003

APPENDIX B

US 97 Sherman County ATR Station 28-001 (1990)

Month	AWDT	Percent of AWDT	ADT	Percent of ADT
January	1643	75	1582	72
February	1673	76	1631	74
March	2083	95	2078	95
April	2229	102	2231	102
May	2339	107	2307	105
June	2605	119	2654	121
July	2682	122	2746	125
August	2692	123	2719	124
September	2547	116	2539	116
October	2274	104	2258	103
November	1925	88	1950	89
December	1699	77	1671	76

US 97 Sherman County ATR Station 28-001 (1991)

Month	AWDT	Percent of AWDT	ADT	Percent of ADT
January	1596	71	1553	69
February	1870	83	1823	81
March	2047	91	2023	90
April	2130	95	2108	94
May	2348	105	2316	103
June	2558	114	2617	117
July	2721	121	2786	124
August	2896	129	2931	131
September	2666	119	2658	118
October	2358	105	2344	104
November	1986	88	1952	87
December	1784	79	1829	81

US 97 Sherman County ATR Station 28-001 (1992)

Month	AWDT	Percent of AWDT	ADT	Percent of ADT
January	1680	71	1640	70
February	1893	80	1855	79
March	2258	96	2255	96
April	2420	103	2421	103
May	2622	111	2558	108
June	2804	119	2825	120
July	2937	125	2927	124
August	2957	125	2988	127
September	2783	118	2743	116
October	2479	105	2438	103
November	2011	85	2001	85
December	1679	71	1654	70

APPENDIX B

US 97 Sherman County ATR Station 28-001 (1993)

Month	AWDT	Percent of AWDT	ADT	Percent of ADT
January	1463	61	1420	60
February	1722	72	1706	72
March	1912	80	1937	81
April	2400	101	2397	101
May	2592	109	2591	109
June	2829	119	2961	124
July	3016	127	3104	130
August	3069	129	3170	133
September	2818	118	2855	120
October	2522	106	2536	106
November	2143	90	2111	89
December	1942	82	1792	75

US 97 Sherman County ATR Station 28-001 (1994)

Month	AWDT	Percent of AWDT	ADT	Percent of ADT
January	1463	61	1420	59
February	1722	72	1706	71
March	1912	79	1937	81
April	2400	100	2397	100
May	2592	108	2591	108
June	2829	118	2961	123
July	3016	125	3104	129
August	3069	128	3170	132
September	2818	117	2855	119
October	2522	105	2536	105
November	2143	89	2111	88
December	1942	81	1792	74

US 97 Sherman County ATR Station 28-001 (1995)

Month	AWDT	Percent of AWDT	ADT	Percent of ADT
January	1743	71	1694	69
February	1900	77	1900	77
March	2300	94	2300	94
April	2450	100	2450	100
May	2524	103	2535	103
June	2742	112	2871	117
July	2861	116	2995	122
August	3098	126	3169	129
September	2861	116	2946	120
October	2585	105	2636	107
November	2155	88	2146	87
December	1896	77	1840	75

APPENDIX B

US 97 Sherman County ATR Station 28-001 (1996)

Month	AWDT	Percent of AWDT	ADT	Percent of ADT
January	1649	70	1584	67
February	1864	79	1854	79
March	2300	98	2300	98
April	2302	98	2331	99
May	2480	105	2470	105
June	2850	121	2850	121
July	2751	117	2859	121
August	2885	123	2979	127
September	2673	114	2730	116
October	2600	110	2600	110
November	1948	83	1924	82
December	1760	75	1765	75

US 97 Sherman County ATR Station 28-001 (1997)

Month	AWDT	Percent of AWDT	ADT	Percent of ADT
January	1707	71	1692	71
February	1893	79	1881	79
March	2112	88	2102	88
April	2303	96	2352	98
May	2479	104	2511	105
June	2676	112	2784	116
July	2973	124	3030	127
August	2937	123	3014	126
September	2751	115	2806	117
October	2486	104	2505	105
November	2151	90	2136	89
December	1916	80	1913	80

US 97 Sherman County ATR Station 28-001 (1998)

Month	AWDT	Percent of AWDT	ADT	Percent of ADT
January	1680	69	1684	69
February	1917	79	1901	78
March	2181	90	2195	90
April	2384	98	2411	99
May	2602	107	2582	106
June	2741	113	2899	119
July	3016	124	3080	127
August	2949	121	3040	125
September	2767	114	2844	117
October	2472	102	2503	103
November	2178	90	2154	89
December	2003	82	1897	78

