City of Helix • P.O. Box 323 • Helix, OR 97835

Transportation System Plan

June 2001

Prepared by:

David Evans and Associates, Inc. and
Umatilla County in coordination with
Oregon Department of Transportation

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CHAPTER 1: INTRODUCTION

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

PLANNING AREA

The City of Helix Transportation System Plan planning area covers all of the areas within the Helix Urban Growth Boundary (UGB). The planning area is shown on Figure 1-1. Roadways included in the Transportation System Plan fall under three jurisdictions: the city of Helix, Umatilla County, and the state of Oregon.

Helix is located in the northern portion of Umatilla County in the northeastern corner of Oregon. It is a small agricultural community with a population of approximately 185 people. The City is laid out in a grid pattern, which is bounded on the west by Greasewood Creek and the abandoned Burlington Northern Railroad track. The majority of the City is within the Greasewood Creek flood area. Commercial and city services are concentrated in the southeast corner of the grid near the Havana-Helix Highway.

Several of the city streets are unpaved and county roads are vital for connecting Helix with nearby communities. In particular, Holdman Road (County Road No. 800) connects the town with Highway 37 and western Umatilla County. The Havana-Helix Highway (ODOT Highway No. 335) connects the town with OR 11 south of the City.

There is only one county road within the UGB, Holdman Road. Holdman Road is County Road for roughly 1300 feet before it turns into Columbia Street within the city limits. The City has jurisdiction over the rest of the existing roadways.

The City's commercial development is limited to minor retail and farm service businesses. It contains its own school district with Griswold High School and Helix Elementary School located just east of the city limits on Main Street. Helix's primary employers are the school district and a mufller distribution center.

PLANNING PROCESS

The Helix Transportation System Plan was prepared as part of an overall effort in Umatilla County to prepare TSPs for Umatilla County and eight small municipalities: the cities of Adams, Athena, Echo, Helix, Pilot Rock, Stanfield, Ukiah, and Weston. Each plan was developed through a series of technical analyses combined with systematic input and review by the county, the cities, the management team, the Transportation Advisory Committee (TAC), ODOT, and the public. The TAC consisted of staff, elected and appointed officials, residents, and business people from Umatilla County, and the eight cities. Key elements of the process include:

- Involving the Helix community (Chapter 1)
- Defining goals and objectives (Chapter 2)
- Reviewing existing plans and transportation conditions (Chapters 3, 4; Appendices A and B)

- Developing population, employment, and travel forecasts (Chapter 5, and Appendix C)
- Developing and evaluating potential transportation system improvements (Chapter 6)
- Developing the Transportation System Plan and a capital improvement plan (Chapter 7)
- Evaluate funding options and develop financial plan (Chapter 8)
- Developing recommended policies and ordinances (Chapter 9)

Community Involvement

Community involvement is an integral component in the development of a TSP for the city of Helix, Umatilla County and each of the other seven cities covered under the Umatilla County TSP process. Since the communities faced many similar transportation and land use issues, a public involvement program involving all the jurisdictions was used. This process allowed for individual attention when needed, and general problem solving for all jurisdictions as appropriate. Several different techniques were utilized to involve each local jurisdiction, ODOT, and the general public.

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

The second part of the community involvement effort consisted of community meetings within Umatilla County. The first public meeting was held in June 1998. The Helix general public was invited to learn about the TSP planning process and provide input on transportation issues and concerns. A second public meeting was held in July 1998. The third and final public meeting was held in September 1998. The public was notified of the public meetings through public announcements in the local newspapers and on the local radio station.

