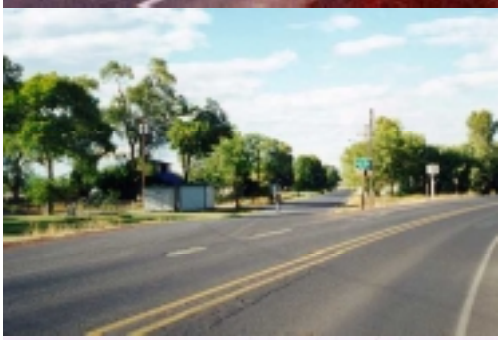

Harney County

Transportation System Plan

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HARNEY COUNTY PLANNING DEPARTMENT

Harney County

Transportation System Plan

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1

1 Introduction

The Harney 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 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.

1.1 Planning Area

The Harney County TSP covers the unincorporated areas of Harney County. The planning area for the Harney County TSP is shown on Figure 1-1. Roadways included in this TSP fall under several jurisdictions: the individual cities, Harney County, the state of Oregon, the US Forest Service (USFS), the Bureau of Land Management (BLM) and the Burns Paiute Indian Tribe represented by the Bureau of Indian Affairs (BIA).

Figure 1-1 Harney County Vicinity Map

Harney County is located in southeast Oregon. It is 10,228 square miles in area, making it the largest county in the state. The county had a 1997 population of 7,500. Burns is the county seat and the largest city in the county, with 40 percent of the population. Hines is the only other incorporated city in Harney County, and has 20 percent of the population. The county is bordered by Grant County to the north; Malheur County to the east; the State of Nevada to the south; and Lake, Deschutes, and Crook Counties to the west. Approximately 10 percent of Harney County lies within the Ochoco and Malheur National Forests. The elevation at Burns is 4,148 feet above mean sea level, and several mountains in the county reach elevations of 6,000 to nearly 10,000 feet above mean sea level. The topography is described as

"high desert" as the area only receives about ten inches of precipitation a year. The southern part of the county lies within the Great Basin of the western United States.

The main routes through the county are US Highway 20 (The Central Oregon Highway) and US Highway 395 (The John Day - Burns and Lakeview - Burns Highways). US Highway 20 runs east west through the northern part of the county. US Highway 395 runs north-south connecting Lakeview (Lake County) with John Day (Grant County). These highways lie along the same alignment where they traverse the Cities of Burns and Hines. OR Highway 78, The Steens Highway, begins in Burns and continues southeast to US Highway 95 in Malheur County. OR Highway 205, The Frenchglen Highway, begins outside of Burns and continues south to Frenchglen. Although the highway terminates at Roaring Springs Ranch Headquarters, Catlow Valley Road, a county road, continues southward to the Nevada border.

Forestry, manufacturing, livestock, and agriculture are the most important county industries. Harney County shares with Grant County the largest Ponderosa pine forest in the nation. More than 100,000 head of beef cattle graze on the county's vast ranges. Malheur Lake and Malheur National Wildlife Refuge provide an abundance of game, numerous campsites, and excellent fishing which have stimulated fast-growing recreational activities. There are also five industrial areas in or adjacent to the cities that have almost 1,400 acres of available land. About 1,200 acres of the industrial areas already have water, sewer, and electric services. The Burns Paiute Indian Reservation lies immediately north of the City of Burns with land in and outside the city limits. The Tribe administers hundreds of acres of farmland with the majority of the property being designated as Indian Trust Land.

1.2 Planning Process

The Harney County TSP was prepared as part of an overall effort in Harney County to prepare TSPs for the County and two municipalities: the City of Burns and the City of Hines. Each plan was developed through a series of technical analyses combined with systematic input and review by the county, the cities, the local working group, the Transportation Advisory Committee, ODOT, and the public. The Advisory Committee consisted of staff, elected and appointed officials, residents, and business people from Harney County, and the Cities of Burns and Hines. Key elements of the process include:

- Involving the Harney County community (Chapter 1)
- Defining goals and objectives (Chapter 2)
- Reviewing existing plans and transportation conditions (Chapters 3 and 4; Appendices A and B)
- Developing population, employment, and travel forecasts (Chapter 5; Appendices C and D)
- Developing and evaluating potential transportation system improvements (Chapter 6)
- Developing the Transportation System Plan (Chapter 7)
- Developing a Capital Improvement Program (Chapter 8)

1.2.1 Community Involvement

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

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

The second part of the community involvement effort consisted of community meetings within Harney County. The first public meeting was held in August 1997 in Burns. The general public was invited to learn about this TSP planning process and provide input on transportation issues and concerns. A second public meeting was held in March 1998. The third public meeting was held in August 1998. The public was notified of the meetings through public announcements in the local newspapers and on the local radio station.

1.2.2 Goals and Objectives Derived from Citizen Involvement

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

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

To begin the planning process, applicable Harney 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 Harney County, including the street system improvements planned and implemented in the past, and how the County is currently managing its ongoing development. Existing plans and policies are described 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.

1.2.4 Future Transportation System Demands

The Transportation Planning Rule requires this 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. Appendix C contains the detailed population forecasts and Appendix D contains the detailed ODOT Potential Development Impact Analysis.

1.2.5 Transportation System Potential Improvements

Once the travel forecasts were developed, it was possible to evaluate a series of potential transportation system improvements. The improvements were evaluated 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; attempting to address the concerns specified in the goals and objectives (Chapter 2). After evaluating the results of the potential improvements analysis, a series of transportation system improvements were selected. These recommended improvements are described in Chapter 6.

1.2.6 Transportation System Plan

This TSP addresses each mode of transportation and provides an overall implementation program. The street system plan was developed from the forecasting

and potential improvements evaluation described above. The bicycle and pedestrian plans were developed based on current usage, land use patterns, and the requirements set forth by the 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.

1.2.7 Funding Options

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

1.3 Related Documents

The Harney County TSP addresses the regional and rural transportation needs in the county. There are several other documents that address specific transportation elements or areas in Harney County.

1.3.1 Other Transportation System Plans

Two other TSPs have been prepared for communities in Harney County. These documents are the City of Burns TSP and the City of Hines TSP.

The city TSP's address the needs of the community within each Urban Growth Boundary. They provide street standards, access management standards, and modal plans. In some cases, an improvement option may be identified in a city TSP that then needs to be addressed in the Harney County TSP as well.

1.3.2 County Inventories

Jean Cain has prepared two inventories Harney County. These documents are:

- Harney County Buildable Lands Inventory (1997)
- Harney County Housing Study (1996)

These reports were prepared as updates to the *Harney County Comprehensive Plan* and address housing, zoning and infrastructure issues.

1.3.3 Corridor Strategies

Generally, corridor planning is intended to implement the goals and policies set forth by the *1992 Oregon Transportation Plan*, the *1991 Oregon Highway Plan*, and the recent modal plans for rail, freight, bike/pedestrian, aviation, and public transportation plus the safety action plan. The corridor strategies have several purposes:

1. They translate the policies of the *Oregon Transportation Plan* into specific actions.
2. They describe the functions of each transportation mode, consider trade-offs, and show how they will be managed.
3. They identify and prioritize improvements for all modes of travel; indicate where improvements should be made.
4. They resolve any conflicts with local land use ordinances and plans; and establish guidelines for how transportation plans will be implemented.

In 1996, ODOT developed a *US 395 South Corridor Strategy* to identify projects for the Oregon State Transportation Improvement Program. Development of the *US 395 South Corridor Strategy* is the first step in the corridor planning process. It will be followed-up by a *US Highway 395 Corridor Plan* which will build upon objectives developed in the strategy to identify, refine, and facilitate the acceptance of specific decisions related to corridor transportation management, capital improvements and service improvements. The corridor plan will identify and discuss the decisions considered to meet each objective, technical analysis of alternatives, and recommendations for action.

ODOT is also in the process of developing a corridor strategy for US 20. The US 20 report is in draft form and has not been adopted at this time. These efforts may be affected by ODOT budget constraints, however, future corridor efforts may be limited.

1.3.4 Other State Plans

In addition to the ODOT corridor strategy, coordination with the following state plans is required:

- Oregon Transportation Plan
- Oregon Highway Plan
- Oregon Bicycle and Pedestrian Plan
- Oregon Aviation Plan
- Oregon Public Transportation Plan

Chapter

2

2 Goals and Policies

2.1 Overall Transportation Goal and Policies

The purpose of this TSP is to provide a guide for Harney County to meet its transportation goals and objectives. The following goals and objectives were developed from information contained in the county's comprehensive plan and public concerns expressed during public meetings. 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.

2.1 Overall Transportation Goal and policies

Overall TSP Goal

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

Overall TSP Policies

1. Maintain and upgrade the overall transportation system within the county to meet present and future needs.
2. Develop and upgrade highway facilities in such a manner that valuable soil, timber, water, scenic, historic, or cultural resources are not damaged or impaired.
3. Provide adequate signage along major and minor county roads for the purpose of easy identification.
4. Design new roads and highways to preserve and enhance natural and scenic resources, i.e., new roads should not be constructed in areas identified as sensitive wildlife areas.
5. Acquire commercial bus service between Harney County and other major cities and bus lines.
6. Actively encourage private freight companies and the public utility commissioner to provide freight service to all portions of the county.
7. Protect the Municipal 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.

8. Comply with all applicable state and federal noise, air, water, and land quality regulations.
9. The general policy of the Planning Commission will be to prevent the creation of traffic hazards in the granting of variances, conditional use permits, and zone amendments.

Goal 1

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

Goal 1 Objectives

A. Develop access management standards that will meet the requirements of the TPR and also consider the needs of the affected communities.
B. Develop alternative, parallel routes which can serve local traffic needs.
C. Promote alternative modes of transportation.
D. Promote transportation demand management programs.
E. Promote transportation system management.
F. Develop procedures to minimize impacts to and protect transportation facilities, corridors, or sites during the development review process.

Goal 2

Improve and enhance safety and traffic circulation and preserve the level of service on local street systems.

Goal 2 Objectives

A. Develop an efficient road network that would maintain a level of service C or better.
B. Improve and maintain existing roadways.
C. Ensure planning coordination between the Cities of Burns and Hines, the county, and the state.
D. Identify truck routes to reduce truck traffic in urban areas.
E. Examine the need for speed reduction in specific areas.
F. Identify local problem spots and recommend solutions.

Goal 3

Identify the 20-year roadway system needs to accommodate developing or undeveloped areas without undermining the rural nature of the county.

Goal 3 Objectives

A. Continue to develop the road system as the principal mode of transportation both for access to the county and within the county.
B. Adopt policies and standards that address street connectivity, spacing, and access management.
C. Improve access into and out of the county for goods and services.
D. Improve the access on to and off of arterial roadways to encourage growth.
E. Inform the public of the access management policies.

Goal 4

Increase the use of alternative modes of transportation (walking, bicycling, rideshare/carpooling, and transit) through improved access, safety, and service.

Goal 4 Objectives

A. Provide shoulders on rural collector and arterial roads.
B. Develop a county bicycle plan (only if required).
C. Promote alternative modes and rideshare/carpool programs through community awareness and education.
D. Encourage development to occur near existing community centers where services are presently available so as to reduce the dependence on automotive transportation.
E. Plan for future transit service by seeking state support.
F. Seek Transportation and Growth Management (TGM) and other funding for projects evaluating and improving the environment for alternative modes of transportation.
G. Periodically assess pedestrian and bicycle modes of transportation within the county and develop programs to meet demonstrated needs (only if required).

Goal 5

Ensure that the road system within the county is adequate to meet public needs, including the transportation disadvantaged.

Goal 5 Objectives

A. Develop a countywide transportation plan.
B. Meet identified maintenance and level of service standards on the county roads.
C. Ensure that roads created in land division and development be designed to tie into existing and anticipated road circulation patterns.
D. Review and revise, if necessary, street cross section standards for local, collector, and arterial streets to enhance safety and mobility.

E. Develop an access management strategy for Highways 20, 395, 78, and 205.
F. Analyze the safety of traveling speeds and consider modifying posted speeds as necessary.
G. Continue to monitor the needs of the transportation disadvantaged and provide support as required.

Goal 6

Improve coordination among Harney County, ODOT, the US Forest Service, the US Bureau of Land Management, the Federal Highway Administration, and the local jurisdictions.

Goal 6 Objectives

A. Work with ODOT in the implementation of the Statewide Transportation Improvement Program.
B. Encourage improvement of state highways.
C. Work with the local and federal jurisdictions in establishing cooperative road improvement programs and schedules.
D. Work with the local and federal jurisdictions in establishing the right-of-way needed for new roads identified in this TSP.
E. Take advantage of federal and state highway funding programs.
F. Promote County concerns with US Forest Service and Bureau of Land Management regarding road matters, including the construction of permanent roads in conjunction with timber sales.

Goal 7

Support efforts to maintain the airport facilities for small aircraft and charter services.

Goal 7 Objectives

A. Encourage the state and local municipalities to improve and maintain airport facilities.
B. Cooperate with airport master planning efforts.
C. Incorporate airport master plans into local Comprehensive Plans.

Chapter

3

3 Transportation System Inventory

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

3.1 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 to carry automobiles and trucks. The mobility provided by the personal automobile has resulted in a great reliance on this form of transportation. Likewise, the ability of trucks to carry freight to nearly any destination has greatly increased their use.

Encouraging the use of cars and trucks must be balanced against costs, livability factors, the ability to accommodate other modes of transportation, and negative impacts on adjacent land uses; however, the basis of transportation in all American cities is the roadway system. This trend is clearly seen in the existing Harney County transportation system, which consists almost entirely of roadway facilities for cars and trucks. The street system will most likely continue to be the

basis of the transportation system 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 county roads and highways within Harney County. Appendix B lists the complete inventory. David Evans and Associates prepared the state highway inventory while the Harney County Public Works Department prepared the county road inventory.

3.1.1 Roadway Classification

The roads in the unincorporated or rural areas of Harney County fall under four jurisdictions: county, state, Bureau of Land Management, and US Forest Service. The state highways generally function as major or principal arterials through the county. The county roads are divided into three classification levels: major collectors, minor collectors, and local streets. The Bureau of Land Management and US Forest Service roads are categorized into five “maintenance levels” based on their function, physical condition, and use.

3.2 County Roads

Although the state highway system forms the backbone of the roadway system in Harney County, county roads are an important part of the circulation system.

3.2.1 Description

Harney County has 107 roads under its jurisdiction covering more than 706 miles. Of these 706 roadway miles, approximately 30 percent are paved, another 40 percent are gravel, and the remaining 30 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, and cities.

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

The Harney County Road Department has developed an independent roadway classification system for all roads under county jurisdiction. All roadways under county jurisdiction are classified into three categories: major collectors, minor collectors, and local streets. Of the 107 county roads, 27 are classified as major collectors (covering 308.7 miles), 19 as minor collectors (213.39 miles) and the remaining 61 as local streets (184.08 miles). The classification of these roadways is based on the intended function and observed traffic volumes.

Major Collectors - The primary function of a major collector is to tie US Forest Service roads, minor collectors, and local roads to nearby highways or arterial roadways. These roads also provide access to agricultural, forest, and recreational areas. Major collector roads are usually unpaved in the rural areas and partially to fully paved in the urban areas of the county with traffic volumes reaching up to 400 vehicles per day. The major collectors in Harney County are summarized in Table 1.

HARNEY COUNTY MAJOR COLLECTORS

County Road #	Name	Surface Mileage			Pavement Treatment
		Paved	Gravel	Dirt	
117	Fry Lane	1.94			Paved 8/15/92, Chip-Sealed 9/20/96
121	Foley Drive	5.92			Paved 1/1/80, Chip-Sealed 10/1/95
125	Hotchkiss Lane	2.83			Paved 8/20/93, Chip-Sealed 9/25/96
127	Hines Logging Road	24.40			Paved 7/15/90, Chip-Sealed 9/1/93
128	Greenhouse Lane	4.14			Paved 7/15/87, Chip-Sealed 9/1/93
138	Silver Creek Road	14.90	0.40		Paved 7/15/87, Chip-Sealed 9/1/93
201	Fields-Denio Road	24.00	61.14		Paved 7/15/86, Chip-Sealed 9/1/92
202	Catlow Valley Road	34.22			Paved 9/15/88, Chip-Sealed 9/1/94
305	Drewsey Road	2.62			Paved 8/1/68, Chip-Sealed 9/1/75
306	Van-Drewsey Road	21.56			Paved 8/1/92, Chip-Sealed 9/1/92
310	Pine Creek Road	12.50	5.32		Paved 8/1/91, Chip-Sealed 7/1/97
312	Crane-Buchanan Road	17.01			Paved 8/1/82, Chip-Sealed 9/1/88
313	Crane-Venator Road	0.80	25.28		Paved 8/1/85, Chip-Sealed 9/1/96
404	Lava Beds Road	23.48			Paved 8/1/90, Chip-Sealed 9/1/95
405	Narrows-Princeton Road	5.75	12.36		Paved 8/1/92, Chip-Sealed 9/1/92
409	Diamond-Grain Camp Road	12.39			Paved 7/1/94, Chip-Sealed 9/1/94
412	Rock Creek Road		18.60	3.98	

Source: Harney County Road Department

Table 1 – Harney County Major Collectors

Minor Collectors - County roads classified as minor collectors are shorter distance roads that branch off from a highway, arterial, or major collector and provide access to agricultural, forest, and recreational areas, and possibly a few rural residential homes. Minor collectors are mostly unpaved with very little traffic, generally between 50 and 100 vehicles per day. The major collectors in Harney County are summarized in Table 2.

HARNEY COUNTY MINOR COLLECTORS

County Road #	Name	Surface Mileage			Pavement Treatment
		Paved	Gravel	Dirt	
102	Rattlesnake Road	8.50			Paved 8/1/92, Chip-Sealed 9/1/97
124	Radar Road	0.70	5.32		Paved 8/20/95, Chip-Sealed 9/1/95
133	Double O Road		34.05		
203	Whitehorse Ranch Road		28.43		
304	Otis Valley Road		5.65	10.50	
309	Calamity Creek Road		2.12		
311	Warm Springs Road			21.60	
317	Main Street	0.25			Paved 1983
401	Virginia Valley Road		6.50		
402	Anderson Valley Road		13.21		
406	Happy Valley Road		12.95		
411	Jack Mountain Road			35.04	

Source: Harney County Road Department

Table 2 – Harney County Minor Collectors

Local Roads - Local county roads are short distance roads that may serve as a short logging road or a driveway to one or a few homes. They are unpaved and carry very low traffic volumes, generally less than 50 vpd.

3.3 Existing 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 that are relatively safe, aesthetic, and easy to administer when new roadways are planned or constructed. They are based on experience, and policies and publications of the profession.

The majority of Harney County roads exist in a 60-foot right-of-way, although in some cases it is wider. Paved county roads are 22 feet wide with gravel shoulders. Gravel roads are of a similar width with no shoulders.

3.3.1 Road Maintenance

Harney County has not adopted a formal county roadway maintenance program. However, the County Road Superintendent provided insight into typical maintenance practices within the county.

Paved Roads - The county had been paving approximately 25 miles of unimproved roadway each year up through 1996. Due to recent budget constraints, the county only paved five new miles of road in 1997 and expects to cease all "new" paving for the foreseeable future until funding becomes available. The county will maintain its focus on maintenance by completing 30 to 40 miles of "chip sealing" each year.

Gravel/Dirt Roads - The Harney County Road Department routinely "blades" its gravel and dirt roads throughout the spring, summer, and autumn to provide for safe and efficient use of the roadways.

3.3.2 Bridges

A review was completed of the bridge inspection inventory (as of December 2000) obtained from ODOT. Three mutually exclusive elements are used to rate bridge conditions[1]: structural deficiency, functional obsolescence, and sufficiency rating.

Structurally deficient bridges have major physical problems that warrant replacement of the structure. 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.

[1] The description of structural deficiency, functional obsolescence, and sufficiency rates are based on the *Oregon Guide for the Inventory and Appraisal of Oregon Bridges* by the Oregon Department of Transportation Bridge Section, May, 1994.

Functionally obsolete bridges cannot adequately service the demand placed upon them. For example, they may be too narrow or unable to accommodate heavy loads. This element is determined based upon the appraisal rating for the deck geometry, under-clearances, approach roadway alignment, structural condition, or waterway adequacy.

Bridges that have a sufficiency rating of 55 or less may be nearing a structurally deficient condition. 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 0 to 100 with higher ratings indicating optimal conditions and lower ratings indicating insufficiency.

Harney County has 105 bridges that are included in the state bridge inspection inventory. Currently, six (6) county-owned bridges are identified as structurally deficient, including:

- Bridge #25A16 on CR #138 (Silver Creek Road) over Silver Creek
- Bridge #25A43 on CR #128 (Greenhouse Lane) over West Creek Silvies River
- Bridge #25A82 on CR #106 (Lawen-Harney Road) over Nine Mile Slough
- Bridge #25E10 on CR #305 (Drewsey Road) over North Drewsey Slough
- Bridge #25E24 on CR #310 (Pine Creek Road) over Pine Creek
- Bridge #25E32 on CR #313 (Crane-Venator Road) over Crane Creek

One bridge is identified as functionally obsolete:

Bridge #25A22 on CR #123 (West Loop Road) over Silvies River

3.4 State Highways

State highways often function as major arterial 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 Harney County, the state highways/major arterial streets often serve statewide, regional, and local traffic demands.

Discussion of the Harney County street system must include the state highways that traverse the planning area. Although Harney County has no direct control over the state highways, the highways heavily influence adjacent development and traffic patterns. Five state highways run through Harney County, as shown in Table 3. These highways serve as the major routes through the county with commercial and industrial development focused along the corridors.

STATE HIGHWAYS

State Highway Number	Highway Name	ODOT Highway Number	State Highway Classification
US Highway 20	Central Oregon Highway	007	Statewide
US Highway 395 North	John Day-Burns Highway	048	Statewide
US Highway 395 South	Lakeview-Burns Highway	049	Statewide
OR Highway 78	Steens Highway	442	Regional
OR Highway 205	Frenchglen Highway	440	District

Table 3 – State Highways in Harney County

3.4.1 State Highway Classifications

The *1999 Oregon Highway Plan* classifies the state highway system into five levels of importance: interstate, statewide, regional, district and local. The State Highway Classifications for the state highways in Harney County are shown in Table 4.

ODOT has established primary and secondary functions for each type of highway and objectives for managing the operations for each one:

Statewide Highways (US 20 and US 395 North): The primary function of a statewide highway is to "provide connections and links to larger urban areas, ports, and major recreation areas that are not directly served by interstate highways." The management objective for statewide highways is to provide for safe and efficient high-speed, continuous-flow operation in rural areas and high- to moderate-speed operations with limited interruptions of flow in urban and urbanizing areas.

Regional Highways (OR 78): 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." 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.

District Highways (OR 205): 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.

Design factors such as controlling access and providing passing lanes are critical to meeting the objectives of the highway classifications.

3.4.2 State Highway Freight System

As part of the draft *1999 Oregon Highway Plan*, a new state highway freight system has been designated. US Highway 20 is one of two east-west freight corridors designated in Oregon. US Highway 20 was chosen because of its connectivity, its use as an alternative route to I-84, and its use in inclement weather. According to the draft plan, "the state highway freight system is intended to facilitate through movement of trucks".

The impact of this new designation is not clear at this time. This designation does not guarantee additional funding for this route. It does have three special management features that may be applied.

1. Highways included in this designation have higher levels of service that other statewide highways.
2. The highway's function as a freight route should be balanced with local accessibility in Special Transportation Areas.

3. Freight system routes may be treated as limited access highways outside of the urban growth boundaries and unincorporated communities.

3.4.3 US Highway 20 – General Description

US Highway 20 (Central Oregon Highway) is a highway of statewide importance. Beginning in Newport, on the Oregon coast and continuing through the cities of Corvallis, Albany, Lebanon, Bend, Burns, and Nyssa before continuing into Idaho, this route is the main east-west highway through central Oregon. The highway shares its alignment with US Highway 395 for approximately 30 miles south and west of Burns, where it is still a highway of statewide importance.

Throughout Harney County, the highway is primarily a two-lane roadway with a speed limit of 55 mph, except in the cities of Burns and Hines where the roadway varies between two and five lanes and the speed varies between 25 and 45 mph. There are no bicycle or pedestrian facilities on the highway except in Burns and Hines. Reconstruction of the highway was completed at the end of summer in 1998. With the completed highway improvements, sidewalks will run along both sides of the roadway from the south city limits of Hines along Oregon Avenue, Hines Boulevard, Monroe Street, and Broadway Avenue. From Broadway Avenue to the north city limits of Burns, shoulders are provided. Bike lanes will be located on both sides of the roadway in Hines, on Oregon Avenue, and in Burns, on Broadway Avenue.

The highway has three westbound and three eastbound passing lanes in the county. Roadway shoulders on both sides of the highway are typically four to six feet wide and partially paved; however, some sections of the highway have shoulders in excess of six feet in width.

3.4.4 US Highway 395 – General Description

US Highway 395 runs north-south through eastern Oregon from California to Washington. North of the City of Burns, US Highway 395 (John Day - Burns Highway) is a highway of statewide importance. The highway shares its alignment with Highway 20 for approximately 30 miles south and west of Burns where it is still a highway of statewide importance. The highway is a two-lane roadway with a speed limit of 55 mph. Roadway shoulders on both sides of the highway are typically four to six feet wide and partially paved.

South of US Highway 20, US Highway 395 (Lakeview - Burns Highway) is classified as a highway of statewide importance. From Riley, it extends southwest beyond Harney County into Lake County. The highway is a two-lane roadway with a speed limit of 55 mph. Roadway shoulders on both sides of the highway are in excess of six feet wide and are typically partially paved.

3.4.5 OR Highway 78 – General Description

OR Highway 78 (Steens Highway) is a highway of regional importance. Beginning within the Burns city limits, it extends southeast through Lawen, Crane, and New Princeton, and continues across the Harney/Malheur County line. It is a two-lane roadway with a speed limit of 55 mph, except within the Burns city limits where the speed varies between 25 and 45 mph. The route is comprised of numerous curves and moderate grade changes resulting in localized speed reductions ranging from 35 to 45 mph. Extended segments of roadway shoulders on both sides of the highway vary in width from two to four and four to six feet and are typically partially paved. A few short shoulder segments are less than two feet wide.

3.4.6 OR Highway 205 – General Description

OR Highway 205 (Frenchglen Highway) is a highway of district importance. Beginning at the OR Highway 78 junction, the highway extends south through the Malheur Wildlife Refuge and Frenchglen, ending its highway designation at Roaring Springs Ranch Headquarters. The roadway continues as a county road in good condition from Roaring Springs to the Nevada border. It is a two-lane roadway with a speed limit of 55 mph. Extended segments of roadway shoulders on both sides of the highway vary in width from two to four and four to six feet and are typically partially paved.

3.4.7 Adjacent Land Use

Land along the rural sections of the highway is primarily zoned for agricultural, farming and forestry uses with numerous county and forest service roads accessing the highways. In the urban centers of Burns and Hines development is denser with other land uses bordering the highways such as light industrial, commercial, public, and residential.

3.4.8 General Pavement Conditions

All 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 1/2 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 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.

Table 4 summarizes the state highway pavement conditions as of 1997. Pavement conditions along the five state highway segments within Harney County vary in both the rural and urban areas. Almost 43 percent of the highways have pavement in Good or Very Good condition, while another 14 percent have pavement in Fair condition. About 36 percent have pavement in Poor condition. The remaining highway segments were under construction

during the 1997 rating period. These pavements should return to Very Good condition following construction.