APPENDIX B

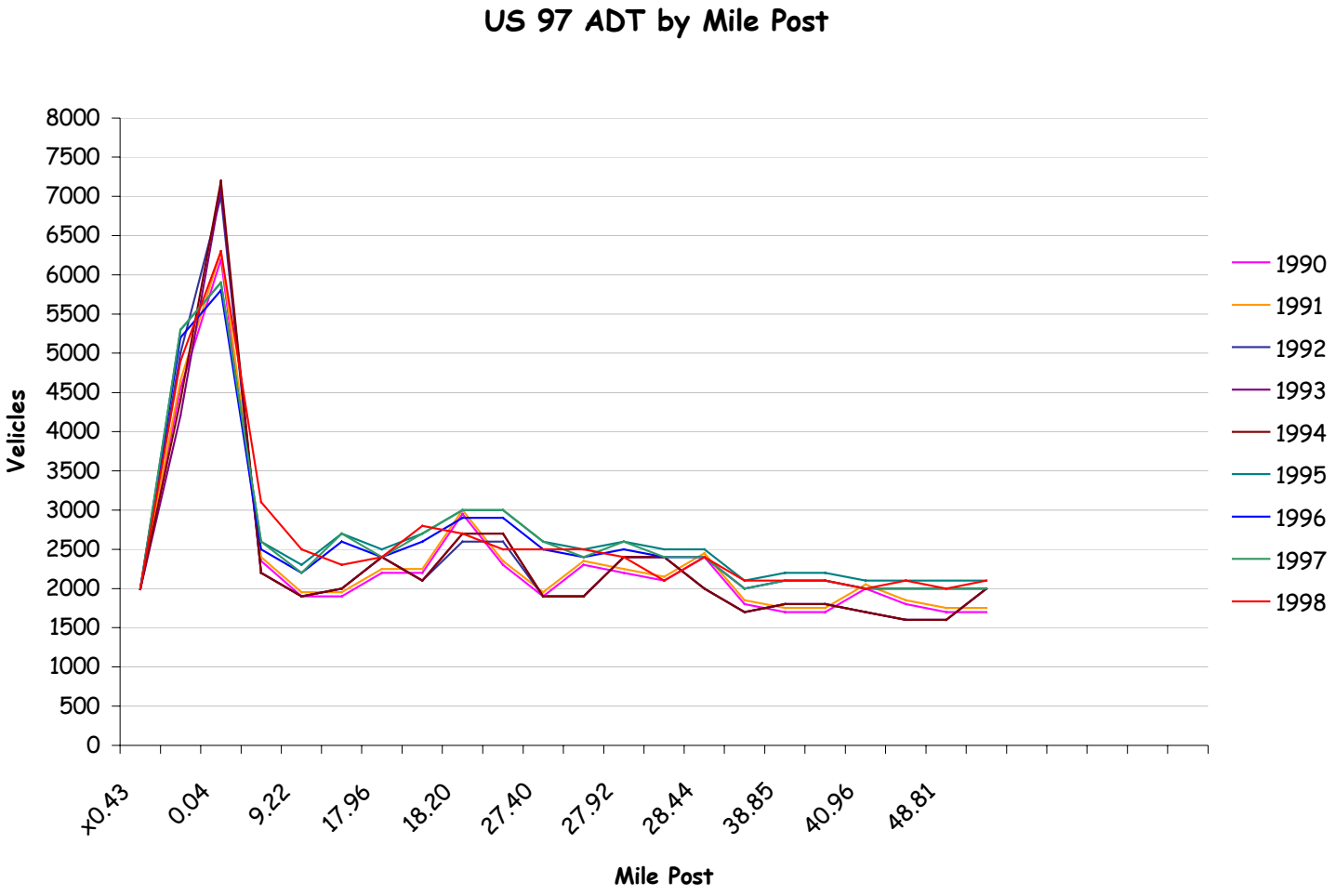
US 97 Sherman County ATR Station 28-001

Year	Passenger Vehicle	Other 2x4 Vehicles	Single Unit Multi- Axle Vehicle	Large Trucks	Buses	Misc.	Total
1990	47.40%	16.40%	6.10%	29.10%	0.70%	0.30%	100.00%
1991	51.40%	13.40%	6.20%	27.90%	0.70%	0.40%	100.00%
1992	51.40%	13.40%	2.80%	28.10%	0.70%	3.60%	100.00%
1993	51.40%	13.80%	2.80%	27.30%	0.70%	4.00%	100.00%
1994	51.40%	13.80%	2.80%	27.30%	0.70%	4.00%	100.00%
1995	47.40%	22.30%	6.60%	22.90%	0.70%	0.10%	100.00%
1996	47.40%	22.30%	6.60%	22.90%	0.70%	0.10%	100.00%
1997	45.70%	29.60%	2.10%	22.10%	0.50%	0.00%	100.00%
1998	45.70%	29.60%	2.10%	22.10%	0.50%	0.00%	100.00%

US 97 Sherman Highway No. 42 Historic Traffic Counts (ADT)

Mile Post	1990	1991	1992	1993	1994	1995	1996	1997	1998	Location
x0.43	4550	4650	5000	4200	4400	5300	5200	5300	4900	Oregon/Washington State Lin
x0.06	6200	6300	7000	7100	7200	5900	5800	5900	6300	South of I-84
0.04	2350	2400	2200	2200	2200	2600	2500	2600	3100	South of OR 206 Spur
7.8	1900	1950	1900	1900	1900	2300	2200	2200	2500	South of Wasco-Heppner Hig
9.22	1900	1950	2000	2000	2000	2700	2600	2700	2300	South of Celilo-Wasco Highw
17.36	2200	2250	2400	2400	2400	2500	2400	2400	2400	South of Monkland Road
17.96	2200	2250	2100	2100	2100	2700	2600	2700	2800	East City Limits of Moro
18.18	2950	3000	2600	2700	2700	3000	2900	3000	2700	NE of 1st St.
18.2	2300	2350	2600	2700	2700	3000	2900	3000	2500	SW of 1st St.
18.88	1900	1950	1900	1900	1900	2600	2500	2600	2500	South City Limits of Moro
27.4	2300	2350	1900	1900	1900	2500	2400	2400	2500	North City Limits of Grass Va
27.67	2200	2250	2400	2400	2400	2600	2500	2600	2400	South of North St.
27.92	2100	2150	2400	2400	2400	2500	2400	2400	2100	North of Bryan St.
28.35	2400	2450	2000	2000	2000	2500	2400	2400	2400	North of Shears Highway
28.44	1800	1850	1700	1700	1700	2100	2000	2000	2100	South City Limits of Grass Va
29.07	1700	1750	1800	1800	1800	2200	2100	2100	2100	South of Rutledge Rd.
38.85	1700	1750	1800	1800	1800	2200	2100	2100	2100	North of Harry Stark Rd.
40.94	2000	2050	1700	1700	1700	2100	2000	2000	2000	North of 2nd St. Kent
40.96	1800	1850	1600	1600	1600	2100	2000	2000	2100	South of 2nd St. Kent
45.64	1700	1750	1600	1600	1600	2100	2000	2000	2000	North of Wilcox Rd.
48.81	1700	1750	2000	2000	2000	2100	2000	2000	2100	Sherman-Wasco County Line

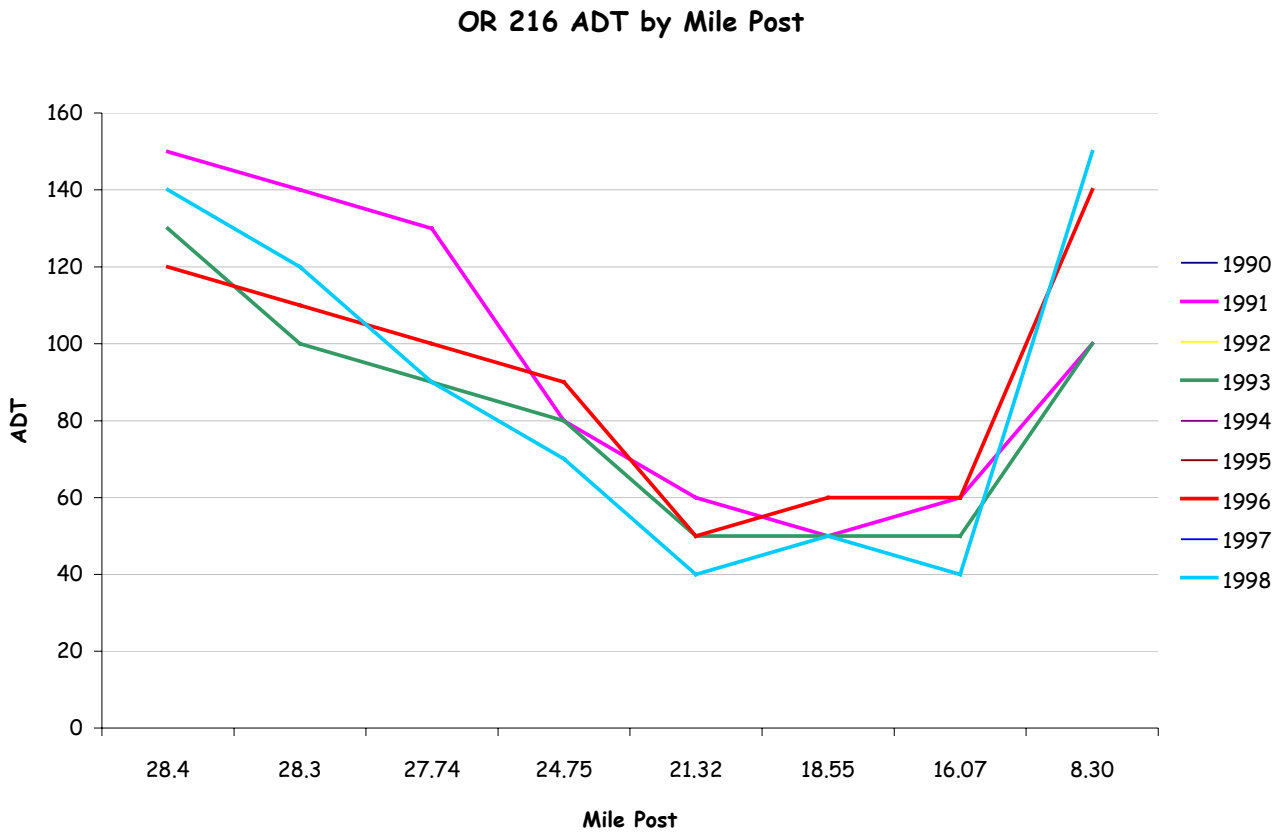
APPENDIX B


US 97 ADT by Mile Post
Velicles
8000
7500
7000
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
x0.43
0.04
9.22
17.96
18.20
27.40
27.92
28.44
38.85
40.96
48.81
Mile Post
1990
1991
1992
1993
1994
1995
1996
1997
1998