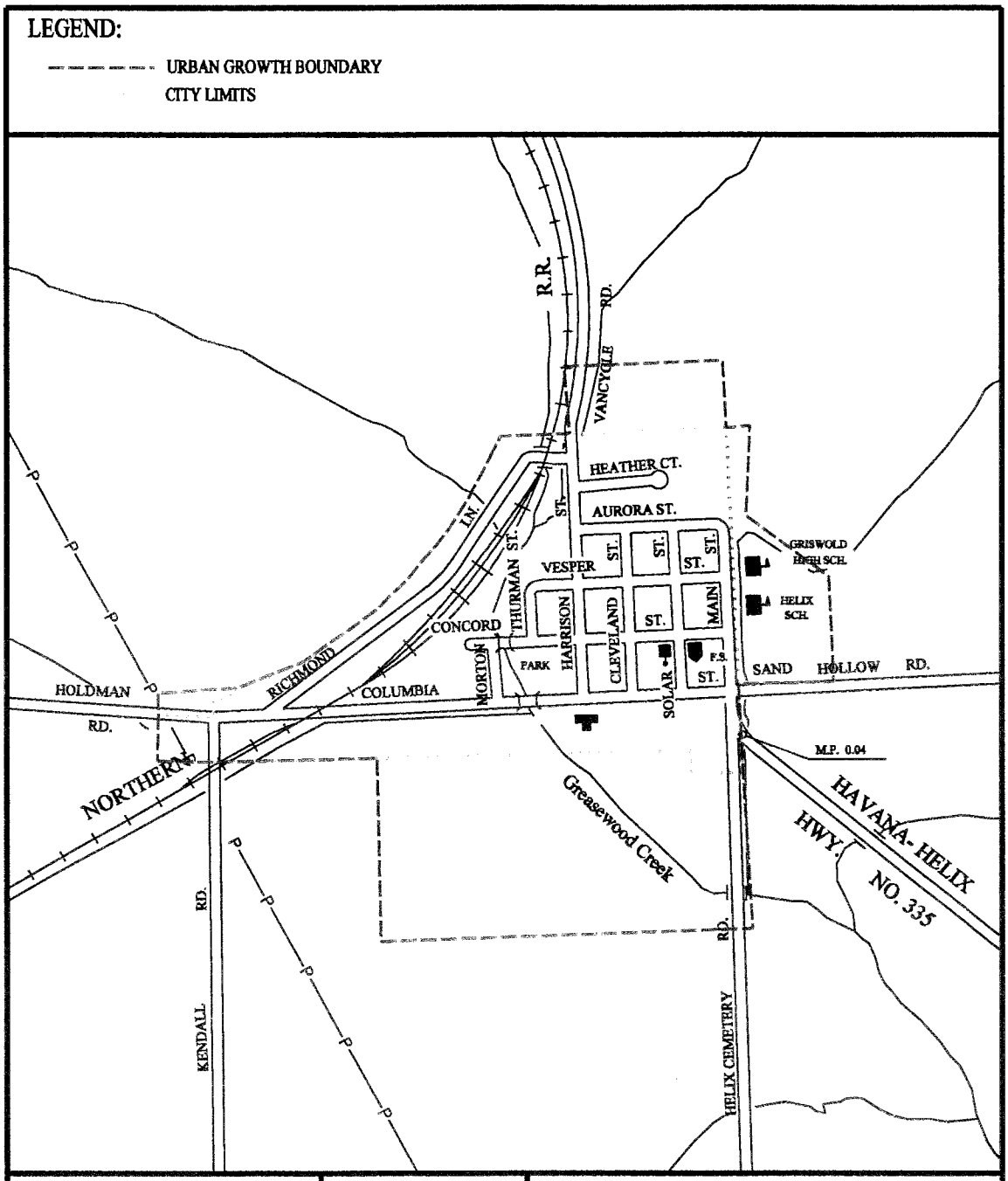
Goals and Objectives

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

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

To begin the planning process, all applicable Helix and Umatilla County transportation and land use plans and policies were reviewed and an inventory of public facilities was conducted. The purpose of these efforts was to understand the history of transportation planning in the Helix area, including the street system improvements planned and implemented in the past, and how the City is currently managing its ongoing development. Existing plans and policies are described in Appendix A of this report.

The inventory of existing facilities catalogs the current transportation system. The results of the inventory are described in Chapter 3, while Chapter 4 describes how the system operates. Appendix B summarizes the inventory of the existing arterial and collector street system.



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NORTH
(not to scale)

FIGURE 1-1

Planning Area -Helix

HELIX TSP

UMC00001/HELIX1-1.DGN/TNT/07-03-98

Future Transportation System Demands

The Transportation Planning Rule requires the Transportation System Plan to address a 20-year forecasting period. Future traffic volumes for the existing and committed transportation systems were projected using ODOT's *Level 1 — Trending Analysis* methodology. The overall travel demand forecasting process is described in Chapter 5.

Transportation System Potential Improvements

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

Transportation System Plan

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

Funding Options

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

Recommended Policies and Ordinances

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

RELATED DOCUMENTS

The Helix TSP addresses the regional and rural transportation needs in the City. There are several other documents which address specific transportation elements or areas in Umatilla County that may directly or indirectly impact transportation elements in and around Helix.

Other Transportation System Plans Prepared Concurrently with the Helix TSP

In addition to the Helix TSP, seven small city TSPs were prepared in conjunction with the Umatilla County TSP project. These documents include:

- City of Adams TSP
- City of Athena TSP
- City of Echo TSP
- City of Pilot Rock TSP
- City of Stanfield TSP
- City of Ukiah TSP
- City of Weston TSP

The following references were reviewed for relevance to the city of Helix TSP:

Helix Comprehensive Plan and Growth Report

The Helix Comprehensive Plan was developed in accordance with the provisions of Oregon Revised Statutes (ORS) Chapters 92, 197, 227 and 696 and was updated in 1993.

The plan provides a statement of the City's goals and policies for guiding the future growth and development of the City. The Plan contains 14 goals, two of which strongly impact the development of the Transportation System Plan; the Transportation goal and the Public Facilities and Services goal. The Transportation Goal is, "To provide and encourage a safe, convenient and economic transportation system." Additionally, the City has the objective of providing for easy pedestrian and vehicular movement within the community. Two policies are listed to help achieve the goal: to continue maintenance and paving of city streets, and to encourage provision of transportation alternatives for the elderly and handicapped. The Public Facilities and Services goal is, "To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban development." This includes cooperating with other agencies to provide and/or coordinate public services and considering pooling with other agencies to provide needed services.

In addition to the goals and policies, the plan contains information, findings, and a growth report. Some of the more important findings include:

- The small, rural community character of Helix is one of the City's chief attributes and must be maintained.
- More growth is desired in the community to support the school (Helix has its own school) and accommodate young local couples and other families that would like to live in Helix.
- There is an inadequate housing supply; more rental accommodations and building lots need to be made available.
- Creation of more manufacturing and service jobs in the community is both necessary and desirable.
- There are several unpaved streets in the City.

- The continued maintenance and availability of county roads is vital to the community, as they provide access within Helix's market area and between neighboring cities.

- There is a need for public transit between Helix and nearby communities, especially to help senior citizens reach destinations outside the City.

Helix Growth Report

The growth report is included as an appendix to the Comprehensive Plan. It examines the existing land use, recent growth, growth problems and potential, and the various growth areas of the community.

Helix is "built-out" for all intents and purposes with all the vacant land built on and any more infill of the existing townsite prohibited due to septic tank/lot size restrictions. The development of the area is also constrained because the City is built almost entirely in the Greasewood Creek floodplain.

An assessment of buildable lands was conducted for the City. It breaks the lands into three categories– residential areas, commercial areas, and industrial areas. Residential areas are concentrated outside of the city limits but within the urban growth area north and south of the City. The growth report assumes that 314 persons could be accommodated on 121 residential lots.

All buildable commercial areas are located in the Helix downtown area. These lands include vacant or underutilized parcels with access to the Helix water system. Industrial areas include approximately 30 acres of industrial lands adjacent to the Burlington Northern right-of-way. Most of the available sites are small, 2-5 acres in size, and would be suitable for small-scale industries.

Primary employers listed for the City include the city of Helix School District with 15-20 employees.

Umatilla County Comprehensive Plan

The Umatilla County Comprehensive Plan was written in 1983 to meet the statewide requirements for planning. It was last amended in 1987. The plan is broken into three sections: the Introduction; Plan Elements – Findings, Recommended Policies; and the Plan Map. The Plan Elements section is broken into sections dealing with the fourteen goals. This includes a Transportation Element with findings and recommended policies.

Umatilla County Development Code

The Umatilla County Development Ordinance was adopted in 1983, and last amended in November of 1991. In 1997 this ordinance was recodified and retitled as Chapter 1528 Development Code. The portions of the code most relevant to the Transportation System Plan include sections on off-street parking requirements, driveways, and road standards. Amendments to the development code include road standards for county roads.