STATE HIGHWAY PAVEMENT CONDITIONS

Highway	Milepost	Length	Section Description	Pavement Condition
US 20 (007)	104.62-115.00	10.38	Riley – Sagehen Hill	Very Good
	115.00-128.25	13.25	Sagehen Hill – Hines	Very Good
	128.25-130.51	2.36	Hines to Burns	Very Good
	130.51-134.32	3.81	Burns to John Day Highway (US 395)	Very Good
	134.32-152.40	18.04	John Day Highway (US 395) to John Logan	Good
	152.40-157.89f	5.49	John Logan to MP 158.00	Good
	157.92-165.96	8.04	MP 158.00 to Beede Res.	Very Good
	166.00-177.65	11.65	Beede Res. to Drinkwater Pass	Fair
US 395 North	40.38-52.80	12.42	Harney / Grant County line to Devine Summit	Very Good
(048)	52.80-67.78	14.98	Devine Summit – Junction US Hwy 20	Very Good
US 395 South	0.00-5.27	5.27	Riley to MP 5.27	Good
(049)	5.27-15.40	10.13	MP 5.27 to MP 15.40	Fair
	15.40-30.00	14.60	Riley-Wagontire to Harney/Lake County line	Poor
OR 78 (442)	0.00-11.20	11.20	US Highway 20 Jct. to MP 11.20	Fair
	11.20-19.70	8.50	MP 11.20 to MP 19.70	Fair
	19.70-20.60	0.90	MP 19.70 to Saddle Butte Quarry	Fair
	20.60-28.40	7.80	Saddle Butte Quarry to Crane	Poor
	28.40-32.70	4.30	Crane to MP 32.70	Good
	32.70-37.20	4.50	MP 32.70 to New Princeton	Good
	37.20-47.23	10.03	New Princeton to Virginia Valley Road	Poor
	47.23-52.20	4.97	Virginia Valley Road to Malheur Cave	Poor
	52.20-61.05	8.85	Malheur Cave to Malheur County Line	Poor
OR 205 (440)	0.00-11.50	11.50	Highway 78 Jct. to Wrights Point	Poor
	11.50-13.07	1.57	Wrights Point to MP 13.00	Poor
	13.07-17.40	4.33	MP 13.00 – MP 17.40	Poor
	17.40-23.10	5.7	MP 17.40 – Narrows	Poor
	23.10-32.00	8.90	Narrows to MP 32.00	Good
	32.00-35.75	3.75	MP 32.00 to MP 35.75	Very Good
	35.75-40.00	4.25	MP 35.75-MP 40.00	Poor
	400.00-42.20	2.20	MP 40.00 to MP 42.20	Fair
	42.20-50.50	8.30	MP 42.20 to MP 50.50	Very Good
	50.50-52.50	2.00	MP 50.50 to MP 52.50	Very Good
	52.50-48.30	5.80	MP 52.50 to Frenchglen	Good
	58.30-73.35	15.05	Frenchglen to Roaring Springs Ranch	Fair

Source: 1999 Pavement Condition Report - Oregon Department of Transportation Pavements Unit.

Table 4 – State Highways Pavement Conditions

3.4.9 State Highway Bridges

The state has 63 bridges located on state highways in both rural and urban Harney County. There are seven bridges located on US Highway 20, 12 bridges located on US Highway 395, 11 bridges located on US Highway 395/20, 19 bridges located on OR Highway 78, and 14 bridges located on OR Highway 205.

Currently, there are no state bridges in Harney County rated as structurally deficient, functionally obsolete or with a sufficiency rating less than 55.

3.5 US Forest Service Roads

The US Forest Service (USFS) has jurisdiction over the 2,932 miles of roads in the Ochoco and Malheur National Forests. Most of the USFS roads are dirt or gravel. The primary function of these roads is to provide access for logging trucks and recreational vehicles to different parts of the forest lands.

The USFS is not a public road agency; therefore, responsibilities and liabilities are not the same as those of the county and state. Road closures in some areas may be imminent with continuing reductions in federal budgets. Priority routes are determined by recreational and commercial uses.

3.5.1 Maintenance Levels

The USFS utilizes five different maintenance levels that are operational and objective in nature. The USFS maintains a database of roads in each of these levels (1997 Transportation Management System: Burns Ranger District, Malheur National Forest). These levels are identified as follows:

Maintenance Level 1 - Assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period must exceed one year. Basic custodial maintenance is performed to keep damage to adjacent resources to an acceptable level and to perpetuate the road to facilitate future management activities. Emphasis is normally given to maintaining drainage facilities and runoff patterns. Planned road deterioration may occur at this level. Appropriate traffic management strategies are "prohibit" and "eliminate."

Maintenance Level 2 - Assigned to roads open for use by high clearance vehicles. Passenger car traffic is not a consideration. Traffic is normally minor, usually consisting of one or a combination of administrative, permitted, dispersed recreation, or other specified uses. Log haul may occur at this level. Appropriate traffic management strategies are either to: (1) discourage or prohibit passenger cars or (2) accept or discourage high clearance vehicles.

Maintenance Level 3 - Assigned to roads open and maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. Roads in this maintenance level are typically low speed, single lane with turnouts and spot surfacing. Some roads may be fully surfaced with either native or processed material. Appropriate traffic management strategies are either "encourage" or "accept." "Discourage" or "prohibit" strategies may be employed for certain classes of vehicles or users.

Maintenance Level 4 - Assigned to roads that provide a moderate degree of user comfort and convenience at moderate travel speeds. Most roads are

double lane and aggregate surfaced, however, some roads may be single lane. Some roads may be paved and/or dust abated. The most appropriate traffic management strategy is “encourage,” however, the “prohibit” strategy may apply to specific classes of vehicles or users at certain times.

Maintenance Level 5 - Assigned to roads that provide a high degree of user comfort and convenience. These roads are normally double-lane, paved facilities. Some may be aggregate surfaced and dust abated. The appropriate traffic management strategy is “encourage.”

The distinction between USFS maintenance levels is not always sharply defined. Some parameters overlap two or more different maintenance levels. Maintenance levels are based on the best overall fit of the parameters for the road in question. In the situations where the parameters do not indicate a definite selection, the desired level of user comfort and convenience is used as the overriding criteria to determine the maintenance level. Forest Service road maintenance includes a variety of work activities. Activities may be either detailed and site specific, or broad and general. The majority of the USFS roads within Harney County are Maintenance Level 2.

3.6 Bureau of Land Management Roads

The Bureau of Land Management (BLM) has jurisdiction over 3,380 miles of roads within Harney County. All of the BLM roads are gravel or native material. The primary function of these roads is to provide access for ranching and recreational users to all the different parts of BLM lands.

The BLM is not a public road agency; therefore, responsibilities and liabilities are not the same as those of the county and state. Road closures in some areas may be imminent with continuing reductions in federal budgets. Priority routes are determined by recreational and commercial uses.

3.6.1 Maintenance Levels

The BLM utilizes five different maintenance levels that are operational and objective in nature. The BLM maintains a listing of roads within their jurisdiction and the maintenance level each is assigned (1986 Burns District Transportation Plan). These levels are identified as follows:

Maintenance Level 1 - Assigned to roads that receive no scheduled maintenance, but are still open to vehicular traffic. Planned road deterioration may occur at this level.

Maintenance Level 2 - Assigned to roads classified as resource roads, and receiving maintenance every eight to ten years. Emphasis is normally given to maintaining drainage facilities and runoff patterns. These roads provide access to open BLM lands and traffic is normally minor.

Maintenance Level 3 - Assigned to roads classified as local roads, and receiving maintenance every three to five years.

Maintenance Level 4 - Assigned to roads classified as local roads, and receiving maintenance every three years.

Maintenance Level 5 - Assigned to roads classified as collector roads that are maintained each year. These roads receive the highest use and have a gravel surface.

The distinction between BLM maintenance levels is not always sharply defined. Some parameters overlap two or more different maintenance levels. Maintenance levels are based on the best overall fit of the parameters for the road in question. In the situations where the parameters do not indicate a definite selection, the desired level of user comfort and convenience is used as the overriding criteria to determine the maintenance level. BLM road maintenance includes a variety of work activities. Activities may be either

detailed and site specific, or broad and general. The majority of the BLM roads within Harney County are Maintenance Level 3.

3.7 Pedestrian System Plan

The majority of pedestrian traffic in Harney County is found within the Cities of Burns and Hines. 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.

3.8 Bikeway System

There are few bikeways in Harney County. On the rural roadways, bicyclists and traffic must share the same travel lane. The four highways in the county either have unpaved shoulders or paved shoulders that are too narrow for bicycles to travel safely separated from traffic. On low volume roadways, such as many of the county facilities, bicyclists and automobiles can both safely and easily use the roadway.

The only bicycle facility in Harney County outside of Burns and Hines is a lane intended for use by both bicyclists and pedestrians. This lane begins in Burns on the western side of Broadway Avenue from D Street north to Foley Drive. It continues along one side of Foley Drive from Broadway Avenue, outside the city limits, to the Burns Paiute Indian Reservation (See Burns Paiute Reservation TSP, March 2000, pages 3-16). The lane switches from one side of the road to the other several times along Foley Drive.

3.9 Public Transportation

Public transportation in Burns consists of the Harney County Senior Center Transportation, a dial-a-ride service for senior citizens and the disabled, and limited taxi service. The city has no local fixed-route transit service or long distance service at this time.

3.9.1 Local Service

The Harney County Senior Center Transportation, based in the City of Burns, provides the senior citizen and disabled dial-a-ride service. It operates a ten-passenger bus with space for two wheelchairs and a six-passenger van. The

bus is used when someone in a wheelchair requests a ride, otherwise, the van, which is more economical, is used.

Another type of public transportation service available in the city is taxi service, which is provided by Little Joe's Taxi Service. Little Joe's operates one cab, and will provide service 24 hours a day, seven days a week. There is a flat rate charge of $5 for a trip within the Burns and Hines' city limits and the Burns Paiute Indian Reservation. Trips outside the urban area are provided at a cost of $1 per mile.

3.9.2 Long Distance Service

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

There are long distance services provided by the Amtrak Throughfare, federally subsidized bus service, which connects the Burns/Hines area to Boise on the east and Bend and other western Oregon cities to the west. The bus service connects with Amtrak Rail services in Portland. This long distance service passes through Burns/Hines every day of the week traveling either east or west. During the holiday season when traveling, historically, is at its peak the bus service does travel through Burns/Hines every day going both directions. The service began in the early part of 2000 and is slated to continue through March of 2003. It has been observed that the number of passengers using the service has been minimal and without federal funds the service most likely could not support itself. It could prove to be a valuable service for a greater segment of the population, but without more usage the service may be terminated after federal funding ends.

Harney County Senior Center Transportation provides long distance service to the city of Bend on the second and fourth Thursday of each month. The primary purpose for the service is to transport the elderly to Bend for doctor appointments; however, the service is available to anyone on a first-come, first-served basis. The round-trip fare is $25; the one-way fare is $12.50. The Oregon Medical Assistance Program pays the fare for those passengers who receive Medicaid. The current service meets the demand and is somewhat underutilized since, at most, the service has transported seven people at one time.

Several years ago ODOT provided funding for a demonstration project connecting Coos Bay, Bend, Burns-Hines, Ontario, and Boise. This service, provided by a private provider, Porter Stage Lines, made one trip a day. The provider believes the service would have become self-supporting after several

years. It was an interline service or feeder service connecting rural communities with Greyhound. After less than a year the pilot project was discontinued from Bend to Boise because some decision-makers did not believe it was serving the needs of their residents. Concerns about the service included a lack of support services for senior citizens when they arrived in Bend.

3.9.3 Demographic Summary

Public transportation is primarily used by three segments of the population:

- Elderly: persons age 60 and over
- Disabled: persons age 16 to 64 with mobility limitations
- Impoverished: persons age 64 or less residing in households having incomes below the poverty level

Table 5 summarizes the 1990 census data regarding these three population segments. In Harney County, about 30 percent of the residents fell into these three categories. Almost 19 percent were elderly. Less than one percent were disabled. More than 10 percent were impoverished.

ELDERLY, DISABLED, AND IMPOVERISHED POPULATION

Population Segment	Persons	Percent of Total
Elderly	1,320	18.9%
Disabled	23	0.3%
Impoverished	738	10.6%
Total	**6,983**	**29.8%**

Source: US 1990 Census.
Table 5 – Elderly, Disabled and Impoverished Population

3.9.4 Rail Service

Harney County has no passenger or freight rail service. As mentioned previously, long distance services, provided by Amtrak Throughfare Bus Service does connect to rail services in Portland allowing individuals to access rail services from the Burns/Hines area.

3.9.5 Air Service

Local air service is available at the Burns Municipal Airport and several private landing strips. These airports provide a multitude of services including package service, recreational transportation, search and rescue, medical transport, fire fighting as well as some types of commerce transport.

Burns Municipal Airport, owned by the City of Burns, is located on approximately 800 acres approximately five miles east of Burns. Vehicular access to the airport is provided from OR Highway 78, which connects to County Road 115, also referred to as Airport Road. The airport is at an elevation of 4,144 feet above mean sea level. The Airport Reference Point coordinates are Latitude 43°35'53" N, and Longitude 118°57'30'' W. The airport currently has 20 based aircraft and approximately 4,400 annual operations. The airport has two runways, both of which are 5,100 feet long and 75 feet wide. The existing runway lengths are adequate to accommodate approximately 93 percent of the general aviation fleet under most conditions.

Burns Municipal Airport is a Basic Utility I category airport providing service to the communities of Burns and Hines, in addition to a large portion of southeastern Oregon. Due to the low population density and the lack of comparable airports in the region, the service area for the airport extends beyond the typical 30 to 60 minute surface travel time.

Devco Engineering, Inc. prepared an *Airport Layout Plan* in April 1996. The plan lists over 20 recommendations for the airport and concludes that the Burns Municipal Airport is capable of being developed to meet the aviation needs of the local area well into the future. A staged 20-year Capital Improvement Program is included with estimates of both local and federal costs for construction. The *Airport Layout Plan* for Burns Municipal Airport is, and will continue to be, the primary plan guiding the development of the airport.

The airport currently provides no commercial air service. Boise Airport, approximately 185 miles east of Burns, is the closest large, commercial airport. From there, scheduled air service and daily non-stop flights are available to Portland and throughout the western United States. Package service and other freight services are available as well. Roberts Field Redmond Municipal Airport is located in Redmond, approximately 145 miles northwest of Hines. This airport also provides commercial passenger service and package service to Portland and Seattle on two carriers: Horizon Air and United Express. Air service operates every day of the week.

3.9.6 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. There are currently no pipelines serving Harney County.

3.9.7 Water Transportation

Harney County has no water transportation services.

Chapter

4

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

4.1 Traffic Volumes

A large base of traffic volume counts exists for Harney County. Extensive 24-hour counts were performed by ODOT on the state highways throughout the county.

4.1.1 Average Daily Traffic

Average daily traffic volumes reflect the annual average of traffic volumes on roadways throughout the year. They do not reflect seasonal fluctuations or special events.

1. County Roads

The major collectors in the county generally carry average daily traffic volumes in the range of 100 to 300 vehicles per day. The minor collectors generally carry average daily traffic volumes in the range of 50 to 100 vehicles per day. Traffic volumes on the local streets are very low, generally less than 50 vehicles per day.

2. State Highways

The average 1997 traffic volumes on the state highways in Harney County are shown in Figure 4-1. Traffic volumes are highest in the cities and drop off significantly in the rural sections as shown also in Table 6.

The volumes shown in Figure 4-2 are average volumes for the year. Summer is the season when volumes are highest. ODOT data on US Highways 20 and 395 north of Burns and south of Hines, indicated that during the summer season, volumes are about 20 to 30 percent higher than average volumes. Other rural highway sections have similar seasonal patterns.

Figure 4-1 1997 Average Daily Traffic Volumes

US Highway 20 - Traffic volumes along US Highway 20 reach 1,400 vpd west of Riley and 1,900 vpd a few miles east of the US Highway 395 junction. The shared alignment of US Highways 20 and 395 through Burns and Hines carries the greatest volumes in Harney County with volumes as high as 7,900 vpd inside of Burns. Just outside of the city limits, traffic volumes on this roadway range from 3,700 vpd west of Hines to 2,600 vpd north of Burns. After US Highway 395 splits to the north, traffic levels become 1,900 vpd and drops to 1,600 at the Harney-Malheur County Line (Table 6).

AVERAGE DAILY TRIPS (ADT) - VOLUME PER DAY (VPD)
US HIGHWAY 20 (1999)

MP	Description	ADT
83.79	Lake-Harney County Line	1400
104.61	0.01 mile west of Lakeview-Burns Highway (US 395)	1400
104.78	0.16 miles east of Lakeview-Burns Highway (US 395)	1900
126.60	Hines Automatic Recorder, Station 13-003, 2.13 miles south of	2400
128.73	South city limits of Hines	3700
129.13	0.01 mile north of Barnes Avenue	5800
129.61	0.01 mile north of Conley Avenue	6700
130.10	Hines-Burns city limits on south Oregon Avenue	6900
131.13	0.01 mile southwest of west Monroe Street on Hines Boulevard	7900
131.34	0.01 mile west of Court Avenue on west Monroe Street	8300
131.49	0.01 mile west of OR 78, on west Monroe Street on north Broadway	6600
131.51	0.01 mile north of OR 78	5300
131.66	0.01 mile north of Adams Street	6000
131.76	0.01 mile north of “A” Street	5000
131.99	0.01 mile south of Foley Drive	4000
132.01	0.01 mile north of Foley Drive	3000
132.51	North city limits of Burns on Senaca Drive	2600
134.07	0.01 mile west of John Day-Burns (US 395)	2200
134.32	0.24 mile east of John Day-Burns (US 395)	1900
144.23	0.01 mile west of Old Lawen-Harney Road	1800
154.98	0.01 mile east of Crane-Buchanan Road	1600
173.23	0.01 mile west of Drewsey Road	1600
180.15	Harney-Malheur County Line	1600

Source: ODOT ADT Data

Table 6 – US Highway 20 Average Daily Trips 1999

US Highway 395 - US Highway 395 (Burns-Lakeview and Burns-John Day) carries the second highest traffic volumes in the county. Traffic levels are 350 vpd at the Lake-Harney County Line with 350 vpd south of the US Highway 20 junction. North of the shared alignment with Highway 20, traffic volumes are 630 vpd falling to 580 at the Harney-Grant County Line (Table 7).

AVERAGE DAILY TRIPS (ADT) – VOLUME PER DAY (VPD)
US HIGHWAY 395 (1999)

MP	Description	ADT
(North)		
40.38	Grant-Harney County Line	580
49.27	0.01 mile south of Call Meadow Road	480
67.46	Burns Automatic Recorder, Sta. 13-001, 0.32 miles north	630
(South)		
0.11	0.11 miles south of US 20 (Central Oregon Highway)	350
30.95	Harney-Lake County Line	350

Source: ODOT ADT Data

Table 7 – US Highway 395 Average Daily Trips 1999

OR Highway 78 - Traffic volumes on OR Highway 78 are highest in Burns, east of the US Highway 20 junction, where traffic volumes are 3,300 vpd. Traffic volumes drop to 850 vpd at Airport Road, 550 vpd at Lawen, and 410 vpd at Diamond Valley Road. Volumes continue to drop to the southeast to 230 vpd near the Harney/Malheur County line (Table 8).

TABLE 8
AVERAGE DAILY TRIPS (ADT) – VOLUME PER DAY (VPD)
OR HIGHWAY 78 (1999)

MP	Description	ADT
0.01	0.01 mile east of US 20 (Central Oregon Highway)	3300
0.06	0.01 mile east of Alder Avenue	2800
0.17	0.01 mile east of Cedar Avenue	2900
0.26	0.01 mile west of south Elm Avenue	2600
0.48	0.01 mile west of Crane Boulevard	2200
0.71	0.01 mile east of Koa Avenue, east city limits of Burns	1600
1.72	0.01 mile west of OR 205 (Frenchglen Highway)	1500
1.74	0.01 mile east of OR 205 (Frenchglen Highway)	1400
3.67	0.01 mile southeast of Airport Road	850
6.61	0.01 mile southeast of Rye Grass Lane	770
16.75	0.01 mile east of Lawen Lane	540
18.00	1.26 miles east of Lawen	550
27.98	0.10 mile northwest of Crane-Buchanan Road	600
28.18	0.10 mile south of Crane-Buchanan Road	540
37.78	0.01 mile north of Diamond Valley Road	370
37.80	0.01 mile southeast of Diamond Valley Road	410
51.82	0.01 mile west of Malheur Cave Road	340
60.88	Harney-Malheur County Line	230

Source: ODOT ADT Data

Table 8 – OR Highway 78 Average Daily Trips

OR Highway 205 – Volumes on OR Highway 205 vary as the road runs south from its origin at the OR Highway 78 junction, where traffic volumes are 550 vpd and go as high as 660 vpd just south of Island Ranch Road. Volumes decrease to 290 vpd south of Narrows, 190 vpd south of Frenchglen, and 80 vpd where the highway ends at the Roaring Springs Ranch (Table 9).

AVERAGE DAILY TRIPS (ADT) – VOLUME PER DAY (VPD)
OR HIGHWAY 205 (1999)

MP	Description	ADT
0.01	0.01 mile south of Steens Highway (OR 78)	550
2.04	0.01 mile south of Hotchkiss Lane	590
5.11	0.01 mile north of Greenhouse Road	530
6.10	0.01 mile north of Island Ranch Road	640
6.12	0.01 mile south of Island Ranch Road	660
23.92	0.01 mile west of Narrows-Princeton Road	290
23.94	0.01 mile south of Narrows-Princeton Road	230
40.69	0.01 mile north of Diamond Grain Camp Road	240
40.71	0.01 mile south of Diamond Grain Camp Road	300
58.64	Frenchglen Post Office	250
58.75	0.01 mile west of Fish Lake Road at Frenchglen	190
73.34	0.01 mile north of Catlow Valley Road	90

Source: ODOT ADT Data

Table 9 – OR Highway 205 Average Daily Trips 1999

3. US Forest Service Roads

Traffic volumes on USFS roads are intermittent and can range from 0 to 100 vpd or more. The 1997 counts show traffic levels ranging from 63 vpd at the south end of FS28 to 13 vpd on FS14.

4. Bureau of Land Management Roads

Traffic volumes of BLM roads are intermittent and can range from zero to 100 vpd. The 1997 counts show traffic levels of 85 vpd on Steens Loop Road. Steens Loop Road has recently been converted from native material to a gravel surface, which may increase traffic volumes.

5. Roadway Capacity

Transportation engineers have established various standards for measuring the traffic capacity of roadways or intersections. Each standard is associated with a particular level of service (LOS). The LOS concept requires consideration of

factors that include travel speed, delay, frequency of interruptions in traffic flow, relative freedom for traffic maneuvers, driving comfort and convenience, and operating cost. Six standards have been established ranging from Level A where traffic flow is relatively free-flowing, to Level F, where the street system is totally saturated with traffic and movement is very difficult. Table 10 presents the level of service criteria for two-lane highways. Table 11 presents the level of service criteria for arterial roadways.

The *1997 Oregon Highway Plan* establishes operating level of service standards for the state highway system[2]. Highways of statewide importance, such as US Highway 20, should operate at LOS C or better (i.e., average speeds between 20 and 25 mph) in urban and urbanizing areas and at LOS B or better in rural areas (i.e., average speeds equal to or greater than 55 mph). For highways of district importance, such as OR Highway 205, the roadways should operate at LOS D (i.e., average speeds between 15 and 20 mph) in both urban and urbanizing areas and at LOS C (i.e., average speeds equal to or greater than 52 mph) or better in rural areas.

The operations analysis of Harney 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 intersections. No urban sections of roadway were addressed as part of this analysis. The urban section analyses can be found in the separate TSP reports prepared for Burns and Hines.

The *1999 Oregon Highway Plan* does away with the Level of Service structure of using lettered designations and uses rather a volume to capacity (V/C) ration (Table 10). For the given roadway, the volumes at the peak hours are divided by the peak capacity to determine the level at which the roadway is functioning. A ratio that is lower than 1.0 would mean the roadway is able to handle the volume of traffic to some degree. For example, if the V/C Ratio was 7.0, this would indicate that the roadway is functioning at 70% capacity. The ratio system provides a more tangible, understandable way in which to describe the roadway's ability to handle the traffic volumes. The *1999 Oregon Highway Plan* (OHP, Table 6, p. 80) provides the V/C Ratios for the various roadways under their jurisdiction.

[2] *1991 Oregon Highway Plan*, Appendix A, Table 1, Operating Level of Service Standards for the State Highway System.

LEVEL OF SERVICE CRITERIA FOR TWO-LANE HIGHWAYS

Volume/Capacity Ratio[1]	Level of Service[2]	Typical Traffic Flow Condition
0.00-0.48	A	Relatively free flow of traffic with some stops at signalized or stop sign controlled intersections. Average speeds would be at least 30 miles per hour.
0.49-0.59	B	Stable traffic flow with slight delays at signalized or stop sign controlled intersections. Average speed would vary between 25 and 30 miles per hour.
0.60-0.69	C	Stable traffic flow with delays at signalized or stop sign controlled intersections. Delays are greater than at level B but still acceptable to the motorist. The average speeds would vary between 20 and 25 miles per hour.
0.70-0.83 0.84-0.87	D DE	Traffic flow would approach unstable operating conditions. Delays at signalized or stop sign controlled intersections would be tolerable and could include waiting through several signal cycles for some motorists. The average speed would vary between 15 and 20 miles per hour.
0.84-0.97 0.98-0.99	E EF	Traffic flow would be unstable with congestion and intolerable delays to motorists. The average speed would be approximately 10 to 15 miles per hour.
>1.00	F	Traffic flow would be forced and jammed with stop and go operating conditions and intolerable delays. The average speed would be less than 10 miles per hour.

1 Transportation Research Board, Highway Capacity Manual, Special Report 209. National Research Council, 1994.

2 1999 Oregon Highway Plan

Table 10 – State Highways in Harney County

6. Rural Roadway Operations

The traffic operations of mainstream traffic along the rural highway sections were determined using the 1994 Highway Capacity Software. 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. The peak hour traffic was assumed to be 10 percent of the 24-hour ADT volume and the directional split was assumed to be 60/40. In segments where more than one volume was reported, a worst-case analysis was performed using the highest reported volume for that 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 11. All rural segments of the state highways operate at LOS A or better.

SUMMARY OF 1997 OPERATIONS ON TWO-LANE HIGHWAYS

Location	1997 LOS
US Highway 20 between Lake-Harney County Line and US 395	A
US Highway 20 between US 395 and Old Lawen-Harney Road	A
OR Highway 78 between OR 205 and Airport Road	A
OR Highway 205 between Greenhouse Road & Island Ranch Road	A
US Highway 395 between Grant-Harney County Line and US 20	A
US Highway 395 between US 20 and Harney-Lake County Line	A
US Highway 20/395 2.5 miles south of Hines	A

Table 11 – Summary of 1997 Operations on Two-Lane Highways

7. Operations at Intersections

The traffic operation was determined at intersections along the rural highway sections using the 1994 Highway Capacity software. 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 three intersections located along the rural sections of the state highways: US Highway 395 and US Highway 20 at Riley; US Highway 395 and US Highway 20 north of Burns; and OR Highway 205 and OR Highway 78 east of Burns. Traffic operations were analyzed using a peak hour two-way traffic volume of roughly ten percent of the daily traffic. 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. This indicates that all other lower-volume roads or driveways accessing any rural portion of the highways are operating at LOS A as well. The resulting level of service for each highway intersection is shown in Table 12.