APPENDIX B

OR 216 Shears Bridge Highway No. 290 Historic Traffic Counts (ADT)

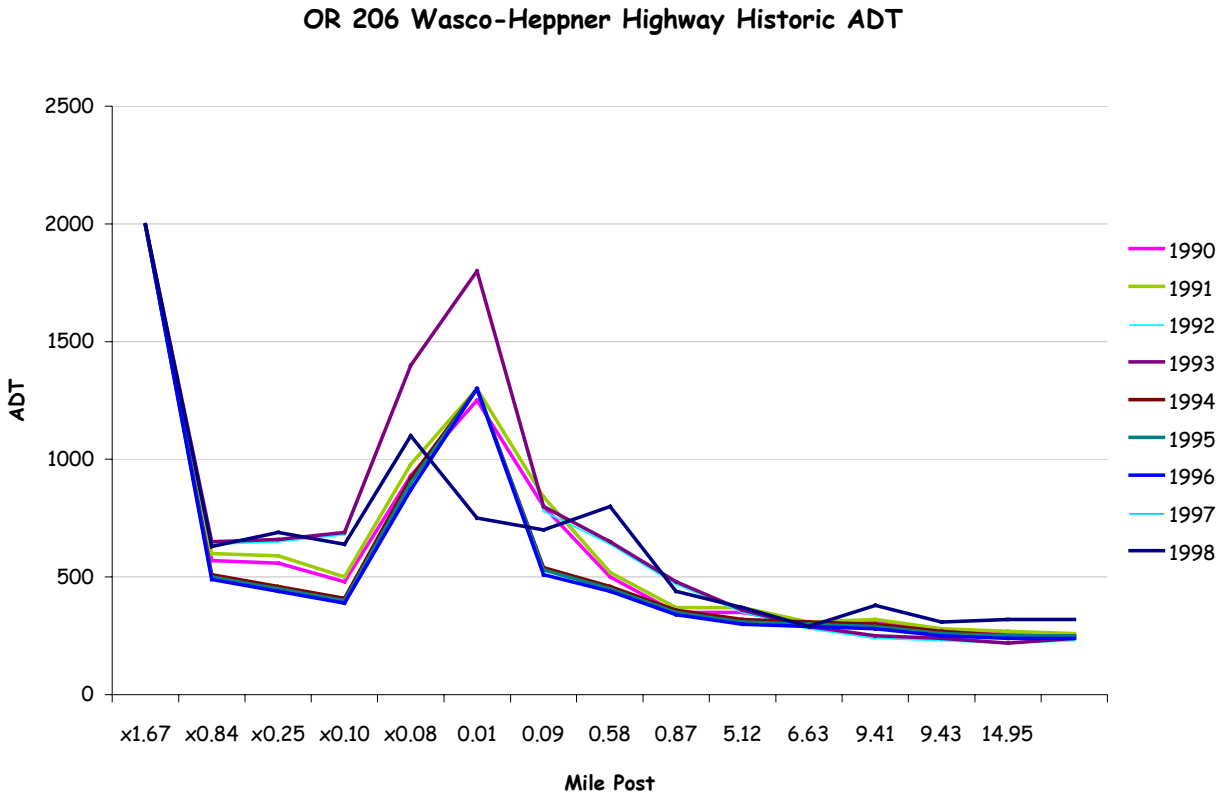
Mile Post	1990	1991	1992	1993	1994	1995	1996	1997	1998	Location
28.41	150	150	130	130	120	120	120	140	140	West of US 97
28.25	140	140	100	100	110	110	110	120	120	South of Grass Valley City Li
27.74	130	130	90	90	100	100	100	90	90	South of Rutledge Rd.
24.75	80	80	80	80	90	90	90	70	70	East of Stradley Road
21.32	60	60	50	50	50	50	50	40	40	North of Michigan Rd.
18.55	50	50	50	50	60	60	60	50	50	North of Fennegan Rd.
16.07	60	60	50	50	60	60	60	40	40	West of Payne Rd.
8.3	100	100	100	100	140	140	140	150	150	Sherman/Wasco County Line



APPENDIX B

OR 206 Wasco-Heppner Highway No. 300 Historic Traffic Counts (ADT)

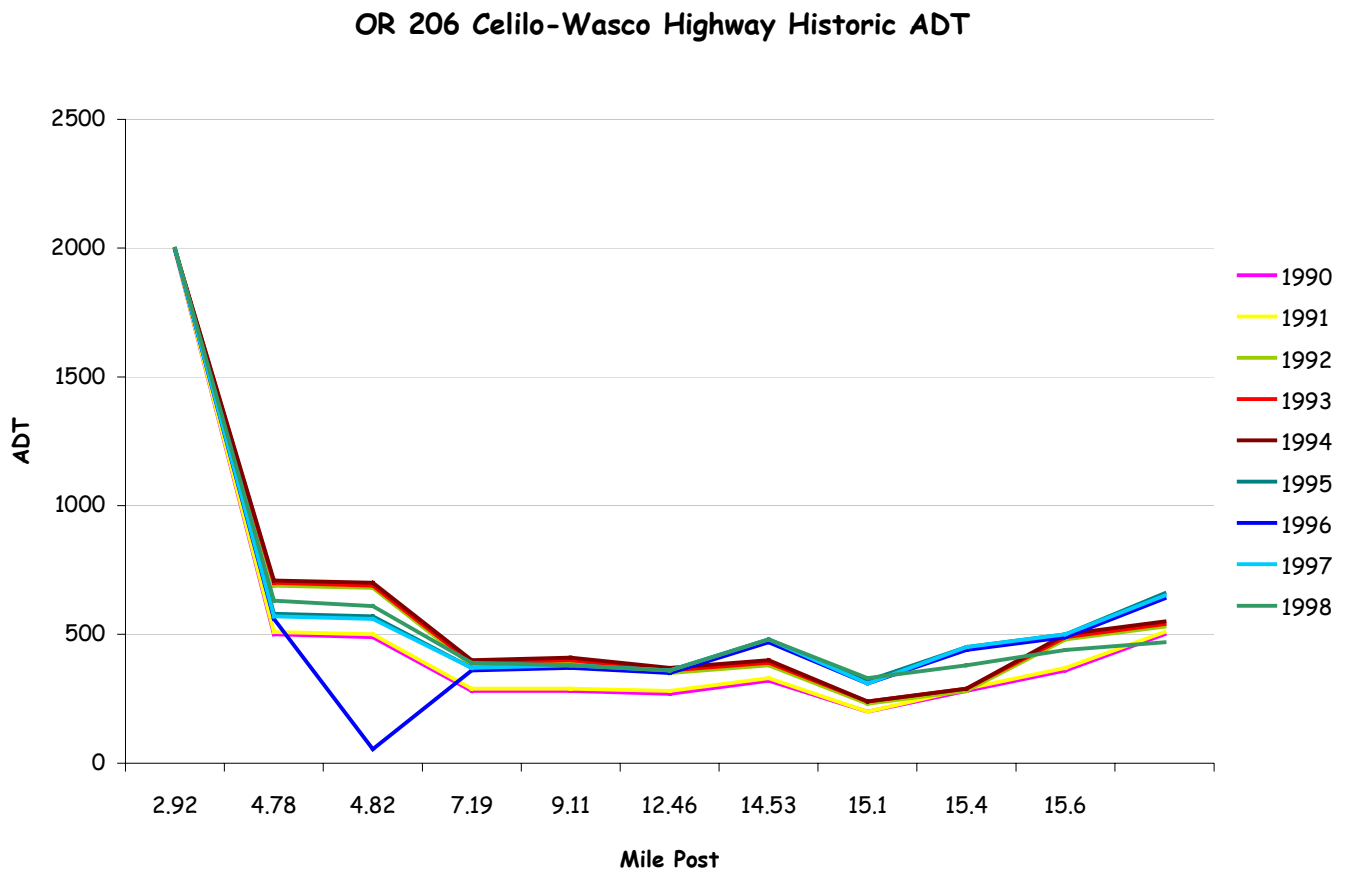
Mile Post	1990	1991	1992	1993	1994	1995	1996	1997	1998	Location
x1.67	570	600	640	650	510	500	490	630	630	East of US 97
x0.84	560	590	650	660	460	450	440	690	690	North City Limits of Wasco
x0.25	480	500	680	690	410	400	390	640	640	West of Clark St.
x0.10	930	980	1400	1400	920	900	870	1100	1100	North of Celilo-Wasco Highw
x0.08	1250	1300	1800	1800	1300	1300	1300	750	750	South of Celilo-Wasco Highw
0.01	800	840	780	800	540	530	510	700	700	East of Old Sherman Highway
0.09	500	520	640	650	460	450	440	800	800	SE of McPherson St.
0.58	350	370	470	480	360	350	340	440	440	East City Limit s of Wasco
0.87	350	370	350	360	320	310	300	370	370	SE of Klondike Rd.
5.12	300	310	280	290	310	300	290	290	290	South of County Rd.
6.63	310	320	240	250	300	290	280	380	380	At Hay Canyon Rd.
9.41	270	280	230	240	270	260	250	310	310	West of Thompson Rd.
9.43	260	270	220	220	250	250	240	320	320	East of Thompson Rd.
14.95	250	260	230	240	250	250	240	320	320	Sherman-Gilliam County Line