Development Ordinance for the Confederated Tribes of Umatilla Indian Reservation

The Land Development Code for the Confederated Tribes of the Umatilla Indian Reservation was adopted in 1983. The Ordinance contains 19 chapters covering each land use zone, supplementary development

standards, and administration. The only section that directly applies to the transportation system is the sections on off-street parking.

OR 11 Corridor Plan

The OR 11 Corridor Plan is currently being prepared for the Oregon – Washington Highway (OR 11) which is the major north-south route through eastern Umatilla County. Corridor planning is a new approach to transportation planning in which ODOT and the communities bordering major transportation corridors work together to create plans for managing and improving transportation modes along entire corridors. The OR 11 Corridor Plan includes objectives that define the policy direction for all modes in the Corridor, as well as for several functional issues such as connectivity, congestion and environmental and energy impacts. The plan includes a list of projects prioritized by funding. The Corridor Plan projects are derived from the county and local TSPs, the Milton-Freewater to Stateline Land Use and Transportation Plan, the STIP, the Umatilla County Needs Assessment, as well as input from the project management team, technical advisory committees and the public. Projects and strategies focus on managing the highway to minimize congestion and improve connectivity while ensuring safety.

The Milton-Freewater Stateline Highway 11 Corridor Land Use and Transportation Plan was a cooperative effort of Umatilla County, the city of Milton-Freewater, and the Oregon Department of Transportation. It was developed by planning consultants at David Evans and Associates, Inc., with input from the local residents, Walla Walla County, and the Washington Department of Transportation. The plan was adopted in 1997, and evaluated existing and projected conditions within the northern portion of the US 11 corridor regarding basic layout and connectivity, conditions of transportation facilities, land use, and population and employment. It analyzed existing deficiencies and proposed strategies for addressing them. The primary deficiencies in the corridor were physical design of facilities, insufficient access control, and inadequate or nonexistent facilities for pedestrians and bicyclists. Recommended actions to improve these conditions included policy and ordinance amendments and transportation system improvements.

Corridor Strategies

Corridor strategies have been prepared for both US 395 and OR 11.

The US 395 corridor is covered in two studies: *the US 395 North (Umatilla-Helix) Draft Corridor Strategy* and the *US 395 South (Pendleton-California Border) Corridor Strategy*. The Corridor Strategies were developed to identify projects for the Oregon State Transportation Improvement Program. Generally, the Corridor Strategies translate the policies of the Oregon Transportation Plan (OTP) into specific actions; describe the functions of each transportation mode, consider trade-offs, and show how they will be managed; identify and prioritize improvements for all modes of travel; indicate where improvements should be made; resolve any conflicts with local land use ordinances and plans; and establish guidelines for how transportation plans will be implemented.

The US 395 Corridor Strategies contain a corridor overview, which includes population and employment forecasts, highway data such as traffic volumes and pavement conditions and descriptions of other modes of travel (air, rail, bicycle, etc.). The overall corridor strategy is to, "accommodate efficient movement of through travel, while maintaining environmental integrity, enhancing travel safety and supporting economic development." The reports set forth objectives that are intended to embody this overall strategy for the corridor, and to set direction and provide guidance for corridor-wide transportation plans and improvements.

Airport Master Plans

The *1986 Hermiston Municipal Airport Master Plan Update* provides a comprehensive analysis of the Hermiston Airport including an inventory of facilities, a discussion of use for a 20-year planning period (ending in 2006), and recommendations for facility improvements. The introduction of the plan also provides a good overview of all the major transportation facilities serving Hermiston and Northeast Oregon.

The primary objective of the *Master Plan Update for Eastern Oregon Regional Airport at Pendleton* was to re-evaluate the recommendations of previous airport planning studies, to determine the long-range requirements for airport development, to identify and assess development alternatives, and to produce an airport development/improvement plan that will yield a safe, efficient, economical, and environmentally acceptable public facility with capacity for future air transport needs of the eastern Oregon area. When approved by the various local, regional, state, and federal agencies, the Airport Master Plan represents the long-term intentions of all agencies regarding the location and extent of airport improvements. This permits long-range programming and budgeting, reduces lengthy review periods for each project, and provides for orderly and timely development.

Other State Plans

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

- Oregon Transportation Plan (1992)
- Oregon Highway Plan (1999)
- Oregon Bicycle and Pedestrian Plan (1995)
- Oregon Public Transportation Plan (1996)
- Oregon Rail Freight Plan (1994)
- Oregon Rail Passenger Policy and Plan (1992)
- Oregon Traffic Safety Action Plan (1995)
- Oregon Aviation System Plan (in development).

CHAPTER 2: GOALS AND OBJECTIVES

The purpose of the TSP is to provide a guide for Helix to meet its transportation goals and objectives. The following goals and objectives were developed from information contained in the city's Comprehensive Plan and reflect public concerns as expressed during public meetings. An overall goal was drawn from the Comprehensive Plan, along with some more specific goals and objectives. Throughout the planning process, each element of the Transportation System Plan was evaluated against these parameters.

OVERALL TRANSPORTATION GOAL

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

Goal 1

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

Objectives

A. Develop access management standards.

B. Develop alternative, parallel routes where practical.

C. Promote alternative modes of transportation.

D. Promote transportation demand management programs.

E. Promote transportation system management.

F. Develop procedures to minimize impacts to and protect transportation facilities, corridors, or sites during the development review process.

Goal 2

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

Objectives

A. Meet identified maintenance level of service standards on the county and state highway systems.

B. Continue paving of city streets.

C. Develop and adhere to a five-year road program for maintenance and improvement of the existing city road system.

D. Review and revise, if necessary, street cross section standards for local, collector, and arterial streets to enhance safety and mobility.

E. Develop access management strategies where needed.

F. Evaluate the need for traffic control devices.

G. Evaluate the safety of the street system and develop plans to mitigate any safety hazards.

Goal 3

Improve coordination among Helix and nearby cities, the Oregon Department of Transportation (ODOT), the US Forest Service (USFS), the Federal Highway Administration (FHWA), and the county.