In general, the rural sections of the state highways currently operate very well. Both the two-lane highway analysis and the unsignalized intersection analysis indicated that traffic flows smoothly and operates at LOS A or better.

SUMMARY OF 1997 OPERATIONS AT RURAL INTERSECTIONS

Location	Movement	1997 LOS
US Highway 395 and US Highway20 at Riley	Eastbound; Through, Right	A
	Westbound; Left, Through	A
	Northbound; Left, Right	A
US Highway 395 and US Highway 20 North of Burns	Eastbound; Left, Through, Right	A
	Westbound; Left, Through, Right	A
	Northbound; Left, Through, Right	A
	Southbound; Left, Through, Right	A
OR Highway 205 and OR Highway 78 east of Burns	Eastbound; Through, Right	A
	Westbound; Left, Through	A
	Northbound; Left, Right	A

Note: The level of service is shown for all movements of the unsignalized intersections.
Reference: 1999 Oregon Highway Plan

Table 12 – Summary of 1997 Operations At Rural Intersections

8. Accident Analysis

ODOT collects detailed accident information on an annual basis along Highways 20, 78, 205, and 395 in Harney 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 13 shows the accident rates for Highways 20, 78, 205 and 395 in Harney County as well as the Oregon statewide average for rural non-freeway primary state highways from January 1, 1994 to December 31, 1996.

The accident rates for the rural segments of US Highways 20 and 395 during those three years are lower than the statewide average for similar highways; however, the rate for the urban segments of US Highway 20 through Burns were higher than the statewide average. Some rural segments of OR Highways 78 and 205 also exceeded the statewide average.

The three-year accident rates for OR Highway 78 are generally lower than the statewide average. The accident rate for 1996 shows a trend of increasing rates along all segments of the highway.

The three-year accident rates for OR Highway 205 are generally lower than the statewide average except for the segment immediately south of OR Highway 78. The accident rate for 1996 shows a trend of increasing rates along all segments of the highway.

HISTORIC ACCIDENT RATES FOR STATE HIGHWAYS
(Accidents Per Million Vehicle Miles Traveled)

Highway	1996	1995	1994
US Highway 20 (Central Oregon Hwy)			
Lake/Harney Co. line to US Hwy 395 junction	0.74	0.65	0.93
US Hwy 395 junction to Hines city limits	0.57	0.58	0.47
Hines city limits to Burns city limits	0.68	0.34	2.06
Burns city limits to OR Hwy 78 junction	1.96	3.38	4.06
OR Hwy 78 junction to Burns north city limits	1.30	1.20	4.21
Burns north city limits to US Hwy 395 junction	0.66	0.63	NA
US Hwy 395 junction to Buchanan Road	0.67	0.58	0.51
Buchanan Road to Malheur/Harney Co. line	0.68	0.34	0.43
US Highway 395 (John-Day Burns Hwy)			
Grant/Harney Co. line to National Forest boundary	0.68	0.64	1.61
National Forest boundary to US Hwy 20 junction	0.77	0.35	0.70
US Highway 395 (Lakeview-Burns Hwy)			
US Hwy 20 junction to Lake/Harney Co. line	0.88	0.24	0.48
OR Highway 78 (Steens Hwy)			
US Hwy 20 junction to Burns	NA	3.46	1.73
Burns to OR Hwy 205 junction	NA	1.97	NA
OR Hwy 205 junction to Crane junction	0.39	0.38	0.76
Crane junction to Lava Beds Road	0.70	0.62	0.62
Lava Beds Road to Malheur/Harney Co. line	1.69	0.54	0.54
OR Highway 205 (Frenchglen Hwy)			
OR Hwy 78 junction to Island Ranch Road	1.08	1.06	NA
Island Ranch Road to The Narrows	0.52	0.50	1.51
The Narrows to Grain Camp Road	NA	NA	1.09
Grain Camp Road to Frenchglen	1.33	NA	NA
Frenchglen to Roaring Springs Ranch/end Hwy	0.59	0.41	0.69
Average for all **Rural** Non-freeway Primary/Secondary State Highways	0.89/1.26	0.89/1.11	0.81/1.10
Average for all **Urban** Non-freeway Primary/Secondary State Highways	3.63/3.10	3.98/3.27	3.45/2.79

Source: Oregon Department of Transportation Accident Rate Tables.

Table 13 – Historic Accident Rates For State Highways

Table 14 contains detailed accident information on Highways 20, 78, 205, and 395 in Harney County from January 1, 1994 to December 31, 1996. It shows the number of fatalities and injuries, property damage only accidents, the total number of accidents, and the overall accident frequencies and rates for the segments of these roadways in Harney County.

ACCIDENT SUMMARIES FOR STATE HIGHWAYS
(January 1, 1994 To December 31, 1996)

Location	Fatalities	Injuries	Property Damage Only	Total Accidents	Accident Frequency (acc/mi/yr)	Accident Rate (acc/mvm)
US Highway 20 (*Central Oregon Hwy*)						
MP 83.79 to MP 128.73	5	49	25	54	0.40	0.66
MP 128.73 to MP 130.10	0	2	7	9	2.19	1.03
MP 130.10 to MP 132.51	0	25	34	53	7.33	2.69
MP 132.51 to MP 180.15	1	37	34	43	0.30	0.56
OR Highway 78 (*Steens Hwy*)						
MP 0.00 to MP 47.23	1	22	9	20	0.11	1.12
OR Highway 205 (*Frenchglen Hwy*)						
MP 0.00 to MP 73.35	0	9	5	12	0.05	0.87
US Highway 395 (*John Day-Burns Hwy*)						
MP 0.00 to MP 67.78	0	10	5	14	0.17	0.79
US Highway 395 (*Lakeview-Burns Hwy*)						
MP 0.00 to MP 73.35	1	4	2	5	0.06	0.53

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

Table 14 – Accident Summaries For State Highways

9. US Highway 20

On the five rural segments of US Highway 20 within Harney County during the three-year period, there was a total of 97 accidents, 59 of which were reported as property damage only. There were six fatalities and 86 injuries on these roadway segments during the period. Seven of the accidents occurred at intersections and 19 occurred on icy pavement. The accidents were scattered along the roadway segments and there were no particular locations which showed a consistent accident pattern. The accident rates on all five of the rural segments are lower than the statewide average of 0.89 accidents per million vehicle miles (mvm) for all primary, rural, non-freeway highways, indicating that these segments do not have significant safety problems.

On the two urban segments of US Highway 20 through the cities of Burns and Hines during the three-year period, there was a total of 62 accidents, 41 of which were reported as property damage only. There were no fatalities and 27 injuries on these roadway segments during the period. Thirty-two of the accidents occurred at intersections and 14 occurred on icy pavement. The two primary causes of accidents occurring at intersections were due to driver error in yielding the right-of-way and driver failure to stop in icy conditions; resulting in rear-end collisions. The accident rates on these two segments are well below the statewide average for all urban, primary, non-freeway highways.

The urban segment within Burns between the OR Highway 78 junction and Burns north city limits (MP 131.50 to MP 132.51) had 11 accidents between 1994 and 1996, with a 1996 accident rate of 1.30 accidents per mvm, well below the statewide average of 3.63 for all urban, primary, non-freeway highways. There

were no fatalities, nine injuries, and eight accidents involving property damage only. Six of the accidents occurred under icy road conditions. The accidents were scattered along this one-mile segment and nearly half (5) of the accidents involved rear-end collisions, three of which occurred under wet or icy road conditions.

The urban segment between the Hines/Burns city limits and the OR Highway 78 junction (MP 130.10 to MP 131.50) had 42 accidents between 1994 and 1996, with a 1996 accident rate of 1.96 accidents per mvm, well below the statewide average of 3.63 for all urban, primary, non-freeway highways. There were no fatalities, 18 injuries, and 29 accidents involving property damage only. The accidents were scattered along this 1.4-mile segment and over half (24) occurred at intersections. The primary vehicle maneuvers involved in the accidents included: turning maneuvers (12), angle maneuvers (7), and rear-end collisions (10). The remaining accidents fall under "other" maneuvers. Two intersections had five or more accidents during the three-year period.

- The intersection of US Highway 20 (W. Monroe Street) and Egan Avenue located at MP 131.22 had six accidents from 1994 through 1996. All accidents occurred during dry roadway conditions. All six accidents appear to stem from driver error including: disregarding traffic signal (3), turning from the wrong lane (1), hitting a fixed vehicle (1), turning in front of an on-coming vehicle (1). It does not appear that a consistent accident pattern exists at the intersection. There is no evidence to suggest that intersection operations (signals, signing, striping, etc.) were contributing factors in any of the accidents.

- The intersection of US Highway 20 (W. Monroe Street) and the OR Highway 78 junction located at MP 131.50 had five accidents from 1994 through 1996. Three of the accidents occurred during icy/snowy roadway conditions. All five accidents appear to stem from driver error including: turning into the wrong lane (1), disregarding traffic signal (1), turning in front of an on-coming vehicle (1), speeding (1), and driving an unsafe vehicle (1). It does not appear that a consistent accident pattern exists at the intersection. There is no evidence to suggest that intersection operations (signals, signing, striping, etc.) were contributing factors in any of the accidents.

10. OR Highway 78

On the four rural segments of OR Highway 78 within Harney County during the three-year period, there was a total of 20 accidents, 11 of which were reported as property damage only. There was one fatality and 22 injuries on these roadway segments during this period. One of the accidents occurred at an intersection and four occurred on icy/wet pavement. The accidents were scattered along the roadway segments and there were no particular locations which showed a

consistent accident pattern. Accident rate information for 1996 was only available for three of the four rural segments. Two segments were below the statewide average of 1.26 accidents per mvm for all rural, secondary, non-freeway highways while the segment from Lava Beds Road (MP 37.79) to the Malheur/Harney County line (MP 47.23) exceeded the state average by nearly 0.50 accidents per mvm. Five accidents occurred along this segment between 1994 and 1996. The identified driver error in four of the five accidents was "driving too fast for roadway conditions." This error does not necessarily imply speeding, but rather failure to adjust speed to prevailing roadway conditions.

On the short urban segment of Highway 78 within Burns during the three-year period, there was a total of three accidents, two of which were reported as property damage only. There were no fatalities and two injuries on this roadway segment during the period. All three accidents occurred at intersections during dry pavement conditions. The identified driver error in all three of the accidents was "failure to yield right-of-way." There is no evidence to suggest that intersection operations (signals, signing, striping, etc.) were at fault. Accident rate information was not available for 1996.

11. OR Highway 205

There were twelve accidents on the rural section of OR Highway 205 during the three-year period. These consisted of no accidents with fatalities, nine with injuries, and five with property damage only. Two of the accidents occurred during wet/icy roadway conditions. The accidents were scattered along the roadway segment and there were no particular locations which showed a consistent accident pattern. Accident rate information for 1996 was only available for four of the five rural segments. Three of the segments were below the statewide average of 1.26 accidents per mvm for all rural, secondary, non-freeway highways, while the following segment exceeded the statewide average with an 1996 accident rate of 1.33: Grain Camp Road (MP 40.62) to Frenchglen (MP 58.76).

Three accidents occurred along this segment. In all three cases, the identified driver error was "driving too fast for roadway conditions." This error does not necessarily imply speeding, but rather failure to adjust speed to prevailing roadway conditions. Roadway conditions for three of the five accidents were wet and/or icy.

12. US Highway 395 (John-Day Burns Highway)

There were 14 accidents on the rural section of US Highway 395 (John-Day/Burns Hwy) during the three-year period. These consisted of no accidents with fatalities, ten with injuries and five with property damage only. Three of the accidents occurred under wet/icy roadway conditions. The accidents were scattered along the roadway segment and there were no particular locations

which showed a consistent accident pattern. The accident rates for the two rural segments of US Highway 395 are below the statewide average for all rural, primary, non-freeway highways, indicating that these segments do not have any significant safety problems. In 10 of 14 accidents, the identified driver error was "driving too fast for roadway conditions." This error does not necessarily imply speeding, but rather failure to adjust speed to prevailing roadway conditions. Roadway conditions for three of those ten accidents were wet and/or icy.

13. US Highway 395 (Lakeview-Burns Highway)

There were five accidents on the rural section of US Highway 395 (Lakeview/Burns Hwy) during the three-year period. Two of the accidents occurred during wet roadway conditions. The accidents were scattered along the roadway segment and there were no particular locations which showed a consistent accident pattern. The accident rate for the rural segment of US Highway 395 is below the statewide average for all rural, primary, non-freeway highways, indicating that this segment does not have significant safety problems. In two of the five accidents, the identified driver error was "driving too fast for roadway conditions." This error does not necessarily imply speeding, but rather failure to adjust speed to prevailing roadway conditions. Roadway conditions for one of the two accidents were wet and/or icy.

4.2 Transportation Demand Management Measures

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

4.2.1 Alternative Work Schedules

One way to maximize the use of the existing transportation system is to spread peak traffic demand over several hours instead of a single hour. Statistics from the 1990 US Census show the spread of departure to work times over a 24-hour period (see Table 15). Twenty-five percent of the total employees depart for work between 7:00 and 8:00 a.m. Another 30 percent depart in either the hour before or the hour after the peak.

DEPARTURE TO WORK DISTRIBUTION

	1990 Census	
Departure Time	**Trip**	**Percent**
12:00 a.m. to 4:59 a.m.	125	4.5
5:00 a.m. to 5:59 a.m.	339	12.2
6:00 a.m. to 6:59 a.m.	477	17.2
7:00 a.m. to 7:59 a.m.	696	25.0
8:00 a.m. to 8:59 a.m.	391	14.1
9:00 a.m. to 9:59 a.m.	121	4.4
10:00 a.m. to 10:59 a.m.	80	2.9
11:00 a.m. to 11:59 a.m.	23	0.8
12:00 p.m. to 3:59 p.m.	333	12.0
4:00 p.m. to 11:59 p.m.	192	6.9
Total	**2,777**	**100.0**

Source: US Bureau of Census.

Table 15 – Departure To Work Distribution

Assuming an average nine-hour workday, the corresponding afternoon peak can be determined for work trips. Using this methodology, the peak work travel hour would occur between 4:00 and 5:00 p.m. which corresponds with the peak hour of activity measured for traffic volumes

4.3 Travel Mode Distribution

Although the automobile is the primary mode of travel for most residents in Harney County, some other modes are used as well. Modal split data is not available for all types of trips; however, the 1990 US Census data does include statistics for journey to work trips as shown in Table 16. The census data reflects the predominant use of the automobile.

Most Harney County residents travel to work via a private vehicle. In 1990, 83 percent of all trips to work were in an auto, van, or truck. Trips in single-occupancy vehicles comprised 73 percent of all trips, and carpooling accounted for ten percent.

Bicycle usage was lower than many other counties (approximately 1 percent) in 1990. Since the census data does not include trips to school or other non-work activities overall bicycle usage may be higher. There are no roadways in Harney County with dedicated bicycle lanes on them. In addition to bicycle lanes, bicycle parking, showers, and locker facilities can help to encourage bicycle commuting. Pedestrian activity was high (8 percent of trips to work) in 1990. Again, census data do not include trips to school or other non-work activities.

JOURNEY TO WORK TRIPS

	1990 Census	
Trip Type	**Trips**	**Percent**
Private Vehicle	2,469	83.1
Drove Alone	*2,168*	*88.2*
Carpooled	*291*	*11.8*
Public Transportation	7	0.2
Motorcycle	2	0.1
Bicycle	30	1.0
Walk	237	8.0
Other	32	1.1
Work at Home	193	6.5
Total	**2,970**	**100.0**

Source: US Bureau of Census.

Table 16 – Journey To Work Trips

Chapter

5

5 Traffic Forecasts

5.1 Land Use

5.2 Traffic Volumes

5.3 Highway System Capacity

The traffic volume forecasts for Harney County are based on the historic growth of 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. Traffic projections were made following ODOT's *Level 1 - Trending Analysis* methodology. More detailed traffic forecasts were performed in the urban sections of Burns and Hines, and are located in the separate TSPs for those cities.

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5.1 Land Use

Land use and population growth play 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. 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 C.

5.1.1 Historic

Population levels in most of Eastern Oregon are close to, or actually lower than, those experienced earlier in the century (see Table 17). Counties included in this phenomenon include Baker, Harney, Union, Grant, and Wallowa. The population of Harney County and the Cities of Burns and Hines actually declined in the 1980s and 1990s, reflecting a general slowdown in the state's economy.

HARNEY COUNTY POPULATION TRENDS

Year	Population	Average Annual Growth Rate	Total Growth
1970	7,215	-	-
1980	8,315	1.4%	15.2%
1985	7,350	-2.4%	-11.6%
1990	7,060	-0.8%	-3.9%
1995	7,050	-0.0%	-0.1%
1997	7,500	3.1%	6.4%

Source: US Bureau of the Census.

Table 17 – Harney County Population Trends

5.1.2 Projected

Projecting future population growth for Harney County is difficult because long-term historic growth has been very low but in the past few years, both the Cities of Burns and Hines have been experiencing a period of strong economic growth. Two methodologies were employed in forecasting the future population of Harney County. One relies more heavily on long-term growth trends while the other tries to factor in the recent economic strength. The results of both forecasts are shown in Table 18.

HARNEY COUNTY POPULATION PROJECTIONS

Year	Population	Average Annual Growth Rate	Total Growth
Office of Economic Analysis Forecasts (1)			
1995	7,050	-	-
2000	7,525	1.3%	6.7%
2005	7,605	0.2%	1.1%
2010	7,650	0.1%	0.6%
2015	7,690	0.1%	0.5%
2017	7,710	0.1%	0.3%
Alternative Growth Scenario (2)			
1990	7,060	-	-
1997	7,500	0.9%	6.2%
2017	8,910	0.9%	18.8%
OEA 1997-2017	**210**	**0.14%**	**2.8%**
Alternative 1997-2017	**1,410**	**0.87%**	**18.8%**

Notes:

(1) 1995 estimates developed by Portland State University Center for Population Research and Census; forecasts developed by State of Oregon Office of economic Analysis.

(2) 1990 data from the US Census Bureau; forecasts developed by David Evans and Associates, Inc.

Table 18 - Harney County Population Projections

5.1.3 Office of Economic Analysis Forecasts

Historical data were compiled as reported by the US Census Bureau and official population estimates were acquired from Portland State University's Center for Population Research and Census. Based on the university estimates through 1995 and a state econometric model, the State of Oregon Office of Economic Analysis provided long-term (through year 2040) 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.

Using this methodology, Harney County is expected to experience a population gain of 210 people between 1997 and 2017. This represents an increase of 2.8 percent from the 1997 estimate of 7,500 to an estimated 7,710 in year 2017.

At the request of Harney County and its jurisdictions, David Evans and Associates, Inc. prepared an alternative growth scenario for the purposes of this TSP. The alternative growth scenario applies the average 1990 to 1997 growth rate of Harney County and each of its jurisdictions to the 20-year planning horizon.
Using this alternative methodology, Harney County is expected to experience a population gain of 1,410 people during the next 20 years. This represents an increase of almost 19 percent from the 1997 estimate of 7,500 to an estimated 8,910 in year 2017. The estimate for the year 2017 is higher than that made by the State Office of Economic Analysis by 1,200 people.

5.1.4 Summary

Factors that will affect the future growth rate of Harney County include employment opportunities, available land area for development, and community efforts to manage growth. These two methodologies were employed to illustrate the range of population growth that may occur in the planning area. Planning efforts must respond carefully to actual growth rates, as recent population estimates have varied widely from forecasts previously developed. The population forecasts described in this report were developed to help determine future transportation needs. The amount of growth, and where it occurs, will affect traffic and transportation facilities in the study area.

5.1.5 Potential Development Impact Analysis

To supplement the demographic analysis and to determine more specific potential growth areas in Harney County, the ODOT Potential Development Impact Analysis was reviewed. The analysis identifies areas of potential growth based on land use. Potential growth areas, or "polygons," are identified around the county based on zoning. The detailed data provided by ODOT is contained in Appendix D. A summary of the data is shown in Table 19. This table reflects

corrections made by Harney County to some of the parcel sizes and zoning. There may be discrepancies between the population forecasts generated for this analysis and those generated by the Office of Economic Analysis. The population forecasts cited here are for transportation purposes only and should not be used otherwise.

For the purposes of the analysis, Harney County was divided into six polygons. These polygons were determined by county zones using a minimum lot size of five acres or less. The following uses were analyzed for potential development:

- Rural Residential (R-1)
- Rural Community (RC)
- Exclusive Farm Use (EFU)

Four of the six polygons in Harney County are designated entirely for Rural Residential uses (R-1). These are the Hebener Tracts, northeast of Burns; North Burns, north of Burns; Highland Ranch Estates, south of the Hines urban growth boundary; and Garland Acres, west of Burns and Hines. Of the 536.8 acres in these polygons, an estimated 353.9 are developed and 18.29 are vacant, allowing up to 72 additional residential units.

The Drewsey polygon is located north of US Highway 20 in northeast Harney County. Comprised of an estimated 112 acres, land in this polygon is designated for Rural Community (RC) uses, yielding an estimated 93 additional residential units.

The Crane polygons are located east of Burns on OR Highway 78 in northeast Harney County. Crane High School occupies an estimated 33 of the 160 acres. The remainder of the polygon is designated for Rural Community uses, yielding an estimated 56 additional residential units.

Overall, the Potential Development Impact Analysis indicates that there are 136 residential units existing in the rural Harney County areas with a maximum potential of 221 additional units. Overall, this would translate to a maximum of about 2,200 additional trips each day (assuming 10 trips per day per household). These additional trips are not expected to cause an undue overload on the road system since they would be spread throughout Harney County. Also, this is a maximum development number, not a forecast, and therefore, it shows a worst-case scenario.

POTENTIAL DEVELOPMENT IMPACT ANALYSIS SUMMARY

		Acreage			Residential Units		
Polygon	**Zoning**	**Net Area**	**Built**	**Vacant**	**Existing**	**Potential**	**Total**
Hebener Tracts	R-1	266.0	203.0	63.0	24	13	37
North Burns	R-1	103.0	69.8	33.2	27	12	39
Highland Ranch Estates	R-1	58.2	21.4	36.8	16	27	43
Garland Acres	R-1	109.6	59.7	49.9	8	20	28
Drewsey	RC	112.0	19.0	93.0	19	93	112
Crane I	EFU	33.0	33.0	0.0	6	0	6
Crane II	RC	127.0	51.4	75.6	36	56	92
Subtotal Residential		**536.8**	**353.9**	**182.9**	**75**	**72**	**147**
Subtotal Rural Community		**239.0**	**70.4**	**168.6**	**55**	**149**	**204**
Subtotal Exclusive Farm Use		**33.0**	**33.0**	**0.0**	**6**	**0**	**6**
TOTAL		**808.8**	**457.3**	**351.5**	**136**	**221**	**357**

Source: Oregon Department of Transportation, Potential Development Impact Analysis

Table 19 – Potential Development Impact Analysis Summary

5.2 Traffic Volumes

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

5.2.1 Historic

Before projecting future traffic growth, it is important to examine past growth trends on the Harney County roadway system. Historic data are only available for the state highway system in Harney 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 and around Harney County were established using the average annual daily traffic volume information presented in the ODOT *Traffic Volume Tables* for the most recent 20-year period. The traffic volumes were obtained for each of these years at several locations along each highway. Using a linear regression analysis of the average volumes, an average annual growth rate was determined. Table 20 summarizes the historic average growth rate on each of these sections.

Over the past 20 years, growth on the rural sections of US Highway 20 in Harney County has ranged between 1.2 and 2.6 percent per year. Traffic volumes on the rural sections of US Highway 395 have been growing at a rate of 0.2 and 0.6 percent per year south of Riley (Lakeview-Burns Highway) and north of Burns (John Day-Burns Highway), respectively. South of Burns, the rural section of OR Highway 78 has had little to no growth in traffic over the past 20 years. The rural section of OR Highway 205 south of Burns has been growing at a rate of 2.9 percent per year.

In general, growth on the rural sections of the state highways exceeded the population growth in Harney County. This relationship reflects the modern trend toward an increase in per capita vehicle miles traveled and the increase in commercial and tourist traffic.

The decrease in traffic volumes on the urban sections of the state highways could be a result of the decrease in population in Harney County during this period.

HISTORIC GROWTH RATES ON STATE HIGHWAYS

Highway Section	20-Year Average Annual Growth Rate	20-Year Total Growth
US Highway 20		
Rural Section west of Hines	2.6%	68.4%
Rural Section east of Burns	1.2%	27.4%
US Highway 395		
Rural Section south of Riley	0.2%	4.6%
Rural Section north of Burns	0.6%	13.6%
OR Highway 78		
Rural Section south of Burns	0.0%	0.5%
OR Highway 205		
Rural Section south of Burns	2.9%	76.9%

Source: ODOT Transportation Volume Tables.
Table 20 – Historic Growth Rate on State Highways

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

5.2.2 Forecasting Methodology

The forecasting methodology was based on the available existing and historical traffic data and population growth trends. The traffic forecast for Harney County was performed using ODOT's *Level 1 - Trending Analysis*[3] methodology. This type of forecast projects future traffic volumes based on one or more of the following growth rates: the historical growth on the state highway system, the historical population growth, and the projected population growth.

The forecasting methodology used in this forecast assumed that traffic demand on the state highways will grow at a rate equivalent to the historical traffic growth trend of each highway. To confirm that using the historical traffic growth trend in the Trending Forecast analysis was the best projection methodology, comparisons were made with the historical and projected population growth for the county.

Comparisons show that historical traffic growth rates on most of the rural sections of the four state highways in the county are higher than the historical and projected population growth rates for the county. In only two areas the historical traffic growth rate was lower than the projected population growth rate. One of these areas is US Highway 395, south of Riley, where the average 20-year traffic growth rate was 0.2 percent per year. The other area is on OR Highway 78, south of Burns, where traffic growth remained flat over the 20-year period. All other rural highway sections in the county had average traffic growth rates ranging from 0.6 to 2.9 percent per year. This range of rates is similar to or

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

higher than both the historical population growth rate, which was negative, and the projected population growth rate of about 0.9 percent per year.

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.

5.2.3 Future Traffic Volumes

Using the same linear regression analysis used to calculate the historic growth rate of traffic, forecasts were made for the year 2018 (See Figure 5-1). Where the historic growth rates were very low, traffic volume projections were based on the projected population for Harney County. The resulting projected growth varies from under 20 percent to over 40 percent.

Figure 5-1 Estimated 2018 Average Daily Traffic Volumes

5.3 Highway System Capacity

Future year 2018 operations analyses were performed on the rural sections of state highways in Harney County.

5.3.1 Rural Roadway Operations

The two-lane highway analyses indicated that all of the highway segments analyzed operate at LOS A in 1997 and will operate at LOS B or better through the 20-year study period. The results of the two-lane highway analyses are shown in Table 21.

