

FINAL

**CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION
TRANSPORTATION SYSTEM PLAN**

September 2001



Prepared for:

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CHAPTER 1: INTRODUCTION

The purpose of this document is to develop a long-range Transportation System Plan (TSP) for the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), including the development of a prioritized list of transportation improvements. This document addresses the transportation needs of the Umatilla Indian Reservation over the next 20 years, and considers key modes of travel including roadway, bicycle, pedestrian, transit, and rail.

The Transportation System Plan is located in Chapter 8 of this report. This plan shall be used as a tool for implementing transportation system improvements on the Umatilla Indian Reservation over the next 20 years. This plan shall also be used by the CTUIR when making decisions related to the classification of existing and future roadways on the Reservation, the implementation of roadway design standards when new roads are built or existing ones are improved, the needs of bicyclists and pedestrians and public transit, and the enforcement of access management policies.

The prioritized list of transportation improvements is located in Appendix I, Tab 1. Two maps showing the locations of all transportation improvements also accompany this list. The priority list of improvements was placed in an appendix to give the CTUIR added flexibility in updating this list periodically. Changes may be made to this list as new projects are identified or when existing projects need to be reprioritized. Every update to this list would need to be approved by a tribal resolution from the Board of Trustees (BOT).

It is the priority list of transportation improvements that will be used by the CTUIR to develop the tribe's Transportation Improvement Program (TIP). The tribal TIP is a multi-year, financially constrained, list of transportation improvement projects to be implemented within the next three or more years. For each of the projects earmarked for BIA funding, a formal application known as a "justification checklist" must be submitted to the Bureau of Indian Affairs (BIA). Upon approval by the BIA, the project is included in the Indian Reservation Roads TIP and a scoping report is issued to identify the improvements to be made. The BIA's TIP is a prioritized list (by year) of funded projects, which are programmed for construction within the next 3-5 years. Projects in the BIA's TIP are then included in the Statewide Transportation Improvement Program (STIP) without further action.

STUDY AREA

The study area covers the entire Umatilla Indian Reservation, which consists of 172,000 acres of land located in northeastern Oregon, just east of Pendleton. The study area is shown in Figure 1-1.

Since the automobile is the primary method of transportation on the Umatilla Indian Reservation, much of CTUIR TSP is devoted to the roadways that make up the Indian Reservation Roads (IRR) System. Therefore, the study area covers all the roadways on the Reservation including those roadways that provide direct access to the Reservation.

RELATIONSHIP OF TRANSPORTATION SYSTEM PLAN TO OTHER PLANNING DOCUMENTS

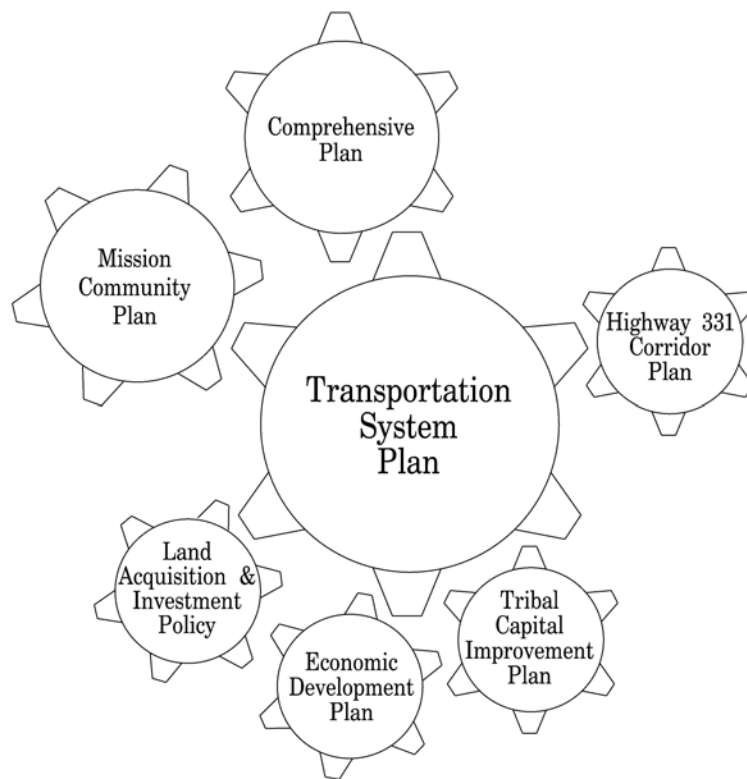
The CTUIR TSP considers other existing plans and policies of the CTUIR. This plan will also be used as a guide for creating new or changing existing policies of the CTUIR. Refer to Figure 1-2 for an illustration of the relationship between the Transportation System Plan and other CTUIR planning documents.

The CTUIR TSP was developed concurrently with the Highway 331 Corridor Plan. The Corridor Plan outlines detailed policies and transportation improvements for the Highway 331 corridor including the I-84 interchange. Since the study area of the Corridor Plan lies almost entirely within the Umatilla Indian Reservation Boundary, all

improvements recommended in the Corridor Plan are recommended here in this TSP. The *Comprehensive Plan*¹, sets forth the Transportation Goal and Objectives for the Umatilla Indian Reservation. The CTUIR TSP incorporates the same goal and objectives and is also considered to be an element of the overall Comprehensive Plan. Both the Corridor Plan and TSP are based on the needs identified in the *Four Corners Master Plan*² and the *Mission Community Plan*³ which are used to guide land use and development decisions of the Mission area. The "*Plan For Growth*"⁴ document was also used to identify the transportation needs for both plans.

The CTUIR TSP will be used as a guide for future policies to acquire and invest in land. The prioritized list of transportation system improvements outlined in this TSP will also be used to add projects to the Tribal Capital Improvement Plan.

FIGURE 1-2



The CTUIR TSP also considers other county and state planning documents such as the *Umatilla County TSP*⁵, the *Umatilla County Public Transportation Needs Assessment*⁶, the *1999 Oregon Highway Plan (OHP)*, and the *1995*

¹ *Comprehensive Plan*, Confederated Tribes of the Umatilla Indian Reservation, Adopted May 15, 1996.

² *Four Corners Master Plan*, Confederated Tribes of the Umatilla Indian Reservation, March 2000, Berryman & Henigar Property Counselors.

³ *Mission Community Plan*, Confederated Tribes of the Umatilla Indian Reservation, Adopted June 17, 1998, BOT Resolution #98-30.

⁴ *Plan For Growth*, Confederated Tribes of the Umatilla Indian Reservation, March 1999, CTUIR and Economic and Community Development Commission and Department of Economic and Community Development.

⁵ *Draft Umatilla County TSP*, Umatilla County, December 1999, David Evans and Associates, Inc. (on-going)

Oregon Bicycle and Pedestrian Plan. A review of all related transportation plans, policies, and studies is provided in the Appendix.

PLANNING PROCESS

The CTUIR TSP was developed through a series of technical analyses combined with systematic input and review by a Technical Advisory Committee (TAC). The TAC consisted of representatives from the CTUIR, BIA, the Oregon Department of Transportation (ODOT), and Umatilla County.

Key elements of the planning process included:

- Involving agencies related to this study and the community (Chapter 1)
- Review of related plans, studies, and policies (Appendix II, Tab 1)
- Defining goal and objectives (Chapter 2)
- Performing an inventory of the existing land uses and the transportation system (Chapter 3)
- Analysis of existing traffic conditions (Chapter 4)
- Developing a forecast and evaluating future traffic conditions (Chapter 5)
- Identification and evaluation of potential transportation improvement projects (Chapter 6)
- Developing the Transportation System Plan along with a prioritized list of transportation improvements (Chapter 7; Appendix I, Tab 1)
- Identifying funding sources (Chapter 8)

Community Involvement

The 12-member TAC included representatives from CTUIR (Tribal Planning Office and Department of Economic and Community Development), BIA (Agency and Regional Offices), ODOT (District and Regional Offices), and Umatilla County (Public Works and Department of Resources and Development). The team met a total of seven times to review work products produced by the consultant team and provide direction on technical tasks and policies. Summaries of the TAC meeting minutes are provided in Appendix II (Tab 2).

This plan will be presented for review to the various CTUIR Commissions (Natural Resources, Economic Development, and Tribal Emergency Response), the Board of Trustees (BOT), the General Council, and the general public. A public hearing will be held by the Natural Resources Commission for the purpose of taking testimony to make a recommendation to the BOT.

Review of Related Plans, Studies, and Policies

To begin the planning process, all applicable transportation and land use plans, studies, and policies produced by the CTUIR, BIA, the State of Oregon, and Umatilla County were reviewed. This was done to gain an understanding of the existing and projected land uses on the Reservation, the economic development plans of the CTUIR, any planned roadway improvements, and any rules or regulations, which govern the development of

⁶ *Umatilla County Public Transportation Needs Assessment*, Oregon Department of Transportation, June 1999, Nelson\Nygaard Consulting Associates.

transportation facilities on the Reservation. Related plans, studies, and policies are described in Appendix II, Tab 1 of this report.

Goal and Objectives

A transportation goal with objectives was defined for this Transportation System Plan. They were taken directly from the Goal and Objectives defined in the CTUIR Comprehensive Plan (Chapter 8- Section P. Transportation). The goal and objectives were used to formulate and evaluate improvements for the Umatilla Indian Reservation. They are defined in Chapter 2.

Existing Land Uses and the Transportation System

Existing land uses were investigated and an inventory was conducted of the facilities that make up the transportation system of the Umatilla Indian Reservation. Supporting graphics of the generalized land uses and land ownership in the Mission Community Area are provided in Appendix II (Tab 3). An inventory of the existing accesses along Highway 331 is located in Appendix II (Tab 4). An extensive inventory was conducted of the IRR System and is present in Appendix II (Tab 5).

Current Traffic Conditions

Existing traffic volumes were determined from traffic counts conducted by ODOT at six intersections along Highway 331. These counts captured traffic for a 24-hour period as well as the PM peak hour, which was determined to be the critical time period when traffic volumes reach their highest levels.

Existing volumes and an inventory of the existing lane configurations and traffic control were used to establish PM peak hour operations at the six intersections along Highway 331.

A five-year history of accidents along Highway 331 was obtained and evaluated. A summary of accidents on other reservation roads is also included.

Future Forecast and Traffic Conditions

Based on an estimate of future population and employment needs and the historical growth trend in traffic, a 20-year traffic forecast was conducted for the six intersections along Highway 331. The forecast was used to assess future PM peak hour traffic operations at these intersections and two new intersections proposed along the highway.

Potential Transportation Improvement Projects

Numerous transportation improvement projects are identified in this section to address specific operational, safety, and/or access concerns, to improve community livability, to encourage more bicycle and pedestrian activity, and to accommodate future growth in population and employment. These projects were also developed in an attempt to address the Goal and Objectives specified in Chapter 2.

Transportation System Plan

The Transportation System Plan highlights roadway classification and design standards, policies to ensure that the needs of bicyclists and pedestrians and public transit are met, an access management plan for Highway 331 and other roads on the Reservation, and a prioritized list of transportation improvements.

Funding Sources

BIA, State, County, and CTUIR funding sources for transportation system improvements are identified in this section along with Federal and State program summaries.

PROCESS TO IMPLEMENT CTUIR TSP PROJECTS

Once the CTUIR TSP is adopted by the Board of Trustees, the priority list of transportation improvement projects identified in this plan will move through a formal approval process by the BIA area office and the Federal Highway Administration (FHWA), before ultimately being placed on ODOT's Statewide Transportation Improvement Program (STIP) list for eventual construction. The following flow chart illustrated in Figure 1-3 .shows the general process used to implement transportation system planning projects. It should be noted as part of the implementation process, analyses of the impacts of individual transportation projects on environmental conditions such as fish and wildlife habitat and water quality will be performed with assistance from the CTUIR Department of Natural Resources and any other related agencies. Environmental analyses efforts should begin after the IRR TIP is approved by the FHWA, and at the time when the BIADOT begins the scoping process for individual projects.

CHAPTER 2: GOALS AND OBJECTIVES

The purpose of this TSP is to provide a guide for the CTUIR to fulfill its transportation goal and objectives. The following goal and objectives were developed from information contained in the transportation section of the CTUIR Comprehensive Plan. The overall mission of the CTUIR TSP is to develop a transportation system that enhances the livability of the Umatilla Indian Reservation and accommodates growth and development through careful planning and management of existing and future transportation facilities. The following Goal and Objectives were developed to achieve this mission.

OVERALL TRANSPORTATION GOAL

To provide an effective and economical transportation system on the Umatilla Indian Reservation.

OBJECTIVES

- A. Consider the needs of all segments of the Tribal community and all modes transportation in the transportation planning process.
- B. Ensure that projects involving land use, economic development, and transportation issues are coordinated at conception.
- C. Develop an effective relationship and process for working with the BIA, County, and State to identify, fund, and implement transportation projects.
- D. Develop and maintain effective lobbying efforts with Tribal organizations to assure adequate funding and political clout on transportation issues.
- E. Provide Tribal input into transportation improvements programs that will affect the Reservation road system.
- F. Adopt and maintain the Umatilla Indian Reservation Transportation Plan.
- G. Coordinate the location of public and private utilities with development planning for new roads and assure adequate right-of-ways and easements are secured at the time of development approval.
- H. Minimize the number and improve safety at railroad crossings by working closely with Umatilla County and the Union Pacific Railroad.
- I. Improve the intersection of stream channel crossings with the current transportation system of railroads, highways and utilities which will decrease damage caused by periodic flooding.
- J. Develop and adopt public and private road standards for new and unimproved roads on the Reservation acceptable to those responsible for maintenance and safety.
- K. Develop and maintain a public transportation system for the benefit of Tribal members and the Reservation residents.

CHAPTER 3: EXISTING LAND USES AND THE TRANSPORTATION SYSTEM

As part of the planning process, DEA investigated existing land uses and conducted an inventory of the facilities that make up the transportation system of the Umatilla Indian Reservation. The inventory covered the roadway system as well as pedestrian, bikeway, public transportation, and rail facilities. An inventory of public emergency services was also performed.

EXISTING LAND USES

Outside of the Mission Community Area, the Umatilla Indian Reservation is mostly rural in nature with large tracts of land that are either undeveloped or used for agricultural purposes. Within the Mission Community Area, most of the land is rural but a wide variety of land uses that have been developed. A map referring to the generalized land uses in the Mission Community Area was taken from the *Mission Community Plan (Figure #3)* and inserted in the Appendix II (Tab 3). Existing land uses are briefly described in the following sections. Existing land uses are described in the following sections. For more thorough summaries of existing land uses, refer to the *Mission Community Plan*.

Agricultural/Undeveloped Areas

Agricultural lands consist mainly of large parcels used for farming. In many areas, there are undeveloped parcels, where landowners are paid by the federal government not to produce.

Residential

Residential areas are broken down into three segments: medium density, low density, and scattered site residential. Medium density areas include the Tribal Housing developments/Short Mile Road, the Mission Road intersection, Theater/Goad Road, and the Riverside subdivision. The low density areas are located around Kirkpatrick Road and numerous areas along the north and south sides of Mission Road. Scattered site residential areas are located mainly in agricultural areas on individual allotments and fee properties.

Tribal/Government/Public Facilities

Most of the government facilities on the Reservation are owned and operated by the CTUIR. These include the maintenance building and well site located at the east end of Short Mile Road, the Senior Center south of Short Mile Road, the Indian Agency Headquarters near Mission Road and 'A' Street, the cemetery at the south end of 'A' Street, and the July Grounds area including the tribal offices and education facilities south of Mission Road and west of Confederated Way. The state owns and maintains the State Fish and Wildlife office located just east of the west Reservation boundary near Hall's Trailer Court. Also, there is the state's gravel shed southwest of the I-84 interchange. There are also tribal cemeteries and the city of Pendleton's water line building on Emmigrant Road.

Commercial

Tourist commercial uses are located north of I-84 along the east side of Highway 331 at the Arrowhead Truck Plaza/Cody's Restaurant and the Wildhorse Resort. The Resort consists of a casino, a hotel, and an RV park.

Semi-Public

Although semi-public facilities are scattered around the Mission Community Area, the most notable are the lands containing the Tamastlikt Cultural Institute and the Wildhorse Resort Golf Course, located at the east end of the Main Entrance Road to the Casino.

Industrial

Grain elevators are located on the north side of Mission Road just east of Highway 331 and adjacent to the railroad. There is also a sand and gravel operation near McKay Lane, a surface mining operation near Davis Lane, and the Pendleton Bus Barn located along Mission Road, all west of Highway 331.

LAND OWNERSHIP

There are three types of land ownership in the Mission Community Area: Deeded, Tribally owned, and Allotment. A map illustrating land ownership in the Mission Community Area was taken from the *Mission Community Plan* (Figure #4) and inserted in Appendix II (Tab 3).

Deeded lands in the area are mainly owned by non-Indians with some Indian ownership. Tribally owned lands consist of both fee and trust properties and are owned by the CTUIR for the members of the tribes. Primary uses of tribally owned lands include economic development, agriculture, and residential development projects. Allotment lands may be tribally owned (CTUIR) or Indian owned, but are administered by the Bureau of Indian Affairs to protect the allottee's interests.

ROADWAY SYSTEM

The most popular form of transportation within the Umatilla Indian Reservation is the automobile. This is because the automobile provides a high level of mobility where people can get from one place to another quickly and comfortably. Because the Reservation is mostly rural in nature, people rely on the automobile to make long distance trips that would otherwise be too far to walk or ride a bike.

There are many purposes for using the automobile. Local residents use their cars to drive to work, go shopping, or visit a friend. Buses pick up and drop off children from school. Trucks hauling freight use Highway 331 to get to Oregon Highway 11 or I-84. Agricultural trucks use the roads on the Reservation to transport crops from farms to the market during harvest season.

Since the automobile is the most widely used form of transportation, most transportation dollars are devoted to maintaining, building, and planning roads to carry automobiles and trucks. It also appears that the road system will continue to be the basis of the transportation system for the 20-year planning period; therefore, there is an emphasis in this plan to improve the existing road system for all users.

The existing roadway system on the Umatilla Indian Reservation is shown in Figure 1-1 at the beginning of this study.

Roadway Jurisdiction

The roads located within or providing access directly to the Umatilla Indian Reservation generally fall under four jurisdictions: state, county, BIA, and tribally-owned. The state highways generally function as principal arterials, providing regional access between cities and communities, and carrying higher traffic volumes. The county roads generally serve local uses but there are several, which function at a higher level, serving adjacent lands and local

access needs of neighborhoods. Roads under BIA or tribal jurisdiction are generally local access or neighborhood roads.

There are other roads on the Reservation known as "Public Use" roads, which do not have an official owner but are used by the public. Although the County may not maintain these roads, the agency will block any obstruction of these roads to protect public use. These roads are generally driveways providing access to one or a few homes or dirt roads used for farming.

The inventory of the existing roadway system (discussed later in the IRR System Inventory section) covers all state, county, BIA, and tribal roads on the Reservation. The inventory also addresses existing "Public Use" roads and any future roads proposed in this plan. In a few cases, these roads serve lots in a rural subdivision plat.

State Highways

Interstate 84 (Old Oregon Trail) traverses 18 miles across the heart of the Umatilla Indian Reservation. From Pendleton, the freeway runs southeast and up into the Blue Mountain Range towards La Grande. On the Reservation, I-84 is a four-lane divided highway with two lanes in each direction. The speed limit is 65 mph for standard vehicles and 55 mph for large trucks.

Oregon Highway 11 (Oregon-Washington Highway) extends northeast from Pendleton where it eventually passes by the cities of Adams, Athena, Weston, through Milton-Freewater and eventually crosses the Oregon-Washington border. A small section of the highway, 0.6 miles in length, is located within the boundaries of the Reservation. Generally, the highway has two lanes of travel and the posted speed is 55 mph.

Highway 331 (Umatilla-Mission Highway) is 4.6 miles in length and runs in a north-south direction connecting Oregon Highway 11 with Interstate 84. It is a two-lane highway with a 55-mph speed limit.

County Roads

County roads constitute the bulk of the roadway system on the Reservation. Of these roads, Mission Road (County Road #900) is the primary route used by most of the local residents. It runs parallel to the Umatilla River in an east-west direction. This road functions as a major collector as it provides a direct connection between the Mission Community and the city of Pendleton. It also provides access to more residences than any other road on the Reservation, several industrial developments, and the governmental offices (tribal and BIA) about one mile east of Highway 331. It is a paved two-lane road with a posted speed limit of 40 mph.

Most of the county roads on the Reservation are oriented in a north-south and east-west grid-like pattern and follow section lines. Most of them have gravel or dirt surfaces.

BIA Roads

The BIA owns and maintains almost eight miles of roads on the Reservation. BIA Route #0002 consists of 10 different streets, primarily serving the BIA and tribal agency offices and local area housing. These roads are paved and in good condition. A list of these roads follows:

- "A" Street
- "B" Street
- Alder Drive
- Cayuse Drive
- Confederated Way
- Cottonwood Lane

- Umatilla Loop Road
- Walla Walla Court
- Whirlwind Drive
- Willow Drive

There are five other roads on the Reservation that are maintained by the BIA but are owned by the tribe. These include:

- Kanine Ridge Road
- Little Johnson Road
- Fort Tank Road
- McKinley Lane/Lavadour Lane
- Indian Lake Road

Kanine Ridge Road (BIA Route #0001), Little Johnson Road (BIA Route #0003), and Fort Tank Road (BIA Route #0004) are rural special use roads, composed of dirt or gravel, that are rarely used by vehicles. McKinley Lane/Lavadour Lane (BIA Route #0005) are gravel roads providing access to residences off of Kirkpatrick Road. Indian Lake Road (BIA Route #0006) is a paved recreation road south of the Reservation. It proceeds around the perimeter of Lake Hum-Pe-Tin (Indian Lake).