APPENDIX B

OR 206 Celilo-Wasco Highway No. 301 Historic Traffic Counts (ADT)

Mile Post	1990	1991	1992	1993	1994	1995	1996	1997	1998	Loca
2.92	500	510	690	700	710	580	560	570	630	Wasco-Sherman County Line
4.78	490	500	680	690	700	570	55	560	610	West of Celilo-Wasco Spur
4.82	280	290	380	390	400	370	360	370	390	South of Celilo-Wasco Spur
7.19	280	290	390	400	410	380	370	380	380	North of Gordon Ridge-Fulton
9.11	270	280	350	360	370	360	350	360	360	West of Welk Rd.
12.46	320	330	380	390	400	480	470	480	480	West of Van Gilder Rd.
14.53	200	200	230	240	240	320	310	310	330	West of US 97
15.07	280	290	280	290	290	450	440	450	380	West City Limits of Wasco
15.44	360	370	480	490	500	500	490	500	440	East of Wilson St.
15.55	500	510	530	540	550	660	640	650	470	West of Wasco-Heppner High



Appendix C

SHERMAN COUNTY ROAD INVENTORY

Road Name	From	To	Length	Prop FC	Exist FC	Pave Type	Pave Condition	# Lanes	Lane Width	Shoulder Width	ADT	Terrain
Wilcox Lane	US 97	Decker Road	1.00	Local	Local	Paved	Good	2	12	0	0-50	0-2%
Wilcox Lane	Decker Road	End	3.20	Local	Local	Gravel	Good	2	10	0	0-50	0-2%
Helyer Road	Wilcox Lane	End	2.40	Local	Local	Gravel	Fair	2	10	0	0-50	0-2%
Decker Road	End	Wilcox Lane	1.70	Local	Local	Gravel	Fair	2	9	0	0-50	0-2%
Decker Road	Wilcox Lane	Road	5.00	Local	Local	Gravel	Fair	2	9	0	0-50	0-2%
Dobie Point Road	US 97	Dobie Point Lane	1.00	Maj Col	Maj Col	Paved	Good	2	10	0	0-50	0-2%
Dobie Point Lane	Dobie Point Road	End of Pavement	2.95	Maj Col	Maj Col	Paved	Very Good	2	11	0	0-50	0-2%
Dobie Point Lane	End of Pavement	End	6.24	Local	Local	Gravel	Fair	2	9	0	0-50	3-5%
McInnes	Dobie Point Road	End	0.94	Local	Local	Gravel	Poor	1	12	0	0-50	3-5%
Road	Dobie Point Road	Rutledge Lane	10.69	Maj Col	Maj Col	Paved	Good	2	11	0	51-100	3-5%
Rosebush Road	Rosebush Lane	Rutledge Lane	2.45	Local	Local	Gravel	Fair	2	9	0	0-50	0-2%
Rosebush Lane	Rosebush Road	US 97	5.60	Local	Local	Gravel	Good	2	10	0	0-50	0-2%
Bourbon Lane	US 97	Road	4.00	Minor Col	Minor Col	Gravel	Good	2	9	0	0-50	0-2%
Bourbon Lane	Road	End	1.22	Local	Local	Dirt	NR	2	8	0	0-50	0-2%
Rolfe Lane	Road	Stark Road	1.95	Local	Local	Gravel	Fair	1	12	0	0-50	3-4%
Carlson Lane	Road	End	0.97	Local	Local	Gravel	Fair	2	9	0	0-50	0-2%
Harry Stark Road	US 97	Rutledge Lane	8.07	Local	Local	Gravel	Fair	2	9	0	0-50	0-2%
Barnett Lane	Harry Stark Road	Farm	2.00	Local	Local	Dirt	NR	1	12	0	0-50	3-4%
Barnett Lane	Farm	US 97	0.45	Local	Local	Gravel	Good	2	9	0	0-50	0-2%
Mauke Road	ORE 216	End	2.11	Local	Local	Gravel	Good	2	9	0	0-50	0-2%
Davis Lane	Twin Lakes Road	ORE 216	1.94	Local	Local	Gravel	Good	2	9	0	0-50	0-2%
Davis Lane	ORE 216	End	0.45	Local	Local	Dirt	NR	2	8	0	0-50	0-2%
Dugger Road	ORE 216	Buckley Road	4.41	Local	Local	Dirt	NR	1	12	0	0-50	0-2%
Buckley Road	Dugger Road	ORE 216	2.65	Local	Local	Gravel	Good	2	9	0	0-50	0-2%
Payne Loop	ORE 216	ORE 216	1.72	Local	Local	Dirt	NR	1	12	0	0-50	0-2%
Brown Road	ORE 216	End	0.88	Local	Local	Gravel	Fair	1	12	0	0-50	0-2%
Ball Lane	ORE 216	Finnegan Road	3.52	Minor Col	Maj Col	Paved	Good	2	11	0	51-100	3-4%
Finnegan Road	Ball Lane	ORE 216	3.75	Minor Col	Minor Col	Gravel	Good	2	10	0	51-100	0-2%
Stradley Road	ORE 216	Farm House	1.65	Local	Local	Dirt	NR	1	12	0	0-50	0-2%
Stradley Road	Farm House	ORE 216	1.25	Local	Local	Gravel	Fair	1	12	0	0-50	0-2%
Stradley Road	ORE 216	US 97	0.42	Local	Local	Gravel	Fair	1	12	0	0-50	0-2%
Michigan Lane	US 97	Twin Lakes Road	2.24	Local	Local	Dirt	NR	1	12	0	0-50	0-2%
Earls Lane	US 97	ORE 216	0.96	Local	Local	Gravel	Fair	1	12	0	0-50	0-2%
Twin Lakes Road	ORE 216	Ball Lane	3.54	Local	Local	Gravel	Good	2	10	0	51-100	0-2%
Finnegan Road	Ball Lane	Liberty Lane	2.24	Minor Col	Maj Col	Paved	Good	2	11	0	51-100	3-4%
Finnegan Road	Liberty Lane	US 97	7.00	Local	Maj Col	Gravel	Good	2	10	0	51-100	3-4%
Liberty Lane	US 97	Finnegan Road	3.28	Minor Col	Minor Col	Paved	Good	2	11	0	51-100	0-2%
Eakin Lane	Finnegan Road	VonBorstel	7.20	Local	Local	Dirt	NR	1	10	0	0-50	0-2%
VonBorstel Road	US 97	Wilson Road	5.50	Local	Local	Gravel	Good	2	9	0	0-50	0-2%
VonBorstel Road	Wilson Road	Haggerty Road	1.89	Local	Local	Dirt	NR	1	9	0	0-50	0-2%
Haggerty Lane	US 97	End	2.60	Local	Local	Gravel	Good	2	9	0	0-50	0-2%
Buck Creek Road	Haggerty Lane	Farm House	0.50	Local	Local	Dirt	NR	1	11	0	0-50	0-2%