SUMMARIES OF FUTURE OPERATIONS OF TWO-LANE HIGHWAYS

Location	1997 LOS	2018 LOS	Maximum Volume to Capacity Ratios (Rural Lands)
US 20 between Lake-Harney County Line & US Highway 395	A	B	0.70
US 20 between Highway 395 & Old Lawen-Harney Road	A	B	0.70
OR 78 between Highway 205 & Airport Road	A	A	0.70
OR 205 between Greenhouse Road & Island Ranch Road	A	A	0.75
US 395 between Grant-Harney County Line & US Highway 20	A	A	0.70
US 395 between US Highway 20 & Harney-Lake County Line	A	A	0.70
US 20/395 2.5 miles south of Hines	A	A	0.70

Reference: 1999 Oregon Highway Plan

Table 21 – Summaries of Future Operations of Two-Lane Highways

5.3.2 Operations at Intersections

Unsignalized intersection analyses were performed at three intersections on the highways for both the existing and future conditions. The analyses indicated that all of the intersections are expected to meet ODOT standards over the 20-year forecast period. In general, the unsignalized intersections on the rural sections of the state highways in Harney County operate very well. All movements operate at LOS A in both the existing and future conditions. The results of the unsignalized intersection analyses are shown in Table 22.

SUMMARY OF FUTURE OPERATIONS AT RURAL INTERSECTIONS

Location	Movement	1997 LOS	2018 LOS	Maximum Volumes To Capacity Ratios (Rural Lands)
US Highway 395 and	Eastbound; Through, Right	A	A	0.70
US Highway 20	Westbound; Left, Through	A	A	0.70
at Riley	Northbound; Left, Right	A	A	0.70
US Highway 395 and	Eastbound; Left, Through, Right	A	A	0.70
US Highway 20	Westbound; Left, Through, Right	A	A	0.70
North of Burns	Northbound; Left, Through, Right	A	A	0.70
	Southbound; Left, Through, Right	A	A	0.70
OR Highway 205 and	Eastbound; Through, Right	A	A	0.75
OR Highway 78	Westbound; Left, Through	A	A	0.75
East of Burns	Northbound; Left, Right	A	A	0.75

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

Reference: 1999 Oregon Highway Plan

Table 22 – Summary of Future Operations at Rural Intersections

In general, the rural sections of the state highways currently operate very well. Both the two-lane highway analysis and the unsignalized intersection analysis indicated that traffic flows smoothly and operates at LOS B or better.

Chapter

6

6 Improvement Options Analysis

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

The proposed transportation system improvements recommended for the Harney County TSP include both state highway and local road projects. This section of this TSP describes the individual improvements and their associated costs.
Each of the transportation system improvement options were developed to address specific deficiencies, safety issues, or access concerns. The following list includes all of the potential transportation system improvements considered. Improvement options evaluated include:

1. Implement Transportation Demand Management Strategies.
2. Improve OR Highway 205 on P Hill.
3. Improve the intersection of Greenhouse Lane and US Highway 20/395.
4. Construct a bypass/truck route around the Burns-Hines urban area.
5. Develop a private road standard for the Meadowlands Ranch area.
6. Upgrade structurally deficient and functionally obsolete bridges.
7. Create a new connection from the main Burns Paiute Indian Reservation to Monroe Street

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

6.1 Evaluation Criteria

The evaluation of the potential transportation improvements was based on an analysis of traffic projections, a qualitative review of safety, environmental, socioeconomic, and land use impacts, as well as estimated cost. The potential improvements were analyzed to determine if they could reduce congestion and delay, as well as vehicle miles traveled, because of the beneficial effects of those reductions.

In addition to the quantitative traffic analysis, three factors were evaluated qualitatively: 1) safety; 2) environmental factors, such as air quality, noise, and water quality; and 3) socioeconomic and land use impacts, such as right-of-way requirements and impacts on adjacent lands.

The final factor in the evaluation of the potential transportation improvements was cost. Costs were estimated in 1998 dollars based on preliminary alignments for each potential transportation system improvement.

6.2 Improvement Options Evaluation

Through the transportation analysis and input provided from the public involvement program, several improvement projects were identified. These options included reconstructing existing intersections and providing improved vehicular traffic flow.

6.2.1 Option 1. Implement Transportation Demand Management Strategies

Overview: One of the goals of the Oregon Transportation Planning Rule is to reduce the reliance on the automobile. The rule recommends that counties should evaluate transportation demand management measures as part of their TSPs. 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 staggered work schedules at local businesses. These types of strategies may be more effective in a large urban city, but some strategies can still be useful in the rural and urban areas of Harney County.

There is one measure that would be useful in Harney County: development of facilities for alternative modes of transportation. This would include paved shoulders and paths that would handle pedestrians and bicyclists.

All future street improvement projects in the rural areas of Harney County, whether they involve new roadways or a retrofit of an existing roadway, should include the addition of two- to four-foot paved shoulders, depending on the amount of traffic on the roadway. This would allow pedestrians and bicyclists to travel separately from the traffic on the road. All future street improvement projects in the urban areas of the cities of Harney County should include a pedestrian facility, such as a walkway or sidewalk, and should consider bicycle lanes as well.

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. With more emphasis on walking or biking in the county, conditions such as air quality and noise levels would be improved as well.

Cost: The present day 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 four feet in width would cost around $25 per linear foot of road. This would include four inches of asphalt and nine inches of aggregate.
- *Multi-Use Paths* - A multi-use path ten feet in width would cost around $16 per linear foot. This includes two inches of asphalt and four 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 Harney County.

Recommendation: Implementing transportation demand management strategies would provide needed facilities for pedestrians and bicyclists, increase the safety of the roadway system, and enhance the quality of life in Harney County. Therefore, the transportation demand management strategies summarized above are recommended.

6.2.2 Option 2. Improve OR Highway 205 on P Hill

Overview: The segment of OR Highway 205, south of Frenchglen known as P Hill, is a high hazard section of state highway for approximately two miles. This segment has a 14 percent grade, lying on the north exposure with a series of significant curves. It has a history of accidents, from minor vehicle damage to serious personal injury. The majority of the Frenchglen school children travel the stretch daily from September through May, and during winter conditions, travel is very hazardous.

ODOT is currently operating under a cooperative agreement with Harney County Road Department for winter maintenance of this segment of OR Highway 205. There is a conscientious effort to keep the snow off the highway and have it sanded prior to the children traveling to school in the mornings; however, this does not negate the inherent risk of the grade and curves on P Hill.

Harney County and ODOT have an agreement to address some of the hazards of the hill by installing guardrails and realigning some curves. The work was completed in the summer of 1998.

To limit additional traffic on this hazardous section of roadway, access to the highway should be evaluated carefully. Very limited access should be permitted to the segment of OR Highway 205, beginning just south of the Frenchglen Hotel in Frenchglen, to the top of P Hill, approximately ¼ mile south of the last curve on top of the hill.

Impacts: Traffic volumes on this section of highway are currently about 160 vpd on the southeast side of Frenchglen tapering off to about 80 vpd at Roaring Springs Ranch. Although there have been some accidents along this stretch of highway, accident rates do not indicate that they are significantly above the state averages.

Cost: None.

Recommendation: Harney County and ODOT should carefully evaluate access to OR Highway 205 from proposed development to determine the potential impacts of a project. If the impacts of a proposed project are determined to be potentially adverse to the safety of this stretch of highway, access may be limited, denied or other possible alternatives review to mitigate potential hazards.

6.2.3 Option 3. Improve the Intersection of Greenhouse Lane & US Highway 20/395

Overview: Greenhouse Lane approaches US Highway 20/395 at an oblique angle and steep grade because the highway lies on a higher elevation than the side street. The angular approach and difference in grade raises several safety issues:

- Trucks making right turns from the highway onto Greenhouse Lane can get hung up or high-centered on the super-elevated corner needed to accommodate both the oblique angle and the grade difference.
- Trucks making left turns from Greenhouse Lane to the highway can also get hung up on the super-elevated corner.
- All vehicles making right turns from the highway onto Greenhouse Lane need to decelerate to a near stop to negotiate the sharp turn.
- Accelerating to merge into the high-speed highway traffic can be difficult especially for vehicles turning from Greenhouse Lane to westbound US Highway 20/395.
- Sight distance can be restricted by both the grade and angle of approach.

To address these issues, the alignment of Greenhouse Lane would need to be adjusted to intersect US Highway 20/395 at a right angle. The vertical curve on Greenhouse Lane would need to be filled to highway elevation for approximately 50 feet behind the stop line and then adjusted to regain the existing Greenhouse Lane elevation approximately 150 feet behind the stop line.

Impacts: The benefits of this improvement would include better sight distance, easier acceleration and deceleration, and at-grade turns. Overall, the intersection would operate more safely than it currently does.

There are no significant negative impacts associated with these improvements. The realignment could require some right-of-way acquisition on the southeast side of the intersection. The additional fill to raise the elevation of Greenhouse Lane would also cover a wider area but would probably not run outside of the standard 60-foot right-of-way for a county road.

Cost: The estimated cost for this improvement is $39,000.

Recommendations: Because this improvement addresses safety issues on both state and county roads, it should be included in the street system plan.

6.2.4 Option 4. Construct a Bypass/Truck Route Around Burns/Hines Urban Area

Traffic on the rural section of Highways 20, 395, 78, and 205 has been increasing at a more rapid rate than traffic in the Cities of Burns and Hines. As a result, through traffic, particularly trucks, is becoming a more noticeable component of traffic within the cities. Currently, through traffic makes up about 15 percent of the total traffic entering the cities. Within the higher volume cores of the cities, through traffic makes up a smaller percentage of the total traffic volume.

To address residents' concerns about through traffic, five alternative bypass/truck routes were developed and evaluated to provide an alternate route around the cities. These alternatives are shown in Figure 6-1. They all seek to use existing roadways when possible with added connections where necessary.

Figure 6-1 Bypass/Truck Route Alternatives

Alternative 1 - Fry Lane to Hotchkiss Lane

Overview: This first alternative, shown in Section A, would take through traffic along Fry Lane, Highway 205, Hotchkiss Lane, and Lottery Lane. Traffic would divert at the north US Highway 20/395 junction and reconnect with the Highway at Lottery Lane on the south side of Hines.

Impacts: This bypass route is the shortest of the four evaluated. It uses existing roadways for all of its length with minor pavement and shoulder improvements as well as several bridge and culvert replacements.

The major impact of this bypass would be to businesses that serve highway travelers. They would lose customers that would go around the cities and be serviced at the next town on the highway. However, because there are no nearby cities, some travelers may still choose to go into Burns and Hines for services.

The junction of US Highway 20/395 would be reconstructed to form a simple three-leg intersection as part of the Silvies River Bridge to Highway 395 Junction project. The new junction will already be aligned with Fry Lane, which means that no new construction would be required to improve the intersection.

Another impact would be the relocation of the weigh station to a site on US Highway 20 east of the north US Highway 20/395 junction.

A final concern would be the construction outside of the Burns UGB. Because this improvement does not require new construction through rural lands or add capacity to existing roadways, goal exceptions may not be needed. However, cooperation between the city and county will be critical.

Cost: The estimated construction cost for this improvement is $1,231,000. It includes modifying approximately 10,300 feet of Fry Lane and 17,000 feet of Hotchkiss Lane/Lottery Lane. The cost includes some overlay, new shoulders and relocating the existing weigh station to a new location.

Alternative 2 - Red Barn Lane to Hotchkiss Lane

Overview: This alternative, shown in Section B, would use a combination of existing roadways and new connections. Red Barn Lane is a county road that runs between US Highway 20 and OR Highway 78. A new connection would extend from Red Barn Lane at OR Highway 78 to Hotchkiss Lane at OR Highway 205. Hotchkiss Lane and Lottery Lane would be used to reconnect with the highway.

Impacts: This bypass route is longer than Alternative 1 and would require some new roadway construction. Existing roadways would need minor pavement and shoulder improvements as well as several bridge and culvert replacements.

The new roadway would travel through seasonally inundated grasslands. Environmental impacts could arise from construction through these wet areas. Water run-off could also be an environmental factor.

This route would only serve through traffic traveling to and from the east on US Highway 20. The loss of this traffic would impact businesses that serve highway travelers. They would lose customers that would go around the cities and be serviced at the next town on the highway. However, because there are no nearby cities, some travelers may still choose to go into Burns and Hines for services.

Another impact would be the relocation of the weigh station to a site on US Highway 20 east of the north US Highway 20/395 junction.

A final concern would be construction outside of the Burns UBG. Because this improvement would require new construction through rural lands, exceptions to several statewide planning goals would be needed. Without strong justification for building outside of the UGB, securing goal exception may not be possible.

Cost: The estimated construction cost for this improvement is $3,395,000. It includes modifying approximately 10,300 feet of Red Barn Lane and 17,000 feet of Hotchkiss Lane/Lottery Lane as well as constructing 16,000 feet of new roadway. The cost includes some overlay and new shoulders on existing roadways. It also includes relocating the existing weigh station.

Alternative 3 - Old Experiment Station Road to Hotchkiss Lane

Overview: This alternative, shown in Section C, would use a combination of existing roadways and new connections. Old Experiment Station Road is a county road that runs between US Highways 20 and OR Highway 78. A new connection would extend from Old Experiment Station Road at OR Highway 78 to Hotchkiss Lane at OR Highway 205. Hotchkiss Lane and Lottery Lane would be used to reconnect with the highway.

Impacts: This bypass route is longer than other alternatives and would require some new roadway construction. Existing roadways would need minor pavement and shoulder improvements as well as several bridge and culvert replacements.
The new roadway would travel through seasonally inundated grasslands. Environmental impacts could arise from construction through these wet areas. Water run-off could also be an environmental factor.

This route would only serve through traffic traveling to and from the east on US Highway 20. The loss of this traffic would impact businesses that serve highway travelers. They would lose customers that would go around the cities and be serviced at the next town on the highway.

However, because there are no nearby cities, some travelers may still choose to go into Burns and Hines for services.

Another impact would be the relocation of the weigh station to a site on US Highway 20 east of the north US Highway 20/395 junction.
A final concern would be construction outside of the Burns UBG. Because this improvement would require new construction through rural lands, exceptions to several statewide planning goals would be needed. Without strong justification for building outside of the UGB, securing goal exception may not be possible.

Cost: The estimated construction cost for this improvement is $4,004,000. It includes modifying approximately 21,000 feet of Old Experiment Station Road and 17,000 feet of Hotchkiss Lane/Lottery Lane as well as constructing 21,000 feet of new roadway. The cost includes some overlay and new shoulders on existing roadways. It also includes relocating the existing weigh station.

Alternative 4 - West Side Route

Overview: This alternative, shown in Section D, would run west of Burns and Hines using a combination of existing roadways and new connections. It would extend westward from Eben Ray Road with a new connection to Radar Road through the Burns Paiute Indian Reservation. A new roadway would then be constructed through the west hills of Burns and Hines running from Radar Road to the Hines Logging Road. The Hines Logging Road would reconnect the bypass with the highway.

Impacts: This bypass route requires more new construction than other alternatives. Eben Ray Road and Hines Logging Road would need minor pavement and shoulder improvements as well as several bridge and culvert replacements. Radar Road would need to be reconstructed. The new roadway would travel through the hillsides west of Burns and Hines.

This route would serve all through traffic but would be significantly longer than traveling through the cities. While some travelers may divert, most would choose the shorter travel route.
The new roadway would have to be coordinated with the Burns Paiute Indian Tribe since it would travel through part of the reservation. This would bring higher traffic volumes to the reservation through areas with very low volumes now. At the same time, however, it would provide a direct connection from the reservation into Burns and Hines.
Another impact would be the relocation of the weigh station to a site on US Highway 20 east of the north US Highway 20/395 junction.

A final concern would be construction outside of the Burns UBG. Because this improvement would require new construction through rural lands, exceptions to several statewide planning goals would be needed. Without strong justification for building outside of the UGB, securing goal exception may not be possible.

Cost: The estimated construction cost for this improvement is $4,878,000. It includes modifying approximately 2,000 feet of Eben Ray Road, replacing 5,000 feet of Radar Road, widening

5,000 feet of Hines Logging Road, and constructing 35,000 feet of new roadway segments. The cost includes some overlay and new shoulders on existing roadways. It also includes relocating the existing weigh station.

Alternative 5 - Fry Lane and OR Highway 78

Overview: This alternative, shown in Section E would run along Fry Lane between the US Highway 20/395 junction and OR Highway 78. It would then use OR Highway 78 from Fry Lane to Broadway Avenue.

Impacts: In general, this alternative has fewer impacts and more benefits.
This route would take trucks completely out of downtown Burns and bring them into town on OR Highway 78. It would have some economic impacts that result from the rerouting. While some businesses along Broadway Avenue could lose some patronage, most of the trucks are likely to be serviced by the new truck stops in Hines. However, some through traffic may also use the truck route. This traffic would bypass the businesses on Broadway Avenue that might otherwise have provided services.

The junction of US Highway 20/395 is going to be reconstructed to form a simple four-way intersection as part of the Silvies River Bridge to US Highway 395 Junction project. The new junction will already be aligned with Fry Lane, which means that no new construction will be required to improve the intersection.

Fry Lane is a county road which has a fairly good base and would only need an overlay and shoulders added to serve truck traffic while OR Highway 78 would need no improvements.

The main impact would be the relocation of the weigh station to a site on US Highway 20 east of the north US Highway 20/395 junction.

Another concern would be the construction outside of the Burns UGB. Because this improvement does not require new construction through rural lands or add capacity to existing roadways, goal exceptions may not be needed. However, cooperation between the city and county will be critical.

Discussions with city and county staff and residents indicate that some trucks already use Fry Lane as an alternative travel route. The county shops are located east of Burns on OR Highway 78, and this route would be more direct for most of their travel. Some of the trucks on OR Highways 78 and 205 also use the Fry Lane route because it provides a more direct connection to/from the north for them.

Cost: The estimated construction cost for this improvement is $687,000. It includes adding four-foot shoulders to Fry Lane and widening on bridge by about four feet. It assumes no significant upgrade to existing pavement. The cost includes relocating the existing weigh station to a new location.

Recommendation: Because through traffic is still a relatively small component of traffic in the core of Burns and Hines, the cost of constructing a bypass far outweighs the benefits. However, Alternative 5 could serve well as a truck route that would bypass Broadway Avenue but keep the through traffic in town and allow the travel services in Hines to maintain their business. Therefore, this improvement, which uses Fry Lane and OR Highway 78 is recommended for implementation in this TSP as a truck route.

Close coordination between the City of Burns, Harney County, and ODOT would be needed since this route would use a combination of county roads and state highways and would also travel within the city limits of Burns.

6.2.5 Option 5. Develop a Private Road Standard for the Meadowlands Ranch Area

Overview: Meadowlands Ranch consists of about 23,000 acres bounded by US Highway 20, OR Highway 78, and Crane-Buchanan Road. When the ranch was subdivided, 40-foot easements were required along each parcel, all deeded to Meadowlands Ranch. The ranch is now defunct and several issues about the private roadways and easements have arisen:

- Harney County has been receiving requests for maintenance on these roadways which lie outside of their jurisdiction.
- Some distinct roadways have been built but there are many partial roadways as well.
- Some roadways have been built but they do not lie along the dedicated easements.
- Some property owners have fenced in the easements.

Most of these issues cannot be addressed by Harney County and must be resolved by the individual property owners along the easements. However, the county can create and enforce a private road standard for future construction of new roadways on Meadowlands Ranch.

Impacts: There are several benefits to creating private road standards. They will make construction of new roadways and reconstruction of existing roadways more consistent. They can also reduce future maintenance requirements by providing roadway design that can better handle travel loads and climatic changes in Harney County.
Existing roadways would not be required to meet the private road standard. This means that problems on many of the Meadowlands Ranch roads will continue.
Enforcing the private road standards may be difficult for the county.

Cost: There is no cost associated with creating new private road standards.

Recommendation: Harney County should develop a private road standard to be included in the roadway standards of the transportation plan.

6.2.6 Option 6. Upgrade Structurally Deficient and Functionally Obsolete Bridges

Overview: The county has bridges which have deficiencies[4] that need to be addressed as soon as possible. These bridges have been identified as structurally deficient (11 county bridges) or functionally obsolete (1 county bridge). In addition to the immediate need, several (5 county bridges) have sufficiency ratings below 55, indicating that they may reach a deficient level in the near future.

Bridges which fall into any of these three categories will need to be repaired or replaced some time in the next 20 years.

Safety: Structurally deficient bridges have been identified as unsafe through inventories of the various structural elements. They need to be replaced or repaired in order to safely serve the traffic demands of the area. Bridges with this rating may have the greatest need for upgrades. Functionally obsolete bridges cannot adequately service the demand placed on them because of some design deficiency such as being too narrow for today's standards. They need to be upgraded as well, which could involve improving or replacing the existing facility. If these bridges serve a high traffic demand, they may be a high priority for upgrades.

Bridges with sufficiency ratings below 55 are not currently deficient but may become so in the future. They have been flagged as facilities which may need repair some time in the next 20 years.

Impacts: If the bridges are not repaired or replaced, limitations on usage may affect users of the facilities. This could include long routes to divert traffic off bridges that cannot safely service demand. Limitations on bridge use could affect the economy of some of the resource-based industries in the area.

Cost: The estimated cost, shown in Table 23 for the bridge upgrades is based on the STIP costs, Harney County estimates, and the state bridge inspection inventory. These estimates have then been increased by an annual rate of five percent to reflect present day dollars. Table 23 summarizes the cost estimates for upgrading the bridges. The improvements have been grouped by type of upgrade.

Recommendation: All of these bridges are recommended for improvement over the next 20 years. Priority for bridge improvements will be a function of several factors including severity of deficiency, demand for the facility, and availability of funding.

[4]The description of structural deficiency, functional obsolescence, and sufficiency ratings are based on the *Oregon Coding Guide for the Inventory and Appraisal of Oregon Bridges* by the Oregon Department of Transportation Bridge Section in May, 1994.

CONSTRUCTION COSTS FOR UPGRADING SUBSTANDARD BRIDGES

Bridge Location	Improvement	Estimated Cost
Structurally Deficient		
Bridge #25A17 on CR #138 (Silver Creek Road) over Silver Creek	Replace	$127,000
Bridge #25A43 on CR #128 (Greenhouse Ln) over W. Creek Silvies River	Replace	
Bridge #25A56 on CR #130 (Airport Road) over Nine Mile Slough (2)	Replace	$225,000
Bridge #25A82 on CR #106 (Lawen-Harney Rd) over Nine Mile Slough (1)	Replace	$225,000
Bridge #25A10 on CR #305 (Drewsey Rd) over North Drewsey Slough (2)	Replace	$168,000
Bridge #25E24 on CR #310 (Pine Creek Road) over Pine Creek (2)	Replace	$140,000
Bridge #25E32 on CR #313 (Crane Venator) over Crane Creek (2)	Replace	$112,000
Functionally Obsolete		
Bridge #25A22 on CR #123 (West Loop Road) over Silvies River	Repair	$221,000
Total for County Roads		**$1,218,000**

Notes:
(1) These bridges are scheduled for improvement in the Final Statewide Transportation Improvement Program 2000-2003, January 1999.
(2) These bridges are scheduled for improvement in the Harney County 5-Year Road and Bridge Improvement Program.

Table 23 – Construction Costs For Upgrading Substandard Bridges

6.2.7 Option 7. Create a New Connection from the Main Burns Paiute Indian Reservation to Monroe Street

Overview: The Burns Paiute Indian Reservation lies in the northwest quadrant of the City of Burns and extends northward into Harney County. Access from the reservation into the city is available along Foley Drive connecting into US Highway 20/395.

The tribe has constructed a casino on the south side of Monroe Street in a separate, smaller parcel of reservation land known as “Old Camp.” To provide more direct access between the two parcels, a new roadway could be constructed between Radar Road and Monroe Street.

This roadway would be approximately 10,000 feet in length. The roadway would lie in Harney County and would be within the Burns Urban Growth Boundary. The road would like within a future urban area and so the road will be constructed to the City of Burns road standards.

Impacts: This new roadway would provide a direct connection between the main reservation on the north side of Burns and Old Camp where the casino is operated. This connection would result in some reduction of traffic volumes on US Highway 20/395 through Burns. It could also serve as an alternate route between the reservation and other businesses besides the casino.

The main disadvantage to constructing this roadway would be acquisition of property. The tribal representative has indicated that they would support the construction of this new roadway and could facilitate property acquisition through the reservation. The Bureau of Indian Affairs (BIA) might also contribute funding to the project.

Cost: The estimated cost for this improvement is about $964,000. This includes constructing a 32-foot-wide roadway with two 12-foot travel lanes and four-foot shoulders on each side of the road.

Recommendation: Constructing the new roadway should be included as part of the street system plan. The new roadway would need to be a combined Harney County and City of Burns project. The Burns Paiute Indian Tribe and the BIA would also be players in the construction of the new street.

6.3 Summary

Table 24 summarizes the recommendations of the transportation improvement options based on the evaluation process described in this chapter. Chapter 7 describes how these improvement options fit into the modal plans for Harney County.

TRANSPORTATION IMPROVEMENT OPTIONS: RECOMMENDATION SUMMARY

Option	Recommendation
1. Implement TDM Strategies	• Implement
2. Improve OR Highway 205 on P Hill	• Completed
3. Improve the intersection of Greenhouse Lane and US Highway 20/395	• Implement
4. Construct a bypass/truck route around Burns/Hines:	
Alternative 1 - Fry Lane to Hotchkiss Lane (Bypass)	• Do Not Implement
Alternative 2 - Red Barn Lane to Hotchkiss Lane (Bypass)	• Do Not Implement
Alternative 3 - Old Experiment Station Road to Hotchkiss Lane (Bypass)	• Do Not Implement
Alternative 4 - West Side Route (Bypass)	• Do Not Implement
Alternative 5 - Fry Lane and OR Highway 78 (Truck Route)	• Implement
5. Develop a private road standard for Meadowlands Ranch	• Implement
6. Upgrade structurally deficient and functionally obsolete bridges	• Implement
7. Create a new connection from the main Burns Paiute Reservation to Monroe Street	• Implement

Table 24 – Transportation Improvement Options: Recommendation Summary

Chapter

7

7 Transportation System Plan

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

7.1 Rural Roadway Standards

The development of the Harney County Transportation System Plan 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 this TSP. The recommended roadway standards are shown graphically in Figrue 7-1 and summarized in Table 25. Since the Harney County Transportation System Plan applies to land outside the urbanized, incorporated cities, rural road standards should be applied in these outlying areas.

Figure 7-1 Recommended Rural Roadway Standards

RECOMMENDED RURAL ROADWAY DESIGN STANDARDS

Classification	Total Width	Travel Lane Width		Shoulder Width		Right-of-Way Width	Minimum Posted Speed
		Gravel	Paved	Gravel	Paved		
Local and Private	28 feet	10 feet	0	4 feet	0	60 feet	25 mph
Collector and Arterial Option 1	28 feet	0	10 feet	2 feet	2 feet	60 feet	25-35 mph
Arterial Option 2	36 feet	0	12 feet	2 feet	4 feet	60 feet	35-55 mph

Note:
County arterial roadways which carry 1,500 or more vehicles per day and lie within a 5-mile radius of the intersection of Broadway Avenue and Monroe Street in Burns or Barnes Avenue and Highway 20/395 in Hines should be constructed to the Arterial Option 2 standard. All other county arterial roadways should be constructed to the Arterial Option 1 standard.

Table 25 – Recommended Rural Roadway Design Standards

7.1.1 Rural Local Roadway

The recommended standard for a rural local roadway is a 28-foot gravel roadway within a 60-foot right-of-way, as shown on Figure 7-1. The roadway includes two ten-foot travel lanes with four-foot shoulders on each side. Generally, parking will not be permitted on rural local roadways.