Tribal Roads

The tribe owns and maintains four roads on the Reservation. Easy Street (IRR Route #0100) is a Tribal Housing Authority Street just off Short Mile Road, which serves several homes. Minthorn Lane (IRR Route #0010) is located south of Tutuilla Church Road just off of Patawa Road and also provides access to several homes. The tribe owns the main entrance road to the Wildhorse Resort. It intersects the east side of Highway 331 approximately three-quarters of a mile north of I-84. It is four lanes wide with a landscaped median in the middle. It provides access to a casino, a hotel, an RV park, a golf course, and the Tamastslikt Cultural Institute. The tribe also owns the Employee Entrance Road to the Casino. It also intersects the east side of Highway 331, approximately one-half mile north of I-84. This road is two lanes wide and provides access to an employee parking lot at the Casino.

Public Use Roads and Orphan Roads

There are various gravel or dirt roads scattered throughout the Reservation that are designated for "Public Use". These roads may or may not have a dedicated right-of-way and are not claimed or maintained by any government entity. Although Umatilla County may not maintain these roads, the agency has indicated it will block any obstruction of these roads to protect public use.

HIGHWAY 331 ACCESS INVENTORY

An inventory was conducted of all existing accesses along Highway 331. The inventory is summarized by a series of figures and a spreadsheet located in the Appendix II (Tab 4).

In the inventory, a unique identifier number was assigned to each access. These identifier numbers link the graphics with access information on the spreadsheet. The inventory indicates the location of each access on the west or east side of Highway 331, the highway milepost, whether the access is a driveway or road, jurisdictional owner, and access use. By calculating the distances between other accesses a check was made to determine whether each access complies with the 1999 OHP access spacing standards. Also, the figures indicate potential access areas along the highway where a new access(es) could be provided.

The information collected in the existing access inventory was instrumental in developing access management strategies for Highway 331 (Chapter 7) and ultimately defining an access management plan (Chapter 8).

IRR SYSTEM INVENTORY

Tribal representatives and the Consultant, together, conducted an inventory of the roads that make up the IRR System of the CTUIR. Indian Reservation Roads include all public roads that are located within or provide access directly to the Indian Reservation. For those roads providing access directly to the Reservation, only the portions that extend to and intersect with another facility of equal or greater classification, up to five miles in length, may be included in the IRR System.

A summary of the complete IRR inventory is located in Appendix II (Tab 5). Inventory elements include:

- Road name
- IRR route and section number¹
- Roadway classification
- Length of road (reservation and non-reservation miles)
- Existing and projected daily traffic volumes (if known)
- Roadway cross-sectional features (widths, surfacing, drainage, striping, signing)
- Right-of-way information
- Socioeconomic data (housing, school bus route, transit route, mail route, presence of churches and businesses)

The purpose of having a complete inventory of the IRR System is so the CTUIR has the information necessary for filling out the BIA 5704 Forms and strip maps, for those roads the CTUIR wishes to add to the BIA Road System. The BIA Road System is comprised of those existing and proposed IRR roads for which the BIA has or plans to obtain legal right-of-way. The BIA has the primary responsibility to improve and maintain the roads on this system. Any changes to this system shall be supported by a tribal resolution.

Another purpose for having a complete inventory of the roads on the Reservation was to help identify existing deficiencies in the system, such as locations where roads need to be overlaid with gravel or even asphalt pavement.

It should be noted that all of Highway 331 was added to the IRR System Inventory. It was anticipated that transportation improvements identified in this plan for this highway could involve the BIA as a financial partner. Also added to the IRR System inventory were the sections of I-84 and OR Highway 11 that lie within the Reservation boundary. The portions that provide access to the Reservation were excluded. It was anticipated that any future project needs along these facilities would be handled by the federal and state governments.

The IRR System inventory also accounts for all new roads and pathways proposed in the CTUIR TSP.

DEFICIENT BRIDGES

ODOT maintains a bridge inspection survey program for all the bridges in the state. In this program, there are three mutually exclusive elements used to rate the status, or condition, of bridges: structural deficiency, functional

¹ The IRR route number for existing roads corresponds to the county road number or the BIA route number, depending on which agency has jurisdiction. The IRR route number for a state highway is the highway name. IRR section numbers divide routes into segments where there is a major break in roadway characteristics (i.e. paved road becomes a dirt road).

obsolescence, and sufficiency rating. Structural deficiency is determined based on the condition rating for the deck, superstructure, substructure, or culvert and retaining walls. It may also be based on the appraisal rating of the structural condition or waterway adequacy. Functional obsolescence is determined based on the appraisal rating for the deck geometry, underclearances, approach roadway alignment, structural condition, or waterway adequacy. The sufficiency rating is a complex formula which takes into account four separate factors to obtain a numeric value rating the ability of a bridge to service demand. The scale ranges from zero to 100 with higher ratings indicating optimal conditions and lower ratings indicating insufficiency. Sufficiency ratings of 55 or less indicate an insufficiency. Bridges with ratings under 50 may be nearing a structurally deficient condition and may be eligible for replacement funding from ODOT.

The state bridge inspection survey indicates there are four bridges on the Reservation that have deficiencies in one of the three categories. These bridges include:

- Umatilla River Bridge (County Bridge #59C727) along Bingham Road (County Road #900) has a sufficiency rating of 42.4.
- Meacham Creek Bridge (County Bridge #59C726) along Bingham Road (County Road #900) has a sufficiency rating of 42.4.
- Wildhorse Creek Bridge (County Bridge #59C401) along Wildhorse Road (County Road #685) is structurally deficient.
- Thornhollow Cattle Pass Bridge (County Bridge #59C378) along Thorn Hollow Road (County Road #745) is structurally deficient.

The County, BIA, and CTUIR support the replacement of each of the above bridges. However, because the county and tribe operate under limited funds, the BIA may be the only source of funding for bridge replacements in the short term.

PEDESTRIAN SYSTEM

The most basic transportation option for people is walking. Walking is the most popular form of exercise in the United States and can be performed by people of all ages and all income levels. However, it is not often considered as a means of travel, mainly because pedestrian facilities are generally an afterthought and not planned as an essential component of the transportation system, or distances to major activity centers are too far to walk.

The majority of the Umatilla Indian Reservation is rural in nature and walking in the remote areas may not be the preferred mode of transportation. Since the Reservation is so large (covering 172,000 acres of land with its longest dimensions measuring 20 miles in the east-west direction and 15 miles in the north-south direction) people living in remote areas are more inclined to use an automobile.

Pedestrian activity on the Reservation is highest in the Mission Community area, particularly in the vicinity of the Tribal Community Complex along Mission Road, east of Highway 331. Currently, there are 569 workers currently employed here. Surrounding the complex are residential neighborhoods such as the Mission Creek Subdivision, HUD housing, and a senior housing center. Many people walk along the existing sidewalks or along streets to get to work or just for recreation.

A windshield survey was conducted of the existing pedestrian and bicycle facilities in the Mission Community. The survey focused mainly on the area around the Tribal Community Complex and adjacent neighborhoods but also covered any existing facilities along Mission Road and Highway 331. Table 3-1 and Figure 3-1 display the results of the facilities survey for the Mission Community Area.

TABLE 3-1
EXISTING PEDESTRIAN FACILITIES

Type of Facility	Location	From/To
Sidewalks (pedestrians only) ¹	Mission Road (north side)	Highway 331 to industrial site
	Mission Road (south side)	Highway 331 to Confederated Way
	Confederated Way (north side)	Whirlwind Drive to Umatilla Loop
	Whirlwind Drive (both sides)	Confederated Way to dead end
	B Street (intermittent along both sides)	Confederated Way to dead end
	Aspen Way (west side)	Mission Road to Lodgepool
	Cedar Street (east side)	Lodgepool to Tamarack Loop South
Paved Shoulder (pedestrians and bicyclists) ¹	Mission Road (south side)	One-half mile west of Highway 331 to Highway 331
	Mission Road (south side)	Confederated Way to West of Short Mile Road
	Mission Road (both sides)	West of Short Mile Road to Aspen Way
Multi-Use Path (pedestrians and bicyclists)	Tamastlikt ²	Confederated Way to Tamastlikt Cultural Institute

¹ Sidewalks are designed for use by pedestrians only, but paved shoulders along roads or separate multi-use paths are designed for both pedestrians and bicyclists.

² The Tamastlikt Path was completed in the summer 2000.

The Tamastlikt Trail accommodates both bicyclists and pedestrians between the Tribal Community Complex area and the Tamastlikt Cultural Institute.

There are several sidewalks and paths on the Reservation that not shown in the previous table. Some are located between buildings on the grounds of the tribal government complex, around homes in adjacent neighborhoods, and others within the Wildhorse Resort such as the walking path that connects the RV park with the hotel and casino. These facilities provide short-distance connections between buildings and homes, but are not part of any continuous system.

The remaining section of Mission Road not shown in the previous table extends from US Highway 30 to approximately one-half mile west of Highway 331. This segment of road has insufficient shoulder width to be considered an existing bike or pedestrian facility. Highway 331, in the Mission Community area, also has insufficient shoulder width to be designated as either a bicycle and pedestrian route.

The resulting inventory was used to develop pedestrian needs for the Reservation as discussed in the Improvement Options Evaluation section (Chapter 6). Improvements proposed in the Transportation Improvement Plan section (Chapter 7) are designed to correct major problems in the pedestrian system and to encourage its use.

BIKEWAY SYSTEM

Bicycling is an efficient and inexpensive mode of transportation. Bicycles take up little space on the road or parked, they do not contribute to noise or air pollution, and offer relatively higher speeds than walking. A typical trip for a bicyclist is around two miles.

In the remote areas of the Reservation, bicycling is not the preferred mode of transportation. As is the case for walking, the distance to major activity centers such as the Mission Community area may be too far for a person riding a bike.

In the *1995 Oregon Bicycle and Pedestrian Plan*, rural highways and county roads are deemed suitable for cycling if they have at least 4-foot paved shoulders and traffic volumes less than 1,000 vehicles per day. Although shoulders are provided along Highway 331, daily traffic volumes reach up to 5,100 vehicles with traffic traveling at speeds in excess of 55 mph. These conditions are not conducive to bicycling along the highway. Auto-oriented businesses near the I-84 Interchange and low population densities along the highway limit bicycle activity.

As is the case for pedestrians, bicycle activity on the Reservation is highest along Mission Road and in the more densely populated area east of the highway near the Tribal Community Complex and adjacent neighborhoods. People use the street shoulders of Mission Road and local street to bike to work, school, or just for recreational purposes. As shown previously in Table 3-1 and Figure 4-1, Mission Road has paved shoulders that are wide enough for bicyclists to travel separate from the traffic lane. On-street parking is allowed in most areas but it is not often that cars park here, providing more room for bikes. Along all other roads, bicyclists must share the roadway with traffic.

Future needs for bicycling on the Reservation are addressed in the Improvement Options Evaluation section (Chapter 6). Improvements proposed in the Transportation Improvement Plan section (Chapter 7) are designed to correct major problems in the bicycle system and to encourage its use.

PUBLIC TRANSPORTATION

School Bus System

The safety and well being of children being picked up and dropped off by school buses and the travel routes these buses use are important concerns of the residents on the Reservation. To assess the transportation needs for school buses, an inventory was conducted of all school bus providers servicing the Reservation.

There are three school districts on the Reservation; Pendleton, Athena-Weston, and Pilot Rock. Each school district provides pick up/drop off service for school children.

Pendleton

The Mid-Columbia Bus Company provides bus service for the Pendleton School District, which serves the bulk of the Reservation. The bus takes children from the Reservation to the following schools in Pendleton: Hawthorne, Washington, Sherwood, McKay, Sun Ridge Middle School, and Pendleton High School. Mid-Columbia uses buses that hold up to 66-87 students depending on the bus. The buses currently carry about 45-85 students depending on the bus type. A representative of the Mid-Columbia Bus Company was contacted to determine what routes the buses use. Although no specific bus route information could be provided, the contact said that Highway 331 was the main route for all the buses, and that they use almost all the county roads on the Reservation (including some unpaved routes). The contact mentioned there is a need to provide lighted bus pullouts on all major roads, that Mission Road is in dire need of a bicycle/pedestrian facility from the Reservation boundary to Highway 331, and that students are missing the bus and not finding another public form of transportation.

Athena-Weston

The Athena-Weston School District supplies their own buses for picking up children on the Reservation. Buses travel along a series of four different routes. They are as follows:

- Cayuse Road/Bingham Road appears to be the east-west route through the Reservation,
- Mann Rd to Crawford Hollow Rd to Johnley Rd is one north-south route,
- Spring Hollow Rd to Thorn Hollow Road is a second north-south route, and
- Wildhorse Rd to Eagle Creek Rd is a third north-south route.

Pilot Rock

The Pilot Rock School District supplies one bus for picking up children on the Reservation and bringing them to Pilot Rock High School and the Elementary School. The bus has an average occupancy of 42 people and makes two trips per day along McKay Creek Road up to the North Fork McKay Creek Road.

Wildhorse Casino Shuttle Bus

The Wildhorse Casino currently provides dial-a-ride shuttle services to casino patrons. The Casino owns two buses and one van. Both buses have a 14-passenger capacity and one bus is wheelchair accessible. The van has an eight-person capacity.

In the beginning of the year 2000, the Casino cancelled its fixed-route operations where the two buses provided free transportation to and from the Casino via the city of Pendleton and the Mission Community area. One shuttle made six trips a day to Pendleton via I-84 stopping at K-mart and the Chamber of Commerce. The second shuttle made six trips a day to Mission Area stopping at several points along the way. The fixed-route shuttle service was for casino use only and not general transportation. Drivers, however, would allow the general public to ride the shuttle along the designated routes, but would not alter the route or make special trips for non-casino use. In 1999, the shuttle bus made 4,590 trips transporting 12,124 customers for the hotel, RV park, golf course, and Tamastlikt Cultural Center. For the entire Wildhorse Resort, the shuttle transported 221,645 people, most of which were customers using the shuttle to get from the parking lot to the casino entrance.

Before fixed-route services were cancelled, the Wildhorse Resort expressed an interest in obtaining another bus.

The shuttle buses are used for large public events to help transport people to and from the event. The biggest event every year is the Pendleton Roundup. During the four-day event in 1999, the shuttles transported 6,500 people. The shuttle buses and van are also available for on-call services to casino patrons at hotels and the airport in Pendleton. The shuttle makes monthly trips to and from retirement homes in the area. The trips are booked by the retirement homes several months in advance possibly indicating that demand is not being met by the current shuttle bus system.

CTUIR Dial-a-Ride

A Dial-a-Ride service for the general public is not provided at this time on the Umatilla Indian Reservation. There is, however, a dial-a-ride service for senior and disabled citizens. This service is described in the following section.

CTUIR Senior Center

On the Reservation, the Senior Center near the BIA offices provides a 24-hour dial-a-ride service for senior and disabled citizens. There is one van and a 14-passenger bus and both of the vehicles are handicap accessible. Normally just the bus is used due to the unreliability of the van. There is one full time and one part time driver. The Senior Center makes approximately 25-30 trips per month and trip destinations are based on passenger needs. The Senior Center provides home delivered meals five days a week. The Center will also pick up passengers

within a 5-7 mile radius to bring them to the Senior Center for meals. Two or three times a week the Senior Center bus travels into Pendleton for shopping.

Pendleton Welfare to Work Shuttle

The Welfare to Work Shuttle does not serve the Umatilla Indian Reservation but there is service in Pendleton.

Retired and Senior Volunteer Program (RSVP)-Pendleton

The Retired and Senior Volunteer Program (RSVP) located in Pendleton does not provide service on the Umatilla Indian Reservation.

Greyhound Bus Lines- Pendleton

Greyhound Bus Lines does not serve the Umatilla Indian Reservation but there is a terminal located in Pendleton, which provides a connection to other cities. There are three departures daily to the southeast along I-84 with stops in La Grande, Boise, and Salt Lake City. There are three departures daily to the west along I-84 to Portland. There are two departures daily to the north along OR Highway 11 with stops in Walla Walla, Pasco, Spokane, and continuing on to Seattle.

UNION PACIFIC RAILROAD

The Union Pacific Railroad (UPRR) passes through the heart of the Mission Community area. From Pendleton, the rail line runs due east and parallel to Mission, Short Mile, Cayuse, and Bingham Roads before turning south along Meacham Creek Road and on into the Blue Mountains towards La Grande.

The UPRR is a Class I line-haul freight railroad. Approximately 35 trains per day pass through Pendleton and the Reservation. These trains vary in size with the longest being up to 90 cars in length.

Currently, there is no passenger rail service provided along this rail line. Until 1997, the Amtrak Pioneer line provided passenger service between Portland and Denver with a stop in Pendleton four days a week.

Railroad Crossings

There are numerous at-grade railroad crossings to the UPRR on the Reservation. The intersecting roads at these crossings vary in use and jurisdictional owner. Table 3-2 below was taken from the ODOT Rail Division Crossing Log and summarizes most of the existing rail crossings on the Reservation. The table displays state and federal crossing I.D. numbers, location, the intersecting road name, crossing jurisdiction, number of tracks, traffic control device type, Average Daily Traffic volume, and the number of accidents within the last ten years. The ODOT Crossing Log does not account for the two local access crossings at Hart Lane (M.P. 219.12) and Williams Lane (M.P. 219.65).

TABLE 3-2
RAILROAD CROSSINGS ON THE UMATILLA INDIAN RESERVATION¹

Crossing ID	US DOT No.	Location	Road Name	Jurisdiction	No. Tracks	Device Type	AADT	10-Yr Acc.
2A-217.90	809029M	Near Pendleton	Mytinger Ln	Local Access	1	STOP	380	2
2A-218.43		Near Pendleton	Mission Frontage Rd	County ²	1	STOP	-	-
2A-218.70	809030G	Munra	Mckay Ln	Local Access	2	STOP	205	2
2A-219.90	809034J	Mission	Davis Ln	Federal	1	STOP		-
2A-221.00	809036X	Mission	Hwy 331	State	2	Active	2,250	1
2A-221.50	809037E	Mission	Parr Ln	Local Access	1	STOP	14	2
2A-224.10	809040M	Mission	Sampson Ln	Federal	1	STOP	12	2
2A-225.20	809041U	Minthorn	Old River Rd (#927)	County ¹	2	STOP	29	-
2A-226.20	809044P	Minthorn	Old River Rd (#918)	County ¹	1	STOP	98	-
2A-227.30	809046D	Cayuse	Cayuse Rd (#925)	County	1	STOP	116	-
2A-231.10	809048S	Thorn Hollow	Cayuse Rd (#900)	County	1	Active	243	-
2A-232.40	809051A	Thorn Hollow	Thorn Hollow Rd (#745)	County	1	STOP	375	-
2A-236.60-C	809211L	Gibbon	Bingham Rd (#900)	County	2	STOP	188	-
2A-237.30	809213A	Gibbon	Meacham Creek Rd (#911)	County	2	Active	226	-

¹The ODOT Rail Division Crossing Log does not account for the local access crossings at Hart Lane (M.P. 219.12) and Williams Lane (M.P. 219.65). These crossings are local access controlled as well.

²The Umatilla County Roadway Department does not have jurisdiction over this railroad crossing. Therefore, it is assumed that the crossing is local access controlled.

POLICE AND FIRE SERVICES

The Tribal Police Department is responsible for crime prevention, law enforcement, patrolling, building checks, investigation and serving legal papers. The department maintains 24-hour dispatch services.

The Tribal Fire Department is responsible for fire prevention and suppression, public education, emergency medical services, and hazardous materials emergency response. The department currently has four fulltime personnel, including three certified paramedics, and 25 volunteer fire fighters.

CHAPTER 4: EXISTING TRAFFIC CONDITIONS

As part of the planning process, the current traffic conditions for the CTUIR transportation system plan were evaluated. Since traffic volumes are low along most roads on the Reservation, the analysis of existing traffic conditions was limited to the major roadways in the Mission Community area, where potential congestion issues may exist today or in the future. The primary focus was along Highway 331 and all the major crossroads along the highway.

INTERSECTION AND ROADWAY CONFIGURATIONS

Highway 331 runs in a north-south direction connecting Oregon Highway 11 with Interstate 84. It is a two-lane highway with a 55-mph speed limit. Figure 4-1 illustrates the existing lane configurations and traffic control devices at the six major intersections along Highway 331.

As shown in the figure, each intersection is stop-controlled on the minor road approaches. At the intersection of Highway 331 and Mission Road, stop signs are posted along the highway approaches since traffic volumes are higher along Mission Road in this area.

EXISTING TRAFFIC VOLUMES

Existing year 2000 traffic volumes were determined along Interstate 84, OR Highway 11, Highway 331, and other major roads in the Mission Community area. This was done through the collection of traffic volume information contained in the *ODOT Daily Traffic Volume Tables*, traffic counts performed by tribal personnel, but primarily from intersection turning movement counts performed by ODOT personnel. A total of six intersections were counted by ODOT at the following locations:

- Highway 331 at OR Highway 11
- Highway 331 at Mission Road
- Highway 331 at Wildhorse Resort entrance road
- Highway 331 at Kash Kash Road
- Highway 331 at Interstate 84 WB Ramps
- Highway 331 at Interstate 84 EB Ramps

ODOT personnel performed the traffic counts over a 12-hour period from 6:00 a.m. to 6:00 p.m. on weekdays in December 1999 and January 2000. Since the traffic counts were conducted during the winter season, the resulting traffic volumes were increased by 35% to reflect the peak seasonal period, which is around the month of July. This factor was determined through an interpolation of traffic data obtained at two ODOT permanent traffic recorder locations: one along OR Highway 11 (south of the Oregon-Washington State Line), and the other along Highway 395 (south of Pilot Rock). It was assumed that the December to July fluctuations in Average Weekday Traffic, as measured in terms of the relative difference in the percent of Average Daily Traffic (ADT), for these two highways would also apply to Highway 331. Table 4-1 shows the results of this analysis.