Appendix C

Road Name	From	To	Length	Prop FC	Exist FC	Pave Type	Pave Condition	# Lanes	Lane Width	Shoulder Width	ADT	Terrain
Buck Creek Road	Farm House	Wilson Road	0.50	Local	Local	Gravel	Good	2	9	0	0-50	0-2%
Wilson Road	US 97	VonBorstel Road	2.50	Local	Local	Gravel	Good	2	9	0	0-50	0-2%
Wilson Road	VonBorstel Road	MP 4.26	1.76	Local	Local	Gravel	Fair	1	10	0	0-50	0-2%
Wilson Road	MP. 4.26	Finnegan Road	1.72	Local	Local	Dirt	NR	1	10	0	0-50	0-2%
Gordor Ridge	54206	End of Pavement	4.98	Minor Col	Minor Col	Paved	Good	2	11	0	51-100	>5%
Gordor Ridge	End of Pavement	Farm House	2.11	Local	Local	Gravel	Fair	2	10	0	0-50	>5%
Gordor Ridge	Farm House	Van Gilder Rd	4.52	Local	Local	Gravel	Fair	1	>12	0	0-50	>5%
Gordor Ridge	Van Gilder Rd	Sawtooth Rd	1.39	Local	Local	Gravel	Fair	1	>12	0	0-50	>5%
Foss Ln	Sawtooth Rd	Van Gilder Rd	1.63	Local	Local	Gravel	Fair	1	>12	0	0-50	>5%
Foss Ln	Van Gilder Rd	Petes Rd	0.79	Local	Local	Gravel	Fair	1	>12	0	0-50	>5%
Petes Rd	End	Foss Ln	0.76	Local	Local	Gravel	Fair	1	>12	0	0-50	>5%
Petes Rd	Foss Ln	Kaseberg Rd	1.21	Local	Local	Dirt	NR	1	12	0	0-50	>5%
Herin Ln	Scott Canyon Rd	Oehman Rd	3.63	Minor Col	Minor Col	Paved	Good	2	11	0	51-100	>5%
Herin Ln	Oehman Rd	Biglow Rd	2.01	Local	Minor Col	Gravel	Fair	1	10	0	0-50	>5%
Biglow Rd	Herin Ln	Emigrant Spring Ln	1.96	Local	Local	Gravel	Fair	1	>12	0	0-50	0-2%
Beacon Rd	Emigrant Spring Ln	Dehler Ln	1.52	Local	Local	Dirt	NR	1	>12	0	0-50	>5%
Beacon Rd	Dehler Rd	Klondike Ln	1.46	Local	Local	Dirt	NR	1	<8	0	0-50	>5%
McDonalds Ferry Ln	Webfoot Rd	J. Day River	5.76	Local	Local	Gravel	Poor	1	9	0	0-50	>5%
Webfoot Rd	klondike Ln	Dehler Ln	1.43	Local	Local	Gravel	Poor	1	>12	0	0-50	>5%
Dehler Rd	Webfoot Rd	Klondike Ln	4.40	Local	Local	Gravel	Poor	1	>12	0	0-50	>5%
Beacon Rd	Emigrant Spring Ln	Biglow Rd	1.46	Local	Local	Dirt	NR	1	>12	0	0-50	0-2%
Weir Rd	Emigrant Spring Ln	End	1.20	Local	Local	Gravel	Poor	1	11	0	0-50	3-4%
Rayburn Rd	Emigrant Spring Ln	Dehler Ln	1.48	Local	Local	Dirt	NR	1	11	0	0-50	3-4%
Emigrant Spring Ln	End of Pavement	End of Pavement	1.35	Local	Local	Gravel	Fair	2	8	0	0-50	0-2%
Emigrant Spring Ln	End of Pavement	Oehman Rd	3.13	Minor Col	Local	Paved	Good	2	11	0	0-50	0-2%
Macnab Ln	Oehman Rd	Scott Canyon Rd	3.15	Local	Local	Dirt	NR	1	12	0	0-50	3-4%
Helms Ln	Scott Canyon Rd	End of Pavement	0.25	Local	Local	Paved	Good	2	11	0	0-50	>5%
Helms Ln	End of Pavement		5.04	Local	Local	Gravel	Good	1	>12	0	0-50	>5%
Kuypers Rd	Helms Ln	End	1.00	Local	Local	Gravel	Fair	1	>12	0	0-50	>5%
Fox Rd	Helms Ln	End of Gate	0.85	Local	Local	Dirt	NR	1	10	0	0-50	>5%
Oehman Rd	Helms Ln	End of Pavement	2.20	Local	Local	Gravel	Fair	1	>12	0	0-50	>5%
Oehman Rd	End of Pavement	Emigrant Spring Ln	2.12	Minor Col	Local	Paved	Good	2	11	0	0-50	>5%
Oehman Rd	Emigrant Spring Ln	Medler Ln	0.50	Local	Local	Gravel	Good	1	>12	0	0-50	3-4%
Medler Ln	Oehman Rd	End of Pavement	3.29	Local	Local	Gravel	Good	1	>12	0	0-50	0-2%
Medler Ln	End of Pavement	Scott Canyon Rd	0.16	Local	Local	Paved	Good	2	11	0	0-50	0-2%
China Hollow Rd	Scott Canyon Rd	End of Pavement	1.15	Local	Local	Gravel	Good	2	11	0	0-50	3-4%
China Hollow Rd	End of Pavement	Tom Ln	4.06	Local	Local	Gravel	Good	1	10	0	0-50	>5%
China Hollow Rd	Tom Ln	Scott Canyon Rd	2.57	Local	Local	Paved	Good	2	11	0	0-50	>5%
Scott Canyon Rd	US 30	SH 206	9.39	Maj Col	Maj Col	Paved	Good	2	11	0	100-200	>5%
Hilder Brand Ln	Scott Canyon Rd	N. Klondike Rd	4.03	Maj Col	Maj Col	Paved	Good	2	11	0	51-100	3-4%
N.Klondike Rd	Emigrant Spring Ln	Klondike Ln	3.00	Minor Col	Maj Col	Paved	Fair	2	11	0	0-50	3-4%
Klondike Ln	N.Klondike Rd	Webfoot Rd	4.48	Minor Col	Minor Col	Paved	Fair	2	10	0	0-50	0-2%
Webfoot Rd	Klondike Ln	Gosson Ln	1.96	Local	Local	Dirt	NR	1	8	0	0-50	0-2%
Gosson Ln	Webfoot Rd	Sandon Rd	3.00	Local	Local	Gravel	Very Poor	1	>12	0	0-50	3-4%
Sandon Rd	Klondike Ln	End of Pavement	2.77	Minor Col	Minor Col	Gravel	Fair	2	9	0	0-50	>5%
Sandon Rd	End of Pavement	SH 206	0.91	Minor Col	Minor Col	Paved	Fair	2	11	0	0-50	>5%