Objectives

A. Work with Umatilla County to coordinate roadway maintenance and improvements.

B. Cooperate with ODOT in the implementation of the Statewide Transportation Improvement Program (STIP).

C. Work with county in establishing right-of-way needed for new roads identified in the Transportation System Plans.

D. Take advantage of federal and state highway funding programs.

E. Encourage the county to improve the existing road systems to and within the City.

F. Consider pooling resources with other cities and the county to provide services that benefit areas both in and outside the City.

Goal 4

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

Objectives

A. Cooperate with other cities and the county to pursue an inter-city transit service.

B. Provide sidewalks or shoulders and safe crossings on collectors and arterials.

C. Explore opportunities for bicycle facilities and coordinate with the county bicycle plan.

D. Seek Transportation and Growth Management (TGM) and other funding for projects evaluating and improving the environment for alternative modes of transportation.

E. Explore reuse of the abandoned railroad tracks west of the City.

CHAPTER 3: TRANSPORTATION SYSTEM INVENTORY

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

STREET SYSTEM

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

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

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

- Street classification and jurisdiction
- Street width
- Number of travel lanes
- Presence of on-street parking, sidewalks, or bikeways
- Speed limits
- General pavement conditions

City Street Classification

The current Comprehensive Plan for the city of Helix does not provide functional classifications for the streets within the City. Typically, streets are classified as either arterials, collectors or local streets. Based on conditions observed during the field reconnaissance (traffic volumes, street widths, etc.), DEA classified all streets within the City. The classification system includes city, county, and state roadways.

Arterials

Arterials form the primary roadway network within and through a region. They provide a continuous road system, which distributes traffic between cities, neighborhoods and districts. Generally, arterials are high capacity roadways that carry high traffic volumes entering or leaving the City.

In Helix, there is one street that functions as an arterial: Main Street (Havana - Helix Highway). This roadway extends for only 0.04 miles (approximately 200 feet) within the Helix southeast city limits.

Collectors

Collectors serve traffic within the commercial, industrial and residential neighborhood areas. They connect local neighborhoods or districts to the arterial network. Collectors help form part of the grid system; however, they are not intended to function as alternate routes to the arterial system.

Four streets in Helix were identified as functioning as collectors: Concord Street, Columbia Street, Harrison Street, and Main Street.

Local Streets

Local streets provide access to all parcels of land and serve travel over relatively short distances. They are designed to carry the very low traffic volumes associated with the local uses that abut them. Through traffic movements are discouraged on local streets.

The local streets in Helix are comprised of all streets not classified as either arterials or collectors. Local streets in Helix also form part of the grid system.

Street Layout

The Helix street system is comprised of a distinct grid pattern. Block sizes vary but are typically 300 feet square. Figure 3-1 shows the roadway functional classification and jurisdiction. Appendix B lists the complete inventory.

State Highways

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

Havana-Helix Highway

The 1999 *Oregon Highway Plan* (OHP) classifies the state highway system into four categories: Interstate, Statewide, Regional, District, and Local Interest. ODOT has established primary and secondary functions for each type of highway and objectives for managing the operations for each one.

The Havana-Helix Highway is classified as a District Highway. According to the 1999 OHP, the primary function of a District Highway is to "serve local traffic and land access." For highways of district significance, emphasis is placed on preserving safe and efficient higher speed through travel in rural areas, and moderate- to low-speed operations in urban or urbanizing areas with a moderate to high level of interruptions to flow. This means that design factors such as controlling access and providing passing lanes are of primary importance. The management objective is to provide for safe and efficient moderate to high-speed continuous-flow operation in rural areas reflecting the surrounding environment, and moderate to low-speed operation in urban and urbanizing areas with a moderate to high level of interruptions to flow.