TABLE 4-1
HIGHWAY 331 SEASONAL ADJUSTMENT FACTOR
(APPLIED TO ODOT TRAFFIC COUNTS PERFORMED DECEMBER 1999/JANUARY 2000)

Location	Month	Average Weekday Traffic ¹	Percent of ADT ²	Adjustment Factor (December to July)
US Hwy 395 Permanent Recorder (South of Pilot Rock)	December	900	79%	
	July	1,342	117%	38%
OR Hwy 11 Permanent Recorder (South of OR-WA State Line)	December	14,598	102%	
	July	16,423	115%	13%
Highway 331 (From OR Hwy 11 to I-84)	December	2,432	NA	
	July	NA	NA	35% (interpolated)

¹ Average Weekday Traffic volumes shown for the two permanent recorder locations were obtained from the 1998 ODOT Traffic Volume Tables. The Average Weekday Traffic shown for Highway 331 in December represents the median for the traffic volumes recorded along the highway in December 1999/January 2000. (The minimum and maximum range of Average Weekday Traffic was 1,030 to 3,835 vehicles).

² The Average Daily Traffic (ADT) is for the average seasonal condition, which is typically during spring and fall months.

Average Weekday Traffic

The Average Weekday Traffic volumes along Interstate 84, OR Highway 11, Highway 331, and the major crossroads along Highway 331 are illustrated in Figure 4-2. As shown, traffic volumes are the highest along Interstate 84 and range between 11,710 and 16,570 vehicles per day (vpd). Along OR Highway 11, traffic volumes range between 6,740 and 7,930 vpd. Highway 331, which is the major north-south route on the Reservation, has volumes which steadily increase from 2,250 vpd south of OR Highway 11, to 3,370 vpd south of Mission Road, and up to 5,180 vpd just north of the I-84 interchange. Mission Road is a major east-west route used by most residents on the Reservation. The Average Weekday Traffic along this road ranges between 3,340 and 4,890 vpd.

PM Peak Hour Traffic

ODOT traffic counts conducted along Highway 331 were also used to determine PM peak hour traffic volumes for individual turning movements at the six intersections. The PM peak hour was established as the most critical time period when traffic volumes are at their highest levels. PM peak hour traffic volumes are also shown in Figure 4-2.

CAPACITY AND LEVEL-OF-SERVICE CRITERIA

Transportation engineers have established various standards for measuring the traffic operations of intersections and roadways. Each standard is associated with a particular Level-of-service (LOS) and/or the Volume-to-Capacity (V/C) ratio. Both the LOS and V/C ratio concepts are related and require consideration of factors that include traffic demand, capacity of the intersection or street, delay, frequency of interruptions in traffic flow, relative freedom for traffic maneuvers, driving comfort, convenience, and operating cost. Six standards have been established to define LOS. They range from LOS “A” where traffic flow is relatively free flowing to LOS “F” where the street or intersection is totally saturated with traffic and movement is very difficult. The minimum operating standards for streets and intersections enforced by most city jurisdictions in Oregon require a LOS D or better. This standard represents conditions where delays may be long, but not excessive, and only occur temporarily during peak periods. The V/C ratio is a measurement of traffic demand along a given roadway or at an intersection divided by that facility’s capacity.

ODOT Highway Mobility Standards

ODOT has established several policies in the 1999 OHP which enforce general objectives and approaches for maintaining highway mobility. Of these policies, the Highway Mobility Standards (Policy 1F) establish maximum Volume-to-Capacity ratios for peak hour operating conditions for all types of highways in Oregon including Interstate, Statewide, Regional, District, and Local Interest Roads. These standards apply to the state highways that traverse across or are adjacent to the Reservation and include Interstate 84, OR Highway 11, and Highway 331.

The OHP Highway Mobility Standards that apply to the highways addressed in the CTUIR TSP are as follows:

- Along highway segments where there are no intersections and where there are unsignalized intersections and road approaches along the highway, the V/C ratio shall not exceed 0.70 along Interstate 84 and OR Highway 11, and 0.80 along Highway 331.
- At unsignalized intersections and road approaches where the Highway 331 approaches are stopped, the V/C ratio shall not exceed 0.80.
- At the freeway interchange between Interstate 84 and Highway 331, the maximum V/C ratio for the eastbound and westbound ramp terminals shall be the same as the crossroad, which is 0.80.

EXISTING OPERATIONS

Traffic operations were determined for the existing year 2000 at the six key intersections along Highway 331, using the existing lane configurations and PM peak hour traffic counts adjusted to peak seasonal conditions. The resulting traffic operations were then compared to the OHP Highway Mobility Standards.

All six intersections included in the existing operations analysis are currently unsignalized. Traffic operations at these intersections were analyzed using ODOT's UNSIG10 software. The criteria used by this program to estimate the Level-of-Service can be found in Appendix II (Tab 6). Table 4-2 displays the results of the analysis. The LOS and V/C ratios are shown for all critical movements.

TABLE 4-2
EXISTING PM PEAK HOUR TRAFFIC OPERATIONS

Highway 331 at	Critical Movement	V/C ¹	LOS
<i>Hwy 11</i>	Northbound; Left	0.02	C
	Northbound; Right	0.11	A
	Westbound; Left	0.06	A
<i>Mission Road</i>	Eastbound; Left, Through, Right	0.11	A
	Westbound; Left, Through, Right	0.04	A
	Southbound; Left, Through, Right	0.29	C
	Northbound; Left, Through, Right	0.37	B
<i>Wildhorse Resort</i>	Westbound; Left	0.16	A
	Westbound; Right	0.06	A
	Southbound; Left	0.03	A
<i>Kash Kash Road</i>	Westbound; Left, Right	0.02	A
	Southbound; Left, Through	0.01	A
<i>I-84 WB Ramps</i>	Westbound; Left, Through, Right	0.08	A
	Northbound; Left, Through	0.07	A
<i>I-84 EB Ramps</i>	Eastbound; Left, Through, Right	0.34	A
	Southbound; Left, Through	0.04	A

¹ ODOT's UNSIG10 program calculates LOS for unsignalized intersections based on the reserve capacity and not V/C ratios. The V/C ratios were calculated by dividing the demand by the potential capacity for all critical movements.

The results show that all of the critical movements at the six intersections are currently operating at a LOS C or better, and have V/C ratios that are in compliance with the OHP Highway Mobility Standards, indicating there are no congestion issues at this time.

ACCIDENT ANALYSIS

An accident analysis was conducted for the full length of Highway 331 between OR Highway 11 (MP 0.0) and the eastbound ramps of the I-84 interchange (MP 4.84). Accident information for Highway 331 was collected and evaluated using the ODOT Safety Priority Index System (SPIS) and detailed accident reports from the ODOT Crash Analysis and Reporting Unit.

The SPIS is a method of prioritizing locations where funding for highway safety improvements can be spent most efficiently. The SPIS is based on accident data covering a three-year period and is comprised of three components: accident frequency, accident rate, and accident severity. A SPIS value is calculated using these three components and then compared with the high SPIS locations in the state (top ten percent). According to the 1999 Accident Summary Report (which is based on 1996-1998 accident data), the highest SPIS value calculated for Highway 331 was 19.64, which does not exceed the 1999 SPIS cut-off value of 50.11. This indicates there is no need for further investigation and potential mitigation under the SPIS program.

Detailed accident information from the ODOT Crash Analysis and Reporting Unit was collected for a five-year period (1995-1999). An accident summary for this period is summarized in Table 4-3.

TABLE 4-3
ACCIDENT STATISTICS FOR HIGHWAY 331

Type of Accident	Number of Accidents
Turning	4
Angle	4
Rear End	3
Fixed Object	3
Non-Collision	3
Miscellaneous	1
Total	18

Source: Oregon Department of Transportation, 1995-1999.

During the five-year period, there were a total of 18 accidents along Highway 331. The highest number of accidents (four each) were turning-type and angle-type collisions.

Of all the accidents, there were no fatalities with six accidents resulting in injuries. Of the six injury accidents, a total of 11 people were injured. One of these injuries was a type A Injury (most severe), eight were a type B Injury (moderate); and two were a type C Injury (least severe).

Of the 18 accidents, three (17%) occurred at the highway's intersection with Mission Road. This intersection is stop controlled on Highway 331 while Mission Road is free flowing. All three accidents were the result of drivers on Highway 331 failing to yield right of way to traffic on Mission Road. The cause of these accidents seems unclear but may be due to the driver's perception that if a stop-sign is posted on the highway then stop-signs are also posted on the Mission Road approaches. In an attempt to eliminate these types of accidents, ODOT recently posted a signs stating, "Cross-Street Traffic Does Not Stop", just below the stop sign. However, a similar accident took place recently in June 2000. The accident report indicated that the driver at fault was on the Highway 331 approach and was expecting the vehicle traveling on Mission Road to stop.

An accident rate of 0.94 accidents per million vehicle miles traveled was calculated for Highway 331. The 1998 statewide average is 1.06 accidents per million vehicle miles traveled for the same type of roadway. The accident rate is based on the number of accidents, the highway length, and the ADT volume.

In addition to the 18 accidents recorded along Highway 331, one accident occurred on OR Highway 11 at its intersection with Highway 331. No injuries were reported.

A request was made to the Umatilla Tribal Police Department for accident information along all Reservation roads. The Department supplied a list of 63 accidents that took place during a two-year period (1998-1999). Most of these accidents occurred at sporadic locations around the Reservation. There were five accidents that occurred along Mission Road. Two of these accidents occurred at the intersection of Aspen Way, with major injuries sustained in one of these accidents.

CHAPTER 5: TRAFFIC FORECAST AND FUTURE CONDITIONS

The future traffic forecast for the CTUIR TSP focuses on a 20-year projection of ADT and PM peak hour traffic volumes along the major roads in the Mission Community area. The forecast is based on a “cumulative analysis”, where traffic generated by planned or potential land uses combined with a through traffic component, are added to existing traffic count information. This level of analysis provides a means to analyze the effects of additional traffic generated by population and employment growth on the local street network, highlight potential problems, and develop alternative solutions. The forecasting process summarized below was coordinated with tribal and ODOT staff.

FORECASTING METHODOLOGY

The forecast methodology basically involved three parts:

1. The existing traffic counts conducted by ODOT in December 1999/January 2000 at the six intersections along Highway 331 were used as a base. All volumes were factored up by 35% to account for peak seasonal conditions.
2. A trip generation analysis was performed for all planned or potential land uses in the Mission Community area. These trips were then distributed and assigned to the major roadways. This step accounted for future increases in local traffic.
3. A through traffic component was added for I-84, Highway 331, and OR Highway 11, which was determined by a 20-year historical growth trend analysis.

Roadways included in the traffic forecast include I-84, OR Highway 11, Highway 331 (including the interchange with I-84), Mission Road, the road accessing the Wildhorse Resort, Kash Kash Road, and South Market Road. These roads are where future congestion issues are most likely to arise on the Reservation. All other roads having ADT volumes of less than 1,000 vehicles on the Reservation, particularly outside the Mission Community area, were not included in the forecast.

FUTURE LAND USES (POPULATION AND EMPLOYMENT NEEDS)

The following sections below describe planned or potential land uses identified for the Mission Community area based on meetings with tribal staff, and information contained in the *Mission Community Plan*, the “*Plan For Growth*” document, the *Four Corners Master Plan*, and articles posted in the Confederated Umatilla Journal (a local newspaper). These land uses are the basis of future increases in local traffic on the Reservation.

The location of planned or potential land uses coincides with the future land use map presented in the *Mission Community Plan* (Figure #5). This map is located in Appendix II (Tab 7).

Population and Housing Needs

Table 5-1 highlights the future population projection and housing needs for the Reservation based on information documented in the *Mission Community Plan*.

TABLE 5-1
FUTURE POPULATION PROJECTION AND HOUSING NEEDS

	Year 2000	Year 2020	20-Year Increase
Population- All Indians in the Area	3,044	4,125	1,081
Additional Dwelling Units	-	347	347
<i>(Scattered Sites)</i>	-	<i>(160)</i>	<i>(160)</i>
<i>(Mission Community)</i>	-	<i>(187)</i>	<i>(187)</i>

Upon further discussion with tribal planning staff it was decided that the projected number of additional dwelling units for the Mission Community area was too low. Therefore, at the tribe's discretion, the number of additional housing units was increased from 187 to 200.

Commercial Land Use Needs

The following is a summary of commercial land use needs for the Reservation.

- Construct a neighborhood grocery store on the northeast corner of the Mission Road intersection.
- Expand the Wildhorse Resort by increasing the floor space at the Casino by 50% and adding 100 additional hotel units. (Currently, the Wildhorse Resort employs between 382 and 411 workers at the casino, hotel, the RV Park, the golf course, and the Tamastslikt Cultural Institute.)
- Develop a multi-use indoor arena with a 5,000-seat capacity.
- Relocate the Arrowhead Truck Stop on east side of Highway 331 to the west side of the highway and add an 8,000 sq. ft truck business center, a 3,000 sq. ft convenience store, a 4,000 sq. ft restaurant, and a 2,000 sq. ft truck repair shop.
- Develop 7.5 acres of land into commercial and retail businesses along the east side of Highway 331 in the vicinity of the existing Arrowhead Truck Stop.
- Develop a tribally owned bank.

Industrial Land Use Needs

As stated in the *Mission Community Plan*, 110 acres of land should be set aside for industrial development over the next 20 years. With the guidance of tribal staff, it was assumed that 25 acres of storage and warehouse facilities and 85 acres of land zoned for light industrial uses would be developed south of the I-84/Highway 331 interchange and west of South Market Road, where the tribe has recently purchased land.

Government/Institutional Land Use Needs

As stated in the *Mission Community Plan*, a new government building is planned for a site located near the Mission Road/Highway 331 intersection. The *Mission Community Plan* identifies this site to be located south of the intersection and west of the highway. The proposed 120,000 sq. ft. building will house the majority of the government offices on the Reservation, with a total employment of around 500 employees.

School Needs

The *Mission Community Plan* recommends 10 to 20 acres be set aside to plan for the development of a tribal or public school on the Reservation. The Plan continues to say the prospect of developing or siting a school is remote at this time. Therefore, this potential land use was not considered in the 20-year traffic forecast.

FUTURE INCREASES IN LOCAL TRAFFIC

The local traffic component of the traffic forecast consists of all Internal-to-Internal (I-I) trips made within the Reservation and those trips that either begin or end on the Reservation, referred to as either Internal-to-External (I-E) or External-to-Internal (E-I) trips.

Future increases in local traffic were estimated through the assessment of planned or potential land uses (see previous section above), an estimate of the trips generated by these types of land uses, and the distribution and assignment of these trips to the major roads in the Mission Community area. Trips produced and attracted by new housing and employment in the area were based on the trip generation rates depicted in the *ITE Trip Generation Manual*¹. This information is provided in the Appendix (Tab 6) along with a summary of the trip distribution.

It was assumed in the trip distribution process that trips produced by new homes on the Reservation would only go to and from new businesses developed on the Reservation. These constitute the I-I trips. All remaining I-E and E-I trips attracted by new businesses were assumed to travel from or to the Reservation at four external locations. These locations include I-84 west of Highway 331 towards Pendleton, I-84 east of Highway 331 towards La Grande, OR Highway 11 towards Milton-Freewater and Walla Walla, and Mission Road at the west Reservation boundary near Pendleton. Trips were assigned to the major roads in the Mission Community area along the shortest and quickest routes.

Table 5-2 provides a detailed summary of the projected increases in local traffic for the PM peak hour.

¹ Institute of Transportation Engineers (ITE), *Trip Generation Manual, 6th Edition*, January 1997.

TABLE 5-2
FUTURE INCREASES IN LOCAL TRAFFIC

Future Land Use Needs	Location	PM Peak Hour Trips		
		Enter	Exit	Total
Housing				
100 units of single family homes	In the vicinity of the Mission Road/Cayuse Road intersection	64	36	100
50 units of single family homes	Southwest of the Mission Road/ Highway 331 intersection	32	18	50
50 units of single family homes	South of I-84 and west of South Market Road	32	18	50
Commercial				
3,000 sq. ft. neighborhood grocery store	Northeast corner of the Mission Road/Highway 331 intersection	51	53	104
50% expansion of floor space at the Casino	Wildhorse Casino	20	25	45
100 additional hotel units	Wildhorse Resort Hotel	32	29	61
Indoor arena with a 5,000 seat capacity	In the vicinity of the entrance road to the Wildhorse Resort	2	10	12
Construct a new truck stop and add an 8,000 sq. ft truck business center, a 3,000 sq. ft convenience store, a 4,000 sq. ft restaurant, and a 2,000 sq. ft truck repair shop	North of I-84 and west of Highway 331	222	216	438
Develop 7.5 acres of land into commercial and retail businesses	North of I-84 and east of Highway 331 (in vicinity of existing Arrowhead Truck Stop)	161	252	413
Tribally owned bank	Southwest corner of the Mission Road/Highway 331 intersection	8	8	16
Industrial				
Develop 25 acres of land for storage and warehouse facilities, and 85 acres of land for light industrial uses	South of I-84 and west of South Market Road	62	216	278
Government				
Construct new 120,000 sq. ft government building	South of Mission Road and either east or west of Highway 331	30	148	178
Total :		716	1,029	1,745

FUTURE INCREASES IN THROUGH TRAFFIC

Future increases in through traffic were determined for I-84, Highway 331, and OR Highway 11 by establishing 20-year historical growth trends for all three highways and applying these trends to existing through traffic volumes (determined from traffic counts). The projected 20-year growth rates and average annual growth rates for all three highways are shown below in Table 5-3. It is important to note that a 20-year trend was established for each highway for the years 1974 to 1994. The construction of the Wildhorse Resort in 1995 resulted in a considerable increase in local trips along each highway; therefore, volume data available for the years 1995 through 1998 was not used.

TABLE 5-3
FUTURE GROWTH PROJECTIONS FOR HIGHWAY TRAFFIC
(APPLICABLE TO THROUGH TRAFFIC ONLY)

	20-Year Growth Rate	Average Annual Growth Rate
I-84		
<i>West of Highway 331</i>	35.6%	1.53%
<i>East of Highway 331</i>	38.7%	1.65%
Highway 331		
<i>North of Mission Road</i>	37.7%	1.61%
<i>South of Mission Road</i>	50.5%	2.06%
<i>South of Wildhorse Resort</i>	41.3%	1.74%
OR Highway 11		
<i>Northeast of Highway 331</i>	27.8% ⁽¹⁾	1.23% ¹

¹ A negative 20-year growth projection was determined for OR Highway 11, northeast of Highway 331. Therefore, to estimate a more conservative traffic forecast, the growth projections documented in the OR Highway 11 Corridor Plan were used. The projections shown in the table are based on a 20-year historical growth trend for the years 1976 to 1996 at a location northeast of the Havana-Helix Highway.

FUTURE NO BUILD TRAFFIC VOLUMES

As part of the planning process, traffic volumes were projected for the future year 2020. This constitutes a “No Build” condition, where the existing roadway network remains unchanged. The results of the forecast are shown in Figure 5-1.

The ADT and PM peak hour traffic volumes were projected for the same roads and intersections previously analyzed under existing traffic conditions. Two new intersections have been included in the future traffic volume forecast. The first intersection, identified as #7 in the figure, represents a potential new access to Highway 331 south of Mission Road. This intersection would serve new housing and the new government office building. The second potential intersection, identified as #8 in the figure, would provide access to planned or potential businesses on the west and east sides of Highway 331, such as a new truck stop facility.

Average Daily Traffic

Along most roads, it was assumed that ADT volumes would increase proportionally to the expected growth in PM peak hour traffic. For example, the future ADT volume of 4,230 vehicles along Mission Road just west of Highway 331 was calculated by increasing the existing ADT volume of 3,340 vehicles by 26.6%. This increase represents the expected growth in PM peak hour traffic for the combined flows entering and exiting this leg of the Mission Road/Highway 331 intersection. This correlation between ADT and PM peak hour volumes was used to project future ADT volumes along the major roads where traffic counts were conducted.

Future ADT volumes along the I-84 mainline were determined in a different fashion since the only information available was existing ADT volumes. East of Highway 331, the existing ADT volume of 11,710 was increased by the projected growth rate of 38.7%, assuming all traffic along this section of freeway is through traffic. Added to this traffic was the additional ADT volumes calculated for the Highway 331 westbound off-ramp and eastbound on-ramp. This yielded a conservative ADT estimate of 19,330 vehicles. West of Highway 331, the existing ADT volume along I-84 is considerably higher than the ADT along the freeway east of Highway 331. This indicates that there is some local and through traffic using Highway 331 interchange. An assumption was made that the 11,700 ADT east of Highway 331 comprises the through traffic component for I-84 west of Highway 331. This through traffic was then increased by the projected growth rate of 35.6% for I-84 west of Highway 331 (15,865 ADT). Projected through traffic was then added to the existing ADT west of Highway 331 that is considered to be local and through traffic related to the Highway 331 interchange (4,860 ADT), and the additional traffic projected for the Highway 331 eastbound off-ramp and the westbound on-ramp (7,660 ADT). This resulted in a conservative ADT estimate of 28,400 vehicles.