7.1.2 Rural Private Roadways

The recommended standard for a rural private roadway shall be the same as the rural local roadway standard, as shown on Figure 7-1. These roadway standards should be applied to new construction or reconstruction of roadways in areas of the county where private roadways exist. By creating private roads to the same standard as county local roads, the potential transfer of ownership at some time in the future could be facilitated.

The County will allow future cul-de-sac roadways; however, they will remain as private roadways and the County will not be responsible for their maintenance.

7.1.3 Rural Collector Roadways

Collector roadways are primarily intended to serve abutting lands and local access needs of neighborhoods. Figure 7-1 shows a cross section with a 60-foot right-of-way and a 24-foot paved width. The paved width allows two ten-foot travel lanes with two-foot paved shoulders on each side. An additional two feet of gravel shoulder on each side of the roadway is also shown in the figure. Generally, parking will not be permitted on rural collector roadways.

7.1.4 Rural Arterial Roadways

Arterial roadways form the primary roadway network within and through a region. They provide a continuous roadway system, which distributes traffic between different neighborhoods and districts. Generally, arterial roadways are high capacity roadways, which carry high traffic volumes with minimal localized activity. Two arterial roadway standards have been developed for Harney County.

Option 1
The basic roadway standard for a rural arterial will be the same as the rural collector standard. The roadway would include a 60-foot right-of-way and a 24-foot paved width, as shown in Figure 7-1. The paved width allows two ten-foot travel lanes with two-foot paved shoulders on each side. An additional two feet of gravel shoulder on each side of the roadway is also shown in the Figure 7-1. No on-roadway parking should be allowed on arterial roadways.

Option 2
County arterial roadways, which carry 1,500 or more vehicles per day and lie within a five-mile radius of the intersection of Broadway Avenue and Monroe Street in Burns or Barnes Avenue and US Highway 20/395 in Hines, should be constructed to the Arterial Option 2 standard. Figure 7-1 shows a cross section with a 60-foot right-of-way and a 32-foot paved width. This width allows two 12-foot travel lanes with four-foot paved shoulders on each side. An additional two feet of gravel shoulder on each side of the roadway is also shown in the figure. No on-roadway parking should be allowed on arterial roadways.

7.1.5 Bike Lanes

For the most part, rural roadways do not require separate bikeway facilities. Bicyclists shall be accommodated on the shared roadway or on a shoulder, depending on traffic volumes. In general, bike lanes should be added on arterial and collector streets when forecast traffic volumes exceed 2,500 to 3,000 vehicles per day. Otherwise shared roadway facilities should be adequate. 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.

7.1.6 Sidewalks

Rural roadways generally do not require separate pedestrian facilities. Pedestrians shall be accommodated on the shoulder of the roadway. In areas with high pedestrian activity, 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.

7.2 Access Management

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

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

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

7.2.1 Access Management Techniques

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

- Restricting spacing between access points (driveways) based on the type of development and the speed along the arterial.
- Sharing of access points between adjacent properties.
- Providing access via collector or local roadways where possible.
- Constructing frontage roads to separate local traffic from through traffic.
- Providing service drives to prevent spill-over of vehicle queues onto the adjoining roadways.
- Providing acceleration, deceleration, and right turn only lanes.
- Offsetting driveways to produce T-intersections to minimize the number of conflict points between traffic using the driveways and through traffic.
- Installing median barriers to control conflicts associated with left turn movements.
- Installing side barriers to the property along the arterial to restrict access width to a minimum.

7.2.2 Recommended Access Management Standards

Access management is hierarchical, ranging from complete access control on freeways to increasing use of streets for access purposes, parking, and loading at the local level.

1. County Roads

General access management guidelines by roadway functional classification for Harney County are described in Table 26. These access management guidelines should be applied to county roads. They 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. In some cases, where there is a recognized problem, such as an unusual number of collisions, these techniques and standards can be applied to retrofit existing roadways.

RECOMMENDED COUNTY ROAD ACCESS MANAGEMENT STANDARDS

Functional	Public Road		Private Drive(2)	
Classification	Type(1)	Spacing	Type	Spacing
Arterial	at-grade	1 mile	L/R Turns	1,200 feet
Collector	at-grade	¼ mile	L/R Turns	300 feet
Local	at-grade	200-400 feet	L/R Turns	Access to Each Lot

Notes:

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

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

Table 26 – Recommended County Road Access Management Standards

2. State Highways

The state highways in Harney County should follow the guidelines specified in the *1999 Oregon Highway Plan,* Appendix C – Access Management Standards. Access to state highway is permitted under Oregon Administrative Rules, Division 51 (OAR 754-54-0190).

7.3 Modal Plans

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

7.3.1 Roadway System Plan

The improvements to the roadway system include projects from several sources: 1) the Harney County five-year road and bridge program, 2) the Statewide Transportation Improvement Program, and 3) those identified in Chapter 6 of this document. All of the improvements are shown in

1. Harney County Road and Bridge Program

The Harney County Road Department implemented a road and bridge program several years ago, and several of the projects identified at that time have been completed (5.0 of the 10.5 miles of Pine Creek Road have been paved). The County Road Supervisor, depending on each road's traffic level, determines priority for these projects, the type of improvement needed, the estimated cost and the availability of funding. The list of proposed improvements is reviewed periodically and updated with changes in priority.

Projects in the county's road and bridge program with the highest priority, as determined by the County Road Supervisor, are shown in Table 27. The County Road Supervisor estimated most of the projects costs. Where those estimates did not exist, the consultant used average costs of $4 per square foot of asphalt for roadway projects and $100 per square foot for bridge projects. These unit costs include a 40 percent contingency per ODOT guidelines.

The total cost to make all of the improvements is approximately $12.6 million. It is expected that the Federal Highway Administration would fund 90 percent of the bridge replacement costs, or $10.15 million, through the Highway Bridge Replacement Program; the County would fund the remaining ten percent, or $125,000. It is expected that the county would fund all of the roadway project costs, except for the improvements to Hines Logging Road, which serves BLM lands, and would be funded by timber receipts.

2. Statewide Transportation Improvement Program 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 identifies all the highway improvement projects in Oregon. The program lists specific projects, the counties in which they are located, and their construction year.

The final 2000-2003 Statewide Transportation Improvement Program, published in January 1999, identified two major highway improvements and three bridge replacements in Harney County as listed in Table 28.

3. Other Roadway and Bridge Improvement Projects

In addition to the projects identified in existing improvement programs, three roadway and ten bridge projects have been identified as possible projects from the analysis presented in Chapter 6.

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HARNEY COUNTY ROAD AND BRIDGE PROGRAM (1998 DOLLARS)

ROAD IMPROVEMENT PROJECTS

Project Number	Road Number	Road Name	Project Type	Estimated Cost
1R	310	Pine Creek Road	Widen and seal (5.5 miles)	$300,000
2R	203	Whitehorse Road	Widen, realign and surface (11.0 miles)	$385,000
3R	405	Narrows Princeton Road	Widen and pave (12.5 miles)	$1,770,000
4R	201	Fields Denio Road	Widen and pave (61.0 miles)	$6,437,000
5R	113	Rye Grass Lane	Construct and surface (2.0 miles)	$138,000
6R	406	Happy Valley Road	Pave and seal (13.0 miles)	$740,000
7R	313	Crane Venator Road	Resurface (25.0 miles)	$460,000
8R	304	Otis Valley Road	Widen and surface (6.0 miles)	$140,000
9R	302	Altnow-Beulah Road	Widen and surface (12.0 miles)	$137,000
10R	311	Warm Springs Road	Construct and surface (22.0 miles)	$650,000
11R	204	Cottonwood Creek Road	Construct and surface (7.0 miles)	$190,000
Subtotal Roadway Projects				$11,347,000

BRIDGE IMPROVEMENT PROJECTS

Project Number	Bridge Number	Bridge Name	Project Type	Estimated Cost
1B	25A56	Nine Mile Slough	Replace	$38,000
2B	25E11	South Drewsey Slough	Replace	$168,000
3B	25E24	Pine Creek	Replace	$140,000
4B	25A43	West Fork Silvies	Replace	$112,000
5B	25E32	Crane Creek	Replace	$112,000
6B	25A52	Red Barn	Replace	$30,000
7B	25A83	Nine Mile Slough	New Structure	$35,000
8B	25A16	Silver Creek	Replace	$38,000
9B	25A18	Silver Creek	Replace	$38,000
10B	25D07	Willow Creek	Replace	$30,000
11B	25D09	Whitehorse	Replace	$30,000
12B	25A70	Embree Bridge	Replace	$168,000
13B	25A57	Poison Creek Slough	Replace	$30,000
14B	25A58	Poison Creek Slough	Replace	$30,000
15B	25A41	Hotchkiss Lane	Remove and Replace with Culvert	$25,000
16B	25A63	McGee Slough	Replace	$112,000
17B	25A65	Chapman Slough	Replace	$112,000
18B	25A66	Island Ranch	Remove and Replace with Culvert	$25,000
Subtotal Bridge Projects				$1,273,000
Total All Projects				**$12,620,000**

Source: Harney County Road Department

Table 27 – Harney County Road and Bridge Program (1998 Dollars)

STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM, 2002-2003

ROAD IMPROVEMENT PROJECTS

Project Number	Hwy Number	Road Name	Project Type	Estimated Cost
12R	OR 78 (440)	Steens Highway	Pavement Preservation (Overlay and Chip Seal) Guard Rail & Bridge Work in FY 2001 at MP 32	$4,552,000
13R		Burns IZEE Section E, PFH 126-1(5) or (3)	Reconstruction of 4.3 miles	$2,790,000
Subtotal Roadway Projects				$7,342,000

BRIDGE IMPROVEMENT PROJECTS

Project Number	Bridge Number	Bridge Name	Project Type	Estimated Cost
10410	25A56	Nine Mile Slough (Airport Rd) Bridge	Replace in FY 2001	$225,000
10412	25A82	Nine Mile Slough Bridge	Replace in FY 2002	$225,000
10461	6451A	Narrows Bridge	Encase Piles in FY 2000 on Hwy 205	$106,000
10485	3506A	Miller Creek Bridge	Replace in FY 2003	$473,000
Subtotal Bridge Projects				$1,029,000
Total All Projects				**$8,371,000**

Source: Final Statewide Transportation Improvement Program 2000-2003, January 1999

Table 28 – Statewide Transportation Improvement Program 2002-2003

OTHER PROPOSED ROADWAY AND BRIDGE IMPROVEMENTS

ROAD IMPROVEMENT PROJECTS

Project Number	Road Name	Project Type	Estimated Cost
14R	Greenhouse Lane	Realign Greenhouse Lane to intersect US Highway 20/395 at a right angle and adjust the vertical curve to match highway elevation for approximately 50 feet behind the stop line and then readjust to regain the existing Greenhouse Lane elevation approximately 150 feet behind the stop line.	$39,000
15R	Truck Route	Create a truck route along Fry Lane and OR Highway 78 in cooperation with Harney County and ODOT.	$687,000
16R	New	Create a new connection from thE Main Burns Paiute Indian Reservation to Monroe Street in cooperation with the City of Burns, the Burns Paiute Tribe, and the Bureau of Indian Affairs.	$964,000
Subtotal Roadway Projects			$1,690,000

BRIDGE IMPROVEMENT PROJECTS

Project Number	Bridge Number	Bridge Name	Project Type	Estimated Cost
23B	25A82	Nine Mile Slough	Replace	$74,000
24B	25A02	East Chicahominy Creek	Replace	$80,000
25B	25A40	Slough	Replace	$78,000
26B	25D01	Dry Creek	Replace	$171,000
27B	25E10	North Drewsey Slough	Replace	$132,000
Subtotal Bridge Projects				$535,000
Total All Projects				**$2,225,000**

Table 29 – Other Proposed Road and Bridge Imporements

7.3.2 Pedestrian System Plan

In rural areas it is typical to accommodate pedestrians on roadway shoulders. Many of the shoulders on both county roads and state highways in Harney County cannot safely accommodate pedestrians. Therefore, Harney County's roads and the state highways are paved, repaved, or reconstructed, shoulders should be widened, when feasible, to meet the standards shown in Figure 7-1. New roads should be constructed with adequate shoulders. 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.

Multi-use paths are popular in rural areas, especially when they provide a viable alternative to a busy highway. Paths should follow the design standards of the *Oregon Pedestrian and Bicycle Plan* (1995). No paved separated paths are currently found in Harney County and no projects are identified at this time. Pedestrian facilities on the urban sections of Harney County's roads are addressed in the city TSPs for those sections.

7.3.3 Bicycle System Plan

At present, bicyclists in Harney 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. These shoulders are also needed to accommodate pedestrians, as mentioned above. Therefore, as Harney County's roads and the state highways are paved, repaved, resurfaced, or reconstructed, shoulders should be widened to meet the standards shown in Figure 7-1. New roads should be constructed with adequate shoulders.

Bike facilities on the urban sections of Harney County's roads are addressed in the city TSPs for those sections.

7.3.4 Transportation Demand Management Plan

Through transportation demand management, peak travel demands can be reduced or spread to more efficiently use the transportation system, rather than building new or wider roadways. Techniques that 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 Harney County, where traffic volumes are low and the population and employment are relatively small, implementing demand management strategies is not practical in most cases. However, the pedestrian and bicycle improvements are also considered demand management strategies. By providing these facilities, Harney County is encouraging people to travel by other modes than the automobile. In rural communities, demand management strategies also include providing mobility options.

7.3.5 Public Transportation Plan

Harney County has several existing local public transportation services available but no long distance service.

1. Local Service

Existing public transportation includes the senior citizen and disabled dial-a-ride service provided by the Harney County Senior Center Transportation and Little Joe's Taxi Service.

No specific expansion of these services is currently planned; however, with county-wide population growth projected as high as 20 percent over the next 20 years, additional demand for these service can be expected. Furthermore, increased usage of these services should be encouraged. The resulting increase in demand may require some expansion in the future.

No costs have been estimated for expanding existing public transportation services. Some potential funding sources include grants to conduct feasibility studies and State and Federal funding to purchase equipment.

2. Long Distance Service

Currently, the Harney County Senior Center provides long distance service to Bend twice a month. Senior Center staff say they would like to expand their service. One problem staff cites in achieving this goal is competition with the volunteer services program that will pay people to drive others to Bend for certain services.

Harney County, together with the Cities of Burns and Hines, is committed to pursuing a viable economic public transit route. For regular intercity service to have a chance of success, it must:

- Attract riders from the general public, not just the elderly
- Connect with Greyhound service
- Serve major destinations (such as Salem or Eugene and Boise)
- Run at regularly scheduled times so that people may depend on the service
- Provide parcel service

State support is usually necessary to get this kind of service started.

7.3.6 Rail Service Plan

Harney County has no rail service.

7.3.7 Air Service Plan

Harney County is served locally by the Burns Municipal Airport, which falls under the jurisdiction of the City. Devco Engineering, Inc. prepared an *Airport Layout Plan* in April 1996. The plan lists over 20 recommendations for the airport and concludes that the Burns Municipal Airport is capable of being developed to meet the aviation needs of the local area well into the future. A staged 20-year capital improvement program is included with estimates of both local and federal costs for construction. The *Airport Layout Plan* for Burns Municipal Airport is, and will continue to be, the primary plan guiding the development of the airport.

Commercial air service is available at the Boise (Idaho) Airport about 185 miles to the east, and the Redmond (Oregon) Municipal Airport, about 145 miles to the west.

7.3.8 Pipeline Service Plan

There are currently no pipelines serving Harney County.

7.3.9 Water Transportation Plan

Harney County has no water transportation services.

7.4 Transportation System Plan Implementation Program

Implementation of Harney County TSP will require both changes to the county comprehensive plan and zoning code and preparation of a 20-year capital improvement program. These actions will enable Harney County to address both existing and emerging transportation issues throughout the urban area in a timely and cost effective manner.

The purpose of the 20-Year Capital Improvement Program is to detail what transportation system improvements will be needed as Harney County grows and provide a process to fund and schedule the identified transportation system improvements. It is expected that this TSP program can be integrated into the existing county Capital Improvement Program, the ODOT Statewide Transportation Improvement Program, and the Capital Improvement Programs of the two cities in Harney County involved in related projects. This integration is important since this TSP proposes that all three governmental agencies will participate in funding the transportation improvement projects.

7.4.1 20-Year Capital Improvement Program

The 20-Year Capital Improvement Program includes roadway and bridge improvement projects, as shown in Table 30. The cost of each project listed in the CIP is shown in 1998 dollars by jurisdiction. These costs include design, construction, and some contingency costs. They are preliminary estimates and generally do not include right-of-way acquisition, water or sewer facilities, adding or relocating public utilities, or detailed intersection design.

Harney County has identified a total of 51 projects in its CIP with a total cost of about $38.6 million. Five street improvement projects have been identified with a cost of over $2.3 million. Seven pedestrian improvement projects have been identified with a cost of about $715,000. Four bikeway improvement projects have been identified with a cost of about $2,000.

CAPITAL IMPROVEMENT PROGRAM (1998) DOLLARS

Project	Description	Estimated Cost County	City	State	Total
Roadway Improvement Projects					
1R	Widen & seal 5.5 miles of Pine Creek Road -CR 310	300,000	0	0	300,000
2R	Widen, realign & surface 11 miles of Whitehorse Rd - CR 203	385,000	0	0	385,000
3R	Widen & pave 12.5 miles of Narrows Princeton Rd - CR 405	1,770,00	0	0	1,770,000
4R	Widen & pave 61 miles of Fields Denio Road - CR 201	6,437,000	0	0	6,437,000
5R	Construct & surface 2 miles of Rye Grass Lane - CR 113	138,000	0	0	138,000
6R	Pave & seal 13 miles of Happy Valley Road - CR 406	740,000	0	0	740,000
7R	Resurface 25 miles of Crane Venator Road - CR 313	460,000	0	0	460,000
8R	Widen & surface 6 miles of Otis Valley Road - CR 304	140,000	0	0	140,000
9R	Widen & surface 12 miles of Altnow-Beulah Road - CR 302	137,000	0	0	137,000
10R	Construct & surface 22 miles of Warm Springs Rd - CR 311	650,000	0	0	650,000
11R	Construct & surface 7 miles of Cottonwood Creek Rd CR 204	190,000	0	0	190,000
12R	Pavement Preservation (overlay & chipseal), guardrails & ridge work at MP 32 on OR 78 (Steens Highway)	0	0	4,552,000	4,552,000
13R	Reconstruction of 4.3 miles of Burns IZEE Rd, Section E, PFH 126-1(5) or (3)	0	0	2,790,000	2,790,000
14R	Realign Greenhouse Land to intersect US 20/395 at a right angle & adjust the vertical curve to match highway elevation for approximately 50 feet behind the stop line and then readjust to regain the existing Greenhouse Lane elevation approximately 150 feet behind the stop line.	39,000	0	0	39,000
15R	Create a truck route along Fry Lane and OR78 in cooperation with Harney County & ODOT	687,000	0	0	687,000
16R	Create a new connection from the Main Burns Paiute Indian Reservation to Monroe Street in cooperation with the City of Burns, the Burns Paiute Tribe & the Bureau of Indian Affairs	964,000	0	0	964,000
Bridge Improvement Projects					
1B	Replace Bridge #25A56 over Nine Mile Slough	38,000	0	0	38,000
2B	Replace Bridge #25E11 over South Drewsey Slough	168,000	0	0	168,000
3B	Replace Bridge #25E24 over Pine Creek	140,000	0	0	140,000
4B	Replace Bridge #25A43 over West Fork Silvies	112,000	0	0	112,000
5B	Replace Bridge #25E32 over Crane Creek	112,000	0	0	112,000
6B	Replace Bridge #25A52 over Red Barn	30,000	0	0	30,000
7B	Replace Bridge #25A83 over Nine Mile Slough	35,000	0	0	35,000
8B	Replace Bridge #25A16 over Silver Creek	38,000	0	0	38,000
9B	Replace Bridge #25A18 over Silver Creek	38,000	0	0	38,000
10B	Replace Bridge #25D07 over Willow Creek	30,000	0	0	30,000
11B	Replace Bridge #25D09 over Whitehorse	30,000	0	0	30,000
12B	Replace Bridge #25A70 over Embree Slough	168,000	0	0	168,000
13B	Replace Bridge #25A57 over Poison Creek Slough	30,000	0	0	30,000
14B	Replace Bridge #25A58 over Poison Creek Slough	30,000	0	0	30,000
15B	Remove Bridge #25A41 over Hotchkiss Lane & replace with culvert	25,000	0	0	25,000
16B	Replace Bridge #25A63 over McGee Slough	112,000	0	0	112,000
17B	Replace Bridge #25A65 over Chapman Slough	112,000	0	0	112,000
18B	Remove Bridge #25A66 over Island Ranch & replace with culvert	25,000	0	0	25,000
19B	Replace Bridge #25A33 over Whiting Slough	0	0	285,000	285,000
20B	Replace Bridge #25A34 over Foley Slough	0	0	287,000	287,000
21B	Replace Bridge #25A17 over Silver Creek	127,000	0	0	127,000
22B	Replace Bridge #25A20 over Foley Slough	208,000	0	0	208,000

23B	Replace Bridge #25A21 over Foley Slough	101,000	0	0	101,000
24B	Replace Bridge #25A82 over Nine Mile Slough	74,000	0	0	74,000
25B	Replace Bridge #25E33 over South Fork Malheur	221,000	0	0	221,000
26B	Replace Bridge #25A22 over Silvies River	221,000	0	0	221,000
27B	Replace Bridge #25A02 over East Chicahominy Creek	80,000	0	0	80,000
28B	Replace Bridge #25A40 over Slough	78,000	0	0	78,000
29B	Replace Bridge #25D01 over Dry Creek	171,000	0	0	171,000
30B	Replace Bridge #25E10 over North Drewsey Slough	132,000	0	0	132,000
Subtotal Roadway Improvement Projects		**12,555,000**	**0**	**22,300,000**	**35,337,000**
Subtotal Bridge Improvement Projects		**2,686,000**	**0**	**572,000**	**3,258,000**
Total		**15,241,000**	**0**	**22,872,000**	**38,595,000**

Notes:
(1) Most of the improvements to create the truck route on Fry Lane and Highway 78 would involve the county road; however, the state may be willing to contribute some funding, especially for the relocation of the weigh station.
(2) The new connection from the reservation to Monroe Street would affect both Burns and Harney County; therefore, the funding has been shown as split between Burns and theCounty. The Burns Paiute Indian Tribe and Bureau of Indian Affairs may also contribute to the construction costs.

Table 30 – Capital Improvement Program (1998 Dollars)

Chapter

8

8 Funding Options

The Transportation Planning Rule requires TSPs to evaluate the funding environment for recommended improvements. This evaluation must include a listing of all recommended improvements, estimated costs to implement those improvements, a review of potential funding mechanisms, and an analysis of existing sources' ability to fund proposed transportation improvement projects. Harney County's TSP identifies over $38.5 million in 51 specific projects over the next 20 years. This section of this TSP provides an overview of Harney County's revenue outlook and a review of some funding and financing options that may be available to Harney County to fund the improvements.

Pressures from increasing growth throughout much of Oregon have created an environment of estimated improvements that remain unfunded. Harney County will need to work with the cities of Burns and Hines and ODOT to finance the potential 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.

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8.1 Historical Street Improvement Funding Sources

In Oregon, state, county, and city jurisdictions work together to coordinate transportation improvements. Table 31 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.

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%

Note: This distribution of road revenues does not reflect the current decline in Federal forest revenues.

Source: ODOT 1993 Oregon Road Finance Study.

Table 31 – Sources of Road Revenues By Jurisdiction Level

At the state level, nearly half (48 percent in Fiscal Year 1991) of all road-related revenues are attributable to the State Highway Fund, whose sources of revenue include fuel taxes, weight-mile taxes on trucks, and vehicle registration fees. As shown in the table, the state road trust is a considerable source of revenue for all levels of government. Federal sources (generally the federal highway trust account and federal forest revenues) comprise another 30 percent of all road-related revenue. The remaining sources of road-related revenues are generated locally, including property taxes, local improvement districts, 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 the price per gallon, Oregon's fuel tax is a fixed amount (currently 24 cents) per gallon.

8.1.1 Transportation Funding in Harney County

Historically, sources of road revenues for Harney County have included federal forest fees, state highway fund revenues, federal grants, earnings from

the investment of the working fund balance, and other sources. Transportation revenues and expenditures for Harney County are shown in Table 32 and Table 33.

HARNEY COUNTY TRANSPORTATION-RELATED REVENUES

	1993-1994	1994-1995	1995-1996	1996-1997
Working Capital	$3,144,408	$1,889,278	$2,448,288	$2,261,392
Revenue				
Investment Earnings	$154,422	$145,518	$152,111	$73,148
75% Forest Fees	$2,845,940	$2,802,153	$2,425,531	$740,283
Federal Mineral Leases	$277,770	$19,419	$37,512	$6,866
Malheur Wildlife Refuge Payments	$28,157	$42,024		$75,050
Economic Development Grants				
Federal Aid Secondary Grants		$184,661		$414,260
5% Public Land Sales	$45,468	$17,232	$13,315	$43,671
Motor Vehicle License Fund	$412,411	$425,331	$432,638	$413,011
Misc. Receipts	$5,905	$17,519	$25,059	$58,948
Equipment Rental				$2,275
Children Grant		$17,581	$22,443	$23,116
Sale of Equipment/Supplies		$30,000		$26,135
Revenue Subtotal	**$3,770,072**	**$3,701,437**	**$3,108,608**	**$1,876,763**

Source: Harney County.

Table 32 – Harney County Transportation Related Revenues

As shown in Table 31, revenues remained relatively stable (between a low of just under $3.1 million in 1995-1996 to a high of over $3.7 million in 1993-1994). A little over $400,000 of the annual revenues comes from the State Highway Fund, declining slightly from over $430,000 in 1995-1996 to approximately $413,000 in 1996-1997. A declining amount has come from Federal Forest receipts. Twenty-five percent of Federal Forest revenue (the 25 percent fund) is returned to the counties based on their share of the total acreage of Federal Forests. Westside National Forests in Oregon and Washington are subject to the Spotted Owl Guarantee, which limits the decline of revenues from these forests to three percent annually. Oregon Forests under the owl guarantee include the Deschutes, Mount Hood, Rogue River, Siskiyou, Siuslaw, Umpqua, and Willamette National Forests. Forest revenues distributed to Harney County are from the Malheur and Ochoco forests, not subject to the owl guarantee and, therefore, they are more difficult to predict. Although declining, the working capital balance has remained at a healthy level. The county has also been able to generate approximately $150,000 annually in interest on its invested funds between 1993-1994 and 1995-1996; in 1996-1997, this amount declined to $73,000.

HARNEY COUNTY TRANSPORTATION-RELATED EXPENDITURES

	1993-1994	1994-1995	1995-1996	1996-1997
Expenses				
Personal Services	$1,118,514	$1,161,705	$1,141,236	$1,155,717
Materials and Services	$2,139,418	$1,641,670	$1,441,284	$1,514,034
Capital Outlay	$305,744	$121,266	$313,189	$358,920
Other	$1,211,526	$217,787	$432,682	$65,000
Expenditure Subtotal	**$4,775,201**	**$3,142,428**	**$3,328,391**	**$3,093,672**

Source: Harney County.

Table 33 – Harney County Transportation Related Expenditures

As shown in Table 33, Harney County has spent between $120,000 and $310,000 annually in capital improvements. The bulk of expenditures in the road fund are for personal services and materials and services relating to maintenance.