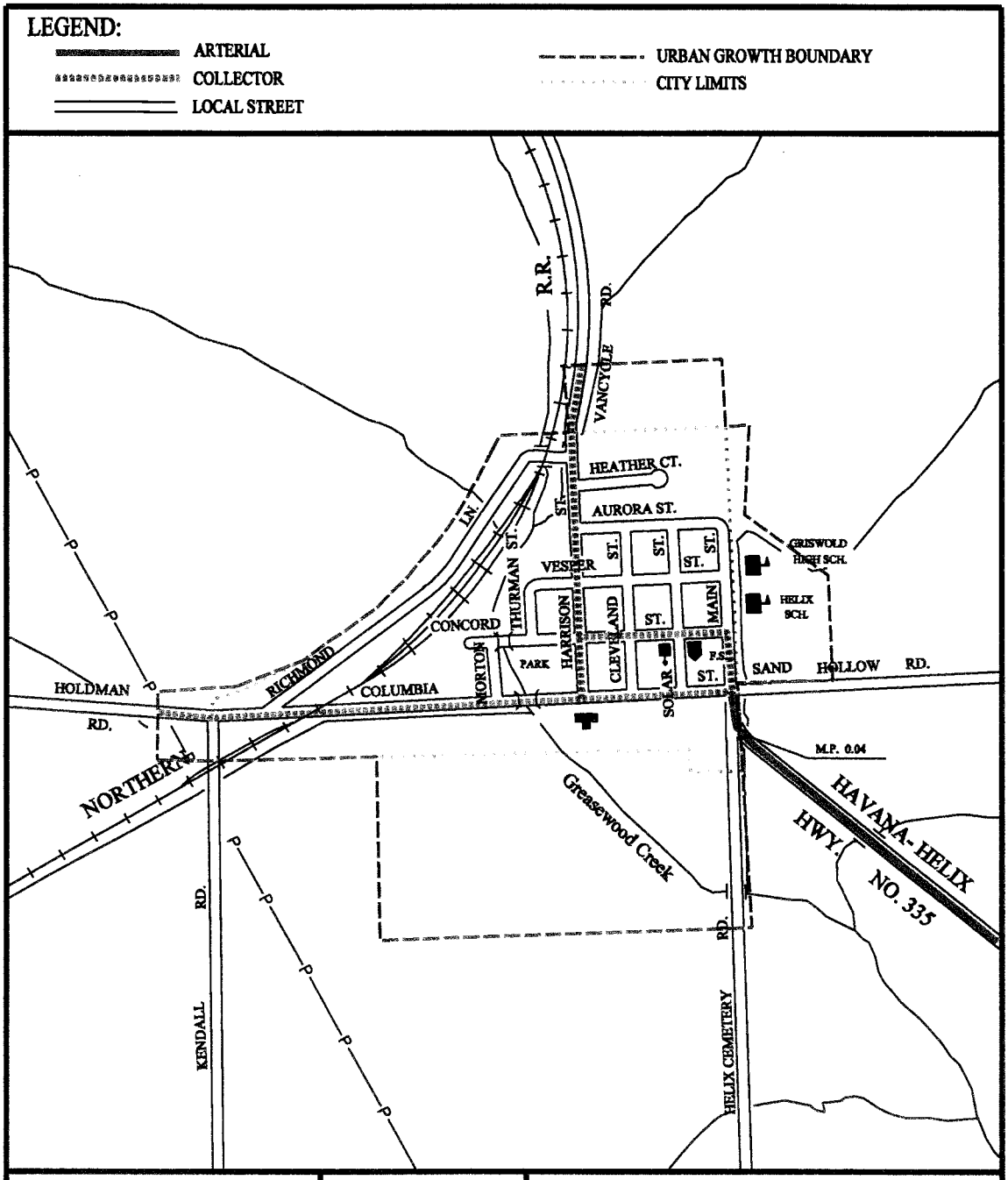

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FIGURE 3-1

Roadway Functional Classification -Helix

HELIX TSP

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The Havana-Helix Highway begins within the Helix city limits at the intersection of Columbia Street (Sand Hollow Road to the east) and extends to the OR 11 junction. It is a two-lane roadway with a speed limit of 55 mph. Throughout the rural area, the highway has a 20-foot pavement width with 2-4-foot partially paved shoulders on both sides.

GENERAL PAVEMENT CONDITIONS

City Streets

The ODOT Pavements Unit published a 1994 report entitled, *Pavement Rating Workshop, Non-National Highway System*. This report thoroughly defines the characteristics that pavements must display to be categorized as Very Good and so on. The report also provides color photographs of roadways that display these characteristics, which aids in field investigation and rating of pavement condition. These established guidelines were employed by DEA in conducting a subjective evaluation of pavement condition for all collectors within the city of Helix.

An inventory of collector roadways was conducted in November 1997 by DEA. The collectors currently in fair condition include Columbia and Concord Streets. Harrison Street is in poor pavement condition.

State Highways

The Oregon Department of Transportation's (ODOT) Pavement Unit surveys the State Highway System on an annual basis. Observed severity levels of certain distress types are used to determine a pavement condition rating score. These scores are used to stratify pavement segments into five condition categories: (1) Very Good, (2) Good, (3) Fair, (4) Poor, and (5) Very Poor. *The Umatilla County Transportation System Plan* briefly defines these condition categories.

According to the 1997 ODOT Pavement Condition Report, the section of the Havana-Helix Highway within the Helix urban area (Main Street) is in fair pavement condition.

BRIDGES

The Oregon Department of Transportation maintains an up to date inventory and appraisal of Oregon bridges. Part of this inventory involves the evaluation of three mutually exclusive elements of bridges. One element identifies which bridges are structurally deficient. This 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. Another element identifies which bridges are functionally obsolete. This element is determined based on the appraisal rating for the deck geometry, under-clearances, approach roadway alignment, structural condition, or waterway adequacy. The third element summarizes the sufficiency ratings for all bridges. The sufficiency rating is a complex formula which takes into account four separate factors to obtain a numeric value rating the ability of a bridge to service demand. The scale ranges from 0 to 100 with higher ratings indicating optimal conditions and lower ratings indicating insufficiency. Bridges with ratings under 55 may be nearing a structurally deficient condition.

There is one bridge within the city of Helix that is included in ODOT's bridge inventory program. The bridge (ODOT bridge No. 59C714) is county owned and maintained and crosses Greasewood Creek. This

bridge is not currently deficient and no bridge improvements are scheduled within Helix under ODOT's 2000-2003 STIP Update.

PEDESTRIAN SYSTEM

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

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

As is typical of most towns the size of Helix, the sidewalk system in the older core of the City is relatively complete. Sidewalks are relatively complete along Concord and Vesper Streets between Harrison and Main Streets. Additional intermittent sidewalk segments exist in the main city core. The completeness of the sidewalk system defines the downtown as shown in Figure 3-2 . Sidewalks and other pedestrian facilities are notably lacking outside of this area. Curb cuts for wheelchair access are largely lacking even where sidewalks exist or are undesirably steep to accommodate pedestrians using wheelchairs.

BIKEWAY SYSTEM

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

Bicycling should be encouraged for short trips in order to reduce some of the negative aspects of urban growth and automobile use. Noise, air pollution, and traffic congestion could be mitigated if more short trips were taken by bicycle or on foot. Typically, a short trip that would be taken by bicycle is around two miles; on foot, the distance commonly walked is around one half mile.

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

An impediment to bicycle use is the lack of parking and storage facilities for bikes throughout the city of Helix.

PUBLIC TRANSPORTATION

The only intercity bus service in Umatilla County is provided by Greyhound bus lines which provides service along I-84, US 395, and Oregon 11 within Umatilla County. Greyhound has terminals located in Hermiston and Pendleton that connect these cities to each other and major population centers outside of the