PM Peak Hour Traffic Volumes

Future PM peak hour turn movement volumes were estimated by adding future increases in local and through traffic to existing base count information. This process was summarized in the previous section.

FUTURE NO BUILD OPERATIONS

Future year 2020 No Build traffic operations at the six existing unsignalized intersections and two potentially new intersections (assumed to be unsignalized) are summarized below in Table 5-4. Traffic operations at all eight intersections were analyzed for the PM peak hour using ODOT's UNSIG10 software.

TABLE 5-4
FUTURE NO BUILD PM PEAK HOUR OPERATIONS

Highway 331 at	Critical Movement	Existing		Future No Build	
		V/C ¹	LOS	V/C ¹	LOS
<i>Hwy 11</i>	Northbound; Left	0.01	C	0.01	D
	Northbound; Right	0.11	A	0.48	C
	Westbound; Left	0.06	A	0.25	A
<i>Mission Road</i>	Eastbound; Left, Through, Right	0.04	A	0.04	A
	Westbound; Left, Through, Right	0.11	A	0.19	A
	Southbound; Left, Through, Right	0.29	C	1.64	F
	Northbound; Left, Through, Right	0.37	B	1.16	F
<i>Wildhorse Resort</i>	Westbound; Left	0.17	A	0.49	D
	Westbound; Right	0.05	A	0.14	A
	Southbound; Left	0.02	A	0.09	A
<i>Kash Kash Road</i>	Westbound; Left, Right	0.02	A	0.09	D
	Southbound; Left, Through	0.01	A	0.01	A
<i>I-84 WB Ramps</i>	Westbound; Left, Through, Right	0.08	A	0.56	D
	Northbound; Left, Through	0.06	A	0.43	C
<i>I-84 EB Ramps</i>	Eastbound; Left, Through, Right	0.34	A	1.73	F
	Southbound; Left, Through	0.04	A	0.22	A
<i>New Intersection South of Mission Road</i>	Eastbound; Left, Through, Right	-	-	0.05	A
	Westbound; Left, Through, Right	-	-	0.52	D
	Southbound; Left, Through, Right	-	-	0.02	A
	Northbound; Left, Through, Right	-	-	0.03	A
<i>New Intersection North of I-84</i>	Eastbound; Left, Through, Right	-	-	0.93	F
	Westbound; Left, Through, Right	-	-	3.62	E
	Southbound; Left, Through, Right	-	-	0.08	A
	Northbound; Left, Through, Right	-	-	0.29	A

¹ ODOT's UNSIG10 program calculates LOS for unsignalized intersections based on the reserve capacity and not V/C ratios. The V/C ratios were calculated by dividing the demand by the potential capacity for all critical movements.

Note: The LOS and V/C ratios shown in **bold** indicate operations are expected to exceed minimum operating standards.

POTENTIAL MITIGATION OF PROJECTED DEFICIENCIES

A total of three intersections along Highway 331 are expected to exceed minimum operating standards within the next 20 years. Operating deficiencies could be mitigated by the following improvements:

- I-84 EB Ramps- Provide separate left and right-turn lanes on the off-ramp and install a traffic signal when warranted.
- New Intersection North of I-84- Provide exclusive left-turn lanes along the highway, and install a traffic signal when warranted.
- Mission Road- Establish a four-way stop.

A potential safety hazard could exist at the I-84 WB Ramps, where traffic volumes in the southbound direction on Highway 331 are projected to be high for the right turn onto I-84 WB on ramp. This safety hazard could be mitigated by providing an exclusive turn lane that would separate right-turning traffic from through traffic. Other improvements include providing separate left and right-turn lanes on the WB off-ramp and installing a traffic signal when one becomes warranted.

CHAPTER 6: POTENTIAL TRANSPORTATION IMPROVEMENT PROJECTS

A number of improvement projects have been identified to address the needs of the Umatilla Indian Reservation transportation system over the next 20 years. These projects were developed from the analysis of existing and future conditions, through meetings with the TAC members, or address needs which were already established prior to the planning process. Each improvement project was developed to address specific operational, safety, and/or access concerns, to improve community livability, to encourage more bicycle and pedestrian activity on the Reservation, and to accommodate future growth in population and employment. These projects were also developed in an attempt to address the Goal and Objectives specified in Chapter 2.

STATEWIDE TRANSPORTATION IMPROVEMENT PROGRAM PROJECTS

The Statewide Transportation Improvement Program (STIP) is the state's transportation capital improvement program, listing the schedule of transportation projects for a four-year period (currently 2000 to 2003). Projects in the STIP are funded mainly through federal and state gas tax revenues, but also include local government funding and other state and federal funding sources. It includes projects on the state, city, and county transportation systems as well as National Parks, National Forests, and Indian Reservations. This program is updated every two years.

The draft 2002-2005 STIP identifies two projects on the Umatilla Indian Reservation. The first project involves the installation of a variable message sign for traffic heading west on I-84. The sign will be located just west of Highway 331. The estimated cost for this project is \$540,000. The second project includes rockfall protection along I-84 in the vicinity of the Deadman's Pass interchange and rest area east of Highway 331. The estimated cost for this project is \$751,000.

The Tamastlikt Trail was a multi-use path that was completed in the summer of 2000. It now links the tribal agencies and adjacent neighborhoods near Mission Road with the Tamastlikt Cultural Institute. This project received STIP funding and was listed on the 1998-2001 STIP.

CTUIR PLANNED OR APPROVED PROJECTS

The CTUIR recently received a grant for \$350,000 to develop the Wetlands Community Park. The park will be located northeast of the Tribal Community Complex, west of the Mission Creek Subdivision and along the north side of Mission Road. As part of this project, a network of paths will be constructed connecting the various neighborhoods, the park, and the Tribal Community Complex together. This system would be used by both pedestrians and bicyclists. The park is expected to be developed within the next year.

BIA TRANSPORTATION PLANNING FUNDS

As stated by representatives of the BIA, up to \$50,000 in funds can be provided to the CTUIR for transportation planning purposes. In order to receive these funds, "Transportation Planning" must be identified as the first priority in the CTUIR TIP.

The tribe may use "Transportation Planning" funds for the following activities:

- Tribal representation at transportation planning meetings, conferences, and seminars.
- Preparation of applications for funds from other transportation funding sources.

- Planning related activities for other modes such as mass transit, air, etc., and intermodal connections.
- Development of a control schedule for the implementation of the IRR projects in the tribal TIP.
- Acquisition (rental or purchase) of equipment necessary to perform ongoing transportation planning.
- Development of rural addressing and street maps.
- Preparation of documents to nominate routes, or segments of routes for State and/or National Scenic Byways designation.
- Employment of a transportation planner to perform eligible transportation planning activities.
- Researching right-of-way records for transportation planning purposes.
- Other eligible activities identified in a proposal that is mutually agreeable to the Indian Tribal Government and the Secretary of the Interior.
- Other activities listed in Chapter 4 of the *Indian Reservation Roads Program Transportation Planning Procedures and Guidelines, Federal Highway Administration, October 1999*.

POTENTIAL IMPROVEMENT PROJECTS

The potential improvement projects developed for the CTUIR TSP are shown graphically in Figures 6-1 and 6-2 and summarized below. Each potential project was assigned a project number to establish a link between the graphics and project summary. The assigned project number does not represent any level of prioritization at this stage of the plan.

The project summaries below were grouped into five improvement categories: (1) Existing Roadways, (2) New Roadways, (3) Highway 331 Improvements, (4) Bridge Replacements, and (5) Bicycle/Pedestrian Improvements. For each project, the purpose or need is defined followed by an overview of improvements, and estimated cost. Costs reflect year 2001 dollars and are estimated from unit costs for similar facility improvements. Unit costs are provided in Appendix II (Tab 8). Some projects address multiple improvement options and were evaluated against one another.

Existing Roadways

River Road - Phase I (Project R1)

This project was initially identified in a roadway improvement needs analysis performed by the previous transportation planner for the CTUIR. The purpose of this project is to improve community livability and driver safety for the residents living along this local access road.

This project would improve River Road, from the west UPRR crossing to White Road. Improvements would consist of widening the roadbed, making minor alignment changes, and adding shoulders. This would be followed by the addition of new gravel. This project would also include paving the two at-grade rail crossings along this section of road with asphalt. This would improve driver safety, particularly for the public school buses that use these crossings on a daily basis. Currently, both crossings have wooden rail ties stacked between the metal rails, which could be hazardous.

It should be noted that ODOT considers both rail crossings along River Road to be “private”. Therefore, improvements to these crossings may be readily made by any interested party or agency.

This section of River Road is considered an orphan road, where no public agency has jurisdiction, but a public right-of-way does exist.

The estimated cost for this project follows below:

1 mile of road @ \$105,000/mile	\$105,000
2 at-grade railroad crossings @ \$2,500/crossing	\$5,000
<u>Total</u>	<u>\$110,000</u>

River Road - Phase II (Project R2)

This project was identified in a roadway improvement needs analysis performed by the previous transportation planner for the CTUIR and was also included as a planned project in the Umatilla County TSP. The purpose of this project is to improve community livability and driver safety for the residents living along this local access road.

This project would improve River Road (County Road #927) from Cayuse Road to the west UPRR crossing and along River Road (County Road #918) from White Road east to North Cayuse Road. Improvements would consist of widening the roadbed, making minor alignment changes, and adding shoulders. This would be followed by the addition of a new gravel surface. This project is shown to be more expensive in the Umatilla County TSP since the plan calls for pavement. Because River Road is a local access road, serving few homes, a gravel surface would be more appropriate.

Both sections of River Road are under the jurisdiction of the county.

The estimated cost for this project follows below:

2.1 miles of road @ \$105,000/mile	\$221,000
<u>Total</u>	<u>\$221,000</u>

56th Street/Gopher Flat Lane (Project R3)

This project was identified in a roadway improvement-needs analysis performed by the previous transportation planner for the CTUIR. The purpose of this project is to improve community livability and driver safety for the residents living along these local access roads.

This project would improve 56th Street from Mission Road to Gopher Flat Lane, and all of Gopher Flat Lane. Improvements would consist of widening the roadbed, making minor alignment changes, and adding shoulders. This would be followed by the addition of a new gravel surface.

Both 56th Street and Gopher Flat Road are orphan roads, where no public agency has jurisdiction, but a public right-of-way does exist.

The estimated cost for this project follows below:

0.85 miles of road @ \$105,000/mile	\$89,000
<u>Total</u>	<u>\$89,000</u>

Parr Lane (Project R4)

This project was identified in a roadway improvement needs analysis performed by the previous transportation planner for the CTUIR. The purpose of this project is to improve community livability and driver safety for the residents living along this local access road.

This project would improve Parr Lane from Mission Road to the end of Parr Lane. Improvements would consist of widening the roadbed, making minor alignment changes, and adding shoulders. This would be followed by the addition of a new gravel surface. This project would also include paving the at-grade rail crossing with asphalt. This would improve driver safety for those residents living along this road. Currently, both crossings have wooden rail ties stacked between the metal rails, which could be hazardous.

It should be noted that ODOT considers the Parr Lane crossing to be “private”. Therefore, improvements to this crossing may be readily made by any interested party or agency.

Parr Lane is considered an orphan road, where no public agency has jurisdiction, but a public right-of-way does exist.

The estimated cost for this project follows below:

0.5 miles of road @ \$105,000/mile	\$52,500
1 at-grade railroad crossing @ \$2,500/crossing	\$2,500
<u>Total</u>	<u>\$55,000</u>

Emigrant Road (Project R5)

This project was identified in a roadway improvement needs analysis performed by the previous transportation planner for the CTUIR and was also included as a planned project in the Umatilla County TSP. The purpose of this project is to improve the deteriorating condition of this paved road. This road serves more than 20 homes and is used for farming and recreational purposes. It also provides access to the church and cemetery at St. Andrews.

This project consists of repaving and improving the shoulders of Emigrant Road (County Road #937) from Cayuse Road to Poverty Flat Road. The project length is 9.0 miles.

Emigrant Road is under the jurisdiction of the county.

The estimated cost for this project \$1,468,000. This was estimated by factoring the 1998 project cost shown in the Umatilla County TSP up to year 2000 dollars by applying a 2.4% annual inflationary rate.

White Road (Project R6)

This project was identified in a roadway improvement needs analysis performed by the previous transportation planner for the CTUIR and was also included as a planned project in the Umatilla County TSP. The purpose of this project is to improve community livability and driver safety for the residents living in the eight homes along this local access road.

This project would improve White Road (County Road #918) from Cayuse Road to River Road. Improvements would consist of widening the roadbed, making minor alignment changes, and adding shoulders. This would be followed by the addition of a new gravel surface. This project is shown to be more expensive in the

Umatilla County TSP since the plan calls for pavement. Because White Road is a local access road, serving just a few homes, a gravel surface would be more appropriate.

White Road is under the jurisdiction of the county.

The estimated cost for this project follows below:

1.1 miles of road @ \$105,000/mile	\$116,000
<u>Total</u>	<u>\$116,000</u>

North Cayuse Road (Project R7)

This project was identified in a roadway improvement needs analysis performed by the previous transportation planner for the CTUIR and was also included as a planned project in the Umatilla County TSP. This project in conjunction with the Mann Road project would provide a continuous paved roadway surface from Cayuse Road to OR Highway 11. This project would improve community livability and driver safety for the residents living along this road and those who use it to travel to and from Athena and OR Highway 11 to the north.

This project would improve North Cayuse Road (County Road #925) from River Road to Mann Road. Improvements would consist of widening the roadbed, making minor alignment changes, and adding shoulders. This would be followed by the addition of a new paved surface. This project is 1.3 miles in length.

North Cayuse Road is under the jurisdiction of the county.

The estimated cost for this project is \$204,400. This was estimated by factoring the 1998 project cost shown in the Umatilla County TSP up to year 2000 dollars by applying a 2.4% annual inflationary rate.

Mann Road (Project R8)

This project was identified in a roadway improvement needs analysis performed by the previous transportation planner for the CTUIR and was also included as a planned project in the Umatilla County TSP. This project in conjunction with the North Cayuse Road project would provide a continuous paved roadway surface from Cayuse Road to OR Highway 11. This project would improve community livability and driver safety for the residents living along this road and those who use it to travel to and from Athena and OR Highway 11 to the north.

This project would improve Mann Road (County Road #925) from North Cayuse Road to Crawford Hollow Road. Improvements would consist of widening the roadbed, making minor alignment changes, and adding shoulders. This would be followed by the addition of a new paved surface. The project is 3.30 miles in length.

Mann Road is under the jurisdiction of the county.

The estimated cost for this project is \$518,800. This was estimated by factoring the 1998 project cost shown in the Umatilla County TSP up to year 2000 dollars by applying a 2.4% annual inflationary rate.

Motanic Road (Project R9)

This project was identified in a roadway improvement needs analysis performed by the previous transportation planner for the CTUIR and was also included as a planned project in the Umatilla County TSP. This project would improve community livability and driver safety for the residents living along this road and for many who

use it to travel to and from the southern section of the Reservation. This road is also used frequently by trucks for agricultural purposes.

This project would improve Motanic Road (County Road #1031) from Best Road to Spring Creek Road. Improvements would consist of widening the roadbed, making minor alignment changes, and adding shoulders. This would be followed by the addition of a new paved surface. The project is 4.80 miles in length.

Motanic Road is under the jurisdiction of the county.

The estimated cost for this project is \$755,800. This was estimated by factoring the 1998 project cost shown in the Umatilla County TSP up to year 2000 dollars by applying a 2.4% annual inflationary rate.

Sumac Road (Project R10)

This project was identified in a roadway improvement needs analysis performed by the previous transportation planner for the CTUIR and was also included as a planned project in the Umatilla County TSP. This project would improve community livability and driver safety for the residents living in the seven homes along this road. This road is also used frequently by trucks for agricultural purposes.

This project would improve Sumac Road (County Road #1050) from Spring Creek Road to McKay Creek Road. Improvements would consist of widening the roadbed, making minor alignment changes, and adding shoulders. This would be followed by the addition of a new paved surface. The project is 3.30 miles in length.

Sumac Road is under the jurisdiction of the county.

The estimated cost for this project is \$518,000. This was estimated by factoring the 1998 project cost shown in the Umatilla County TSP up to year 2000 dollars by applying a 2.4% annual inflationary rate.

McKay Creek Road (Project R11)

This project was identified in a roadway improvement needs analysis performed by the previous transportation planner for the CTUIR and was also included as a planned project in the Umatilla County TSP. The purpose of this project is to improve community livability and driver safety for the residents living in the seven homes along this local access road.

This project would improve McKay Creek Road (County Road #1050) from Cayuse Road to River Road. Improvements would consist of widening the roadbed, making minor alignment changes, and adding shoulders. This would be followed by the addition of a new gravel surface. This project is shown to be more expensive in the Umatilla County TSP since the plan calls for pavement. Because McKay Creek Road is a local access road, serving just a few homes, a gravel surface would be more appropriate.

McKay Creek Road is under the jurisdiction of the county.

The estimated cost for this project follows below:

4.1 miles of road @ \$105,000/mile	\$430,500
Total	\$430,500

Kash Kash Road/St. Andrews Road (Project R12)

This project was identified in a roadway improvement needs analysis performed by the previous transportation planner for the CTUIR and was also included as a planned project in the Umatilla County TSP. This project would improve community livability and driver safety for the residents living in the two homes along Kash Kash Road and the three homes along St. Andrews Road. St. Andrews Road also serves a school, church, and cemetery.

This project would improve Kash Kash Road (County Road #934) and St. Andrews Road (County Road #931) from the end of pavement on Kash Kash Road to Niktyoway Road. Improvements would consist of widening the roadbed, making minor alignment changes, and adding shoulders. This would be followed by the addition of a new paved surface. The project is 2.60 miles in length.

Both Kash Kash and St. Andrews Roads are under the jurisdiction of the county.

The estimated cost for this project is \$384,800. This was estimated by factoring the 1998 project cost shown in the Umatilla County TSP up to year 2000 dollars by applying a 2.4% annual inflationary rate.

New Roadways**North-South Connector Road (Project R13)**

This project was identified as a future roadway improvement in the *Mission Community Plan*. Oriented in a north-south fashion east of Highway 331, this new road would provide a faster and more direct travel route between the tribal government offices/neighborhoods and the Wildhorse Resort.

Improvements would include the construction of a new rural connector road beginning at the end of "A" Street and ending at the entrance road to the Wildhorse Resort.

The estimated cost for this project follows below:

1.38 miles of new rural road @ \$1,100,000/mile	\$1,518,000
ROW 2,640 ft x 50 ft @ \$1/square ft	\$132,000
Total	\$1,650,000

East-West Connector Road - Phase I (Project R14)

This project was identified as a future roadway improvement in the *Mission Community Plan*. Oriented in an east-west fashion, this new road would parallel Mission Road to the south. It would serve as a local access road for new homes that may be built in the area designated for a community residential land use.

This project is also the first of three phases to extend a new road west to a new access with Highway 331. Once connected, it will assist in removing some traffic from Mission Road and Highway 331 (south of Mission Road).

Improvements would include the construction of a new connector road beginning at Mission Road, across from Aspen Way, and ending at the proposed north-south connector road described previously. A portion of this project lies within a future Community Residential area, where an urban road design standard should be used including curb, gutter, and sidewalks, to accommodate future development. The remaining section is located in an Open Space area and should be constructed to a rural standard.

The estimated cost for this project follows below:

0.35 miles of new urban road @ \$2,000,000/mile	\$700,000
0.41 miles of new rural road @ \$1,100,000/mile	\$451,000
<u>Total</u>	<u>\$1,151,000</u>

East-West Connector Road - Phase II (Project R15)

This project is the second of three phases and would provide direct access to the east side of Highway 331 from the proposed North-South Connector Road.

Improvements would include the construction of a new rural road beginning at the proposed North-South Connector Road and ending at a new intersection with Highway 331.

The need for this project is driven by future plans to construct new homes along this road in the area east of Highway 331 that is designated for a community residential land use. The road would provide an alternative route to Mission Road between future homes and the proposed government office building on the west side of Highway 331.

The estimated cost for this project follows below:

0.59 miles of new rural road @ \$1,100,000/mile	\$649,000
<u>Total</u>	<u>\$649,000</u>

East-West Connector Road - Phase III (Project R16)

This project was identified from discussions with tribal officials and would serve developments planned for this area.

The project begins from a new intersection with Highway 331 across from the proposed East-West Connector Road (Phase II) and extends west and then north to a new intersection with Mission Road.

Improvements would include the construction of a new connector road, where urban road design standards should be used, such as providing curb, gutter, and sidewalks. This road would provide needed access to Mission Road and Highway 331 from the planned government building and planned housing developments.

The estimated cost for this project follows below:

0.47 miles of new urban road @ \$2,000,000/mile	\$940,000
<u>Total</u>	<u>\$940,000</u>

Connector Road Between Kash Kash Road and Wildhorse Resort (Project R17)

This project was identified as a future roadway improvement in the *Mission Community Plan*. Oriented in a north-south fashion east of Highway 331, this new road would provide a convenient connection between a realigned Kash Kash Road and the Wildhorse Resort. This connection would assist in reducing traffic demand along the highway.

Improvements would include the construction of a new connector road beginning at the entrance road to the Wildhorse Resort and ending at the realigned extension of Kash Kash Road. The proposed alignment will overlap the existing road fronting the west side of the RV park.