8.1.2 Transportation Revenue Outlook in the Harney 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 Transportation Planning Rule requiring a ten-percent reduction in per-capita vehicle miles of travel in Metropolitan Planning Organization 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 increases of 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
- The revenues will be shared among the state, counties, and cities on a "50-30-20 percent" basis rather than the previous "60.05-24.38-15.17 percent" basis
- Inflation occurs at an average annual rate of 3.6 percent (as assumed by ODOT)

Figure 8-1 shows forecast in both current-dollar and inflation-deflated constant (1998) dollars. As highlighted by the constant-dollar data, the highway fund is expected to grow slower than inflation early in the planning horizon until fuel-tax and vehicle-registration fee increases occur in year 2002. It will increase

to a rate somewhat faster than inflation through year 2015 and then continue a slight decline through the remainder of the planning horizon.
Figure 8-1 State Highway Fund (in Millions of Dollars)

As the State Highway Fund is expected to remain a significant source of funding for Harney County's street operations, the county is highly susceptible to changes in the State Highway Fund. In 1996-1997, the State Highway Fund supplied over 22 percent of Harney County's total street fund revenue. Together with the federal timber receipts, the state highway fund accounted for nearly 85 percent of all revenue from 1993-1994 to 1996-1997.

In order to analyze the county's ability to fund the recommended improvements from current sources, David Evans and Associates, Inc., applied the following assumptions:

- The State Highway Fund will continue to account for the majority of the county's street fund
- The amount of revenue received from Federal Timber Receipts will continue to decline and will not be replaced with a reliable funding source
- Interest and other local sources continue to provide stable revenue streams
- The proportion of revenues available for capital expenditures for street improvements will remain a stable proportion (about 9 percent, as averaged for years 1993-1994 to 1996-1997) of all resources.

Applying these assumptions to the estimated level of the State Highway Fund resources, as recommended by ODOT, resources available to Harney County for all operations, maintenance, and capital outlay purposes are estimated at approximately $395,000 to $490,000 annually (in 1998 dollars), as shown in Table 34.

ESTIMATED RESOURCES AVAILABLE TO HARNEY COUNTY FROM STATE HIGHWAY FUND, 1998 DOLLARS

Year	Total Estimated Resources from State Highway Fund	Estimated Funds Available for Capital Outlay
1999	$128,100	$187,148
2000	$125,200	$182,832
2001	$122,300	$178,657
2002	$129,600	$189,270
2003	$131,400	$191,818
2004	$133,100	$194,365
2005	$138,900	$202,856
2006	$137,800	$201,228
2007	$138,600	$202,360
2008	$139,100	$203,139
2009	$143,100	$209,011
2010	$143,000	$208,870
2011	$142,400	$208,021
2012	$148,000	$216,158
2013	$150,400	$219,625
2014	$149,200	$217,856
2015	$147,900	$215,945
2016	$143,700	$209,790
2017	$145,000	$211,700
2018	$143,200	$209,153

Table 34 – Estimated Resources Available To Harney County From State Highway Fund (1998 Dollars)

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
- The population growth in Burns (since the distribution of state highway funds is based on an allocation formula which includes population)

Based on the amount of resources historically available to fund capital improvements this analysis suggests that the Harney County will have between $182,000 and $220,000 available annually for capital improvements.

8.2 Revenue Sources

In order to finance the recommended transportation system improvements requiring expenditure of capital resources, it will be important 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 Measure 5 has significantly reduced property tax revenues. This trend is expected to continue with the recent passage of Measure 47. The alternative revenue sources described in this section may not all be appropriate in Harney County however, this overview is being provided to illustrate the range of options currently available to finance transportation improvements during the next 20 years.

8.2.1 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 due, in large part, to the fact that property taxes are easy to implement and enforce. Property taxes are based on real property (i.e., land and buildings) which has a predictable value and appreciation to base taxes upon. This is as opposed to income or sales taxes, which can fluctuate with economic trends or unforeseen events.

Property taxes can be levied through: 1) tax base levies, 2) serial levies, and 3) bond levies. The most common method uses tax base levies that do not expire and are allowed to increase by six percent per annum. Serial levies are limited by amount and time that 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 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. They also estimate 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.

8.2.2 System Development Charges

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

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

Typically, the fee is collected when new building permits are issued. The Jurisdiction would calculate the fee based on trip generation of the proposed development. Residential calculations would be based on the assumption that a typical household will generate a given number of vehicle trips per day. Nonresidential use calculations are based on employee ratios for the type of business or industrial uses. The System Development Charge revenues would help fund the construction of transportation facilities necessitated by new development.

8.2.3 State Highway Fund

Gas tax revenues received from the State of Oregon are used by all counties and cities to fund 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 counties is divided among all counties based on population.

8.2.4 Local Gas Taxes

The Oregon Constitution permits counties and incorporated cities to levy additional local gas taxes with the stipulation that the monies 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) have levied a local gas tax. Harney 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 Harney 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.

8.2.5 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 Harney 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 Harney 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.

8.2.6 Local Improvement Districts

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

8.2.7 Grants and Loans

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

These programs include the Immediate Opportunity Grant and the Oregon Special Public Works Fund program as described below.

8.2.8 Immediate Opportunity Grant Program

The Oregon Economic and Community Development Department and ODOT collaborate to administer a grant program designed to assist local and regional economic development efforts. The program is funded to a level of approximately $5,000,000 per year through state gas tax revenues. The following are primary factors in determining eligible projects:

- Improvement of public roads

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

The maximum amount of any grant under the program is $500,000. Local governments who 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.

8.2.9 Oregon Special Public Works Fund

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

While Special Public Works Fund 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. The maximum loan amount per project is $11,000,000 and the term of the loan cannot exceed the useful life of the project or 25 years, whichever is less. Interest rates for loans funded with the State of Oregon Revenue Bonds are based on the rate the state may borrow through the Oregon Economic and Community Development Department Bond Bank. The Department may also make loans directly from the Special Public Works Fund and the term and rate on direct loans can be structured to meet project needs. The maximum grant per project is $500,000, but may not exceed 85 percent of the total project cost.

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

8.2.10 ODOT Funding Options

The State of Oregon provides funding for all highway related transportation projects through the Statewide Transportation Improvement Program administered by ODOT. The Statewide Transportation Improvement Program outlines the schedule for ODOT projects throughout the state. It is updated on an annual basis. In developing this funding program, ODOT must verify that the identified projects comply with the Oregon Transportation Plan, ODOT Modal Plans, Corridor Plans, local comprehensive plans, and the federal Transportation Equity Act for the 21st Century. The Statewide Transportation Improvement Program must fulfill federal planning requirements for a staged, multi-year, statewide, intermodal program of transportation projects. Specific transportation projects are prioritized based on a review of the federal planning requirements and the different state plans. ODOT consults with local jurisdictions before highway related projects are added to the Statewide Transportation Improvement Program.

The highway-related projects identified in Harney 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 5. Harney County, its incorporated cities, and ODOT will need to communicate on an annual basis to review the status of the STIP and the prioritization of individual projects within the project area. Ongoing communication will be important for the city, county, and ODOT to coordinate the construction of both local and state transportation projects.

ODOT also has the option of making some highway improvements as part of their 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 construction projects are usually done by ODOT field crews using state equipment. 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 Harney County's TSP is the use of state and federal transportation dollars for off-system improvements. Until the passage and implementation of Intermodal Surface Transportation Efficiency Act of 1991, 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.

8.3 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 include the sources discussed above: property taxes, System Development Charges, fuel taxes, vehicle registration fees, Local Improvement Districts, and various grant programs. In contrast, financing refers to the collecting of funds through debt obligations.

There are a number of debt financing options available to Harney 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 the period of years. If such improvements were to be tax financed immediately, a large short-term increase in the tax rate would be required. By utilizing debt financing, local governments are essentially spreading the burden of the costs of these improvements to more of the people who are likely to benefit from the improvements and lowering immediate payments.

8.3.1 General Obligation Bonds

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

State statutes require that the general obligation indebtedness of a jurisdiction not exceed three percent of the real market value of all taxable property in its jurisdiction. 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 new bonds must be specifically voter approved, Measure 47 and 50 provisions are not applicable to outstanding bonds, un-issued voter-approved bonds, or refunding bonds.

8.3.2 Limited Tax Bonds

Limited tax general obligation bonds 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, limited tax general obligation bonds do not require voter approval. However, since the full taxing power of the issuer does not secure them, 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 limited tax general obligation bonds are not voter approved, they are subject to the limitations of Ballot Measures 5, 47, and 50.

8.3.3 Bancroft Bonds

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

8.4 Funding Requirements

Harney 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 51 projects, totaling an estimated $38.6 million. Estimated costs by financial leader are shown in Table 35.

SUMMARY OF RECOMMENDED PROJECT COSTS BY FINANCIAL LEADER

Financial Leader	Estimated Cost
County	$12,823,600
City	$482,000
State	$22,872,000
Federal	$2,417,000
Total	**$38,595,000**

Table 35 – Summary of Recommended Project Costs By Financial Leader

As discussed in Chapter 7, the bridge projects are expected to receive federal funding through the Federal Highway Administration's Highway Bridge Replacement Program. This project is expected to be able to fund 90 percent of the bridge projects, with the county providing the balance. As shown in Table 35, of the total $38.5 million in projects recommended for Harney County, the county will be expected to provide nearly $13 million as the financial leader, with ODOT providing financial leadership in nearly $23 million in projects. Through the Highway Bridge Replacement Program, the federal government is expected to provide $2.4 million for specific bridge projects.

Based on current revenue sources for Harney County and the improvements identified in this Transportation System Plan, the County is expected to experience a severe budget shortfall, as shown in Table 36.

ESTIMATED CAPITAL FUNDING BALANCE HARNEY COUNTY

	Amount
Capital Available from Existing Revenue Sources	$4,251,200
Capital Needed to Fund Projects Identified as County-Funded Projects	$12,823,600
Surplus (Deficit)	**$(8,572,400)**

Table 36 – Estimated Capital Funding Balance, Harney County

Some of the projects listed in the county's five-year Road and Bridge Program appear to be capacity-related improvements. These projects include widening and surfacing projects for Pine Creek Road, Whitehorse Road, Narrows Princeton Road, Fields Denio Road, Rye Grass Lane, Happy Valley Road,

Otis Valley Road, Altnow Beulah Road, Warm Springs Road, and Cottonwood Creek Road. As noted earlier, a key legislative requirement for charging System Development Charges is the link between the need for the improvements and new developments being charged. If this link can be made, these projects would be eligible for System Development Charge funding. With System Development Charges funding these projects totaling an estimated $10,887,000, Harney County would be able to fund the recommended improvements. The decision to implement System Development Charges must be carefully considered because it could encourage development in neighboring counties and may discourage future development in Harney County.

8.5 Funding Options Conclusions

This Transportation System Plan identifies 51 projects recommended for Harney County over the 20-year planning horizon. The cost of the projects is estimated at over $38.5 million in 1998 dollars. From existing funding sources, the county expects some funding available for capital improvements, but the amount will be limited to approximately $4.3 million over the next 20 years. Even with federal and state support, projects will require nearly $12.8 million in county funding; relying on available county sources would result in a budget shortfall of over $8.5 million over the 20-year planning horizon. With nearly $10.9 million in projects that appear to be capacity related, the county would have the option of implementing System Development Charges to assess new development for the infrastructure costs to serve it. Harney County will need to work with its incorporated cities and ODOT to explore System Development Charges and other alternative sources of funding to finance these transportation projects over the 20-year planning horizon.

APPENDICES INDEX:

Appendix A: Technical Memorandum: Review of Existing Plans and Policies'

HARNEY COUNTY

Several planning documents were reviewed to establish the history of planning in the county, and a comparison was made of the information in the existing plans with the requirements of the Oregon Transportation Planning Rule (TPR). These plans included the Harney County Comprehensive Plan, a Harney County Buildable Lands Inventory, a Harney County Housing Study, and the US Highway 395 South (Pendleton – California) Corridor Strategy. A description of the information in the plans is provided followed by comments in italics.

HARNEY COUNTY COMPREHENSIVE PLAN

The Harney County Comprehensive Plan was prepared in 1978 by Morgan, Ryan & Associates.

The plan was developed for the purpose of providing a guide for the conservation of Harney County's land resources. It is a generalized long-range policy guide and decision-making tool, which affects economic, social, and physical development of Harney County. It represents a public statement of the most desirable land uses projected for the future. Its policies and statements are based on inventories, physical and governmental limitations on development, projected needs, and public attitudes. It was prepared to address the fourteen Statewide Goals and Guidelines developed by the Land Conservation and Development Commission (LCDC).

The 14 goals developed by the LCDC are as follows:

I. To develop a citizen involvement program that ensures the opportunity for citizens to be involved in all phases of the planning process.
II. To establish a land use planning process and policy framework as a basis for all decisions and actions related to the use of land and to assure an adequate factual base for such decisions and actions.
III. To preserve agricultural lands.
IV. To conserve forest lands for forest uses.
V. To conserve open space and protect natural and scenic resources.
VI. To maintain or improve the quality of air, water, and land resources of the county.
VII. To protect life and property from natural disasters and hazards.

VIII. To satisfy the recreational needs of the citizens of the county, state, and visitors.
IX. To diversify and improve the economy of the county.
X. To provide for the housing needs for the citizens of the county.
XI. To plan and develop a timely, orderly, and efficient arrangement of public facilities and services to serve as the framework for urban and rural development.
XII. To provide and encourage a safe, convenient, and economic transportation system.
XIII. To conserve energy.
XIV. To provide for an orderly and efficient transition from rural to urban land use.

For each goal, the plan presents findings and policies. Only Goal XII specifically relates to transportation.

Transportation Goal
Goal
To provide and encourage a safe, convenient, and economic transportation system to serve the needs of Harney County.

Policies
The following statements of policy are related to satisfying the above goal.
1. Maintain and upgrade the overall transportation system within the county to meet present and future needs.
2. Develop and upgrade highway facilities in such a manner that valuable soil, timber, water, scenic, historic, or cultural resources are not damaged or impaired.
3. Provide adequate signage along major and minor county roads for the purpose of easy identification.
4. Design of new roads and highways should preserve and enhance natural and scenic resources, i.e., new roads should not be constructed in areas identified as sensitive wildlife areas.
5. Commercial bus service to areas outside of Harney County should be retained.
6. At a minimum, rail freight service to Harney County should be retained.
7. A bikepath should be completed from central Hines to central Burns.
8. An “Airport Master Plan” has been developed to assure the Burns/Hines area of adequate air service in the future.
9. The county will actively encourage private freight companies and the public utility commissioner to provide freight service to all portions of the county.
10. The county shall develop an airport overlay zone applicable with state and federal standards.

11. The Municipal Airport shall be protected from the encroachment of incompatible land uses to ensure efficient aviation operations and to minimize the noise and safety problems for the general public.
12. The county shall comply with all applicable state and federal noise, air, water, and land quality regulations.
13. The general policy of the Planning Commission will be not to create a traffic hazard in the granting of variances, conditional uses permits, and zone amendments.

No existing traffic volume data nor projections of future traffic demand were presented. No analysis of existing or future system operations was performed. No future improvements were recommended. All of these elements will need to be included to meet the requirements of the TPR.

Population estimates were made for the period from 1978 to 2000. These forecasts will have to be updated for the next 20-year period.

HARNEY COUNTY BUILDABLE LANDS INVENTORY

The Harney County Buildable Lands Inventory was prepared in June 1997 by Jean Cain.

The Buildable Lands Inventory is an update to the Harney County Comprehensive Plan. Some of the issues presented in the inventory which affect transportation are described below.

Harney County is currently experiencing growth after a prolonged period of population decline. The projected growth rate is one percent per year, which would result in a countywide population of 7,800 by the year 2000. Growth rates are not so great as to tax the capacities of most infrastructure which is already in place.

The Buildable Lands Inventory reveals that there is ample room for development of housing, commercial, and industrial uses within the Urban Growth Boundaries of Burns and Hines. Some of the rural communities, on the other hand, are completely built. Frenchglen, Lawen, Buchanan, and Diamond are all fully occupied. Others, such as Crane and Fields, have room to grow.

Forest receipts have plummeted from a high of $5 million in 1992 to less than $750,000 in 1996. Receipts are projected to continue to decline. Forest receipts are used by the county for roads and schools. The loss of the funds to the county government has been devastating and is projected to get worse, with the effect on maintenance of roads being the most difficult problem.

Currently, Hines is enjoying a building boom, with the addition of a restaurant, two new motels, three fast food restaurants, an additional convenience store, and a truck stop all under construction this summer. In addition, a large truck stop with full amenities is opening just south of Hines in the location vacated by a former timber contractor. Total employment in these new businesses is not clearly defined as yet, but is conservatively estimated at 75 new jobs. Hines is also the site of a subdivision which will add 20 or so single-family dwellings in the $60,000 to $75,000 range. Oregon Youth Authority is currently constructing a youth correction facility which will be in operation during the latter part of 1996. The State of Oregon will add approximately 45 full-time jobs to the economy.

The Burns Paiute Tribe is moving forward on plans to build and begin operations on a gaming casino within the next year. This venture is expected to capture visitors to the area for a longer period and to support tribal needs and have a positive impact on the economy of the county as well.

Harney County has 876.7 miles of county roads in its system. Of those, 272.4 miles are paved. The county has responsibility for maintaining the roads and streets for rural communities. Exception areas which are covered in this inventory are all served by county roads, paved or graded gravel. The cities of Burns and Hines each maintain their own streets. Both communities are located on US Highway 20/395 which is a highway of national significance. Highway 20/395 is the responsibility of Oregon Department of Transportation. Burns has a total of 37.5 miles of paved streets, with 4.15 miles remaining to be paved. Hines has paved all of its streets. Plans are for new developments to include paving of all streets.

In spite of the good highway connections, Harney County is without public transportation for passengers. Citizens have been frustrated in their efforts to remedy this situation over the past decade. Freight and parcel delivery companies do serve the area with second-day delivery. Burns Municipal Airport serves as the air transportation hub of the county. No passenger service is available. There are several private air strips in the county.

Recommendations

- The City of Burns should encourage the rezoning of Open Space, replacing it with Residential, Commercial, or Industrial zones as need occurs.
- The County Planning Commission and City of Hines Planning Commission should consider adjustment of the Urban Growth Boundary to section line or appropriate survey line rather than current topographic lines for management ease. Boundary realignment is not to change the net acreage inside or outside the UGB.
- The county should consider developing a zoning ordinance for those areas inside the Hines Urban Growth Boundary, to facilitate transition from rural to urban densities.

- As areas within the Hines urban growth boundary are developed, density and amenities should be consistent with those within the Hines city limits.
- The City of Hines should encourage property owners in Exclusive Farm Use Zoning to seek change to Residential Zoning as need occurs.

HARNEY COUNTY HOUSING STUDY

The Harney County Housing Study was prepared in 1996 by Joan Cain Community and Resource Development.

Individuals and groups in Harney County working for economic development considered a Housing Study critical to their planning efforts for growth and community improvement. Any planning effort requires good information on which to build good decisions. The county strategic planning committee, Community Response Team, identified housing as a critical issue several years ago.

The Harney County Housing Study reveals the following:

- Housing inventory in Harney County is aging and in somewhat poor condition, on the whole.
- Additions to the housing inventory have been sporadic.
- The average house in Harney County was built in 1946, is in fair to poor condition and worth $32,000.
- Harney County housing needs improvement; in condition, in inventory of dwelling types and in class to increase value and livability.
- Housing costs are still reasonable in Harney County, however they are under pressure as the population is growing.
- Rental properties are in short supply, especially larger family units.
- Rural communities in the county were found to be in better and worse shape in terms of housing stock than Burns and Hines. Fields and Denio, in particular have houses older and of less value than those in the rest of the county. The area outside of Burns and Hines has the best houses available. The downside of such development is that, continued for long, sprawl will result.
- Housing of special populations who tend to be hard to house does not seem to be a problem yet in Harney County.

US HIGHWAY 395 SOUTH (PENDLETON – CALIFORNIA BORDER) CORRIDOR STRATEGY

The US Highway 395 South (Pendleton – California) Corridor Strategy was prepared by Oregon Department of Transportation (ODOT).

The report is not dated; however, it was prepared in 1996 or 1997.

The Corridor Strategy was developed to identify projects for the Oregon State Transportation Improvement Program (STIP). Development of the US 395 Corridor Strategy is the first step in the corridor planning process. Corridor planning is intended to implement the goals and policies set forth by the 1992 Oregon Transportation Plan (OTP), the 1991 Highway Plan, and the recent modal plans for rail, freight, bike/pedestrian, aviation, and public transportation plus the safety action plan.

Generally, the Corridor Strategy translates the policies of the OTP into specific actions; describes the functions of each transportation mode, considers trade-offs, and shows how they will be managed; identifies and prioritizes improvements for all modes of travel; indicates where improvements should be made; resolves any conflicts with local land use ordinances and plans; and establishes guidelines for how transportation plans will be implemented.

The US 395 Corridor Strategy contains a corridor overview, which includes population and employment forecasts, highway data such as traffic volumes and pavement conditions and descriptions of other modes of travel (air, rail, bicycle, etc.). The overall corridor strategy is to "accommodate efficient movement of through travel, while maintaining environmental integrity, enhancing travel safety and supporting economic development." The report sets forth objectives which are intended to embody this overall strategy for the corridor, and to set direction and provide guidance for corridor-wide transportation plans and improvements.
The Highway 395 Corridor Strategy will be followed-up by a Highway 395 Corridor Plan which will build upon objectives developed in the Strategy to identify, refine, and facilitate the acceptance of specific decisions related to corridor transportation management, capital improvements and service improvements. The Corridor Plan will identify and discuss the decisions considered to meet each objective, technical analysis of alternatives, and recommendations for action.

US HIGHWAY 20 (BEND – VALE) CORRIDOR STRATEGY

The US Highway 20 (Bend – Vale) Corridor Strategy was prepared by the Oregon Department of Transportation (ODOT) and Otak, Inc. and is dated June 10, 1996

The Corridor Strategy was developed to identify projects for the Oregon State Transportation Improvement Program (STIP). Development of the US 20 Corridor Strategy is the first step in the corridor planning process. Corridor planning is intended to implement the goals and policies set forth by the 1992 Oregon Transportation Plan (OTP), the 1991 Oregon Highway Plan, and the recent modal plans for rail, freight, bike/pedestrian, aviation, and public transportation plus the safety action plan.

Generally, the Corridor Strategy translates the policies of the OTP into specific actions; describes the functions of each transportation mode, considers trade-offs, and shows how they will be managed; identifies and prioritizes improvements for all modes of travel; indicates where improvements should be made; resolves any conflicts with local land use ordinances and plans; and establishes guidelines for how transportation plans will be implemented.

The US 20 Corridor Strategy contains an overview of the nearly 250-mile corridor, including general descriptions of each of the nine corridor segments, population and employment forecasts, highway data such as traffic volumes, travel times, pavement conditions, safety analysis, and descriptions of other modes of travel (air, rail, bicycle, etc.). The overall corridor strategy is to, "accommodate efficient movement of through travel from US Highway 97 to I-84 by focusing on maintenance and safety improvements; while maintaining environmental integrity, and supporting economic development." The report sets forth objectives which are intended to embody this overall strategy for the corridor, and to set direction and provide guidance for corridor-wide transportation plans and improvements.

The US 20 Corridor Strategy outlines policies and issues pertaining to each of the specific corridor objectives which are broken into two categories as follows:

Transportation Performance Objectives

- Transportation balance and intermodal connection
- Regional connectivity
- Highway level of service
- Facility management
- Roadway conditions
- Safety

Transportation Impact Objectives

- Environmental
- Social and land use
- Energy
- Economic

The four underlying themes of the Corridor Strategy include enhancing safety, environmental preservation, economic development, and partnering.