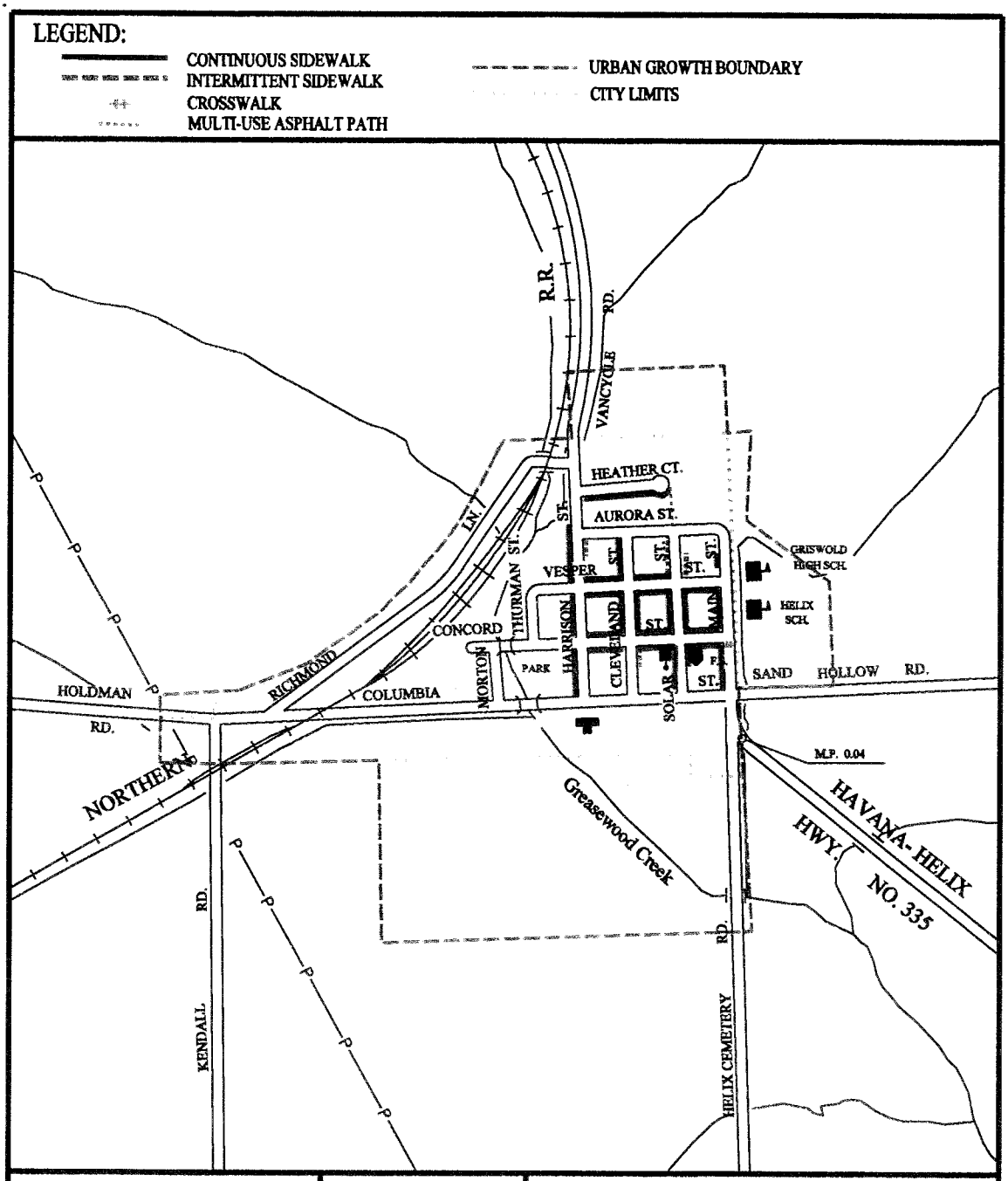

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FIGURE 3-2

Pedestrian and Bikeway System Inventory -Helix

HELIX TSP

UMC00001/HELIX3-2.DGN/TNT/07-06-98

county. The Hermiston terminal has two departures heading southeast (with stops in Pendleton, La Grande, Boise, and Salt Lake City); three buses running west to Portland; and two buses heading north on US 395 to Pasco and Spokane daily. The Pendleton terminal has three departures southeast (with stops in La Grande, Boise and Salt Lake City); three departures west to Portland; and two departures north to Seattle via Walla Walla, Pasco, and Spokane daily. The line to Seattle could serve Milton-Freewater as it runs through the City along OR 11.

Although Pendleton, Hermiston, Pilot Rock, and the Umatilla Indian Reservation have dial-a-ride type transit service available for the transportation disadvantaged Helix does not have this service. Dial-a-ride service is defined as door-to-door service initiated by a user's request for transportation service from their origins to specific locations on an immediate or advance reservation basis. These services are provided by the Pendleton Senior Center in Pendleton, the Confederated Tribes of the Umatilla Indian Reservation on the Umatilla Indian Reservation, the Hermiston Senior Center in Hermiston, and the Pilot Rock Lions Club in Pilot Rock. A similar kind of service could be appropriate for Helix.

Helix has no local fixed-route transit service at this time. The small size and low traffic volumes on city streets indicate that mass transit is not necessary or economically feasible at this time. The Transportation Planning Rule exempts cities with a population of less than 25,000 from developing a transit system plan or a transit feasibility study as part of their Transportation System Plans.

RAIL SERVICE

Helix has no passenger or freight rail service. Until recently, AMTRAK service was available in Hermiston and Pendleton along the rail line that follows the I-84 corridor from Portland to Boise, Idaho and points east. Amtrak is currently experiencing a funding crisis. As a result, passenger service between Portland and Denver, including service to cities within Umatilla County, was discontinued in May 1997. This line serves only freight traffic now.

The City is bounded on the west by the Burlington Northern Railroad track. This track is abandoned. The nearest freightlines to Helix is the Union Pacific mainline that runs through Pendleton. There is are also a major freight lines owned and operated by Union Pacific Railroad, a Class I line-haul freight railroad, which stops in Hermiston. In addition, there is a switch line out of Pendleton which hauls freight from Pilot Rock two to three days per week, and a line between Milton-Freewater and Weston on the Blue Mountain Railroad consisting of one freight train per day (maximum) or some local switching.

AIR SERVICE

Helix does not have its own air service within the City. However, there are many airport facilities nearby. Eastern Oregon Regional Airport is located in Pendleton, which is approximately 25 miles southwest of Helix. Walla Walla Airport is located in Walla Walla, WA, which is approximately 35 miles northeast of Helix. Hermiston Municipal Airport is located in Hermiston, which is approximately 40 miles west of Helix. Other small nearby airports in the county include: Barrett Field northwest of Athena, the Pea Growers' Field south of Athena, and Curtis Airfield northwest of Pendleton. These airports are small, private, uncontrolled airstrips mainly used for cropdusting operations.

Eastern Oregon Regional Airport in Pendleton is a tower-controlled airport with 40,600 annual operations. Passenger service includes 16 scheduled flights per day by Horizon Airlines, with flights to Portland and Seattle. The airfield is also home to 60 locally owned fixed-wing aircraft, four rotor, and eight CH-47 Chinook helicopters with the Oregon Army Air Guard.