The estimated cost for this project follows below:

0.42 miles of new urban road @ \$2,000,000/mile	\$840,000
<u>Total</u>	<u>\$840,000</u>

Tamastlikt Cultural Institute Connector Road (Project R18)

This project was identified as a future roadway improvement in the *Mission Community Plan*. The road would provide a direct connection for those driving between Cayuse Road and the Tamastlikt Cultural Institute/Wildhorse Resort.

Improvements would include the construction of a new rural connector road beginning at the end of the proposed east-west connector road (Phase 1), near Cayuse Road, and ending at the one-way entrance roads to the Tamastlikt Cultural Institute.

The estimated cost for this project follows below:

1.38 miles of new rural road @ \$1,100,000/mile	\$1,518,000
<u>Total</u>	<u>\$1,518,000</u>

Highway 331 Improvements

I-84 EB Ramps at HWY 331 (Project R19)

The purpose of this project is to mitigate a capacity deficiency expected to occur at this intersection within the next 20 years. This project would also help establish a system of traffic signals that are spaced evenly and efficiently along Highway 331.

Improvements would include the construction of exclusive left and right-turn lanes on the eastbound off-ramp approach and the installation of a traffic signal. Improvements to this intersection would occur only when a signal becomes warranted.

As stated in the Traffic Forecast and Future Conditions section of this plan (Chapter 5), the No Build P.M. peak hour traffic operations are expected to deteriorate to LOS F and a V/C ratio of 1.73 for the off-ramp approach. With a traffic signal, operations are expected to improve to LOS B.

Once implemented, a traffic signal at this location could provide large enough gaps in mainstream traffic on the Highway 331 overpass to help delay or deter the need for a traffic signal at the westbound ramps.

A traffic signal installation at this location would help to provide the best possible traffic progression along Highway 331, assuming traffic signals are ultimately constructed at the proposed new intersection of Kash Kash Road (located ¼ mile north of the I-84 westbound ramps) and at the existing Wildhorse Casino Entrance Road. The approximate spacing between these three signals would be around 2,300 feet (around ½ mile).

According to the *Technical Guidelines for the Control of Direct Access to Arterial Highways*¹ traffic progression along the highway could be optimized under this spacing by maintaining highway speeds of 45-55 mph and cycle lengths of 60-70 seconds.

The estimated cost for this project follows below:

Install new Traffic Signal	\$150,000
Intersection Approach Improvements	\$50,000
Total	\$200,000

I-84 WB Ramps at HWY 331 (Project R20)

The purpose of this project is to mitigate any potential safety or capacity deficiency that may exist at this intersection within the next 20 years.

Improvements would include the construction of exclusive left and right-turn lanes on the westbound off-ramp approach and an exclusive right-turn lane on the north approach along Highway 331. An optional improvement would be to construct a traffic signal, if one becomes warranted.

The need for the exclusive right-turn lane on the north approach along Highway 331 is driven by the future traffic volume forecast, where over 500 vehicles are expected to make this turn during the P.M. peak hour compared to over 250 vehicles going straight through the intersection. This improvement would effectively separate turning traffic from through traffic and allow vehicles to access the westbound on-ramp more easily.

As shown in the Traffic Forecast and Future Conditions section of this plan (Chapter 5), the No Build P.M. peak hour traffic operations at the off-ramp approach to this unsignalized intersection are expected to remain at acceptable levels (LOS D and V/C ratio of 0.56). Although the traffic projection indicates a traffic signal will not be needed in the future, the need may arise due to unforeseen circumstances. If a traffic signal were installed, future P.M. peak hour operations are expected to be LOS B. It should be noted that the operational need for a traffic signal at this location may be delayed or deterred by first constructing a traffic signal at the I-84 eastbound ramps. A signal there could provide large enough gaps in mainstream traffic on the Highway 331 overpass to help vehicles on the westbound off ramp to access Highway 331 more freely.

The estimated cost for this project follows below:

Install new Traffic Signal	\$150,000
Intersection Approach Improvements	\$100,000
Total	\$250,000

Kash Kash Road at Highway 331 (Project R21)

The purpose of this project is to provide a safer access to Highway 331, and one that will accommodate future developments planned for the area. The improvements proposed are designed to provide safe access to adjacent land uses, preserve the integrity/capacity of the highway and I-84 interchange, and maintain acceptable highway operations.

¹ *Technical Guidelines for the Control of Direct Access to Arterial Highways* - Volumes I and II, Federal Highway Administration (FHWA-RD-76-86)

Improvements would include closing the existing Kash Kash Road access and rerouting this road north and west to a new intersection with Highway 331. Other improvements at the proposed intersection would include the addition of exclusive left-turn lanes along the north and south approaches along Highway 331 and a new driveway/street access on the west approach, opposite of Kash Kash Road. A traffic signal should also be installed at this intersection when warranted.

As shown in the Traffic Forecast and Future Conditions section of this plan (Chapter 5), the No Build P.M. peak hour traffic operations on the minor approaches of the proposed intersection would reach LOS E or worse over the next 20 years, if stop-control were used. If a traffic signal were installed, future operations are expected to reach LOS C.

A traffic signal installation at this location would help to provide the best possible traffic progression along Highway 331, assuming traffic signals are ultimately constructed at the I-84 eastbound ramps to the south and at the existing Wildhorse Casino Entrance Road to the north. The approximate spacing between these three signals would be around 2,300 feet (around ½ mile).

The estimated cost for this project follows below:

0.34 miles of road @ \$2,000,000/mile	\$681,800
Install new Traffic Signal	\$150,000
Intersection Approach Improvements	\$150,000
<u>Total</u>	<u>\$981,800</u>

Highway 331 Median (Project R22)

The purpose of this project is to preserve the capacity and maintain safety along Highway 331 north of the I-84 interchange, while providing safe and convenient access to adjacent land uses and creating an aesthetically pleasing environment. This project would also improve bicycle and pedestrian travel along the highway.

To plan for future development and increased traffic around the I-84 interchange, the tribe and ODOT support the construction of a non-traversable landscaped median along Highway 331 beginning at the Wildhorse Resort Entrance Road and ending at the I-84 westbound ramps. The design of the median would allow for left-turns to be made at major intersections. The project length is approximately 0.70 miles.

The tribe supports the construction of a landscaped median to create a visual gateway to the Wildhorse Resort and the Mission Community Area. ODOT supports this project as an access management tool that would improve driver safety by effectively limiting the number of conflicting turn movements along the highway.

Improvements would consist of widening the highway to include a 14-foot wide median with landscaping, maintaining two 12-foot travel lanes, and either the construction of bike lanes and sidewalks or a paved shoulder that is wide enough for bicycle and pedestrian travel. Figure 6-3 provides typical cross-sections of these two options.

The TAC agreed paved shoulders for bicycle and pedestrian travel should be provided from the I-84 westbound ramps to the proposed right-in/right-out driveway accesses north of the interchange. On the west and east sides of the highway, these right-in/right-out access points would be located 990 feet and 750 feet north of the I-84 westbound ramps, respectively. It is possible that a right-turn deceleration lane would be constructed in the northbound direction on the highway at the east access point.

The TAC supports a more urban cross-section consisting of bike lanes and sidewalks along the remaining section of Highway 331 from the proposed right-in/right-out accesses up to the Wildhorse Resort Entrance Road. The tribe considers this area to be urban because it lies within the future tourist commercial boundary.

Both types of cross-sectional improvements could be made within the existing right-of-way along the highway.

The estimated cost for this project follows below:

0.16 miles of Median Improvements @ \$700,000/mile	\$112,000
0.54 miles of Median Improvements @ \$1,800,000/mile	\$972,000
<u>Total</u>	<u>\$1,084,000</u>

Wildhorse Resort Entrance Road at Highway 331 (Project R23)

The purpose of this project is to improve driver safety and traffic progression along Highway 331.

Improvements would consist of adding an exclusive left-turn lane on the north approach along Highway 331 and adding a traffic signal when warranted.

The construction of an exclusive left-turn lane on the highway is driven by the need to improve driver safety. Cars and trucks reach speeds of over 55 mph in this area and there is potential conflict between vehicles decelerating to access the entrance road to the resort and through traffic on the highway. This improvement would effectively separate left-turning traffic from through traffic on the highway.

The installation of a traffic signal at this location is driven by the need to provide efficient traffic progression along the highway in the future. With traffic signals installed at the I-84 eastbound ramps and the proposed new intersection of Kash Kash Road, a traffic signal at the entrance road would allow traffic to be progressed efficiently. The approximate spacing between these three signals would be around 2,300 feet (around ½ mile).

The potential for further development along the Wildhorse Resort Entrance Road is high. Although the future traffic forecast and operations analysis does not indicate a traffic signal will be needed over the next 20 years, it is possible that a signal may become warranted due to unforeseen developments.

Right-of-way does not appear to be an issue at this intersection. The current right-of-way width is around 80 feet along the highway, which is sufficient for adding a left-turn lane on the north approach and a traffic signal.

The estimated cost for this project follows below:

Intersection Improvements	\$50,000
<u>Install Traffic Signal</u>	<u>\$150,000</u>
Total	\$200,000

Highway 331 Shoulder Widening (Project R24)

The purpose of this project is to enhance pedestrian and bicycle safety along the highway and encourage more people to walk or ride between the Wildhorse Resort and Mission Road.

There are several areas along Highway 331 between the Resort and Mission Road where the existing shoulders lack sufficient pavement width to be conducive to bicycle and pedestrian use. As development densities increase around existing or future activity centers such as the Wildhorse Resort, Truck Stop area, and the Mission Road intersection, demand will rise to provide improved bicycle and pedestrian facilities along the

highway. Since the land uses adjacent to the highway between the Wildhorse Resort and the proposed new intersection south of Mission Road will remain generally rural in nature, urban improvements such as sidewalks and bike lanes may not be suitable.

This project would establish 8-foot wide paved shoulders along the highway between the Wildhorse Resort Entrance Road and the proposed new intersection just south of Mission Road. North of this project, sidewalks and bike lanes will ultimately be constructed up to the Mission Road intersection (see Highway 331 Sidewalk Improvements project). South of this project, sidewalks and bike lanes are proposed (see Highway 331 Median project).

The existing right-of-way along the highway is sufficient for shoulder widening.

The estimated cost for this project follows below:

1.00 miles of new pavement @ \$200,000/mile	\$200,000
Total	\$200,000

New Intersection South of Mission Road at Highway 331 (Project R25)

The purpose of this project is to provide a new intersection along Highway 331 to accommodate future development and street improvements planned for the area. The improvements proposed are designed to provide safe access to adjacent land uses, while preserving the integrity/capacity of the highway and maintaining acceptable highway operations.

The tribe has plans to develop a new government agency building on the west or east side of the highway, just south of the Mission Road intersection. This building would house most of the 500 employees currently working at the government offices along Mission Road. This development would have direct access to the highway via the proposed East-West Connector Road (Phases II and III). It is possible some residential development could occur in the area opposite of the new government building.

Intersection improvements would include the addition of exclusive left-turn lanes along the north and south approaches along Highway 331. It was assumed the minor road accesses on the west and east approaches would be constructed when the East-West Connector Road is built.

As shown in the Traffic Forecast and Future Conditions section of this plan (Chapter 5), the proposed intersection is expected to operate at an acceptable level (LOS D or better) with only stop-control on the minor street approaches.

The estimated cost for this project follows below:

Intersection Improvements	\$100,000
Total	\$100,000

Highway 331 Sidewalks and Bike Lanes (Project R26)

The purpose of this project is to provide urban pedestrian and bicycle improvements along Highway 331 that will encourage people, traveling from/to future developments planned for the immediate area, to walk or ride along Highway 331 instead of driving.

Improvements would include the construction of bike lanes with curb, gutter and sidewalks, from the Mission Road intersection to the proposed new intersection to the south at the East-West Connector Road, for a distance

of around 0.22 miles. This project is mainly driven by the tribe’s plans to construct a tribally-owned community store at the Mission Road intersection and a new government headquarters to the south near the proposed intersection. The tribe has strategically planned for these developments to be close to each other to encourage some 500 workers to shop and eat at the proposed community store. Since the distance would be a relatively short walk (approximately six minutes) or bike ride (approximately three minutes) the need for sidewalks and bike lanes is high, but only when both developments are in place.

It is a State policy (OAR 660-012-0045- Section 1B) to provide sidewalks along arterials in urban areas, as these facilities are improved. Since Highway 331 is an arterial and the tribe has urban-type land uses planned for this area (Community Commercial, Community Residential, and Government), sidewalks should be provided along the highway when development occurs. Bikeways are also required by the same State policy. In this case, bike lanes would be an appropriate facility if sidewalks were built.

This project is also one of the first steps to providing a continuous bicycle/pedestrian connection along Highway 331 from Mission Road to the Wildhorse Casino and Truck Stop areas.

The estimated cost for this project follows below:

0.22 miles of bike lanes and sidewalks @ \$1,000,000/mile	\$220,000
Total	\$220,000

Mission Road at Highway 331 (Project R27)

This project was identified by the TAC to accommodate anticipated traffic congestion, to improve driver safety as well as pedestrian safety, and to improve community livability as commercial businesses are developed in the immediate area.

This project would include the addition of stop signs on all four approaches, the construction of sidewalks with curbing and wheelchair ramps on all four corners, and crosswalk striping for pedestrians.

Currently, there are stop signs posted only on the north and south approaches of Highway 331. There are flashing amber lights posted on the highway approaches and flashing yellow lights posted on the Mission Road approaches.

The CTUIR has plans to construct a neighborhood convenience store on the northeast corner of this intersection. According to the *Four Corners Master Plan*² the tribe plans to build the store close to the corner of the intersection to provide a more pedestrian friendly environment with parking located at the rear of the property. Since this development will draw more pedestrians to the area, sidewalks will be needed along and around all four corners of this intersection, including wheelchair ramps and crosswalk striping.

Two driveway accesses are proposed; one on Highway 331 and a second on Mission Road. Currently, there is a sidewalk flanking the south side of the lot along Mission Road and a continuous driveway along the west side of the lot along Highway 331. The development plans for the store show a single driveway accessing the highway at the north property line instead of maintaining the continuous driveway access that is there today. ODOT officials have stated that a single access will likely be permitted along Highway 331, pending a review.

² *Four Corners Master Plan*, CTUIR, Berryman & Henigar Property Counselors, March 2000.

No formal plans have been made for developing the commercially zoned parcel on the southwest corner of this intersection but tribal officials indicate the design would similar to the neighborhood store, where the building structure would be located close to the intersection.

As mentioned in the Existing Conditions section of this study (Chapter 4), P.M. peak hour traffic operations at this intersection are currently at LOS C or better for all critical movements. Without any changes, future operations are expected to reach LOS F. By providing stop-control on all four approaches to this intersection, future traffic operations are expected to improve to LOS D or better.

The current traffic control at this intersection was identified as a potential safety problem in the existing conditions section of this report (Chapter 4). All three accidents, which took place at this intersection over the past five years, involved vehicles on Highway 331 that did not yield right-of-way to free flowing traffic on Mission Road. The cause of these accidents seems unclear but may be due to the driver's perception that if a stop-sign is posted on the highway then stop-signs are posted on the Mission Road approaches as well. Tribal officials agreed that there are many "close encounters" between vehicles at this intersection. In an attempt to eliminate these types of accidents, ODOT recently posted signs stating "Cross-Street Traffic Does Not Stop", just below the stop sign. However, a similar accident recently took place in June 2000. The accident report indicated that the driver at fault was expecting the vehicle traveling on Mission Road to stop.

The estimated cost for this project follows below:

4 Stop Signs @ \$200/sign	\$800
600 ft of sidewalk and curbing @ \$30/linear ft	\$18,000
260 ft of crosswalk striping @ \$3/linear ft	\$800
Total	\$19,600

Bridge Replacements

Umatilla River Bridge (Project BR1)

The CTUIR is actively pursuing the replacement of the Umatilla River Bridge (County Bridge #59C727) to improve driver safety and comfort. The bridge is located approximately 16 miles east of the Mission area along Bingham Road (County Road #900). Bingham Road and the Umatilla River Bridge provide the only vehicular access for the residents living in Bingham Springs to the east. This road is also used to access the Umatilla National Forest.

The Umatilla River Bridge is 104 feet long and 22.5 feet wide and was built in 1955. It has steel I-beam supports and concrete decking.

A preliminary inspection of this bridge was performed recently by a representative of the BIA. The inspection revealed that the concrete has worn away in places leaving the re-bar exposed on the deck and edges. It was also noted that the bridge is unable to sustain two-way travel when trucks are crossing.

ODOT has also inspected this bridge within the last three years. The state bridge inspection survey indicates the Umatilla River Bridge is not structurally deficient or functionally obsolete, but does have a substandard sufficiency rating of 42.4.

The Umatilla County TSP identifies the need to replace this bridge over the next 20 years. However, the county may not be able to support its replacement because of limited finances. The CTUIR is currently working with the BIA to secure federal dollars for the design and replace this bridge.

The estimated cost to replace this bridge is \$198,300. This estimate is based on the bridge replacement cost stated in the Umatilla County TSP for the replacement of this bridge. The cost was factored up to year 2000 dollars from 1998 dollars, by applying a 2.4% annual inflationary rate.

Meacham Creek Bridge (Project BR2)

The CTUIR is also pursuing the replacement of the Meacham Creek Bridge (County Bridge #59C726) to improve driver safety and comfort. The bridge is located just west of the Umatilla River Bridge along Bingham Road (County Road #900). Bingham Road and the Meacham Creek Bridge provide the only vehicular access for the residents living in Bingham Springs to the east and vehicular access the Umatilla National Forest. This bridge also provides the only means for vehicles to access Meacham Creek Road (County Road #911), which follows the UPRR rail line to the south and provides access to fish hatcheries.

The Meachum Creek Bridge is 102 feet long and 22.5 feet wide and was built in 1955. It has steel I-beam supports and concrete decking.

A preliminary inspection of this bridge was also performed by a representative of the BIA, and revealed that the condition of this bridge is similar to the Umatilla River Bridge.

The state bridge inspection survey indicates the Meacham Creek Bridge is not structurally deficient or functionally obsolete, but does have a substandard sufficiency rating of 44.3, which is slightly better than the sufficiency rating for the Umatilla River Bridge.

The CTUIR has submitted a request through the BIA for federal dollars to design and replace this bridge. However, the request for design money was denied, as the federal government did not agree with the warrants for improvement. A more formal inspection of this bridge is expected in the near future to assess the need for replacement.

The estimated cost to replace this bridge is \$194,400. This estimate is based on 1998 unit costs supplied by ODOT, which were factored up to reflect year 2000 dollars. This estimate assumes a cost of \$6.30 per square foot for bridge removal and \$63 per square foot for bridge construction. It is also assumed that the deck width would be increased to at least 28 feet to account for a sidewalk on one side of the bridge.

Thornhollow Cattle Pass Bridge (Project BR3)

The Thornhollow Cattle Pass Bridge (County Bridge #59C378) is in need of replacement. The bridge is located approximately 11 miles east of the Mission area along Thorn Hollow Road (County Road #745). Thorn Hollow Road and all the bridges along this road provide vehicular access for more than 35 residences north of Bingham Road.

The Thornhollow Cattle Pass Bridge is 20 feet long and 24 feet wide and was built in 1965.

ODOT has also inspected this bridge within the last three years. The state bridge inspection survey indicates this bridge is structurally deficient.

The County, BIA, and CTUIR support the replacement of this bridge. The BIA may be the only source of funding for its replacement, due to the limited resources of the County and tribe.

The estimated cost to replace this bridge is \$36,000. This estimate is based on the bridge replacement cost stated in the Umatilla County TSP for the replacement of this bridge. The cost was factored up to year 2000 dollars from 1998 dollars, by applying a 2.4% annual inflationary rate.

Wildhorse Creek Bridge (Project BR4)

The Wildhorse Creek Bridge (County Bridge #59C401) is in need of replacement. The bridge is located approximately 2 miles south of Athena and Weston along Wildhorse Road (County Road #685).

The Thornhollow Cattle Pass Bridge is 26 feet long and 20 feet wide and was built in 1952.

ODOT has also inspected this bridge within the last three years. The state bridge inspection survey indicates this bridge is structurally deficient.

The County, BIA, and CTUIR support the replacement of this bridge. The BIA may be the only source of funding for its replacement, due to the limited resources of the County and tribe.

The estimated cost to replace this bridge is \$46,000. This estimate is based on the bridge replacement cost stated in the Umatilla County TSP for the replacement of this bridge. The cost was factored up to year 2000 dollars from 1998 dollars, by applying a 2.4% annual inflationary rate.

Bicycle and Pedestrian Improvements**Mission Road Bike/Pedestrian Facility - Phase I (Project BP1)**

The purpose of this project is to encourage those residents living along or adjacent to Mission Road to walk or ride a bicycle rather than use an automobile for short distance trips. This project is around 3 miles in length and extends from Highway 331 to the west Reservation boundary near Hal's Trailer Court.

The tribe is currently considering two different options (Options 1 and 2) to provide bicycle and pedestrian improvements along Mission Road. Although the BIA is now in the process of performing the engineering design for one of these options, it was determined in the TAC meetings that a second alternative should be evaluated to confirm whether or not the BIA is pursuing the best design. One of these options will ultimately be selected by the tribe and placed in the priority list of transportation improvements for the CTUIR Transportation System Plan. Typical cross-sections of each option are shown in Figure 6-4.

The evaluations of both options consist of an overview and addresses several factors including safety, socioeconomic impacts, land use impacts, and cost. Following this, are the transportation consultant's recommendations.