Appendix C

Road Name	From	To	Length	Prop FC	Exist FC	Pave Type	Pave Condition	# Lanes	Lane Width	Shoulder Width	ADT	Terrain
Smith Ln	SH 206	US 97	2.41	Local	Local	Gravel	Poor	1	9	0	0-50	3-4%
Klondike Rd	SH 206	N. Klondike Rd	3.30	Local	Local	Gravel	Fair	1	>12	0	0-50	3-4%
Egypt Rd	klondike Ln	SH 206	2.25	Local	Local	Dirt	NR	1	10	0	0-50	3-4%
Gerking Rd	Scott Canyon Rd	China Hollow Rd	3.22	Local	Local	Gravel	Poor	1	>12	0	0-50	3-4%
Tom Ln	China Hollow Rd	Greenberry Rd	1.57	Local	Local	Paved	Good	2	11	0	0-50	3-4%
Greenberry Rd	Tom Ln	End	0.51	Local	Local	Gravel	Fair	1	11	0	0-50	3-4%
Mud Hollow Rd	US 97	End of Pavement	1.03	Local	Local	Paved	Good	2	10	0	0-50	>5%
Mud Hollow Rd	End of Pavement	Locust Grove Ln	3.00	Local	Local	Gravel	Fair	1	>12	0	0-50	>5%
Locust Grove Ln	SH 206	End of Pavement	2.82	Local	Local	Gravel	Fair	1	>12	0	0-50	3-4%
Locust Grove Ln	End of Pavement	N Sawtooth Rd	0.08	Local	Local	Paved	Fair	2	11	0	0-50	3-4%
N. Sawtooth Rd	US 97	Locust Grove Ln	0.32	Local	Local	Paved	Fair	2	12	0	0-50	3-4%
N. Sawtooth Rd	Locust Grove Ln	Farm House	0.18	Local	Local	Gravel	Fair	1	>12	0	0-50	3-4%
N. Sawtooth Rd	Farm House	SH 206	0.75	Local	Local	Dirt	NR	1	>12	0	0-50	>5%
Welk Rd	SH 206	US 30	4.21	Local	Local	Gravel	Fair	1	12	0	0-50	>5%
Goat Ranch Ln	Gordon Ridge	End of Gate	1.82	Local	Local	Gravel	Very Poor	1	>12	0	0-50	>5%
McDermid Ln	Gordon Ridge	SH 206	2.35	Minor Col	Local	Paved	Fair	2	11	0	0-50	>5%
Wheat Acres Rd	Mc Dermid Ln	End	1.41	Local	Local	Gravel	Fair	1	10	0	0-50	3-4%
Toad Ln	Wheat Acres Ln	Gordon Ridge	0.58	Local	Local	Gravel	Fair	1	10	0	0-50	0-2%
Kaseberg Ln	Gordon Ridge	Van Gilder Rd	4.83	Local	Local	Gravel	Fair	2	10	0	0-50	3-4%
Van Gilder Rd	SH 206	Foss Ln	3.25	Maj Col	Minor Col	Paved	Fair	2	11	0	51-100	3-4%
Van Gilder Rd	Foss Ln	Hood St	4.60	Maj Col	Minor Col	Paved	Good	2	11	0	51-100	3-4%
Sawtooth Rd	Court St	De Moss Springs	1.50	Local	Local	Gravel	Fair	1	9	0	0-50	>5%
Sawtooth Rd	De Moss Springs	Haven Ln	3.72	Local	Local	Gravel	Fair	1	12	0	0-50	3-4%
Haven Ln	Sawtooth Rd	End of Pavement	1.60	Local	Local	Gravel	Fair	1	12	0	51-100	3-4%
Haven Ln	US 97	End of Pavement	0.10	Local	Local	Paved	Fair	2	10	0	0-50	0-2%
De Moss Springs	US 97	Sawtooth Rd	2.53	Local	Local	Gravel	Fair	2	>12	0	0-50	3-4%
Monkland Ln	US 97	Hay Canyon Rd	4.99	Maj Col	Maj Col	Paved	Fair	2	10	0	51-100	>5%
Monkland Ln	Hay Canyon Rd	Fairview Rd	2.51	Maj Col	Maj Col	Paved	Good	2	10	0	0-50	3-4%
Monkland Ln	Fairview Rd	SH 206	1.86	Local	Maj Col	Gravel	Good	2	9	0	0-50	3-4%
Starvation Ln	SH 206	Drinkard Rd	4.32	Local	Local	Gravel	Fair	1	>12	0	0-50	>5%
Starvation Ln	Drinkard Rd	MP 4.95	4.95	Local	Local	Gravel	Fair	1	10	0	0-50	0-2%
Starvation Ln	MP 4.95	End	1.84	Local	Local	Gravel	Poor	1	9	0	0-50	>5%
Drinkard Ln	Starvation Ln	End	1.86	Local	Local	Gravel	Fair	2	9	0	0-50	3-4%
Baseline Ln	Gate	SH 206	7.86	Local	Local	Gravel	Poor	1	8	0	0-50	3-4%
Fairview Ln	Baseline Ln	SH 206	1.14	Local	Local	Gravel	Fair	1	>12	0	0-50	3-4%
Fairview Ln	SH 206	Monkland Ln	0.81	Maj Col	Local	Paved	Poor	2	>12	0	0-50	3-4%
Fairview Ln	Monkland Ln	Burckert Ln	3.46	Local	Local	Gravel	Good	2	9	0	0-50	3-4%
Metzler Ln	Fairview Rd	End	1.00	Local	Local	Dirt	NR	1	>12	0	0-50	3-4%
Fairview Ln	Burckert Ln	Higgley Loop	1.48	Local	Local	Gravel	Fair	1	>12	0	0-50	3-4%
Higgley Loop	Hay Canyon Rd	Fairview Rd	2.18	Local	Local	Gravel	Fair	2	9	0	0-50	3-4%
Higgley Loop	Fairview Rd	MP 1	1.00	Local	Local	Gravel	Fair	1	>12	0	0-50	3-4%
Higgley Loop	MP 1	Hart Rd	3.78	Local	Local	Gravel	Poor	1	9	0	0-50	3-4%
Hart Rd	Lone Rock Rd	Hay Canyon Rd	4.34	Local	Local	Gravel	Good	2	9	0	0-50	3-4%
Hay Canyon Rd	Hart Rd	Crites Ln	0.75	Minor Col	Local	Gravel	Good	2	9	0	0-50	3-4%
Bruckert Ln	Hay Canyon Rd	Fairview Rd	2.61	Local	Local	Gravel	Fair	2	9	0	0-50	3-4%
Crites Ln	Hay Canyon Rd	End of Pavement	1.13	Minor Col	Minor Col	Paved	Good	2	10	0	51-100	3-4%