Appendix B: Inventory Tables

Table B-1
1997 Transportation System Inventory
Harney County

Roadway	Roadway			Location			Right-of-Way	Miles			Date		Traffic
Number	Name	Classification	F.A.S.	Township	Range	Section	Width	Paved	Gravel	Dirt	Paved	Chip-Sealed	Count
101	Cow Creek Road	Local		22	32.5	34	60		2.43				30
102	Rattlesnake Road	Minor Collector		22	32.5	31	60	8.50			8/1/1992	9/1/1997	75
103	Harris Place	Local		22	32.5	30	60		0.38				15
104	North Harney Road	Local		22	32	31	60	6.20			7/15/1991	9/15/1996	40
105	Reed Road	Local		22	32	27	80	1.50			7/15/1991	9/15/1996	15
106	Lawen-Harney Road	Local		23	32.5	6	60		10.35				50
106A	Hutchenson Road	Local							2.50				25
107	Lawen-Dump Road	Local		25	32.5	5	na		0.25	1.03			
108	Lawen Lane	Local		24	32.5	32	60		7.00	6.50			15
109	Sealy Lane	Local		24	32.5	30	60		3.02				20
110	Embree Bridge Road	Local		24	32	23	60		3.97				30
111	Oil Well Road	Local		24	32	5	60		3.07				30
112	Faye Lane	Local		23	31	23	60		2.01				40
113	Rye Grass Road	Local		23s	32e	19		3.00	1.00	12.75	7/1/1984	9/15/1993	30
114	Old Experiment Station Road	Local		23s	32	6	60	4.14			7/15/1993	9/1/1993	80
115	Airport Road	Local		23s	31e	11	60	2.04			8/1/1985	9/1/1993	150
116	Red Barn Lane	Local		23	32	6	60	2.02			7/15/1991	9/1/1991	100
117	Fry Lane	Major Collector		23	31	5	60	1.94			8/15/1982	9/20/1996	100
118	Black Rock Road	Local		22	31	33	60	2.00	4.20	4.50	7/25/1985	9/15/1996	120
119	Eben Ray Road	Local		23	31	5	60	1.26			7/15/1982	9/1/1996	90
120	Stancliffe Road	Local		23	31	6	60	0.89			7/15/1982	9/1/1993	90
121	Foley Drive	Major Collector		23	31	6	60	5.92			1/1/1980	10/1/1995	200
122	Lone Pine Road	Local		22	30	25	60	1.00	2.01	10.11	8/15/1988	9/1/1991	30
123	West Loop Road	Local		22	30	36	60	3.03			7/15/1987	9/1/1993	50
124	Radar Road	Minor		23	30	1	60	0.70	5.32		8/20/1995	9/1/1995	50

		Collector										
124A	Indian Camp	Local					1.00			7/15/1980	9/1/1992	50
125	Hotchkiss Lane	Major Collector	23	31	29	60	2.83			8/20/1993	9/25/1996	150
125A	Hotchkiss Lane Extension	Local	23	30	24	100	1.80			8/1/1986	9/20/1996	200
125B	Lottery Lane	Local	23	30	24	100	0.49			8/25/1986	9/25/1996	300
125C	Snow Mountain Lane	Local	23	30	24	100	0.50			8/25/1986	9/25/1996	150
125D	Smith Lane	Local						0.80				10
126	Culp Lane	Local	23	31	19	60	1.27			7/15/1986	9/1/1991	40
126A	Norris Addition	Local				40	0.50			8/25/1986	9/25/1996	10
127	Hines Logging Road	Major Collector	23	30	26	100	24.40			7/15/1990	9/1/1993	100
128	Green House Lane	Major Collector	23	30	2	60	4.14			7/15/1987	9/1/1993	50
129	Potter Swamp Road	Local	24	30	12	60		2.35				15
130	Island Ranch Road	Local	24	31	9	60		6.99				30
131	Sunset Valley Road	Local	24	31	24	60		3.10				20
131A	Engstrom Road	Local						3.00				20
132	Weaver Springs Road	Local	25s	31s	24	60		7.16				30
133	Double O Road	Minor Collector	27	26	31	60/80		34.05				50
134	South Harney Lake Road	Local	27	30	2	60		4.00	18.71			10
136	Spud Fame Road	Local	99	99	99			1.96	7.94			20
137	Market Road 7	Local	23	27	28	60		3.89				10
138	Silver Creek Road	Major Collector	23	26	25	60	14.90	0.40		7/15/1987	9/1/1993	50
139	Miller Canyon Road	Local	23	27	19	60		3.28				10
140	Best Lane	Local	23	26	9	60		1.50	9.90			20
141	Newton Road	Local	24	33	30	80		6.50				30
142	Steens View Road	Local	23	31	11	60		0.70				60
144	Garland Addition	Local					1.30			6/9/1905	6/12/1905	100
144A	Sands Road	Local					0.20			9/25/1986	9/25/1996	100
144B	Skelton Road	Local					0.40			8/25/1986	9/25/1996	80
144C	City Dump Road	Local					1.00			7/15/1980		200

145	Gronso Addition	Local						0.60	0.50		7/15/1995	34943	80
201	Fields-Denio Road	Major Collector	B471	30	34	24	60	24.00	61.14		7/15/1986	9/1/1992	140
202	Catlow Valley Road	Major Collector	B470	31	33	3	60	34.22			9/15/1988	9/1/1994	110
203	Whitehorse Ranch Road	Minor Collector		39	35	27	60		28.43				20
204	Cottonwood Creek Road	Local		39	36	32	60			6.90			15
205	Cottonwood Ranch Road	Local		40	36	34	60		0.75	4.40			15
207	Cottonwood Fields Road	Local		40	36	34	60			9.35			10
208	Wild Horse Road	Local					60		1.50				10
209	Dump Road	Local					60		2.00				10
210	Oregon End Ranch Road	Local								10.00			10
3008	Highway 20 Mayo Ranch Road	Local								11.93			
3009	Best Ranch Road	Local								3.55			
301	Cottonwood Road	Local		40	36	34	60			5.49			10
3018	Gap Ranch Wagontire Road	Local								9.92			
3019	Gap Ranch Wagontire Road	Local								11.04			
302	Altnow-Beulah Road	Local		20	36	6	60		5.00	6.79			50
303	Juntura Cutoff Road	Local		20	37	31	60	7.45			8/1/1991	9/1/1995	90
304	Otis Valley Road	Minor Collector		20	35	23	60		5.65	10.50			50
3040	Ruh-Red South	Local								6.25			
305	Drewsey road	Major Collector	B476	20	35	23	60	2.62			8/1/1968	9/1/1975	120
306	Van-Drewsey Road	Major Collector	B476	20	35	23	60	21.56			8/1/1992	33848	90
307	Drewsey Market Road	Local		20	35	26	60		12.94				40
308	Clark Lane	Local		19	34	33	60		2.08				50
309	Calamity Creek Road	Minor Collector		19	33	25	60		2.12				20
310	Pine Creek road	Major Collector	B475	22	34	7	60	12.50	5.32		8/1/1991	7/1/1997	60
311	Warm Springs Road	Minor Collector		21	35	10	BLM			21.60			15

312	Crane-Buchanan road	Major Collector	B474	22	33	23	60	17.01			8/1/1982	9/1/1988	150
313	Crane-Venator Road	Major Collector	B484	25	34	8	60	0.80	25.28		8/1/1985	9/1/1996	100
313A	Malheur Caves Road	Local							2.00	9.30			
314	Crane Dump Road	Local		25	32.5	99	60		1.57				80
315	Fairmount Street	Local							0.25				30
316	Clyde Street	Local							0.25				30
317	Main Street	Minor Collector						0.25			1983		100
318	1st Street	Local							1.00				30
401	Virginia Valley Road	Minor Collector		27	35	20	60		6.50	22.3			20
402	Anderson Valley Road	Minor Collector		27	34	18	60		13.21				20
403	Princeton Spur Road	Local		27	31	1	60		1.55				30
404	Lava Beds Road	Major Collector	B472	23	33	7	100	23.48			8/1/1990	9/1/1995	100
405	Narrows-Princeton road	Major Collector	B473	27	30	20	60	5.75	12.36		8/1/1992	9/1/1992	120
406	Happy Valley Road	Minor Collector		28	33	21	60		12.95				30
407	Coon Town Road	Local		99	9	99	60			1.12			5
408	North Diamond Loop Road	Local		29	33	29	60		4.91				30
409	Diamond-Grain Camp Road	Major Collector	B472	29	31	24	60	12.39			7/1/1994	9/1/1994	90
410	Ham Brown Road	Local		29	33	32	60		0.60				10
411	Jack Mountain Road	Minor Collector		28	31	3	60			35.04			10
412	Rock Creek Road	Major Collector		32	32	32	60		18.60	3.98			40

Roadway Segment Location	Jurisdiction	Level of Importance	Speed Limit (mph)	Street Width (feet)	No. of Travel Lanes	Passing Lanes (direction)	Shoulders Width (feet)	Shoulders Side	Shoulders Paving	On-Street Parking	Curbs	Sidewalks	Bikeway	1997 Pavement Condition*
US Hwy 20 (Lake Co. line to Malheur Co. line)														
MP 83.79 (Lake Co. line) to MP 91.00	State	Statewide	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Under const.
MP 91.00 to MP 101.00	State	Statewide	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Good
MP 101.00 to MP 115.59	State	Statewide	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Very Good
MP 115.59 to MP 116.52	State	Statewide	55	36	3	Westbound	4 - 6	Both	Partial	No	No	No	No	Very Good
MP 116.52 to MP 124.39	State	Statewide	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Very Good
MP 124.39 to MP 125.55	State	Statewide	55	24	2	No	> 6	Both	Partial	No	No	No	No	Very Good
MP 125.55 to MP 126.31	State	Statewide	55	36	3	Westbound	> 6	Both	Partial	No	No	No	No	Very Good
MP 126.31 to MP 127.84	State	Statewide	55	24	2	No	> 6	Both	Partial	No	No	No	No	Very Good
MP 127.84 to MP 128.00	State	Statewide	45	24	2	No	> 6	Both	Partial	No	No	No	No	Very Good
MP 128.00 to MP 128.31	State	Statewide	45	36	3	No	> 6	Both	Partial	No	No	No	No	Poor
MP 128.31 to MP 128.68 (Hines city limit)	State	Statewide	45	24	2	No	4 - 6	Both	Partial	No	No	East side	East side	Poor
MP 128.68 to MP 130.00	State	Statewide	35	24	2	No	4 - 6	Both	Partial	No	No	East side	East side	Poor
MP 130.00 to MP 130.06	State	Statewide	35	36	3	No	No	NA	NA	No	East side	East side	East side	Poor
MP 130.06 to MP 130.10 (Burns city limit)	State	Statewide	35	60	5	No	No	NA	NA	No	Both sides	Both sides	No	Poor
MP 130.10 to MP 130.23	State	Statewide	35	60	5	No	No	NA	NA	No	Both sides	Both sides	No	Poor
MP 130.23 to MP 131.00	State	Statewide	35	48	4	No	No	NA	NA	No	Both sides	Both sides	No	Poor
MP 131.00 to MP 131.54	State	Statewide	25	48	4	No	No	NA	NA	No	Both sides	Both sides	No	Poor
MP 131.54 to MP 131.91	State	Statewide	25	48	2	No	No	NA	NA	Both sides	Both sides	Both sides	No	Poor
MP 131.91 to MP 132.12	State	Statewide	25	24	2	No	4 - 6	Both	Partial	No	No	No	No	Poor
MP 132.12 to MP 132.56	State	Statewide	35	24	2	No	4 - 6	Both	Partial	No	No	No	No	Poor
MP 132.56 to MP 134.05	State	Statewide	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Poor
MP 134.05 to MP 152.40	State	Statewide	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Good
MP 152.40 to MP 154.97	State	Statewide	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Good

MP 154.97 to MP 156.55	State	Statewide	55	24	2	No	> 6	Both	Partial	No	No	No	No	Good
MP 156.55 to MP 157.92	State	Statewide	55	36	3	Eastbound	> 6	Both	Partial	No	No	No	No	Good
MP 157.92 to MP 158.28	State	Statewide	55	36	3	Eastbound	> 6	Both	Partial	No	No	No	No	Very Good
MP 158.28 to MP 160.29	State	Statewide	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Very Good
MP 160.29 to MP 160.86	State	Statewide	55	36	3	Eastbound	4 - 6	Both	Partial	No	No	No	No	Very Good
MP 160.86 to MP 165.60	State	Statewide	55	36	3	Westbound	4 - 6	Both	Partial	No	No	No	No	Very Good
MP 165.60 to MP 175.04	State	Statewide	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Fair
MP 175.04 to MP 177.50	State	Statewide	55	36	3	Eastbound	4 - 6	Both	Partial	No	No	No	No	Fair
MP 177.50 to MP 180.15 (Malheur Co. line)	State	Statewide	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Fair
US Hwy 395 (Lakeview-Burns Hwy)														
MP 0.00 (Riley) to MP 5.27	State	Regional	55	24	2	No	> 6	Both	Partial	No	No	No	No	Good
MP 5.27 to MP 15.50	State	Regional	55	24	2	No	> 6	Both	Partial	No	No	No	No	Fair
MP 15.50 to MP 29.71	State	Regional	55	24	2	No	> 6	Both	Unpaved	No	No	No	No	Poor
MP 29.71 to MP 30.00 (Lake Co. line)	State	Regional	55	24	2	No	> 6	Both	Partial	No	No	No	No	Poor
US Hwy 395 (John Day-Burns Hwy)														
MP 40.38 to MP 67.78	State	Statewide	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Poor
OR Hwy 205 (OR Hwy 78 to Roaring SP. Ranch)														
MP 0.00 (Intersection OR Hwy 78) to MP 17.31	State	District	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Poor
MP 17.31 to MP 23.10	State	District	55	24	2	No	2 - 4	Both	Partial	No	No	No	No	Good
MP 23.10 to MP 28.91	State	District	55	24	2	No	2 - 4	Both	Partial	No	No	No	No	Poor
MP 28.91 to MP 31.07	State	District	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Poor
MP 31.07 to MP 32.00	State	District	55	24	2	No	2 - 4	Both	Partial	No	No	No	No	Poor
MP 32.00 to MP 35.75	State	District	55	24	2	No	2 - 4	Both	Partial	No	No	No	No	Under const.
MP 35.75 to MP 40.00	State	District	55	24	2	No	2 - 4	Both	Partial	No	No	No	No	Poor
MP 40.00 to MP 42.20	State	District	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Fair
MP 42.20 to MP 50.50	State	District	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Under const.
MP 50.50 to MP 52.50	State	District	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Good
MP 52.50 to MP 58.32	State	District	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Under const.

MP 58.32 to MP 59.27	State	District	55	22	2	No	< 2	Both	Unpaved	No	No	No	No	Good
MP 59.27 to MP 68.00	State	District	55	22	2	No	2 - 4	Both	Unpaved	No	No	No	No	Good
MP 68.00 to MP 73.35 (Roaring SP. Ranch)	State	District	55	22	2	No	< 2	Both	Unpaved	No	No	No	No	Good
OR Hwy 78 (Burns, OR to Malheur Co. line)														
MP 0.00 (Burns, OR) to MP 0.35	State	Regional	25	24	2	No	4 - 6	Both	Paved	No	No	No	No	Fair
MP 0.35 to MP 0.68	State	Regional	40	24	2	No	4 - 6	Both	Partial	No	No	No	No	Fair
MP 0.68 to MP 11.20	State	Regional	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Fair
MP 11.20 to MP 19.51	State	Regional	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Good
MP 19.51 to MP 20.70	State	Regional	55	22	2	No	2 - 4	Both	Unpaved	No	No	No	No	Fair
MP 20.70 to MP 22.50	State	Regional	55	22	2	No	2 - 4	Both	Unpaved	No	No	No	No	Poor
MP 22.50 to MP 28.40	State	Regional	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Poor
MP 28.40 to MP 32.70	State	Regional	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Good
MP 32.70 to MP 37.65	State	Regional	55	24	2	No	4 - 6	Both	Partial	No	No	No	No	Very Good
MP 37.65 to MP 47.26	State	Regional	55	22	2	No	2 - 4	Both	Unpaved	No	No	No	No	Poor
MP 47.26 to MP 52.20	State	Regional	55	24	2	No	4 - 6	Both	Paved	No	No	No	No	Poor
MP 52.20 to MP 55.50	State	Regional	55	24	2	No	4 - 6	Both	Paved	No	No	No	No	Poor
MP 55.50 to MP 60.88 (Malheur Co. line)	State	Regional	55	22	2	No	2 - 4	Both	Unpaved	No	No	No	No	Poor

APPENDIX C: HARNEY COUNTY POPULATION AND EMPLOYMENT ANALYSIS

Methodology and Data Sources

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. These annual population estimates for cities and counties are used for the purpose of allocating certain state tax revenues to cities and counties. Based on PSU's estimates through 1995 and a state econometric model, the State of Oregon Office of Economic Analysis (OEA) provided long-term (through year 2040) state population forecasts, disaggregated by county, for state planning purposes. OEA also developed county-level employment forecasts based on covered employment payrolls as reported by the Oregon Employment Department.

The Office of Economic Analysis used business-cycle trends (as reflected by the Employment Department's employment forecasts) as the primary driver of population and employment for the short term. For the long term, the forecasts shift to a population-driven model, which emphasizes demographics of the resident population, including age and gender of the population, with assumptions regarding life expectancy, fertility rate, and immigration.

Two methodologies were employed in forecasting the future population of Harney County. One methodology employs historical census data, official annual estimates, and official long-range forecasts. For this method, David Evans and Associates, Inc. (DEA) used a methodology based on OEA's county-distribution methodology in developing population and employment forecasts for each of the cities in Harney County. DEA calculated a weighted average growth rate for each jurisdiction (weighting recent growth more heavily than past growth) and combined this average growth rate with the projected county-wide growth rate. This methodology assumes convergence of growth rates because of the physical constraints of any area to sustain growth rates beyond the state or county average for long periods of time. These constraints include availability of land and housing, congestion, and other infrastructure limitations.

At the request of Harney County and its jurisdictions, David Evans and Associates, Inc., also prepared an alternative growth scenario for the purposes of this Transportation System Plan. The alternative growth scenario applies the average 1990 to 1997 growth rate of Harney County and each of its jurisdictions to the 20-year planning horizon.

These two methodologies were employed to illustrate the range of population growth that may occur in the planning area. Planning efforts must respond carefully to actual growth rates, as recent population estimates have varied widely from forecasts previously developed. The population and employment forecasts described in this report 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 was designed.

Historical Growth

The population of Harney County actually declined in the 1980s, reflecting a general slowdown in the state's economy.

TABLE C-1
HARNEY COUNTY HISTORICAL POPULATION TREND

							1970-1990 Change	
	1970	1980	1985	1990	1995	1996	Number	CAARG*
Harney County	7,215	8,314	7,350	7,060	7,050	7,500	(155)	(0.11%)
Burns	3,293	3,579	2,830	2,913	2,890	2,935	(380)	(0.61%)
Hines	1,407	1,632	1,470	1,452	1,445	1,525	45	0.16%

* Compound Average Annual Rate of Growth

Source: U.S. Bureau of the Census

In the last 25 years, the number of persons per job has decreased. With 7,215 reported persons in 1970 and total employment estimated at 3,020, the population/employment ratio in 1970 was 2.39 persons per job. In 1996, there were 3,210 jobs for the estimated population of 7,500, for a population/employment ratio of 2.34 persons per job. One factor leading to this declining ratio is a rising rate of labor participation by women and older adults (of traditional retirement age).

Oregon Employment data suggests that fully one-quarter of all employment in Harney County is agriculture-based. This agriculture-based proportion, although higher than the state average, is typical for more rural counties in Oregon. The economy of Harney County has been wavering between an agriculture-based economy and a more diversified economy, struggling with a high unemployment rate, as shown in the table below.

TABLE C-2
EMPLOYMENT TREND
HARNEY COUNTY

	1970	1975	1980	1985	1990	1995	1996
Total Estimated Employment	3,020	3,310	3,220	3,490	3,370	3,150	3,210
Unemployment Rate	5.9%	10.5%	21.8%	11.0%	8.9%	11.3%	13.0%
Nonfarm Payroll Employment	2,150	2,440	2,280	2,180	2,430	2,310	2,410
Agricultural Proportion	29%	26%	29%	38%	28%	27%	25%

Source: Oregon Employment Department

Current Population and Employment Level

Estimated at 7,500 in 1997, the population of Harney County has grown moderately since the 1990 Census, with an average annual growth rate of just under one percent. However, the year-over-year estimates by PSU suggest growth since 1990 in Harney County occurred within the last year, as the 1995 population is estimated at 7,050, less than the 1990 census number of 7,060. The 1995 and 1996 estimates represent a growth rate of 6.4 percent between these two years; however, Howard Wineberg, Assistant Director of the PSU CPRC and chief demographer for the population estimates, cautions against analyzing the estimates in such an isolated manner, since the estimates are based on the 1990 census year, not the previous year's estimates. The following table shows the estimated change in population for Harney County and the jurisdictions of Burns and Hines for 1990, 1995, 1996, and 1997.

TABLE C-3
HARNEY COUNTY POPULATION LEVEL

					1990-1997 Change	
	1990	1995	1996	1997	Number	CAARG*
Harney County	7,060	7,050	7,500	7,500	440	0.87%
Burns	2,913	2,890	2,935	2,975	62	0.30%
Hines	1,452	1,445	1,525	1,505	53	0.51%

* Compound Average Annual Rate of Growth

Source: Portland State University Center for Population Research and Census

Nearly 60 percent of Harney County's population lives within its two incorporated municipalities, Burns and Hines. Recent growth has been more concentrated in unincorporated parts of the county as these two cities have grown at a rate slower than Harney County as a whole.

Employment levels have decreased since 1990. The unemployment rate has increased as a result of two simultaneous factors: the population and labor force have grown while the number of jobs has declined. The loss of jobs and increase in unemployment rate are shown in the table below.

TABLE C-4
HARNEY COUNTY EMPLOYMENT

	1990	1996	1990-1996 Change Number	1990-1996 Change CAARG*
Total Employment	3,370	3,210	(160)	(0.81%)
Non-Agricultural Employment	2,430	2,410	(20)	(0.14%)
Unemployment Rate	8.9%	13.0%	N.A.	N.A.

Note: These figures are reported as place-of-work series, rather than place-of-residence. In other words, these estimated total jobs in Harney County may be held by residents of other counties. The impact of this difference is considered minimal for Harney County as the 1990 Census reports that over 97 percent of workers who live in Harney County also work in the County.

* Compound Average Annual Rate of Growth

Source: Oregon Employment Department.

The average unemployment rate in Harney County is significantly higher than the state average unemployment rate. The State of Oregon's unemployment rate has been at approximately 5 percent for several years, and has just begun creeping upward. As of October 1997, the statewide unemployment rate was 5.1 percent--still a historically low rate.

Populations with Specific Transportation Needs

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

As stated above, Portland State University's Center for Population and Census estimates the Harney County's population as 7,500 in 1996. The Center further estimates that 1,919 of these people, or about 26 percent of the population, is under the age of 18. Because the purpose of this analysis is to determine the number of people with specific transportation needs, DEA used PSU's age disaggregation to estimate that 1,678 people are under 16, the legal driving age in Harney County.

According to the 1990 Census, 10.6 percent of the 6,983 persons living in Harney County (for whom poverty status is determined) were below 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 populations are affected by this indicator, as shown in the following table.

TABLE C-5
POVERTY STATUS
HARNEY COUNTY--1990 CENSUS

	Below Poverty Level				
	Male	Female	Total Below Poverty Level	Total* Population	Percent of Total Population Below Poverty
11 and under	87	82	169	1,298	13.0%
12 to 17	42	23	65	658	9.9%
18 and over	185	319	504	5,027	10.0%
Total	**314**	**424**	**738**	**6,983**	**10.6%**

* For whom poverty status is determined

Source: U.S. Census Bureau

The Census Bureau reports that 3.5 percent of the population 16 and older 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.

Using the proportion of the population with mobility limitations and below the poverty level[5] in 1990, DEA estimated the number of people with specific transportation needs in 1996. The following table shows that an estimated 34.8 percent of the population may have specific transportation needs. (There is likely to be some overlap between the 3.5 percent of the population with mobility limitations and the 10.0 percent below the poverty level; therefore, the sum of the figures may overstate the proportion of the population with specific transportation needs.)

TABLE C-6
ESTIMATED POPULATION WITH SPECIFIC TRANSPORTATION NEEDS
1996, HARNEY COUNTY

	Percent of Total Population	Estimated Number
Persons between the ages of 5 and 15	22.4%	1,678
Persons 16 and older under Poverty Level	10.0%	750
Persons 16 and older with Mobility Limitation	3.5%	263
Total Specific Transportation Needs Population	**34.8%**	**2,691**

Planning for the overall transportation system will need to consider the special needs of these populations.

[5] DEA used the Census Bureau's age disaggregation to estimate that 10.0 percent of the population over the age of 16 was under the poverty level in 1990.

Population and Employment Forecasts

Harney County is expected to experience small population gains for the next 20 years. Based on historical growth, the 1995 PSU estimates, and the state econometric model, the State Office of Economic Analysis prepared long-term population projections by county. These projections are not entirely consistent with the locally-prepared documents, the Harney County Housing Study and the Harney County Buildable Lands Inventory. Based on the 1996 estimate of 7,500, the Harney County Buildable Land Inventory forecasts the population of Harney County to reach an estimated 7,800 residents by year 2000, an increase of 10 percent over the 1990 level. Based on forecasts prepared in July of 1993, forecasts used in the housing study suggest a net loss of population in Harney County. These various forecasts are shown in the following table.

TABLE C-7
HARNEY COUNTY POPULATION FORECAST
OFFICE OF ECONOMIC ANALYSIS;
HARNEY COUNTY BUILDABLE LAND INVENTORY; AND
HARNEY COUNTY HOUSING ANALYSIS

	1990	1995	1996	1997	2000	2005	2010
Historic Data	7,060	7,050	7,500	7,500			
Office of Economic Analysis					7,528	7,603	7,649
Harney Co. Housing Study					6,642	6,417	6,185
Harney Co. Buildable Lands Inventory					7,800	N/A	N/A

Source: 1990 data from the U.S. Census Bureau; 1995, 1996, and 1997 estimates developed by Portland State University Center for Population Research and Census

As shown in the above table, the State Office of Economic Analysis expects the population of Harney County to grow at the rate of 0.4 percent over the 20-year planning horizon. As noted by the Buildable Land Inventory, this growth rate may need to be revisited as PSU has estimated significant population growth between 1995 and 1996. However, the 1997 estimate does not suggest that this rapid growth continued into 1997.

Based on the OEA projections, population forecasts for the jurisdictions of Burns and Hines are shown in five-year increments in the following table.

TABLE C-8
HARNEY COUNTY POPULATION FORECAST
OEA CONVERGENCE METHODOLOGY

	1995	2000	2005	2010	2015	2017	1995-2000 CAARG	1995-2017 CAARG
Harney County	7,050	7,528	7,603	7,649	7,691	7,711	1.32%	0.41%
Burns	2,890	3,000	3,040	3,080	3,110	3,120	0.72%	0.35%
Hines	1,445	1,560	1,590	1,610	1,635	1,640	1.56%	0.59%

Source: 1990 data from the U.S. Census Bureau; 1995 estimates developed by Portland State University Center for Population Research and Census; County forecasts developed by State of Oregon Office of Economic Analysis; and Jurisdiction forecasts developed by David Evans and Associates, Inc.

Using the alternative methodology of recent growth rates as requested by Harney County and its incorporated cities, an alternative growth scenario would yield higher population levels throughout Harney County, as shown in the following table.

TABLE C-9
HARNEY COUNTY POPULATION FORECAST
STRAIGHT GROWTH RATE METHODOLOGY

			1990-1997 Change		
	1990	1997	Number	CAARG*	2017
Harney County	7,060	7,500	440	0.87%	8,910
Burns	2,913	2,975	62	0.30%	3,160
Hines	1,452	1,505	53	0.51%	1,670

* Compound Average Annual Rate of Growth

Both of these methodologies yield growth rates lower than those proposed in the *Public Review Draft of the U.S. Highway 20 Corridor Strategy (Bend-Vale).* However, the Highway 20 Corridor Strategy was released in June 1996, prior to the January 1997 release of the Office of Economic Analysis' *Long-Range Population and Employment Forecast* and the December 1997 Governor's Executive Order to use those OEA population and employment forecasts.

One point of interest for county planning efforts should this alternative growth scenario occur is that the vast majority of the population growth would be in rural Harney County, as this scenario estimates that only 350 of the over 1,400 new residents in Harney County would live in one of its incorporated cities.

Like much of rural Oregon, the economy of Harney County remains largely seasonal, with fully one-quarter of all employment agriculture-based. Therefore, population increases are difficult to predict, and are not likely to be as stable as the forecasts appear to imply. Planning efforts must respond carefully to actual growth rates, as the most recent population estimates reflect some population losses followed by significant population growth.

The Office of Economic Analysis also developed forecasts of Non-Agricultural Employment by county. As noted earlier, an estimated 25 percent of all employment in Harney County was agriculture based in 1996. Although the economy has seen some movement recently, agricultural employment accounted for an estimated 26 percent of employment in 1975, only one percent greater than the 1996 estimated of 25 percent. Based on the 1996 estimated proportion, the following table shows non-agricultural and estimated total employment for Harney County to year 2017.

TABLE C-10
HARNEY COUNTY EMPLOYMENT FORECAST*

	1995	2000	2005	2010	2015	2017	1995-2000 CAARG	1995-2017 CAARG
Non-Agricultural Employment	2,310	2,580	2,620	2,650	2,670	2,670	2.20%	0.63%
Estimated Total Employment	3,150	3,430	3,495	3,535	3,550	3,560	1.72%	0.56%

* The Office of Economic Analysis inflated non-agricultural employment in 1995 to 2,317 to correct for Oregon jobs not attributed to any specific county.

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

Employment is expected to grow by nearly 11 percent over the next 20 years. The population/employment ratio will remain relatively stable (falling slightly from 2.34 persons per job in 1996 to 2.17 persons per job forecast for year 2017). Two factors affecting this ratio include an increasing number of working-age people moving into retirement age and a rising rate of labor participation by older adults, as evidenced by nationwide trends.

Appendix E: TECHNICAL MEMORANDUM - SUMMARY OF OR HIGHWAY 78 ANALYSIS

The Harney 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. A section of OR Highway 78 is a part of that transportation system. This technical memorandum summarizes the elements of the TSP which pertain to the section of OR Highway 78 which lies within Harney County.

Inventory

OR Highway 78 runs through eastern Harney County for approximately 47 miles. Beginning within the Burns city limits, it extends southeast through Lawen, Crane, and New Princeton, and continues across the Harney/Malheur County line. It crosses the Steens Mountains and connects with US Highway 95 in Malheur County.