It should be noted that Phases I and II together address the immediate need to provide a safe and attractive bicycle and pedestrian connection linking the Reservation with the city of Pendleton.

Option 1: Widen Mission Road to Include Paved Shoulders

Overview: Over the past several months the BIA has been working on final design plans to widen Mission Road to provide bicycle lanes. Currently, the design is roughly 90% complete and construction could conceivably begin within the next one to two years. Design plans show two 11-foot travel lanes with 8-foot paved shoulders on both sides of the road. The paved shoulders would be striped for 6-foot bike lanes. The design also includes 2-foot gravel shoulders and open drainage ditches on both sides of the road, all within the existing 60-foot right-of-way.

Safety: Safety for bicyclists will be enhanced with the addition of bike lanes. Today, the narrow shoulders along Mission Road force bicyclists near or into the travel lanes, creating a potential conflict

with traffic. According to the ODOT Bicycle and Pedestrian Plan³, a shared roadway condition, where bicyclists share the travel lane with vehicles, is becomes less suitable in rural areas where traffic speeds and volumes increase. Currently, the posted speed along Mission Road is 40 mph and daily traffic volumes are projected to increase from around 3,500 to 4,500 vehicles. With 6-foot bike lanes established under this option, cyclists would be able to safely avoid conflicts with passing vehicles.

Pedestrian safety would also be improved with wider shoulders established along Mission Road. With six-foot bike lanes and an additional two-feet of paved shoulder, a pedestrian would have plenty of clearance from passing vehicles.

Currently, Mission Road is striped with 12-foot travel lanes, which is a desirable width for drivers. The design plan being prepared by the BIA shows a reduction to 11-foot travel lanes. The purpose of reducing the travel lane width is to limit the amount of shoulder widening needed to install bike lanes, thus reducing overall construction cost. However, narrower travel lanes will reduce the lateral clearance for drivers, increasing their chances of straying outside the designated travel lane. This may adversely affect the safety for bicyclists and pedestrians traveling along the shoulders.

With wider shoulders established along Mission Road, drivers making emergency stops will have sufficient room to pull completely off the road.

Another tool to consider when making improvements along Mission Road would be the addition of rumble strips between the travel lanes and bike lanes. By providing a continuous set of lateral grooves in the pavement, rumble strips can warn drivers when they travel outside the designated travel lane.

Socioeconomic Impacts: Widening the paved shoulders along Mission Road will make this facility more attractive to bicyclists and pedestrians alike. Potential users include residents living along Mission Road who work in Pendleton or in the government offices along the east end of Mission Road, children traveling to or from school in Pendleton, or even residents making a trip to the planned grocery store at the Highway 331 intersection. Residents could also use the shoulders for recreational uses, i.e. jogging, bicycling, and roller-blading. This option would also create safer conditions for hitchhiking, which is common along Mission Road

It should be noted that if striping is used to designate bike lanes along the paved shoulders of Mission Road, pedestrians might feel that walking within a designated bike lane is not appropriate and may choose to walk on the gravel shoulder. To eliminate confusion, it would be more appropriate to have only a painted stripe between the travel lane and outside shoulder. This would designate 8 feet of paved shoulder for both bicyclist and pedestrian use.

Land Use Impacts: According to the design plans being prepared by BIA, this option will require a small amount of right-of-way to be acquired. Right-of-way is generally 30 feet to each side of the roadway centerline for a total right-of-way width of 60 feet. A majority of the changes to the cross-sectional features of the roadway, shoulders, and drainage ditches should occur within the right-of-way.

Cost: The estimated cost for constructing bike lanes along Mission Road is around \$1,000,000. The BIA engineer in charge of the design has made an effort to minimize the construction cost by maintaining the existing roadway centerline in the design and widening the roadway from both sides. This will minimize the amount of fill and asphalt needed for construction.

³ Oregon Bicycle and Pedestrian Plan, ODOT, 1995, pg. 66

Because the CTUIR has limited transportation finances, the tribe cannot afford to fund this project. If pursued, the CTUIR will need to borrow its future allocation of construction dollars from the BIA. This means all other CTUIR projects funded by the BIA will be delayed by approximately five to six years.

Option 2: Construct A Multi-Use Path Along Mission Road

Overview: This project would include the construction of an 8-foot wide multi-use path along Mission Road. From discussions with tribal and BIA staff, the most likely location for this path would be along the south side of the road separated from the eastbound travel lane by a 5-foot median. In order to install the path within the available right-of-way and maintain open drainage ditches, the existing centerline and crown of the road would have to move up to ten feet to the north. The width of the travel lanes would be restricted to 11 feet and the shoulder along the north side of the road to only 4 feet. The median separating the path and eastbound travel lane would have to be at-grade to provide some room for vehicles to make emergency stops. Also, an at-grade median would allow the path to be plowed during the winter months.

Safety: Safety for bicyclists and pedestrians would be greatly improved with the addition of a multi-use path. With a separate multi-use path, bicyclists and pedestrians would no longer have to ride or walk along the shoulder of the road. However, the proposed at-grade median separating the path and eastbound travel lane does not guarantee absolute protection from passing vehicles.

Driver comfort and safety may not necessarily be enhanced due to the proposed improvements of this option, since travel lanes will be restricted to 11 feet and shoulder widths will only be 4 to 5 feet. As mentioned previously, restricting travel lane widths can increase driver discomfort and the possibility of driving outside the designated lane and onto the shoulder. Also, the narrower shoulder widths will not allow drivers to pull completely off the road when making an emergency stop.

Socioeconomic Impacts: The socioeconomic impacts for this option are similar to Option 1.

Land Use Impacts: By moving the centerline of the road to accommodate a multi-use path, this option will require a small amount of right-of-way to be acquired. Adding a path and changing the cross-sectional features of the roadway, shoulders, and open drainage ditches could occur within the existing 60-foot right of way.

Cost: The estimated cost for constructing bike lanes along Mission Road is roughly three times the cost of Option 1, at around \$3,000,000. The BIA engineer in charge of the design for Option 1 states that an exceptional amount of asphalt material will be required to move the roadway centerline and crown. He also stated that the use of painted asphalt or brick to define the at-grade median separating the path and eastbound travel lane would add to the construction cost.

Again, if the CTUIR wishes to pursue this option, the tribe will need to borrow the construction dollars from the BIA. This means all other CTUIR projects funded by the BIA will be delayed by approximately fifteen years.

Transportation Planning Consultant's Recommendation

After evaluating the two options being considered, it is recommended that Option 1 be pursued by the CTUIR and added to the priority list of transportation improvements for the TSP. Option 1 will clearly cost much less in construction dollars and would allow the CTUIR to pursue other BIA funded projects in the near future. The wide shoulders proposed under this option focuses not only on the safety of bicyclists and pedestrians, but drivers as well.

There are also some recommended changes to the design plans currently being prepared by the BIA. These are to allow for 12-foot travel lanes along Mission Road, with the addition of 8-foot paved shoulders. Other options to consider are the addition of 8-inch wide painted stripe separating the travel lane and shoulder, and the installation of rumble strips. Signage should also be placed along the road to indicate the proper direction of bicycle travel.

Mission Road Bike/Pedestrian Facility - Phase II (Project BP2)

Together with Phase I, this project would complete the extension of a bicycle/pedestrian facility along Mission Road to the city of Pendleton. Once constructed, it would encourage residents living on the Reservation to walk or bike into Pendleton, instead of using an automobile. Residents could use such a facility to ride to work or school and for recreational uses.

Several options were addressed on how to extend a bike/pedestrian facility into Pendleton from Mission Road. The type of facility and location of improvements had to be weighed against various constraints, such as the topography of the land, natural and man-made physical barriers such as the Umatilla River and the UPRR line, and the existing development patterns along OR Highway 11 and US Highway 30. Other factors were considered such as minimizing construction costs, continuity with other existing or planned bike/pedestrian facilities, and minimizing out-of-direction travel.

Of the various options considered, the most viable alternative would be to construct a multi-use path along the north side of Mission Road and US Highway 30 beginning at the west Reservation boundary and terminating at Court Place in Pendleton. This distance is approximately one mile. At this time, it is uncertain whether at-grade or grade-separated improvements would be needed at the intersection of US Highway 30 and OR Highway 11, and how this path would connect with Court Place. There is also an uncertainty about how this path would transition into the bike/pedestrian facility planned under Phase I. These issues should be addressed at a later time when the CTUIR or other agency begins implementation.

It should be noted that there are several bicycle and pedestrian facilities in northeastern Pendleton that may provide useful and continuous connections for the Mission Road Bike/Pedestrian project. These facilities include:

- The River Pathway on the south side of the Umatilla River, just west of OR Highway 11, ending near the little league park (bike and pedestrian facility),
- A signed bike route along Court Place and 20th Street (bike facility),
- Bike lanes along OR Highway 11 from US Highway 30 to the east UGB line (bike facility), and
- Continuous and intermittent sidewalks along the north and south sides of US Highway 30, from the UPRR viaduct to the OR Highway 11 intersection (pedestrian facility).

According to the Pendleton TSP, the city has plans to establish bike lanes along Court Place, 20th Street, and a portion of US Highway 30 from 20th Street to the east UGB line. Striping bike lanes along Court Place and 20th Street should be relatively easy since they are low volume roads and are already signed as part of a bike route. However, the possibility of establishing bike lanes along US Highway 30 from 20th Street east through the OR Highway 11 intersection within the next 20 years is uncertain.

Representatives from ODOT and the City of Pendleton recently performed a study to look at various options for improving the OR Highway 11 connection with US Highway 30. No analysis was done to assess bicycle and pedestrian needs at this intersection since the main purpose of this study was to address traffic safety. No formal recommendation was made as part of the study for future improvements to this intersection. However, a traffic signal could conceivably be installed but it may be more than 20 years before this type of improvement

is warranted. If built, the type of geometric improvements necessary to install a traffic signal would then allow for the design of bicycle lanes along US Highway 30. Until then, the chances of constructing bike lanes or paved shoulders (at least six feet in width) along US Highway 30 are remote. There are other constraints along the highway that would hinder such an improvement. These include a limited right-of-way and pavement width contained within the businesses present along both sides of the highway. A representative from the CTUIR public works department stated that it would not be possible to construct a bike lane in the eastbound direction along the US Highway 30 off-ramp onto Mission Road because of limited clearance under the US Highway 30 overpass. He also mentioned that this area does not get much exposure to sunlight and that the road is often icy during the winter months and would not be safe for bicyclists.

Another option was explored to extend a path across the Umatilla River to connect with Riverside Avenue. It was thought that from Riverside Avenue, access could either be provided to the bicycle lane on Oregon Highway 11 or a new path extending west and back over the Umatilla River to connect with the Riverside Trail. Neither option would be feasible or practical as they would be expensive to build and would cause out-of-direction travel.

If the CTUIR wishes to pursue this project within the next 20 years, the best option at this point would be to construct a multi-use path along the north side of Mission Road and US Highway 30. Such a path would either continue at-grade through the intersection of Oregon Highway 11 and cross two roads, or cross over Oregon Highway 11 via a pedestrian bridge located just south of the UPRR overcrossing. A potential connection to Court Place could be made either through the parking lot of the adjacent Ford dealership along an easement or around the west side of the dealership along a widened sidewalk. The estimated cost for this project is \$329,200, assuming a pedestrian bridge is constructed.

Wildhorse Resort Entrance Road Path (Project BP3)

The purpose of this project is to provide a multi-use path linking the entire Wildhorse Resort (casino, hotel, RV park, and golf course) to the Tamastlikt Cultural Institute. This project was identified by the CTUIR Department of Economic and Community Development. It is needed to enhance connectivity between the various developments within the Wildhorse Resort and to the Tamastlikt Cultural Institute. Potential users of this facility are the patrons of the resort, visitors, workers, and recreationalists. This project would also complement the Mission Trail path recently constructed.

The location of this path is tentative, but would likely extend along the north side of the one-way loop road exiting the Tamastlikt Cultural Institute, pass by the golf course, cross the four-lane entrance road to the Wildhorse Resort, pass by the RV park and hotel, and end at the Casino.

The estimated cost for an 8-foot paved path is as follows:

5,500 ft of multi-use path @ \$15/linear ft	\$82,500
<u>Total</u>	<u>\$82,500</u>

South Market Road Path (Project BP4)

The purpose of this project is to provide a bicycle and pedestrian route along South Market Road, with access to Highway 331 via the overpass over I-84. Future developments along the west side of South Market Road could consist of industrial warehouse and storage facilities just south of I-84 and residential developments near Tutuilla Church Road. Once constructed, these developments would drive the need for improved bicycle and pedestrian access along South Market Road and north to Highway 331.

Improvements would include a multi-use path constructed along the west side of South Market Road, from Tutuilla Church Road to the I-84 interchange. The TAC decided that a multi-use path would be better than widening the paved shoulders along South Market Road. The main reason was the tribe already owns the land west of South Market Road and could build and maintain a path as the area develops. Shoulder widening along South Market Road would prove to be more expensive and require the County’s assistance.

Connectivity to the Highway 331 overpass was not addressed in detail. This issue should be addressed once the tribe actively pursues design and construction.

The estimated cost for an 8-foot paved path is as follows:

2,200 ft of multi-use path @ \$15/linear ft	\$33,000
Total	\$33,000

Path Across Umatilla River (Project BP5)

The purpose of this project is to improve community livability and provide residents living along Kirkpatrick Road an alternative to driving or having to walk or ride a bike on the narrow shoulders along Highway 331 to Mission Road.

Improvements would consist of a new multi-use path connecting Mission Road with Kirkpatrick Road. This project would also consist of a new pedestrian bridge over the Umatilla River. The exact location of this path is unknown but could be in the vicinity of the baseball park and swimming hole. Potential connections could be provided along Kelly Lane to Kirkpatrick Road and Parr Lane to Mission Road.

Initially, the TAC explored the option to widen the shoulders along Highway 331 for bicycle and pedestrian travel, but this concept was dismissed. The improvements needed to do this would be expensive, particularly the retrofication of the Umatilla River Bridge and UPRR rail crossing.

The TAC agreed such a path located across from a major activity center such as the governmental offices would encourage people living on the north side of the river to walk or ride to work. This path would also attract recreational users as it would tie into the path recently constructed from the government offices to the Tamastlikt Cultural Institute.

Because much of the area lies within the Umatilla River floodplain, it is possible the pathway could be submerged under water during times of flooding.

The estimated cost for an 8-foot paved path and bridge are as follows::

2400 ft of Bike/Pedestrian Path @ \$15/linear ft	\$36,000
200 ft Bike/Pedestrian Bridge @ \$450/linear ft	\$90,000
Total	\$126,000

CHAPTER 7: ACCESS MANAGEMENT POLICIES AND STRATEGIES

Access management is an important tool for promoting safe and efficient travel for both local and long distance users along a roadway. Too many access points along busy roads lead to an increased number of potential conflict points between vehicles entering and exiting driveways and through vehicles on the road. This leads to not only increased vehicle delay and deterioration in the level of service, but may lead to a deterioration in safety.

The implementation of access management policies is essential if the safety, efficiency and investment of the existing highways like Highway 331 are to be protected. Access management guidelines are generally not intended to eliminate existing intersections or driveways. Rather, they should be applied as new development occurs. Over time, as land is developed and redeveloped, the access to roadways will meet these guidelines. However, where there is a recognized problem, such as an unusual number of collisions, these techniques and standards can be applied to retrofit existing roadways.

Prepared concurrently with the CTUIR TSP, the Highway 331 Corridor Plan identifies various access management techniques, policies, and strategies that are designed to enhance the integrity (capacity, safety, and level-of-service) of Highway 331 while providing safe and convenient access to adjacent land uses along this highway. Because Highway 331 is one of the principal routes on the Umatilla Reservation these techniques, policies, and strategies are summarized in this chapter of the TSP. An access management plan for the highway follows in the Transportation System Plan (Chapter 8).

ACCESS MANAGEMENT TECHNIQUES

The following techniques describe how the number of access points to a road can be restricted or reduced, and are the most applicable to the conditions along Highway 331:

- Restrictions on spacing between access points (driveways) and public/private roads based on the type of development and the speed along the road.
- Sharing of access points between adjacent properties.
- Providing driveway access via local roads 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 deceleration and right-turn only lanes.
- Offsetting driveways at proper distances to produce T-intersections which 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 (in or out of driveway or roadway).
- Installing barriers to the property along the road to restrict access width to a minimum.

1999 OREGON HIGHWAY PLAN ACCESS MANAGEMENT STANDARDS

The *1999 OHP* specifies an access management classification system for state facilities. It also establishes standards and guidelines to be applied when making access management assignments. Highway 331 is designated as a District highway in the *1999 OHP*. District highways are described as facilities of county-wide significance and function largely as county and city arterials or collectors. In rural areas, their objective is to provide safe and efficient, moderate to high-speed continuous flow operation. The access spacing standards for a District level highway like Highway 331 are summarized in the following sections.

General Access Spacing Standard

The general access spacing standard is 700 feet for a District highway in rural and urban areas where the posted speed is greater than or equal to 55 mph. This standard applies to both streets and driveway approaches and is measured from the center of one access to the center of the next access on the same side of the road. This standard generally applies to unsignalized access points.

Deviations to Access Spacing Standard

Under some circumstances, deviations to the general access spacing standard are allowed. The two types of deviations are minor and major. A minor deviation to the access spacing standard allows for a spacing of 650 feet between driveways and 660 feet between public roads. A permit for an access under a minor deviation is allowed per the review of the district highway engineer. Any request for an access at less than the minor deviation spacing standard shall be considered a major deviation. Although there are no spacing standards for a major deviation, the process for state approval is lengthy and thorough. To process a major deviation application, a technical group must be established to assist the regional highway engineer with the review. Rejected applications for an access permit under a major and minor deviation can be appealed through a formal appeals process.

Access Spacing Standards for Freeway Interchange Areas

The access spacing standards for interchanges with two-lane crossroads, such as the interchange of Highway 331 with I-84, are listed below in Table 7-1 and shown graphically in Figure 7-1. It should be noted that the interchange access management standards displayed in the table supercede the general access management standards unless the latter standards are greater.

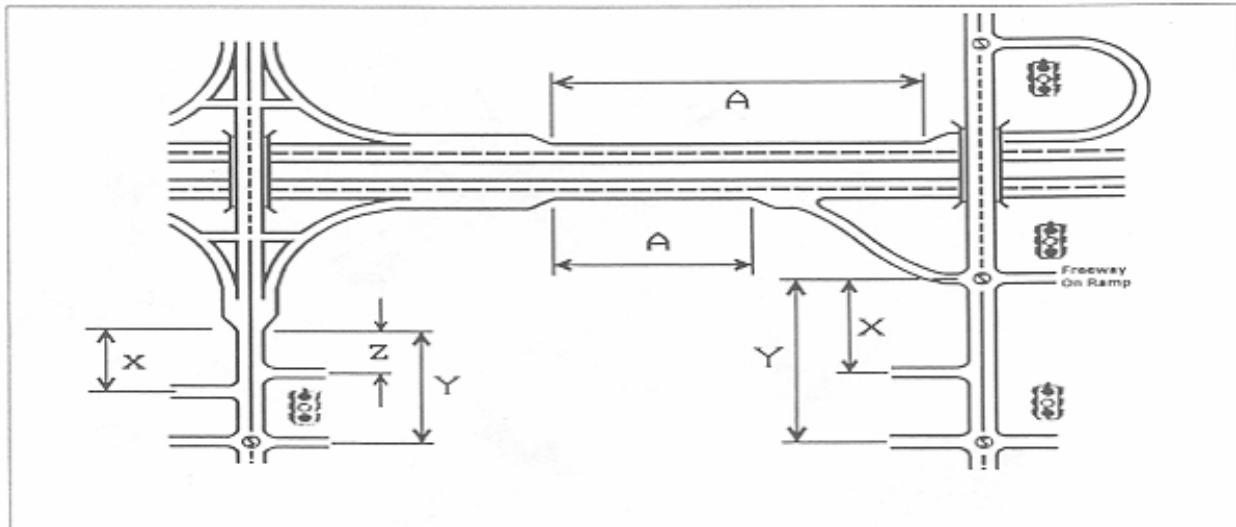
TABLE 7-1
MINIMUM SPACING STANDARDS APPLICABLE TO FREEWAY INTERCHANGES
WITH TWO-LANE CROSSROADS

Category of Mainline	Type of Area	Spacing Dimension			
		A	X	Y	Z
FREEWAY	Fully Developed Urban	1 mile	750 ft	1320 ft	750 ft
	Urban	1 mile	1320 ft	1320 ft	990 ft
	Rural	2 mile	1320 ft	1320 ft	1320 ft

Notes:

- 1) If the cross road is a state highway, these distances may be superceded by the Access Management Spacing Standards, providing the distances are greater than the distances listed in the above table.
 - 2) No four-legged intersections may be placed between ramp terminals and the first major intersection.
- A = Distance between the start and end of tapers along freeway between adjacent interchanges
 X = Distance to the first approach on the right side of the two-lane crossroad; right in/ right out only
 Y = Distance to first major intersection on the two-lane crossroad; no left turns allowed within this roadway section
 Z = Distance between the last right in/ right out approach to the two-lane crossroad and the start of the taper for the on-ramp to the freeway

Figure 7-1
MINIMUM SPACING STANDARDS APPLICABLE TO FREEWAY INTERCHANGES
WITH TWO-LANE CROSSROADS



It should be noted there is no official urban growth boundary on the Reservation. However, the CTUIR considers the undeveloped land in the northwest and southwest quadrants of the I-84/Highway 331 interchange to be “urban” areas. The CTUIR also considers the developed land in the northeast quadrant of the interchange to be “fully developed urban”, since there is a truck stop (Arrow Head Truck Plaza) and a restaurant (Cody’s), and the Wildhorse Resort further to the north. The “urban” designation is supported by the *Mission Community Plan*, where the land immediately north of the interchange is zoned for future tourist commercial uses on the east and west sides of Highway 331. There are two areas along the east side of Highway 331 that are designated for rural uses. They are located between I-84 and the Arrowhead Truck Plaza, and between the truck stop and the Wildhorse Casino. The land immediately south and west of the interchange is zoned for future industrial land use. The tribe also has plans to extend water and sewer services to most of the area surrounding the interchange, except in the southeast quadrant, which will remain rural.