Appendix C

Road Name	From	To	Length	Prop FC	Exist FC	Pave Type	Pave Condition	# Lanes	Lane Width	Shoulder Width	ADT	Terrain
Crites Ln	End of Pavement	Beginning of Pavement	2.77	Minor Col	Minor Col	Gravel	Fair	2	9	0	0-50	3-4%
Crites Ln	Beginning of Pavement	Lone Rock Rd	0.44	Minor Col	Minor Col	Paved	Good	2	10	0	0-50	0-2%
Goelsch Rd	Lone Rock Rd	End	0.42	Local	Local	Gravel	Poor	1	8	0	0-50	>5
Douma Rd	Henricks Rd	Crites Ln	3.13	Local	Local	Gravel	Poor	1	12	0	0-50	3-4%
Douma Rd	Crites Ln	Henricks Rd	2.46	Local	Local	Dirt	NR	1	>12	0	0-50	3-4%
Henrichs Rd	Lone Rock Rd	Crites Ln	2.40	Local	Local	Gravel	Poor	1	>12	0	0-50	3-4%
Henrichs Rd	Crites Ln	McIntyre	1.35	Local	Local	Gravel	Good	1	9	0	0-50	3-4%
Henrichs Rd	McIntyre	Monkland Ln	2.40	Local	Local	Paved	Good	2	9	0	0-50	>5%
Henrichs Rd	Monkland Ln	US 97	1.37	Local	Local	Gravel	Fair	1	>12	0	0-50	3-4%
De Moss Springs	US 97	Creek	1.00	Local	Local	Gravel	Fair	1	12	0	0-50	3-4%
Martin Rd	Monkland Ln	McIntyre	1.48	Local	Local	Dirt	NR	1	12	0	0-50	3-4%
McIntire Rd	Henricks Rd	MP .85	0.85	Local	Local	Gravel	Fair	1	>12	0	0-50	3-4%
McIntire Rd	MP .85	Lavendar Rd	1.20	Local	Local	Dirt	NR	1	10	0	0-50	3-4%
Lavender Rd	Monkland Ln	Crites Ln	2.75	Local	Local	Dirt	NR	1	9	0	0-50	3-4%
Fraiser Rd	McIntyre	Crites Ln	1.00	Local	Local	Dirt	NR	1	9	0	0-50	3-4%
Fraiser Rd	MP 1	Lone Rock Rd	3.95	Local	Local	Gravel	Fair	2	9	0	0-50	3-4%
Lone Rock Rd	Rutledge Ln	US 97	11.95	Maj Col	Maj Col	Paved	Good	2	10	0	0-50	3-4%

EXISTING FUNCTIONAL CLASSIFICATION OF COUNTY ROADS

Sum of Length	FC			
	Local	Maj Col	Minor Col	Grand Total
Total	208.49	48.68	34.97	292.14

PROPOSED FUNCTIONAL CLASSIFICATION OF COUNTY ROADS

Sum of Length	Prop FC			
	Local	Maj Col	Minor Col	Grand Total
Total	210.2	45.48	36.46	292.14

EXISTING PAVEMENT SURFACE OF COUNTY ROADS

Sum of Length	Pave Type			
	Dirt	Gravel	Paved	Grand Total
Total	28.48	182.53	78.18	289.19
Percentage	9.85%	63.12%	27.03%	

EXISTING PAVEMENT CONDITIONS OF ALL COUNTY ROADS

Sum of Length	Pave Condition						
	Fair	Good	NR	Poor	Very Good	Very Poor	Grand Total
Total	110.74	106.49	28.48	38.66	0	4.82	289.19
Percentage	38.29%	36.82%	9.85%	13.37%	0.00%	1.67%	100.00%

PAVED COUNTY ROADS

Pavement Condition as Percent of Total

Very Good	3.40%
Good	66.66%
Fair	26.23%
Poor	3.71%

GRAVEL COUNTY ROADS

Pavement Condition as Percent of Total

Very Good	0.00%
Good	26.63%
Fair	50.00%
Poor	20.74%
Very Poor	2.64%

APPENDIX D
LEVEL OF SERVICE CRITERIA DESCRIPTIONS

This appendix describes the level-of-service (LOS) criteria for unsignalized intersections and two-lane rural highway sections.

Unsignalized Intersections

The operational characteristics of selected unsignalized intersections within Wheeler County were evaluated using procedures outlined in the 1997 Highway Capacity Manual for unsignalized intersections. The highest volume intersections, located along the state highways within the three urban areas were analyzed using design hour volumes for existing and future volume conditions. Unsignalized intersections include Two-Way Stop-Controlled (TWSC), All-Way Stop Controlled (AWSC), and Roundabouts. This program calculates delay and LOS for the critical movements of an intersection, based on the control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The LOS criteria for unsignalized intersections are presented in Table D-1.

It should be noted that the LOS criteria for unsignalized intersections are somewhat different than the criteria used for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, there are a number of driver behavior considerations that combine to make delays at signalized intersections less onerous than at unsignalized intersections.

For example, drivers at signalized intersections are able to relax during the red interval, while drivers on the minor street approaches to TWSC intersections must remain attentive to the task if identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized intersections than signalized intersections. For these reasons, it is considered that the total delay threshold for any given LOS is less for an unsignalized intersection than for a signalized intersection. While overall

intersection LOS is calculated for AWSC intersections, LOS is only calculated for the minor approaches and the major street left turn movements at TWSC intersections. No delay is assumed for the major street through movements. For TWSC intersections, the overall intersection LOS is defined by the movement having the worst LOS (typically a minor street left turn).

TABLE D-1

LEVEL-OF-SERVICE CRITERIA

FOR TWO-WAY UNSIGNALIZED INTERSECTIONS

Level of Service	Delay Range
A	≤10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	>50

Source: Transportation Research Board, Highway Capacity Manual, Special Report 209, page 10-25.

Two-lane Highways

The six LOS grades are described qualitatively for two-lane highways in Table D-2 below.

TABLE D-2

LEVEL OF SERVICE CRITERIA FOR TWO-LANE HIGHWAYS

Service Level	Typical Traffic Flow Conditions
A	Motorists are able to drive at their desired speed which, without strict enforcement, would result in average speeds approaching 60 mph. Passing demand is well below passing capacity, and almost no platoons of three or more vehicles are observed.
B	Speeds of 55 mph or slightly higher are expected on level terrain. Passing demand needed to maintain desired speeds becomes significant and approximately equals the passing capacity.
C	Further increases in flow result in noticeable increases in platoon formation, platoon size, and frequency of passing impediment. Average speed still exceeds 52 mph on level terrain, even though unrestricted passing demand exceeds passing capacity. While traffic flow is stable, it is becoming susceptible to congestion due to turning traffic and slow-moving vehicles.
D	Unstable traffic flow as passing demand is very high. Average platoon sizes of 5 to 10 vehicles are common, although speeds of 50 mph can still be maintained under ideal conditions. This is the highest flow rate that can be maintained for any length of time over an extended section of level terrain without a high probability of breakdown
E	Under ideal conditions, speeds will drop below 50 mph. Average travel speeds on highways with less than ideal conditions will be slower, as low as 25 mph on sustained upgrades. Passing is virtually impossible and platooning becomes intense when slower vehicles or other interruptions are encountered.
F	Heavily congested flow with traffic demand exceeding capacity.