Walla Walla Airport is owned and operated by the Port of Walla Walla. Located three miles from downtown Walla Walla, it is a tower-controlled airport with 25,000 annual enplanements. Passenger service includes ten scheduled flights per day to Seattle (five daily flights provided by Horizon Airlines and five daily flights provided by United Express). The airport is at an elevation of 1,205 feet above Mean Sea Level and has three runways varying in length from 6,450 feet to nearly 7,200 feet.

The city of Hermiston owns and operates a municipal airport. No commercial flights are available at the present time, but there is charter service available. The Hermiston Municipal Airport is located 1.5 miles from downtown Hermiston and had 12,380 annual operations in 1995. The airport is at an elevation of 641 feet above Mean Sea Level and has one runway which is 4,500 feet long and positioned in a northeast-southwest direction. The airport is often used by businesses such as Simplot, Gilroy Foods, Les Schwab Tires, UPS, and other large organizations such as PGE, Bonneville Power, and the Army Corps of Engineers. There is an agricultural spray operation based at the airport, and local residents also use the airport for recreational purposes.

PIPELINE SERVICE

There are currently no pipelines serving Helix; however, there is an oil pipeline that runs through the area just southwest of the City.

WATER TRANSPORTATION

Helix has no water transportation services. The nearest commercial port is the Port of Umatilla located in the northwest corner of the county along the Columbia River.

CHAPTER 4: CURRENT TRANSPORTATION CONDITIONS

As part of the planning process, the current operating conditions for the transportation system were evaluated. This evaluation focused primarily on street system operating conditions since the automobile is by far the dominant mode of transportation in Helix. Census data were examined to determine travel mode distributions. Traffic counts were used to determine how well traffic is currently flowing.

TRAFFIC VOLUMES

Historic traffic volume counts exist for the Havana-Helix Highway in Helix.

Average Daily Traffic

ODOT annually reports average daily traffic (ADT) volume along the Havana-Helix Highway at the south city limits. The 1996 ADT volume was 460 vehicles per day (vpd) at this location and has not grown since 1990.

ADTs are average volumes for the year, however summer is the season when volumes are highest. ODOT data from permanent recorder stations on nearby Westin-Elgin and Athena-Holdman Highways indicate summer season volumes are about 10 to 40 percent higher than average volumes respectively. It is reasonable that the Havana-Helix Highway would experience summer increases in volume that are within this range.

No other daily or hourly traffic data were available for the city streets in Helix, nor were any counts taken. Because the daily volumes on the Havana-Helix Highway in the City were so low (fewer than 500 vpd), traffic volumes on the other city streets were expected to be very low, and capacity deficiencies on city streets do not appear to be an issue in Helix.

Street Capacity

Transportation engineers have established various standards for measuring traffic capacity of roadways or intersections. Each standard is associated with a particular level of service (LOS). The LOS concept requires consideration of factors that include travel speed, delay, frequency of interruptions in traffic flow, relative freedom for traffic maneuvers, driving comfort and convenience, and operating cost. In the 1991 OHP, levels of service were defined by a letter grade from A-F, with each grade representing a range of volume to capacity (v/c) ratios. A volume to capacity ratio (v/c) is the peak hour traffic volume on a highway divided by the maximum volume that the highway can handle. If traffic volume entering a highway section exceeds the section's capacity, then disruptions in traffic flow will occur, reducing the level of service. LOS A represents relatively free-flowing traffic and LOS F represents conditions where the street system is totally saturated with traffic and movement is very difficult. The 1999 OHP maintains a similar concept for measuring highway performance, but represents LOS by specific v/c ratios to improve clarity and ease of implementation. Table 4-1 presents the level of service criteria for arterial roadways.

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

Service Level (v/c Ratio)[2]	Typical Traffic Flow Conditions
A (0.00-0.48)	Relatively free flow of traffic with some stops at signalized or stop sign controlled intersections. Average speeds would be at least 30 miles per hour.
B (0.49-0.59)	Stable traffic flow with slight delays at signalized or stop sign controlled intersections. Average speed would vary between 25 and 30 miles per hour.
C (0.60-0.69) C-D (0.70-0.73)	Stable traffic flow with delays at signalized or stop sign controlled intersections. Delays are greater than at level B but still acceptable to the motorist. The average speeds would vary between 20 and 25 miles per hour.
D (0.74-0.83) D-E (0.84-0.87)	Traffic flow would approach unstable operating conditions. Delays at signalized or stop sign controlled intersections would be tolerable and could include waiting through several signal cycles for some motorists. The average speed would vary between 15 and 20 miles per hour.
E (0.84-0.97) E-F (0.98-0.99)	Traffic flow would be unstable with congestion and intolerable delays to motorists. The average speed would be approximately 10 to 15 miles per hour.
F (≥1.00)	Traffic flow would be forced and jammed with stop and go operating conditions and intolerable delays. The average speed would be less than 10 miles per hour.

Source: (1) Transportation Research Board, *Highway Capacity Manual*, Special Report 209. National Research Council, 1985.
(2) ODOT, *SIGCAP Users Manual.* ODOT, 1994.

The *1999 Oregon Highway Plan* (OHP) establishes mobility standards for the state highway system[1]. Highways of district importance, such as the Havana-Helix Highway, should operate at v/c ratio of .74-.83 or better where the average speeds are between 15 and 20 mph in urban and urbanizing areas.

Traffic operations were determined at one representative intersection along the Havana-Helix Highway at Columbia Street using the 1985 Highway Capacity Software for unsignalized intersections. This software is based on the 1985 Highway Capacity Manual, Special Report 209, published by the Transportation Research Board. Since all intersecting streets and driveways are controlled by stop signs in the City, the analysis was performed for an unsignalized intersection. The peak hour traffic on the highway was assumed to be 10 percent of the 24-hour ADT volume and the directional split was assumed to be 60/40. Because side street traffic volumes were unavailable, an assumed volume of 30 vph was used and unsignalized intersection level-of-service calculations were generated for the intersection. The peak hour operations at the intersections are shown in Table 4-2.

[1] 1999 Oregon *Highway Plan*, Table 6. Maximum Volume To Capacity Ratios Outside Metro.