Oregon Highway Plan

The 1991 Oregon Highway Plan (OHP) classifies the state highway system into four levels of importance (LOI): Interstate, Statewide, Regional, and District. ODOT has established primary and secondary functions for each type of highway and objectives for managing the operations for each one. OR Highway 78 is classified as a highway of regional importance.

The primary function of a Regional Highway, such as OR Highway 78, according to the OHP, 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 within the vicinity of these highways. The overall emphasis for this type of highway is to provide safe and efficient high speed through travel in rural areas, and moderate to low speeds in urban or urbanizing areas with moderate interruptions in mainstream traffic flow.

Physical Description

OR Highway 78 (Steens Highway) is a highway of regional importance. It is a two-lane roadway with a speed limit of 55 mph except within the Burns city limits where the speed varies between 25 and 40 mph. The route is comprised of numerous curves and moderate grade changes resulting in localized speed reductions ranging from 35 to 45 mph. Extended segments of roadway

shoulders on both sides of the highway vary in width from two to four and four to six feet and are typically partially paved. A few short shoulder segments are less than two feet wide.

Pavement conditions along OR Highway 78 vary, as shown in Table E-1. 36.6% of the highway is classified as *Good* or *Very Good*, and 25.6% as *Fair* condition. 37% of the pavement falls in the *Poor* condition category, with none of the highway in the *Very Poor* condition category.

TABLE E-1
STATE HIGHWAY PAVEMENT CONDITIONS

Highway	Milepost	Length	Section Description	Pavement Condition
OR 78	0.00-11.20	11.20	US Highway 20 Jct. to MP 11.20	Fair
	11.20-19.70	8.50	MP 11.20 to MP 19.70	Good
	19.70-20.60	0.90	MP 19.70 to Saddle Butte Quarry	Fair
	20.60-28.40	7.80	Saddle Butte Quarry to Crane	Poor
	28.40-32.70	4.30	Crane to MP 32.70	Good
	32.70-37.20	4.50	MP 32.70 to New Princeton	Very Good
	37.20-47.23	10.03	New Princeton to Harney/Malheur County line	Poor
Summary of	9.5%	4.50		Very Good
Pavement	27.1%	12.80		Good
Conditions	25.6%	12.10		Fair
	37.8%	17.83		Poor
	0.0 %	0.00		Very Poor
	100.0 %	47.23		Total

Bridges

The state has 19 bridges located on OR Highway 78. Bridge inventory data were supplied by the ODOT Bridge section. None of the bridges on this highway were identified as having any deficiencies.

Current Transportation Conditions

As part of the planning process, the current operating conditions for OR Highway 78 were evaluated.

1997 Traffic Volumes

Traffic volumes on OR Highway 78 are highest in Burns, east of the US Highway 20 junction, where traffic volumes are 3,300 vpd. Traffic volumes drop to 600 vpd at Airport Road, 380 vpd at Lawen, and 330 vpd at Diamond Valley Road. Volumes continue to drop to the southeast to 150 vpd near the Harney/Malheur County line.

1997 Roadway Capacity

Analysis of the roadway system capacity in Harney County was evaluated in two different ways: traffic operations along the roadway alone, and traffic operations at intersecting local streets or driveways

Rural Roadway Operations

The traffic operations of mainstream traffic along the rural highway sections were determined using the 1994 Highway Capacity Software. 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.

The peak hour traffic was assumed to be 10 percent of the 24-hour ADT volume and the directional split was assumed to be 60/40. In segments where more than one volume was reported, a worst case analysis was performed using the highest reported volume for that segment.

The operations on the rural sections of the highway were analyzed for a typical peak hour condition. All rural segments of OR Highway 78 operate at LOS A or better.

Operations at Intersections

The traffic operation was determined at intersections along the rural highway sections using the 1994 Highway Capacity software. Since all intersecting streets and driveways are controlled by STOP signs in these areas, the analysis was performed for unsignalized intersections.

The intersection operations were analyzed at the junction of OR Highway 205 and OR Highway 78 east of Burns. Traffic operations were analyzed using a peak hour two-way traffic volume of roughly ten percent of the daily traffic. 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 intersection currently operates at LOS A. This indicates that all other lower-volume roads or driveways accessing any portion OR Highway 78 are operating at LOS A as well. The resulting level of service for each highway intersection is shown in Table E-2.

TABLE E-2
SUMMARY OF 1997 OPERATIONS AT RURAL INTERSECTIONS

Location	Movement	1997 LOS
OR Highway 205 and OR Highway 78 east of Burns	Eastbound; Through, Right	A
	Westbound; Left, Through	A
	Northbound; Left, Right	A

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

Safety Analysis

The three-year accident rates for OR Highway 78 are shown in Table E-3. They are generally lower than the statewide averages for secondary state highways except during 1995, when accident rates in and around Burns were higher than average.

TABLE E-3
HISTORIC ACCIDENT RATES FOR STATE HIGHWAYS
(Accidents per Million Vehicle Miles Traveled)

Highway	1996	1995	1994
OR Highway 78 (Steens Hwy)			
US Hwy 20 junction to Burns city limits (urban)	NA	**3.46**	1.73
Burns city limits to OR Hwy 205 junction (rural)	NA	**1.97**	NA
OR Hwy 205 junction to Crane junction (rural)	0.39	0.38	0.76
Crane junction to Lava Beds Road (rural)	0.70	0.62	0.62
Lava Beds Road to Malheur/Harney Co. line (rural)	**1.69**	0.54	0.54
Average for all **Rural** Non-freeway Secondary State highways	1.26	1.11	1.10
Average for all **Urban** Non-freeway Secondary State highways	3.10	3.27	2.79

Source: Oregon Department of Transportation Accident Rate Tables.

Table E-4 contains detailed accident information on OR Highway 78 from January 1, 1994 to December 31, 1996.

TABLE E-4
ACCIDENT SUMMARIES FOR STATE HIGHWAYS
(January 1, 1994 To December 31, 1996)

Location	Fatalities	Injuries	Property Damage Only	Total Accidents	Accident Frequency (acc/mi/yr)	Accident Rate (acc/mvm)
OR Highway 78 (*Steens Hwy*)						
MP 0.00 to MP 47.23	1	22	9	20	0.11	1.12

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

On the four rural segments of OR Highway 78 within Harney county during the three-year period, there was a total of 20 accidents, 11 of which were reported as

property damage only. There was one fatality and 22 injuries on these roadway segments during this period. One of the accidents occurred at an intersection and four occurred on icy/wet pavement. The accidents were scattered along the roadway segments and there were no particular locations which showed a consistent accident pattern. Accident rate information for 1996 was only available for three of the four rural segments. Two segments were below the statewide average of 1.26 accidents per mvm for all rural, secondary, non-freeway highways while the segment from Lava Beds Road (MP 37.79) to the Malheur/Harney County line (MP 60.88) exceeded the state average by nearly 0.50 accidents per mvm. Five accidents occurred along this segment between 1994 and 1996. The identified driver error in four of the five accidents was "driving too fast for roadway conditions." This error does not necessarily imply speeding, but rather failure to adjust speed to prevailing roadway conditions.

On the short urban segment of OR Highway 78 within Burns during the three-year period, there was a total of three accidents, two of which were reported as property damage only. There were no fatalities and two injuries on this roadway segment during the period. All three accidents occurred at intersections during dry pavement conditions. The identified driver error in all three of the accidents was "failure to yield right-of-way." There is no evidence to suggest that intersection operations (signals, signing, striping, etc.) were at fault. Accident rate information was not available for 1996.

TRAVEL FORECASTS

The traffic volume forecasts for OR Highway 78 are based on the historic growth on the highway, historic population growth, and projected population growth.

Land Use

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

Population Trends

Population levels in most of Eastern Oregon are close to or actually lower than those experienced earlier in the century (see Table E-5). The population of Harney County actually declined in the 1980s and early 1990s, reflecting a general slowdown in the state's economy.

TABLE E-5
HARNEY COUNTY POPULATION

Year	Population	Average Annual Growth Rate	Total Growth
Historic Trends			
1970	7,215	-	-
1980	8,315	1.4%	15.2%
1985	7,350	-2.4%	-11.6%
1990	7,060	-0.8%	-3.9%
1995	7,050	-0.0%	-0.1%
1997	7,500	3.1%	6.4%
Office of Economic Analysis Forecasts (1)			
1995	7,050	-	-
2000	7,525	1.3%	6.7%
2005	7,605	0.2%	1.1%
2010	7,650	0.1%	0.6%
2015	7,690	0.1%	0.5%
2017	7,710	0.1%	0.3%
Alternative Growth Scenario (2)			
1990	7,060	-	-
1997	7,500	0.9%	6.2%
2017	8,910	0.9%	18.8%
OEA 1997-2017	**210**	**0.14%**	**2.8%**
Alternative 1997-2017	**1,410**	**0.87%**	**18.8%**

Notes:
(1) 1995 estimates developed by Portland State University Center for Population Research and Census; forecasts developed by State of Oregon Office of economic Analysis.
(2) 1990 data from the US Census Bureau; forecasts developed by David Evans and Associates, Inc.

Two population forecasts were prepared for the county, one is based on the State of Oregon Office of Economic Analysis (OEA), the other is alternative scenario based on the average growth rate from 1990 to 1997. The OEA estimates population growth at 2.8 percent over 20 years. The alternative forecast growth is estimated at 18.8 percent.

Potential Development Impact Analysis

To identify locations where growth on the highway may be affected by nearby rural development, a review of ODOT's Potential Development Impact Analysis (PDIA) was also performed. The PDIA identifies areas of potential growth based on land use. Potential growth areas or "polygons" are identified around the county based on zoning.

Harney County would have two polygons that could potentially affect OR Highway 78. These are summarized in Table E-6. The Crane polygons are located east of Burns on OR Highway 78 in northeast Harney County. Crane

High School occupies an estimated 33 of the 160 acres. The remainder of the polygon is designated for Rural Community uses, yielding an estimated 56 additional residential units.

TABLE E-6
POTENTIAL DEVELOPMENT IMPACT ANALYSIS SUMMARY

Polygon	Zoning	Acreage			Units		
		Net Area	Built	Vacant	Existing	Potential	Total
Crane I	EFU	33.0	33.0	0.0	6	0	6
Crane II	RC	127.0	51.4	75.6	36	56	92

Source: Oregon Department of Transportation, Potential Development Impact Analysis

Traffic Volumes

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

Historical Traffic Volumes

Historical traffic volumes along all the state highways in the county were established using the ADT volume information presented in the ODOT Traffic Volume Tables for the years 1975 through 1995. The ADT volumes were obtained at all rural and urban sections of each highway within the county. Averaging the ADT volumes in each area together for each year and using a linear regression analysis, an average annual growth rate was determined for OR Highway 78, as shown in Table E-7

TABLE E-7
HISTORIC GROWTH RATES ON STATE HIGHWAYS

Highway Section	20-Year Average Annual Growth Rate	20-Year Total Growth
OR Highway 78		
Rural Section south of Burns	0.0%	0.5%

Source: ODOT Transportation Volume Tables.

Forecasting Methodology

The traffic forecast for OR Highway 78 was performed using ODOT's *Level 1 - Trending Analysis*[6] methodology. The forecasting methodology used in this forecast assumed that traffic demand on the state highways will grow at a rate equivalent to the historical traffic growth trend of each highway.

[6] ODOT *Transportation System Planning Guidelines*, August 1995, pg. 29.

Future Traffic Volumes

Using the same linear regression analysis used to calculate the historic growth rate of traffic, forecasts were made for the year 2018. Where the historic growth rates were very low, traffic volume projections were based on the projected population for Harney County.

Future Roadway Capacity

Future traffic operations were determined for a typical unsignalized intersection located along the most heavily traveled rural highway section of OR Highway 78. The traffic operations of mainstream traffic along the rural highway sections were also determined for the year 2018.

Rural Operations

The two-lane highway analysis indicates that the rural highway segment of OR Highway 78 operates at LOS A in 1996 and will continue to operate at LOS A through the 20-year study period

Operations at Intersections

An unsignalized intersection analysis was performed at the junction of OR Highways 78 and 205 for both the existing and future conditions. The analysis, summarized in Table E-8, indicates that the intersection is expected to continue to operate at LOS A. This indicates that all other lower volume roads or driveways accessing any portion of OR Highway 205 are operating at LOS A as well.

TABLE E-8
SUMMARY OF FUTURE OPERATIONS AT RURAL INTERSECTIONS

Location	Movement	1997 LOS	2018 LOS
OR Highway 205 and OR Highway 78 east of Burns	Eastbound; Through, Right	A	A
	Westbound; Left, Through	A	A
	Northbound; Left, Right	A	A

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

ACCESS MANAGEMENT

The state highways in Harney County should follow the guidelines specified in the 1991 OHP. On OR Highway 78, OHP Category 5, “Partial Control” for regional/district highways is most appropriate. The standards for Category 5 from the OHP are summarized in Tabe E-9.

TABLE E-9
STATE HIGHWAY ACCESS MANAGEMENT STANDARDS

		Intersection					
	Urban/	Public Road		Private Drive[2]		Signal	Median
Category	Rural	Type[1]	Spacing	Type	Spacing	Spacing	Control
5	Urban	at-grade	¼ mile	L/R Turns	300 feet	¼ mile	None
	Rural	at-grade	½ mile	L/R Turns	500 feet	½ mile	None

Source: Table 1 - Access Management Classification System, Appendix B, 1991 Oregon Highway Plan.

Roadway System Plan

Two roadway system projects were identified for OR Highway 78 in Harney County, as shown in Table E-10.

TABLE E-10
STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM

Highway Number	Road Name	Project Type	Estimated Cost
OR 78 (1)	Steens Highway (442)	Level roadway, overlay pavement, and install guard rails between mileposts 19.7 and 28.4 in FFY 2001.	$1,983,000
OR 78 (2)	Truck Route	Create a truck route along Fry Lane and OR Highway 78 in cooperation with Harney County and ODOT.	$687,000

Notes:
(1) Project from the *Final Statewide Transportation Improvement Program 1998-2001, December 1997.*
(2) Project recommended based on analysis of options presented in the *Harney County Transportation System Plan* and the *City of Burns Transportation System Plan*.

Pedestrian System Plan

No improvements along OR Highway 78 were identified.

Bicycle System Plan

No specific shoulder widening projects are recommended as part of this plan; however, as the highway is paved, repaved, resurfaced, or reconstructed, shoulders should be widened to meet the recommendations in the *Oregon Bicycle and Pedestrian Plan*.

APPENDIX F: TECHNICAL MEMORANDUM - SUMMARY OF OR HIGHWAY 205 ANALYSIS

The Harney 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. A section of OR Highway 205 is a part of that transportation system. This technical memorandum summarizes the elements of the TSP which pertain to the section of OR Highway 205 which lies within Harney County.

Inventory

OR Highway 205 runs through central Harney County for approximately 73 miles. Beginning at the OR Highway 78 junction, the highway extends south through the Malheur Wildlife Refuge and Frenchglen, ending its highway designation at Roaring Springs Ranch Headquarters. The roadway continues as a county road in good condition from Roaring Springs to the Nevada border.

Oregon Highway Plan

The 1991 Oregon Highway Plan (OHP) classifies the state highway system into four levels of importance (LOI): Interstate, Statewide, Regional, and District. ODOT has established primary and secondary functions for each type of highway and objectives for managing the operations for each one. OR Highway 205 is classified as a highway of district importance.

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.

Physical Description

OR Highway 205 (Frenchglen Highway) is a highway of district importance. It is a two-lane roadway with a speed limit of 55 mph. Extended segments of roadway shoulders on both sides of the highway vary in width from two to four and four to six feet and are typically partially paved.

Pavement conditions along OR Highway 205 vary. Approximately 31% has been classified as in *Good* condition and 3% as *Fair.* Over 41% of the highway is classified as in *Poor* condition. The remaining 24% of the highway is under construction.

TABLE F-1
STATE HIGHWAY PAVEMENT CONDITIONS

Highway	Milepost	Length	Section Description	Pavement Condition
OR 205	0.00-17.40	17.40	Highway 78 Jct. to MP 17.40	Poor
	17.40-23.10	5.70	MP 17.4 – Narrows	Good
	23.10-32.00	8.90	Narrows to MP 32.00	Poor
	32.00-35.75	3.75	MP 32.00 to MP 35.75	Under construction
	35.75-40.00	4.25	MP 35.75 to MP 40.00	Poor
	40.00-42.20	2.20	MP 40.00 to MP 42.20	Fair
	42.20-50.50	8.30	MP 42.20 to MP 50.50	Under construction
	50.50-52.50	2.00	MP 50.50 to MP 52.50	Good
	52.50-58.30	5.80	MP 52.50 to Frenchglen	Under construction
	58.30-73.35	15.05	Frenchglen to Roaring Springs Ranch	Good
Summary of Pavement Conditions	0%	0.0		Very Good
	31%	22.75		Good
	3%	2.20		Fair
	41.7%	30.55		Poor
	0	0.00		Very Poor
	24.3%	17.85		Under Construction
	100%	73.35		Total

Bridges

The state has 14 bridges located on OR Highway 205. Bridge inventory data were supplied by the ODOT Bridge section. None of the bridges on this highway were identified as having any deficiencies.

Current Transportation Conditions

As part of the planning process, the current operating conditions for OR Highway 205 were evaluated.

1997 Traffic Volumes

The highest volumes on OR Highway 205 are found where the highway begins, at the OR Highway 78 junction, where traffic volumes are 400 vpd. Volumes decrease to 270 vpd south of Narrows, 220 vpd south of Frenchglen, and 80 vpd where the highway ends at the Roaring Springs Ranch.

1997 Roadway Capacity

Analysis of the roadway system capacity in Harney County was evaluated in two different ways: traffic operations along the roadway alone, and traffic operations at intersecting local streets or driveways

Rural Roadway Operations

The traffic operations of mainstream traffic along the rural highway sections were determined using the 1994 Highway Capacity Software. 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.

The peak hour traffic was assumed to be 10 percent of the 24-hour ADT volume and the directional split was assumed to be 60/40. In segments where more than one volume was reported, a worst case analysis was performed using the highest reported volume for that segment.
The operations on the rural sections of the highway were analyzed for a typical peak hour condition. All rural segments of OR Highway 205 operate at LOS A or better.

Operations at Intersections

The traffic operation was determined at intersections along the rural highway sections using the 1994 Highway Capacity software. 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 at the junction of OR Highway 205 and OR Highway 78 east of Burns. Traffic operations were analyzed using a peak hour two-way traffic volume of roughly ten percent of the daily traffic. 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. This indicates that all other lower-volume roads or driveways accessing any portion of OR Highway 205 are operating at LOS A as well. The resulting level of service for each highway intersection is shown in Table F-2.

TABLE F-2
SUMMARY OF 1997 OPERATIONS AT RURAL INTERSECTIONS

Location	Movement	1997 LOS
OR Highway 205 and OR Highway 78 east of Burns	Eastbound; Through, Right	A
	Westbound; Left, Through	A
	Northbound; Left, Right	A

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

Safety Analysis

The three-year accident rates for OR Highway 205 are shown in Table F-3. They are generally lower than the statewide averages for secondary state highways.

TABLE F-3
HISTORIC ACCIDENT RATES FOR STATE HIGHWAYS
(Accidents per Million Vehicle Miles Traveled)

Highway	1996	1995	1994
OR Highway 205 (Frenchglen Hwy)			
OR Hwy 78 junction to Island Ranch Road (rural)	1.08	1.06	NA
Island Ranch Road to The Narrows (rural)	0.52	0.50	**1.51**
The Narrows to Grain Camp Road (rural)	NA	NA	1.09
Grain Camp Road to Frenchglen (rural)	**1.33**	NA	NA
Frenchglen to Roaring Springs Ranch/end Hwy (rural)	0.59	0.41	0.69
Average for all **Rural** Non-freeway Secondary State Highways	1.26	1.11	1.10

Source: Oregon Department of Transportation Accident Rate Tables.

Table F-4 containes detailed accident information on OR Highway 205 from January 1, 1994 to December 31, 1996.

TABLE F-4
ACCIDENT SUMMARIES FOR STATE HIGHWAYS
(January 1, 1994 To December 31, 1996)

Location	Fatalities	Injuries	Property Damage Only	Total Accidents	Accident Frequency (acc/mi/yr)	Accident Rate (acc/mvm)
OR Highway 205 (*Frenchglen Hwy*)						
MP 0.00 to MP 73.35	0	9	5	12	0.05	0.87

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

There were twelve accidents on the rural section of OR Highway 205 during the three-year period. These consisted of no accidents with fatalities, nine with injuries, and five with property damage only. Two of the accidents occurred during wet/icy roadway conditions. The accidents were scattered along the

roadway segment and there were no particular locations that showed a consistent accident pattern. Accident rate information for 1996 was only available for four of the five rural segments. Three of the segments were below the statewide average of 1.26 accidents per mvm for all rural, secondary, non-freeway highways, while the following segment exceeded the statewide average with an 1996 accident rate of 1.33: Grain Camp Road (MP 40.62) to Frenchglen (MP 58.76).

Three accidents occurred along this segment. In all three cases, the identified driver error was "driving too fast for roadway conditions." This error does not necessarily imply speeding, but rather failure to adjust speed to prevailing roadway conditions. Roadway conditions for the accidents were wet and/or icy.

TRAVEL FORECASTS

The traffic volume forecasts for OR Highway 205 are based on the historic growth on the highway, historic population growth, and projected population growth.

Land Use

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

Population Trends

Population levels in most of Eastern Oregon are close to or actually lower than those experienced earlier in the century (see Table F-5). The population of Harney County actually declined in the 1980s and early 1990s, reflecting a general slowdown in the state's economy.

TABLE F-5
HARNEY COUNTY POPULATION

Year	Population	Average Annual Growth Rate	Total Growth
Historic Trends			
1970	7,215	-	-
1980	8,315	1.4%	15.2%
1985	7,350	-2.4%	-11.6%
1990	7,060	-0.8%	-3.9%
1995	7,050	-0.0%	-0.1%
1997	7,500	3.1%	6.4%
Office of Economic Analysis Forecasts (1)			
1995	7,050	-	-
2000	7,525	1.3%	6.7%
2005	7,605	0.2%	1.1%
2010	7,650	0.1%	0.6%
2015	7,690	0.1%	0.5%
2017	7,710	0.1%	0.3%
Alternative Growth Scenario (2)			
1990	7,060	-	-
1997	7,500	0.9%	6.2%
2017	8,910	0.9%	18.8%
OEA 1997-2017	**210**	**0.14%**	**2.8%**
Alternative 1997-2017	**1,410**	**0.87%**	**18.8%**

Notes:
(1) 1995 estimates developed by Portland State University Center for Population Research and Census; forecasts developed by State of Oregon Office of economic Analysis.
(2) 1990 data from the US Census Bureau; forecasts developed by David Evans and Associates, Inc.

Two population forecasts were prepared for the county, one is based on the State of Oregon Office of Economic Analysis (OEA), the other is alternative scenario based on the average growth rate from 1990 to 1997. The OEA estimates population growth at 2.8 percent over 20 years. The alternative forecast growth is estimated at 18.8 percent.

Potential Development Impact Analysis

To identify locations where growth on the highway may be affected by nearby rural development, a review of ODOT's Potential Development Impact Analysis (PDIA) was also performed. The PDIA identifies areas of potential growth based on land use. Potential growth areas or "polygons" are identified around the county based on zoning. There were no polygons identified in the OR Highway 205 corridor.

Traffic Volumes

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

Historical Traffic Volumes

Historical traffic volumes along all the state highways in the county were established using the ADT volume information presented in the ODOT Traffic Volume Tables for the years 1975 through 1995. The ADT volumes were obtained at all rural and urban sections of each highway within the county. Averaging the ADT volumes in each area together for each year and using a linear regression analysis, an average annual growth rate was determined for OR Highway 205, as shown in Table F-6

TABLE F-6
HISTORIC GROWTH RATES ON STATE HIGHWAYS

Highway Section	20-Year Average Annual Growth Rate	20-Year Total Growth
OR Highway 205		
Rural Section south of Burns	2.9%	76.9%

Source: ODOT Transportation Volume Tables.

Forecasting Methodology

The traffic forecast for OR Highway 205 was performed using ODOT's *Level 1 - Trending Analysis*[7] methodology. The forecasting methodology used in this forecast assumed that traffic demand on the state highways will grow at a rate equivalent to the historical traffic growth trend of each highway.

Future Traffic Volumes

Using the same linear regression analysis used to calculate the historic growth rate of traffic, forecasts were made for the year 2018. Where the historic growth rates were very low, traffic volume projections were based on the projected population for Harney County.

Future Roadway Capacity

Future traffic operations were determined for a typical unsignalized intersection located along the most heavily traveled rural highway section of OR Highway 205. The traffic operations of mainstream traffic along the rural highway sections were also determined for the year 2018.

[7] ODOT *Transportation System Planning Guidelines*, August 1995, pg. 29.

Rural Operations

The two-lane highway analysis indicates that OR Highway 205 operates at LOS A in 1997 and will continue to operate at LOS A through the 20-year study period.

Operations at Intersections

An unsignalized intersection analysis was performed at the junction of OR Highways 205 and 78 for both the existing and future conditions. The analysis, summarized in Table F-7, indicates that the intersection is expected to continue to operate at LOS A. This indicates that all other lower volume roads or driveways accessing any portion of OR Highway 205 are operating at LOS A as well.

TABLE F-7
SUMMARY OF FUTURE OPERATIONS AT RURAL INTERSECTIONS

Location	Movement	1997 LOS	2018 LOS
OR Highway 205 and OR Highway 78 east of Burns	Eastbound; Through, Right	A	A
	Westbound; Left, Through	A	A
	Northbound; Left, Right	A	A

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

ACCESS MANAGEMENT

The state highways in Harney County should follow the guidelines specified in the OHP. On OR Highway 205, OHP Category 6, "Partial Control" for regional/district highways is most appropriate. The standards for Category 6 from the OHP are summarized in Table F-8.

TABLE F-8
STATE HIGHWAY ACCESS MANAGEMENT STANDARDS

		Intersection					
		Public Road		Private Drive[2]		Signal	Median
Category	Urban/ Rural	Type[1]	Spacing	Type	Spacing	Spacing	Control
6	Urban	at-grade	500 feet	L/R Turns	150 feet	¼ mile	None
	Rural	at-grade	¼ mile	L/R Turns	500 feet	½ mile	None

Source: Table 1 - Access Management Classification System, Appendix B, 1991 Oregon Highway Plan.

Roadway System Plan

Two roadway system projects were identified for OR Highway 205 in Harney County, as shown in Table F-9. Both are from the final 1998-2001 Statewide Transportation Improvement Program, published in December 1997.

TABLE F-9
STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM

Highway Number	Road Name	Project Type	Estimated Cost
OR 205	Frenchglen Highway (440)	Level roadway, overlay pavement, and install guard rails between mileposts 49.60 and 71.30 in FFY 2000.	$754,000
OR 205	Frenchglen Highway (440)	Improve roadway including EAC leveling, a chip seal, guard-rail installation, roadway realignment, and selected bridge work between mileposts 0.0 and 32.0 in FFY 2001.	$4,370,000

Source: Final Statewide Transportation Improvement Program 1998-2001, December 1997.

Pedestrian System Plan

No improvements along OR Highway 205 were identified.

Bicycle System Plan

No specific shoulder widening projects are recommended as part of the Harney County TSP plan; however, as the highway is paved, repaved, resurfaced, or reconstructed, shoulders should be widened to meet the recommendations in the *Oregon Bicycle and Pedestrian Plan*.