Source: Transportation Research Board, Highway Capacity Manual, Special Report 209. National Research Council, 1994.

APPENDIX E

TECHNICAL MEMORANDUM #2

POPULATION AND EMPLOYMENT FORECASTS FOR SHERMAN COUNTY

The purpose of this memorandum is to present population and employment forecasts for Sherman County and the incorporated cities of Rufus, Wasco, Moro & Grass Valley. This memorandum briefly discusses historical population growth trends, the methodology used to develop the future forecasts, and the future population and employment trends estimated through the year 2020.

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) develops annual population estimates for cities and counties for the purpose of allocating certain state tax revenues to cities and counties. In January of 1997, the State of Oregon Office of Economic Analysis (OEA) developed 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.

Using a methodology based on OEA's county-distribution methodology calculations were done to develop population and employment forecasts for each of the cities in Sherman County. A weighted average growth rate was calculated for each jurisdiction (weighting recent growth more heavily than past growth) and combined to develop an 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. The forecasts were then modified to reflect more recent official estimates and local knowledge.

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.

Historical Growth

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, Wallowa, Grant, Gilliam and Sherman counties. The population of Sherman County actually declined during the 1960s, 1970s, and 1980s reflecting the general slowdown trend of the state's economy during the 1960's and 1980's. This trend was especially experienced in rural Oregon.

Sherman County's population was estimated at 1,900 in the mid-1990's. However the county was beginning to show signs of recovering from the declining trend of earlier decades. Table 1 shows historical population levels for Sherman County, Rufus, Wasco, Moro and Grass Valley, as well as the State of Oregon. The population of Sherman County with the exception of the city of Rufus and the unincorporated areas began to grow an average of nearly 0.5% percent annually since 1990. The overall growth rate for Sherman county was still estimated to be in the negative in 1996 because of the effects of the continued population loss in the city of Rufus and the unincorporated area, as all other cities in Sherman County were showing a moderate increase in population.

Table 1
Population Growth, 1980 to 2000

	1980 Census	1990 Census	1996 Estimate	2000 Census	1980-2000 Percent Change	1980-2000 Annual Avg. % Change *	1990-2000 Percent Change	1990-2000 Annual Avg. % Change *
Sherman County	2172	1918	1900	1934	-10.96	-0.55	0.83	0.08
Rufus	352	295	290	268	-23.86	-1.19	-9.15	-0.92
Wasco	415	374	390	381	-8.19	-0.41	1.87	0.19
Moro	336	292	295	337	0.30	0.01	15.41	1.54
Grass Valley	164	160	180	171	4.27	0.21	6.88	0.69
Unincorporated	905	797	745	777	-14.14	-0.71	-2.51	-0.25
Oregon State	2,633,156	2,842,321	3,181,000	3,421,399	29.94	1.50	20.37	2.04

* Average Annual Percent Change

Source: 1980 and 1990 and 2000: U.S. Census
1991 to 1996: PSU-CPRC and WA OFM:

This trend of population increase in Sherman County is continuing. It is reflected in the results from the 2000 census showing Sherman County population at 1934. This shows an **average annual increase in population of 0.08% from 1990 to 2000 for Sherman County**. This begins to show a reverse in Sherman County's population loss experienced in the 70' & 80's. Individual results from each of the cities reflect the same trend except for the city of Rufus and the unincorporated areas.

Population and Employment Forecasts

Sherman County is expected to experience small population gains for the next 20 years. Like much of Eastern Oregon, the economy of Sherman County has a large seasonal component, with over one-third of all employment agriculture-based. Therefore, the population increases are difficult to predict, and are not likely to be as stable as the forecasts appear to imply. Population and employment as forecast by the State of Oregon Office of Economic Analysis are shown in Table 2.

Table 2
Population and Employment Forecast, 1995 to Year 2020
Sherman County and State of Oregon

							1995 - 2020 Change	
								Annual Avg.
Sherman County	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**	**Number**	**% change**
Population	1,900	1925	1974	2020	2068	2116	216	0.45%
Non-Ag. Empl.	553	583	603	614	617	618	65	0.47%
State of Oregon								
Population	3,217,100	3,421,399	3,631,000	3,857,000	4,091,000	4,326,000	1,109,000	1.30%
Non-Ag. Empl.	1,524,900	1,601,718	1,718,659	1,814,276	1,882,653	1,947,702	422,802	1.07%

Source: *Portland State University Center for Population Research and Census (1997 population estimates) Oregon Employment Department (1997 employment estimates); and State Of Oregon Office of Economic Analysis (forecasts).*

As shown in Table 2, the State Office of Economic Analysis expected the population and employment in Sherman County to grow in their study done in 1997. The population and employment information available to them at that time indicated the population growing at an average rate of 0.4547 percent over the 25-year planning horizon and, non-agriculture based employment growing at an average rate of 0.4701 percent.

Based on the 2000 Census data, population forecasts for Sherman County cities are shown in Table 3 using two methods to forecast the 2020 population. The first projection presents Sherman County population in the year 2020 at 1,733 persons using the annual average percent change of -0.55% that assumes the downward trend begun in 1980 was to continue. The second projection presumes Sherman County population in the year 2020 to be 1,965 persons. This estimate is more consistent with the Oregon Employment Department estimates and is based on more recent data from the 2000 Census indicating an increase in population with an annual average percent change of +1.58%.

Table 3
Population Forecast, 2000 to Year 2020
Sherman County and the cities of Rufus, Wasco, Moro and Grass Valley

				1980-2000	1990-2000	Forecast	Percent	Forecast	Percent
	1980	1990	2000	Annual Avg.	Annual Avg.	For 2020	Change	For 2020	Change
				% Change	% Change	using 80-00	using 80-00	using 90-00	using 90-00
Sherman County	2172	1918	1934	-0.55	0.08	1733	-10.41	1965	1.58
Rufus	352	295	268	-1.19	-0.92	207	-22.67	221	-17.39
Wasco	415	374	381	-0.41	0.19	351	-7.78	395	3.56
Moro	336	292	337	0.01	1.54	338	0.28	436	29.28
Grass Valley	164	160	171	0.21	0.69	178	4.05	193	13.06
Unincorporated	905	797	777	-0.71	-0.25	673	-13.44	740	-4.77

Source: US Census 1980, 1990 & 2000

This analysis incorporates city specific growth patterns & projections unlike the OEA estimates where only county information is used for projection. Based on past trends within the last decade, Wasco, Moro and Grass Valley are expected to continue to grow at a greater rate than the overall County. This growth is expected to represent a net increase of 31 persons or approximately 1.58% growth by the year 2020. This growth is attributable to increased populations within the cities of Moro to 436 (29.98% increase), Wasco to 395 person (3.56% increase) and Grass Valley to 193 persons (13.06% increase).