Given the above criteria, the following *1999 OHP* access spacing requirements apply in the I-84 Interchange area:

- the distance to first approach on the right (right in/right out only) from a ramp terminal is 750 feet on Highway 331 and 1,320 feet on South Market Road,
- the distance to first major intersection from a ramp terminal is 1,320 feet on both Highway 331 and South Market Road,
- the distance between the last approach road and the start of the taper for the on-ramp is 990 feet along Highway 331, and

Signal Spacing Standard

In terms of signal spacing, a distance of a half-mile is desirable for Statewide and Regional Highways. Even though Highway 331 is classified as a District highway, ODOT’s policy is to support a half-mile signal spacing. Signal spacing standards supercede general access spacing standards at signalized intersections.

ACCESS MANAGEMENT STRATEGIES FOR HIGHWAY 331 AND I-84 INTERCHANGE

With the assistance of the TAC, access management strategies were developed for Highway 331 including the I-84 Interchange and South Market Road. The focus was primarily on three areas in the corridor, where land is zoned for future commercial uses (tourist and community) and growth potential is high or where the CTUIR has recently purchased land for future planned developments. These areas include:

- Area surrounding the Mission Road intersection,
- Area from Wildhorse Resort Entrance Road to I-84 Interchange
- South Market Road from I-84 Interchange to Tutuilla Church Road

The areas zoned for rural uses (agricultural and residential) as identified in the *Mission Community Plan*, will remain largely rural along the highway. Therefore, specific strategies for these areas were not seen as a critical need.

In the beginning stages of developing access strategies for the corridor, the TAC reviewed the general access spacing standards documented in the *1999 OHP* that are applicable to a District highway such as Highway 331. Also reviewed were the access standards for freeway interchange areas and signal spacing standards.

Mission Road Intersection (Four Corners Area)

The TAC developed an access management strategy for Highway 331 in the area of the Mission Road intersection.

Northeast Corner: From Mission Road intersection north to the UPRR crossing there are numerous driveways to homes on the east side of the highway that do not comply with the spacing standards of the *1999 OHP*. The future land use designation for this area is community commercial and it is a future goal of the CTUIR to consolidate or eliminate these driveways as homes become vacated and commercial development occurs. At this time there are no formal plans for redeveloping the individual parcels with homes. The tribe does have formal plans to construct a community grocery store on the northeast corner of the Mission Road intersection, as described in the *Four Corners Master Plan*. Currently, there is a long continuous driveway accessing the site along the east side of the highway. The tribe intends to provide a single driveway at the northern edge of the property boundary and install a continuous sidewalk with curbing to the Mission Road intersection. It is possible this single driveway would provide joint access to the adjacent property to the north, as it develops over time. Although this driveway would not meet the minimum access spacing of 700 feet along the highway, having a joint access with the adjacent property does move towards the spacing standards of the *1999 OHP*.

Northwest Corner: On the west side of the highway and north of Mission Road, there is a single driveway to a vacant site next to the UPRR tracks (900 feet north of Mission Road). This site is on a parcel of land zoned for a future community commercial land use. There is another vacant parcel to the south that is zoned for the same use, is much larger in size, and extends all the way to the Mission Road intersection. According to the *Four Corners Master Plan*, future development on this larger parcel is tentative but could include industrial storage facilities, a riding club/stable yard, and another shopping-type development on the street corner. Currently, there is no access to this parcel along the highway. The CTUIR intends to have at least two highway accesses to the parcel. A logical location for the first access would be to share the existing access to the adjacent parcel to the north. The second location would be roughly half way between the new joint access and Mission Road. This would create a spacing of 450 feet between accesses. If two accesses are provided to this parcel, the OHP spacing standard of 700 feet for a District Highway with a posted speed of 55 mph will not be met. However, the CTUIR feels the average speed of cars in the area is well below 55 mph due to the presence of stop signs on the highway approaches to the Mission Road intersection. If a speed study concludes the actual speed of cars is significantly lower than 55 mph, the CTUIR may pursue a second access to this parcel. If the posted speed were lowered, say to 35 mph, the required spacing between access points along the highway would decrease to 400 feet. It is also possible for the

CTUIR to apply for a deviation to the spacing standard. Additionally, the ODOT Regional Traffic Operations Manager stated that if the spacing standards cannot be met, special design features such as median control, a right-in/right-out access, or a deceleration lane may allow for a second access to be permitted. Another alternative would be to provide a new street accessing the parcel from Mission Road. Umatilla County roadway standards would permit a new access roughly 250 to 500 feet from the Highway 331 intersection. The TAC agreed that since a second access would not meet current OHP spacing standards, based on current conditions, it will not be shown as a planned access in the Access Management Plan of this corridor study.

Southwest and Southeast Corners: A new highway intersection to a proposed East-West Connector street would be located along Highway 331 approximately 1,160 feet south of Mission Road. The proposed street access on the west side of the highway would meet the access spacing requirements of the *1999 OHP*. The access from the east would also meet the spacing standard if an existing agricultural access another 160 feet to the south is removed. Closer to the Mission Road intersection, there are single driveways on the west and east sides of the highway only 160 feet from the Mission Road intersection. According to the *Four Corners Master Plan*, future development on southwest corner could include a produce market with new housing on the southeast corner, but plans are still tentative at this time. Access to the existing driveway on the west and east sides of the highway would need to be revised during the development review process. Perhaps a speed survey to reduce the posted speed or the various access management measures discussed previously could be employed in this area to retain the highway accesses to these parcels when they are redeveloped.

Wildhorse Resort to I-84 Interchange

The TAC reviewed three different access management strategies prepared by the Consultant for a segment of Highway 331 extending from the Casino Employee Entrance Road to the I-84 Interchange. After reviewing these strategies, the TAC then developed and agreed to a fourth and “preferred” option. All four options including the “preferred” option are shown graphically in Figures 7-2 – 7-5.

Option 1 is a strategy that would be in full compliance with the *1999 OHP* without any major or minor deviations from the spacing standards. It would consist of the removal of all existing driveways between the Casino Employee Entrance Road and the I-84 westbound ramps and the establishment of a single new intersection at 1,320 feet north of the westbound ramps. The highway access at Kash Kash Road would be removed and Kash Kash Road will be realigned to the east approach of this new intersection.

Option 2, is a strategy based on a proposed truck master plan for relocating the Arrowhead Truck Plaza to the west side of the highway. Similar to Option 1, this strategy would include the relocation of Kash Kash Road to a new intersection 1,320 feet north of the I-84 westbound ramps. All the existing driveways on the east side of the highway between the Casino Employee Entrance Road and I-84 would be removed, except at one location 750 feet north of the I-84 westbound ramps. A right-in access would be imposed upon this driveway. In the same location a right-out only access would be established at a new driveway on the west side of the highway. A new intersection with driveways on both sides of the highway would be constructed 665 feet north of the new Kash Kash Road intersection and approximately 175 feet south of the dirt road across from the Casino Employee Entrance Road. This option does not comply with the *1999 OHP* access standards.

Option 3, is a variation of the first two options. This option would not meet *1999 OHP* standards either.

A fourth alternative, known as the “preferred” option, was developed and agreed upon by the TAC. This option, if implemented, would comply with the *1999 OHP* standards assuming the following criteria is true:

- The posted speed is 55 mph along the entire length of Highway 331 (even though traffic may be traveling at lower speeds near the interchange)

- The west side of the highway is considered to be in an urban area since it lies in a future tourist commercial zone, is located within the Mission Community, and the tribe has plans to extend water and sewer services to this area.
- A majority of the land on the east side of the highway is deemed for future tourist/commercial uses and is considered to fully developed urban in the vicinity of the Arrowhead Truck Plaza site.

The “preferred” option would have a right-in only access on the east side of the highway at 750 feet north of the I-84 westbound ramps. Also, a right-out only access would be installed on the west side of the highway at a distance of 990 feet from the I-84 westbound ramps. These distances meet the OHP access spacing standards for an interchange area assuming the land east of the highway is in a fully developed urban area and the land west of the highway is in an urban area. The first fully directional intersection would be located 1,320 feet from the I-84 westbound ramps. Kash Kash Road will be realigned to the east approach of this intersection. The second fully directional intersection would be located another 900 feet north. At this location, accesses are already provided on both sides of the highway. The east driveway to the Casino Employee Entrance Road will not be changed. The dirt road on the west side of the highway will be realigned to intersect directly across from the Casino Employee Entrance Road. About 270 feet north of the dirt road, trucks access several storage tanks on the west side of the highway. To meet OHP standards, the access to this area would need to be restricted along the highway and an alternate access would need to be provided along the dirt road when it is improved.

Under the “preferred” option the CTUIR is proposing the removal of five driveways accessing the existing truck stop and restaurant on the east side of the highway and one access on the west side of the highway which serves an abandoned home but is still being used by agricultural vehicles.

The “preferred” option would be implemented concurrently with the Mission Highway Median (Project R10 in Chapter 6). The construction of a landscaped median on the highway would effectively restrict left-turn movements, except at intersections where all movements would be allowed.

I-84 Interchange to Tutuilla Church Road (South Market Road)

The TAC reached a consensus on an access management strategy for South Market Road, beginning at the I-84 eastbound ramps down to Tutuilla Church Road. This includes a new intersection located on the west side of the road at 1,320 feet south of the I-84 eastbound ramps. The proposed intersection would serve both industrial and residential developments that are planned for the future. The existing intersection with the dead-end road to the waste transfer station would also be removed and realigned to the new intersection. However, it may be possible to construct a right-in right-out access at 750 feet south of the I-84 eastbound ramps. This access may be approved as a result of the removal of the existing access to the dead end road (located 475 feet from the interchange). The TAC agreed that the dead end road could be relocated to an internal network of streets leading to both a right-in/right-out access and the fully directional intersection. This realignment would be done as the area zoned for a future industrial land use is developed.

Officials from Umatilla County, which has jurisdiction over South Market Road, indicated any new accesses within the interchange area will be required to comply with the 1999 OHP access standards.

CHAPTER 8: TRANSPORTATION SYSTEM PLAN

The CTUIR Transportation System Plan addresses the transportation needs of the Umatilla Indian Reservation over the next 20 years. The plan consists of a priority list of improvement projects addressing the street, pedestrian, and bicycle systems. Other components of this plan include roadway functional classification and design standards, an access management plan for roads on the IRR system (including Highway 331), and policies to ensure that the needs of bicyclists, pedestrians, and public transportation are met.

CTUIR PRIORITY LIST OF TRANSPORTATION IMPROVEMENTS

As one of the main goals of developing a long-range plan that addresses all modes of transportation, a prioritized list of transportation improvement projects was developed for the Umatilla Indian Reservation. The list is located in Appendix I (Tab 1) and was developed from the potential improvement projects evaluated in Chapter 6. The placement of the priority list of improvements in an appendix allows the tribe the latitude to update this list periodically. This could occur as new projects are identified, and existing projects are reprioritized or taken off the list. Every update to this list would need to be approved by a tribal resolution from the General Council.

Projects in the list were prioritized by the TAC members based on expected time of development and relative need, and reviewed by the CTUIR Natural Resources Commission, the Department of Economic and Community Development, the Board Of Trustees, and the general public.

The priority list of transportation improvements assigns each project a number which reflects the level of prioritization, a project name, and includes a description of the improvements to be made, the agencies involved, and the estimated cost. Costs are expressed in year 2001 dollars. This list is not financially constrained which means that financing for individual projects has not been secured. The intent of the priority list of improvements is to implement each project beginning with the first listed when the opportunity of financing becomes available.

It is the priority list of transportation improvements that will be used by the tribe to develop the CTUIR Transportation Improvement Program (TIP). The tribal TIP is a multi-year, financially constrained, list of proposed transportation improvement projects to be implemented within the next 3 or more years. Once complete, the projects contained within the CTUIR TIP are submitted to the BIA for inclusion in the IRR TIP. The IRR TIP is a prioritized list (by year) of IRR funded projects, that are programmed for construction in the next 3-5 years. Projects in the IRR TIP are then included in the Statewide Transportation Improvement Program (STIP) developed by ODOT without further action.

Coordination of Transportation Related Projects

Coordination between appropriate agencies is essential for projects involving land use, economic development, and transportation issues. This is also one of the objectives of this Transportation System Plan (Objective B). It is the CTUIR's intent to cooperate and notify all appropriate local, county, state, and federal agencies when a land use proposal is submitted that could potentially impact another agency's transportation facility. Notification will help to identify agency standards, and provide an efficient and economical transportation system. Through cooperative efforts, the CTUIR can strive to achieve an effective relationship and process for working with agencies such as BIA, Umatilla County, and ODOT to identify, fund, and implement transportation projects (Objective C).

When properties develop or redevelop with access to a state highway, county, local, or federally maintained road, the owner/developer of the adjacent property shall notify and coordinate with the appropriate agency or agencies to ensure proper access management, consistent with the access management provisions of this Transportation System Plan and the 1999 OHP. This will be necessary to obtain the permits to construct, operate, and use accesses to state highways.

ROADWAY FUNCTIONAL CLASSIFICATIONS

Roadway classification standards relate the design of a roadway to its function. The function of a road is determined by operational characteristics such as traffic flow, capacity, operating speed, and safety. It is also determined by the type of adjacent land uses and connections to other roadways.

The development of the CTUIR TSP provides the tribes with the opportunity to review and revise the functional classification of streets and roadways that make up the local IRR system. The CTUIR has elected to continue the use of the BIA functional classification system of roads. This system includes four road classes: Class 2, Class 3, Class 4, and Class 5. Definitions of each class of roads are shown below in Table 8-1.

It should be noted that the BIA classification system does not necessarily coincide with how ODOT and Umatilla County classify roads. To prevent any disagreements between agencies, a correlation between the two classification systems is also defined in Table 8-1. Examples of key roads on the Reservation are also provided in this table to further define the classification of roadways. The IRR inventory in located in Appendix II (Tab 5) provides the classification of all existing and proposed roads and trails.

TABLE 8-1
IRR FUNCTIONAL CLASSIFICATIONS FOR THE UMATILLA INDIAN RESERVATION
(WITH COMPARISONS TO STATE AND COUNTY CLASSIFICATIONS AND EXAMPLES)

IRR Classification	State And County Classification	Examples
<p>Class 2 Roads: Major or minor arterial roads providing an integrated network having the characteristics for serving traffic between large population centers, generally without stub connections. May also link smaller towns and communities to major resort areas which attract travel over long distances and generally provide for relatively high overall travel speeds with minimum interference to through traffic movement. Generally provide for at least inter-county or interstate service and are spaced at intervals consistent with population density.</p>	<p>Principal Arterials: Form an integrated network of continuous routes which serve statewide or interstate travel. They link major cities and provide connections to urban areas outside the region.</p>	I-84, OR Highway 11, Highway 331
	<p>Minor Arterials: In conjunction with principal arterials, form an integrated network that link cities and significant traffic generators, and provide interstate and inter-county service.</p>	--
	<p>Major Collectors: Roads that connect with the arterials and provide intra-county service to towns and large traffic generators not served directly by an arterial.</p>	Mission Rd., Cayuse Rd.
<p>Class 4 Roads: Section line and/or stub type roads which collect traffic for arterial type roads, make connections within the grid of the IRR system. May serve areas around villages, into farming areas, to schools, tourist attractions, or various small enterprises. Also included are roads and vehicular trails for administration of forest, grazing, mining, oil, recreation, or other utilization purposes. This classification encompasses all those public roads not falling into Class 2 or 3 definitions above.</p>	<p>Minor Collectors: Distributes traffic from local roads of neighborhoods and abutting lands to major collectors or arterials.</p>	South Market Rd., Tutuilla Church Rd.
<p>Class 3 Roads: Street-roads, which are located within communities serving residential, and other urban type settings.</p>	<p>Local Roads: Provide access to adjoining land and short distance travel.</p>	Confederated Way
<p>Class 5 Roads: This classification encompasses all non-road type paths, trails, walkways, or other designated types of routes for public use by foot traffic, bicycles, trail bikes, or other uses to provide for general access of non-vehicular traffic.</p>	<p>No Classification (trails, etc.)</p>	Tamastlikt Trail

ROADWAY DESIGN STANDARDS

Road design standards ensure the design of a roadway supports its intended use. Road standards consist of design parameters necessary to provide a community with roadways or streets, which are relatively safe, aesthetically pleasing, and easy to administer when new facilities are planned or constructed or existing facilities are reconstructed.

CTUIR and BIA Roads

The CTUIR has elected to use the roadway design standards employed by the BIA. These standards are documented in the *BIA Road Inventory and Project Request Guide*¹ and have been included in Appendix II (Tab 9). There are a total of 21 “Adequacy Design Standards” defined in this guide. Each standard is determined by the functional classification of the road, the 20-year Average Daily Traffic volume projection, and the type of terrain.

The CTUIR will enforce a 60-foot right-of-way width for all new roads constructed on the Reservation, and do not support the varying widths specified for the BIA “Adequacy Design Standards”. A 60-foot right-of-way will be sufficient for all Class 2, Class 3, and Class 4 roads.

The tribes support the BIA “Adequacy Design Standards” for shoulder improvements (type and width) in rural areas. However, in urban or urbanizeable areas, the tribes will enforce the design of curb, gutter, and sidewalks with optional planting strips along all new or improved roadways. These areas are located within the Community Commercial, Community Residential, Government, Light Industrial/Manufacturing, and Tourist Commercial land use boundaries, as defined in the Future Land Use Map of the *Mission Community Plan*.

County Roads

Umatilla County has developed its own road design standards. They are documented in the Umatilla County TSP, and apply to the county roads that intersect Highway 331.

Highway 331

When roadway improvements are made to Highway 331, one of four design standards shall apply depending on the location of improvements. These standards are shown graphically in the Appendix II (Tab 9).

The first standard (Option 1) shall be applied in the area between the I-84 westbound ramps and the first proposed right-in right-out accesses north of the interchange. It consists of two 12-foot travel lanes separated by a 14-foot landscaped median, with 8-foot paved shoulders and open drainage ditches.

The second standard (Option 2) shall be applied between the first proposed right-in right-out accesses north of the interchange and the Wildhorse Resort Entrance Road. It consists of two 12-foot travel lanes separated by a 14-foot landscaped median, with 6-foot bike lanes, 6-foot sidewalks, and underground storm water drainage.

¹ *Road Inventory and Project Request Guide*, Bureau of Indian Affairs Portland Area, Road Construction and Maintenance Team, 1994

The third standard (Option 3) shall be applied along two sections of highway. The first section is between the Wildhorse Resort Entrance Road and the proposed intersection to the East-West Connector Road south of Mission Road. The second section is between Mission Road and OR Highway 11. The cross-sectional features will consist of two 12-foot travel lanes, with 8-foot paved shoulders, and open drainage ditches.

The fourth standard (Option 4) shall be applied between the proposed intersection to the East-West Connector Road and Mission Road. It consists of two 12-foot travel lanes, with 6-foot bike lanes, 6-foot sidewalks, and underground storm water drainage.

All four standards above have the flexibility to provide optional 14-foot left-turn lanes at major intersections. ODOT will also maintain the current right-of-way widths, which vary between 80 feet and 200 feet.

PAVEMENT DESIGN STANDARDS

Pavement design standards address the type of material and depth of layers that make up a roadbed. Pavement design is sensitive to key parameters such as heavy truck volumes, environmental conditions, soil conditions, the type of materials used, and the desired service life of the pavement.

As a planning document, the development of detailed pavement design standards is outside the scope of this TSP. Development of such standards constitutes a separate and detailed evaluation. Detailed pavement designs may follow the procedures outlined in the 1986 *AASHTO Guide for Design of Pavement Structures* published by the American Association of State Highway Transportation Officials. Since many of the roads on the Reservation are owned by the county, the pavement design standards used by the Umatilla County Roadway Department may serve as a good reference.

ACCESS MANAGEMENT PLAN

Highway 331

With the assistance of the TAC, a detailed access management plan was developed for Highway 331. The plan addresses existing or potential future conflicts between the highway traffic movements and the need for safe access to adjacent developing properties and intersections with the local road system. The access management plan in combination with recommended street improvements, promotes better connectivity of the street system. The location of new intersecting and parallel routes in the corridor can help reduce reliance on the highway for local use.

The access management plan covers all of Highway 331, from its intersection with OR Highway 11 down to Interstate 84, including the freeway interchange and a segment of South Market Road down to Tutuilla Church Road. This plan moves towards the access spacing standards outlined in the *1999 OHP*, including the access standards for freeway interchange areas.

The access management plan is summarized in the Appendix (Tab 10). It is defined by five figures illustrating where existing access points will be maintained, relocated, or removed. It also illustrates the location of planned accesses (driveways and intersections) along Highway 331. Other pertinent information is shown on these figures such as the future land uses adjacent to the highway, parcel boundaries, right of way, and locations where there is a reservation of access or access control along the highway. All existing or proposed access points are assigned an access identifier number. These numbers are linked to an accompanying spreadsheet with specific details on each access (location, jurisdiction, use, and distance from other accesses).

It should be noted that existing developments and legal accesses along Highway 331 will not be affected by the recommended access management standards until either a land use action is proposed, a safety or capacity deficiency is identified that requires specific mitigation, redevelopment of existing properties along the highway occurs, or a major construction project is begun on the street. Under any of these circumstances the appropriate agencies (ODOT, CTUIR, BIA, and/or Umatilla County) shall be contacted to collectively revise existing and new accesses to the highway.

The resulting access management plan is a balanced, comprehensive program that provides reasonable access spacing standards while maintaining the safety and efficiency of traffic movements. The following sections outline specific details of the access management plan for Highway 331.

UPRR Crossing to Mission Road

- Establish a shared access between the existing driveway to the vacant site south of the railroad tracks (Access #15) and the adjacent property to the south on the northwest corner of the Mission Road intersection.
- Consolidate two existing driveways (Accesses #47 and #48) to establish a shared access (Access #47-A) between the proposed community store on the northwest corner of the Mission Road intersection and the adjacent property to the north.

Mission Road to Wildhorse Resort Entrance Road

- Construct a new intersection south of Mission Road (Access #18 on the west side and #44-A on the east side) to provide access for a planned east-west connector road. An access used for agricultural purposes will be removed (Access #44).
- Relocate the access on the east side of Highway 331 (Access #40) to the south so it is now located on land zoned for Tourist Commercial use (Access #39-A).

Wildhorse Resort Entrance Road to Casino Employee Entrance Road

- Restrict access to the farming equipment on the west side of Highway 331 (Access #21).
- Relocate the dirt road on the west side of Highway 331 (Access #22) to intersect opposite the Casino Employee Entrance Road (Access #21-A).

Casino Employee Entrance Road to I-84 Westbound Ramps

- Remove one access on the west side of Highway 331 (Access #23) and five accesses on the east side (Accesses #37, #36, #35, #33, and #32).
- Construct a new intersection providing access to Kash Kash Road on the east side of the highway (Access #36-A) and a driveway to a new Truck Stop on the west side (Access #22-A).
- Establish a new driveway to the proposed Truck Stop on the west side of the highway (Access #22-B). This driveway will have right-in right-out movements only.
- Modify an existing driveway on the east side of the highway (Access #34) for right-in right-out movements only.

- Construct a non-traversable landscaped median along the highway from the Casino Employee Entrance Road to the I-84 Westbound Ramps. Left-turns will be allowed at major intersections only.

I-84 Eastbound Ramps to Tutuilla Church Road (South Market Road)

- Remove the intersection providing access to the waste transfer station (Access #26).
- Construct a new intersection further south (Access #26-A).

Deviation From Highway 331 Access Management Plan

Any request for a new access or change in access along Highway 331, that results in a deviation from this access management plan, should intend to comply with the 1999 OHP access spacing guidelines (refer to Chapter 7).

Umatilla County Access Spacing Standards

Umatilla County has established access spacing standards along county roads and has documented these standards in the *Umatilla County Transportation System Plan*². According to the plan, roads classified as major and minor collectors are allowed a public road spacing of 500 feet and a private drive spacing of 250 feet. Local roads are allowed a public road spacing of 250 feet with private driveways allowed to access each lot. These standards are generally not intended to eliminate existing intersections or driveways, but should be applied as new development occurs.

According to the Umatilla County TSP, the following county roads within the study area are identified as major and minor collectors:

- Mission Road (County Road #900)
- South Market Road (County Roads #1025 and #1027)
- Tutuilla Church Road (County Road #932)

All remaining county roads within the Highway 331 Corridor study area are considered to be local roads in the plan.

It should be noted future revisions to the *Umatilla County TSP* will include interchange spacing standards that are consistent with the 1999 OHP. Therefore, the County's access spacing standards will apply to South Market Road in the I-84 interchange area. The access management plan developed for Highway 331, including the I-84 interchange and South Market Road, is also consistent with OHP.

CTUIR Access Spacing Standards

The CTUIR supports the access spacing standards for county roads on the Reservation. The tribe has also elected to apply these standards to the roads maintained and/or owned by the tribe or BIA. To handle any discrepancies between functional classifications, the county standards for major and minor collectors should

² Umatilla County Draft Transportation System Plan, November 1999, David Evans and Associates, Inc.

apply to all Class 2 and Class 4 roads (except state highways). The county standards for local roads should apply to all Class 3 roads.

PEDESTRIAN SYSTEM

Pedestrian facility improvement projects are shown graphically and summarized in the Transportation Priority List of Improvement Projects located in Appendix I. Besides pedestrian specific improvements, there are several proposed new roadways will also include some sort of pedestrian walkway.

Full implementation of all improvement projects would result in a safe and continuous pedestrian route along Highway 331 from Mission Road to South Market Road consisting of a combination of paved shoulders, sidewalks, and a multi-use path. A useful pedestrian connection would also be established to the City of Pendleton along Mission Road along either paved shoulders or a multi-use path. A new path would be extended across the Umatilla River connecting Mission Road with Kirkpatrick Road and another path constructed along the Wildhorse Resort Entrance Road connecting the Tamastlikt Path with the Casino. In the area of highest pedestrian activity, a figure was prepared to illustrate the future network of pedestrian facilities surrounding the Tribal Community Complex. Figure 8-1. shows where both pedestrian and bicycle facilities would be located in the future. The future multi-use path network shown would be from the Wetlands Community Park development.

The pedestrian system should provide direct and safe access to all areas of the Mission Community area. Properly configured, the system provides good circulation, encourages walking, and enables neighbors to know each other and to enjoy the community. The system comprises sidewalks, paths, shoulders in rural areas, crosswalks, curb ramps, signals, signing, and supporting facilities.

Sidewalks should be present along all roads located in the urban or urbanizeable areas of the Reservation. These areas are located within the Community Commercial, Community Residential, Government, Light Industrial/Manufacturing, and Tourist Commercial land use boundaries, as defined in the Future Land Use Map of the *Mission Community Plan*. Sidewalks should be added as new streets are constructed and when existing streets are reconstructed. New sidewalks should be at least five to six feet in width and should be placed adjacent to the curb but may also be separated from the street by landscaping. Sidewalks should have sufficient clearance from obstructions such as utility poles and mailboxes.

Another component to the pedestrian system is road crossings. In urban or urbanizeable areas, new intersections shall be designed to provide safe and comfortable crossing opportunities. This includes striping for crosswalks, adequate crossing time at traffic signals, and other enhancements such as curb extensions, which are used to decrease pedestrian crossing distances and as a traffic calming measure, and wheelchair ramps. Crosswalks at intersections along state highways will be in accordance with ODOT design standards.

Along the rural roads of the Reservation, sidewalks may not be necessary. However, paved shoulders should be provided for new or improved roads to a width that will safely accommodate pedestrians (see "Adequacy Design Standards" in Appendix II (Tab 9)).

BICYCLE SYSTEM

There are several multi-use path projects shown graphically and summarized in the Transportation Priority List of Improvement Projects located in Appendix I that will improve the bicycle system and encourage its use. Besides these multi-use path projects, there are several proposed new roadways that will also include some sort of bicycle facility (bike lanes or paved shoulders). Again, Figure 8-1 illustrates where both pedestrian and bicycle facilities would be located in the future in the area of highest activity.

The bicycle system should provide direct and safe access to all areas of the Mission Community. In cases where bike lanes are proposed, five to six feet of roadway pavement should be provided between the curb and vehicle travel lane. Striping should also be provided to distinguish the bike lane from the travel lane. Where on-street parking is available (parking at curb), bike lanes should be provided between the travel lane and parking stalls. In some situations, curb parking may have to be removed to permit a bike lane.

Bike lanes should be added in urban areas when new roads are built or road improvements are made as part of the road system plan. Bike lanes would be most appropriate along Class 2 and Class 4 roads (arterials and major and minor collectors).

On existing Class 2 or Class 4 roads that are not scheduled to be improved as part of the road system plan, bike lanes may be added at any time to encourage cycling, or when forecast traffic volumes exceed 2,500 to 3,000 vehicles per day.

MULTI-USE PATHS

Because the CTUIR owns a vast amount of land in the Mission Community Area, the potential for developing multi-use paths is high. A good example is the Tamastlikt Trail which traverses tribal land and provides a useful connection between the Tamastlikt Cultural Institute and the government offices and adjacent neighborhoods. This path serves both bicyclists and pedestrians and is used for a multitude of purposes (i.e. travel to work, recreation).

Multi-use paths should be paved and have a minimum width of eight feet. Such a width would provide enough room to avoid the conflicts of two-way travel.

PUBLIC TRANSPORTATION

Currently there is no transit service available to the “general public” on the Umatilla Indian Reservation. There are, however, three types of transit services provided for specific users:

- School buses from the Pendleton, Athena-Weston, and Pilot Rock School Districts pick up and drop off children on the Reservation,
- The CTUIR Senior Center provides a dial-a-ride shuttle service for seniors only, and
- The Casino operates a dial-a-ride service for casino patrons only.

Public Transportation Needs

The need for public transportation to be available to all residents on the Reservation was discussed during the planning process of the CTUIR TSP. This topic was addressed at two of the TAC meetings. From these meetings, basic needs on the Reservation were identified such as a dial-a-ride program and/or fixed route bus service; both of which would be open to the “general public”. Two reasons for having a dial-a-ride program would be to assist students who miss the school bus in the morning and for workers who need to travel to Pendleton for the Welfare-to-Work Program in the city. There were discussions but no general consensus from the TAC that this type of service could be linked with the dial-a-ride services already provided by the CTUIR Senior Center and the Wildhorse Casino.

The purpose for initiating a fixed route bus service would be so residents in the Mission Community Area would not have to rely solely on the automobile as a means of transportation. Also, a fixed-route service could assist the more than 1,000 employees working for the CTUIR, many of which live in Pendleton and

commute to their place of work. Increase energy efficiency and reduced environmental impacts are important considerations for the tribes.

A fixed route service could provide stops along Mission Road near or at the tribal government offices and adjacent neighborhoods, stops near or at major activity areas along Highway 331 such as the proposed Mission Community Store, the Wildhorse Resort, and the Arrowhead Truck Plaza. Potential connections could also be made to the city of Pendleton or even Milton-Freewater for residents who work or shop in those cities. Such a service may even encourage the design of a park-and-ride facility in the Mission Community Area.

The exact needs of the Reservation could not be assessed fully in this study. Tribal staff is now in the process of determining the feasibility of partnering with the city of Pendleton to provide transit service to the “general public” between the city and Reservation. Issues such as the type of service to be provided, securing the services of other providers in the area, capital and operating expenses, and establishing on-going funds to sustain this effort are being addressed. This effort coincides with one of the goals outlined in the *Umatilla County Public Transportation Needs Assessment*, June 1999, to establish intercity service between the CTUIR and Pendleton. Once the needs of the Reservation are fully assessed, then the CTUIR should incorporate identified transit-related projects into the Transportation System Plan and pursue available federal and state funding.

Programs and Available Funding

A representative from ODOT Public Transit Division in Salem spoke at one of the TAC meetings about the various programs and funds that are available for communities to establish public transit.

One source of funding is through the Federal Transit Administration (FTA) which sponsors a program for general transit services in small urban and rural areas. These funds are distributed through the ODOT Public Transit Division and can be used for capital and operation needs.

Another option is available through the establishment of the new Federal Transportation Efficiency Act for the 21st Century, or TEA 21 bill, where funding for public transit has been established through Surface Transportation Program (STP). Funds in this program have increased substantially, including the money available to rural areas. These funds are distributed to rural areas by the state and can be used for small communities that already have a public transit service or need a service. Funds are generally limited to capital projects, such as the purchase of vehicles and operating funds. Funds cannot be used for planning purposes.

Currently, there are two funds that have money obligated for establishing public transit on the Umatilla Indian Reservation. The first fund is through the FTA program, where the state has obligated around \$56,000. In order for the CTUIR to receive these funds, the tribe must provide matching funds up to 50% for operating uses and 20% for capital expenses. Additional information on this fund is provided in Appendix II (Tab 11), including funding available and the federal and state requirements. The second program is also through the federal government, where a small properties package program has set aside \$43,200 for the CTUIR. This money can only be used for capital investments.

ODOT has agreed to assist the tribe in meeting the federal requirements and regulations, with buying equipment, and with the public involvement process. Milton-Freewater and Pendleton are currently using FTA funds to establish transit services that are open to the public.

CHAPTER 9: FUNDING SOURCES

EXISTING BIA AND CTUIR PRACTICES

To assist the BIA and CTUIR in preparing a consistent and realistic approach to the construction, reconstruction, and maintenance of roads, an understanding of the funding sources and the potential application of these resources is necessary. Once the funding sources are identified, knowledge of their distribution method is also beneficial.

The Transportation Equity Act for the 21st Century (TEA-21) is the mechanism that provides funding for improvements of roads and bridges in the Indian Reservation Road System.

Capital Improvement Funds

Capital improvements include construction and reconstruction of the roads and bridges that are in the Indian Reservation Roads system. Capital improvements are generally funded with the federal Highway Trust Fund (HTF). Funds from the HTF are appropriated by Congress to the Federal Highway Administration and subsequently to the thirteen field offices of the BIA. Once the BIA Portland Area Office receives its portion of the available resources, the construction funds are further divided and allocated to the Indian tribes based on a relative need allocation formula. The construction funding allocated to the Umatilla Indian Reservation over the past eight years can be seen in Table 9-1.

TABLE 9-1
UMATILLA INDIAN RESERVATION CONSTRUCTION FUNDING

FY 1992	\$1,270,200
FY 1993	\$239,300
FY 1994	\$45,800
FY 1995	\$6,900
FY 1996	\$631,700
FY 1997	\$98,800
FY 1998	\$156,600
FY 1999	\$68,100

Source: Personal communication with BIA representative on 7/13/00

Within the BIA structure, the Agency Road Engineer contacts each of the tribes within his/her jurisdiction to determine the projects most needed by each tribal government. Since the socioeconomic needs of one tribe are difficult to weigh against the needs of another tribe, the BIA representatives selecting projects for inclusion in the 6-year construction plan can come under considerable political pressure, particularly since limited funding results in only a few construction projects each year. Additional constraints to achieving a constructed project are the remote locations of projects, the inability to fund the entire project, and the ability to maintain the new improvement once constructed.

The BIA has been exceeding its allocation of construction dollars to the Umatilla Reservation, placing the tribe in an indebted position. Therefore it is conceivable that the BIA will not be able to allocate any construction funds to the Umatilla Reservation over the next five years.

Maintenance Funds

The BIA is obligated by the Codified Federal Regulations (CFR 25- Section 170) to maintain the roads and bridges that are in the BIA's IRR System to a safe and satisfactory use based on the availability of funds and the road's as-built condition. The funds used to preserve BIA roads and bridges come from annual appropriations included in the budget for the BIA. These maintenance funds are allocated to the 13 field offices in the nation for use on the road systems within each agency's area of coverage.

While the funds allocated for maintenance may be reduced in the budgetary process, funds from the HTF are dedicated for road construction or reconstruction and cannot be used for maintenance of the Indian Reservation Road System.

The Agency Road Engineers work with the tribes in establishing the road maintenance priority to determine the type and level of maintenance to be performed within the budgetary constraints. Maintenance priorities are frequently determined by weather or road conditions necessary to provide safe access for the community to and from their facilities. Emergency road conditions have the highest priority. These conditions include washouts, snow and ice control. Roadway surface type and use determine secondary priorities.

If roadways funded and constructed with HTF moneys are not properly maintained, then future HTF road construction funds can be withheld. This situation might occur if maintenance funding is limited such that adequate repairs and upkeep of the highways is not possible. Or, if proportionately more maintenance funds were spent on one reservation over another. The inability to meet maintenance responsibility equally and adequately could endanger construction project funding in the Portland Area Field Office.

Table 9-2 provides a historical breakdown of the road maintenance funding allocated to the Umatilla Indian Reservation. Funds are separated into the different types of roads on the Umatilla Indian Reservation; paved roads, gravel roads, and dirt roads. Also included in the table is the funds allocated for snow removal.

TABLE 9-2
UMATILLA INDIAN RESERVATION
ROAD MAINTENANCE FUNDING
COST PER MILE (\$)

	Paved Road	Gravel Road	Dirt Road	Snow Removal
FY 1995	2,571	0	0	0
FY 1996	2,227	958	0	150
FY 1997	5,050	0	60	198
FY 1998	1,653	374	0	557
FY 1999	1,507	12,333	0	490

Source: Table provided by BIA representative

STATE FUNDS

The State of Oregon receives revenue from three primary sources. These include motor carrier transportation fees, motor vehicle fuels tax, and DMV license registrations and operator fees. As shown in Table 9-3, the revenue for the state for fiscal year 1999-2000 totaled over \$626 million with over 61 percent of the revenue coming from the motor vehicle fuels tax.

TABLE 9-3
STATE HIGHWAY REVENUE SOURCES
FY 1999-2000

Revenue Source	Amount (\$Millions)	Percent of Total
Motor Carrier Transportation Fees	218.9	35.0
Motor Vehicles Fuels Tax	385.0	61.5
DMV License Registrations and Operator Fees	22.0	3.5
Road Use Assessment Fees	0.2	-
Total	626.1	100.0

Source: ODOT 1998 Fiscal & Statistical Data Report, ODOT website.

The State of Oregon receives revenues from the federal Highway Trust Fund. Net revenues from the HTF are deposited into an account known as the State Highway Fund. With minor exceptions, state highway funds are dedicated for construction, improvement, maintenance, operation, and use of public highways, roads, streets, and roadside rest areas. The State Highway Fund is distributed to the State, cities, and counties based on the following distribution: 60.05% to the State, 15.57% to the cities, and 24.38% to the counties. Each city shall receive such share of the moneys as its population relates to the total population of the cities. A similar method is applied to the county moneys. Instead of population the measure is the amount of registered vehicles, trailers, semitrailers, pole trailers and pole or pipe trailers in each county to the total number of such vehicles registered in the state as of December 31 of the preceding year.

There are a number of programs available to provide financial assistance to local agencies like CTUIR for transportation projects and related activities. A summary of the various federal and state programs is located in the *1999 Transportation Funding Programs Report* located in the Appendix (Tab 12). Also included in this appendix a copy of the state's *Community Solutions Web Page*.

UMATILLA COUNTY TRANSPORTATION FUNDS

Historically, sources of road revenues for Umatilla County have come from various departments including local, state, federal, and other resources. The transportation revenues for these departments are shown in Table 9-4.

TABLE 9-4
UMATILLA COUNTY TRANSPORTATION REVENUES BY DEPARTMENTS

	1995-1996 Actual	1996-1997 Actual	1997-1998 Actual	1998-1999 Actual	1999-2000 Actual
Local Resources	\$2,039,574	\$1,991,961	\$1,908,677	\$1,573,990	\$1,458,834
State Resources	\$3,579,606	\$3,634,293	\$3,587,041	\$3,722,391	\$3,849,190
Federal Resources	\$267,708	\$674,190	\$533,519	\$150,897	\$216,415
Other Resources	\$0	\$19,426	\$0	\$0	\$0
Total Revenues	\$5,886,887	\$6,319,870	\$6,029,237	\$5,447,277	\$5,524,439

Source: Umatilla County

As shown in the table above, revenues remained relatively stable (between a low of just under \$5.5 million in 1998-1999 to a high slightly over \$6.3 million in 1996-1997). Approximately \$3.5 million of the annual revenues come from the State Highway Fund in 1995-1996, rising slightly to over \$3.8 million in 1999-2000. The annual revenue from the federal apportionment has lowered slightly over the last five years, rising to a high of \$675 thousand in 1996-1997 before dropping to a low of \$150 thousand in 1998-1999. The local revenues have also lowered consistently from slightly over \$2 million in 1995-1996 to just under \$1.5 million in 1999-2000.

Sources of revenue for Umatilla County are broken down further in Table 9-5.

TABLE 9-5
UMATILLA COUNTY TRANSPORTATION REVENUE SOURCES

	1995-1996 Actual	1996-1997 Actual	1997-1998 Actual	1998-1999 Actual	1999-2000 Actual
Beginning Balance	\$1,762,230	\$1,669,074	\$1,687,238	\$1,369,041	\$1,199,064
DMV License & Gas Tax Fees	\$3,356,616	\$3,259,924	\$3,219,156	\$3,379,790	\$3,538,368
Misc. State Receipts	\$222,990	\$374,369	\$367,885	\$342,600	\$310,822
National Forest Rental	\$189,902	\$334,860	\$512,338	\$144,777	\$199,801
Mineral Leasing 75%	\$125		\$135		
Misc. Federal Receipts	\$77,681	\$339,330	\$21,045	\$6,119	\$16,614
Interest on Invested Funds	\$92,220	\$70,519	\$69,117	\$54,016	\$76,206
Refunds & Reimbursements	\$338	\$71,543	\$22,256	\$4,967	\$15,093
Sale of Public Lands	\$102				
Rentals/Sale of Supplies	\$74,498	\$45,505	\$24,769	\$17,699	\$14,024
Outstanding Checks				11	
Misc. Receipts Local	\$48,997	\$56,696	\$45,453	\$68,715	\$154,447
Service Center	\$61,189	\$78,624	\$59,844	\$59,541	(1)
Rural Address Fund		\$19,426			
Total	\$5,886,887	\$6,319,870	\$6,029,237	\$5,447,277	\$5,524,439

¹ The Service Center revenue was combined with the Misc. Receipts Local.
Source: Umatilla County