TABLE 4-2
SUMMARY OF OPERATIONS
AT HAVANA-HELIX HIGHWAY AND COLUMBIA STREET

Intersection Location	Direction	Movement	1996 LOS (v/c)
Havana-Helix Hwy (N-S) and Columbia Street (E-W)	Northbound	Left	A (<0.48)
	Southbound	Left	A (<0.48)
	Eastbound	Left, Through, Right	A (<0.48)
	Westbound	Left, Through, Right	A (<0.48)

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

In general, the intersection of Columbia Street with the Havana-Helix Highway currently operates very well based on the traffic volume assumptions made. Traffic volumes on both roadways are very low. Traffic on the highway flows smoothly at LOS A (v/c ratio less that 0.48) as do all movements from the minor street approaches.

TRANSPORTATION DEMAND MANAGEMENT MEASURES

In addition to inventorying the transportation facilities in Helix, an inventory was performed of any Transportation Demand Management (TDM) strategies that may currently be in place. TDM strategies are designed to relieve congestion on the street system by spreading peak hour traffic over a longer period of time, encouraging the use of alternative modes of transportation (i.e. sidewalks, bike lanes, public transit), and encouraging the single car driver to ride with others through local carpool programs. Other than the sidewalk and bicycle facilities that exist in Helix, no formal TDM strategies exist in the City.

This following sections briefly describe two elements that may impact future transportation demand management decisions in the City: 1) distribution of departure time to work, and 2) distribution of travel modes.

Alternative Work Schedules

One way to maximize the use of the existing transportation system is to spread peak traffic demand over several hours instead of a single hour. Statistics from the 1990 Census show the spread of departure to work times over a 24-hour period (see Table 4-3). Approximately 52 percent of the total employees (those not working at home) depart for work between 7:00 and 8:00 a.m. Another 28 percent depart the hour before the peak. Therefore, four-fifths of all morning commute trips occur between 6:00 a.m. and 8:00 a.m.

TABLE 4-3
DEPARTURE TO WORK DISTRIBUTION

	1990 Census	
Departure Time	**Trips**	**Percent**
12:00 a.m. to 4:59 a.m.	0	0%
5:00 a.m. to 5:59 a.m.	0	0%
6:00 a.m. to 6:59 a.m.	13	28.3%
7:00 a.m. to 7:59 a.m.	24	52.2%
8:00 a.m. to 8:59 a.m.	7	15.2%
9:00 a.m. to 9:59 a.m.	2	4.3%
10:00 a.m. to 10:59 a.m.	0	0%
11:00 a.m. to 11:59 a.m.	0	0%
12:00 p.m. to 3:59 p.m.	0	0%
4:00 p.m. to 11:59 p.m.	0	0%
Total	**46**	**100.0%**

Source: US Bureau of Census.

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

Travel Mode Distribution

Although the automobile is the primary mode of travel for most residents in the Helix area, some other modes are used as well. Modal split data is not available for all types of trips. The 1990 Census statistics that were reported for journey to work trips are shown in Table 4-4 and reflect the predominant use of the automobile in this area.

In 1990, 65.2 percent of all trips to work were in a private vehicle (auto, van, or truck). Trips in single-occupancy vehicles made-up 83.3 percent of these trips, and carpooling accounted for 16.7 percent.

The 1990 census data indicated that bicycles were not utilized for transportation. Since the census data do not include trips to school or other non-work activities, overall bicycle usage may be greater. (None of the city of Helix roadways include dedicated bicycle lanes). Dedicated bicycle lanes can encourage bicycle commuting, as can other facilities such as bicycle parking, showers, and locker facilities.

Pedestrian activity was very high accounting for 34.8 percent of trips to work in 1990. Statewide, 4.2 percent of trips to work in 1990 were made on foot. The high amount of walking is due to the extensive sidewalk systems downtown, the small size of Helix (most of the City is within a few minutes walk of the city center), and the concentration of employment at the city and the schools. The census data indicated that approximately 41 percent of the travel time to work was less than five minutes.

TABLE 4-4
JOURNEY TO WORK TRIPS

	1990 Census	
Trip Type	**Trips**	**Percent**
Private Vehicle	30	65.2%
Drove Alone	*25*	*83.3%*
Carpooled	*5*	*16.7%*
Public Transportation	0	0%
Motorcycle	0	0%
Bicycle	0	0%
Walk	16	34.8%
Other	0	0%
Work at Home	0	0%
Total	**46**	**100.0%**

Source: US Bureau of Census.

ACCIDENT ANALYSIS

The Oregon Department of Transportation (ODOT) collects detailed accident information on an annual basis along the Havana-Helix Highway within Umatilla County. However, no accident rate information exists for the Helix urban area (MP 0.00 to MP 0.04) for the three-year period analyzed from January 1, 1994 to December 31, 1996; nor does it exist as far back as 1988.

Historic

There were no ODOT coded accidents within the Helix city limits during the three-year period analyzed.

CHAPTER 5: TRAVEL FORECASTS

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

LAND USE

Land use and population growth plays an important part in projecting future traffic volumes. Population forecasts were developed to help determine future transportation needs since the amount of growth and where it occurs will affect traffic and transportation facilities in the study area. The population analysis presented here is not intended to provide a complete economic forecast or housing analysis, and it should not be used for any purpose other than that for which it was designed.

The population projections for Umatilla County are based on historic growth rates, the original population and employment forecasts made by the State of Oregon Office of Economic Analysis (OEA), and a recent study [1] identifying new economically-driven factors that will result in a higher population total than what was initially projected in the DEA forecast.

Historic and projected population estimates for Umatilla County, Helix, and seven other cities in the county are summarized in Table 5-1. Factors that will affect the future growth rates of the county and incorporated cities include employment opportunities, available land area for development, and community efforts to manage growth.

TABLE 5-1
UMATILLA COUNTY POPULATION TRENDS

	1970[1]	1980[1]	1990[1]	1996[1] Estimate	2017[2] Projected
Umatilla County	44,923	58,855	59,249	65,500	80,073
Incorporated Cities					
Helix	**152**	**155**	**150**	**185**	**230**
Adams	219	240	223	260	310
Athena	872	965	997	1,105	1,360
Echo	479	624	499	530	660
Pilot Rock	1,612	1,630	1,478	1,570	1,650
Stanfield	891	1,568	1,568	1,755	2,490
Ukiah	NA	249	250	280	340
Weston	660	719	606	680	730

Sources:
1) Portland State University Center for Population Research and Census.
2) The population forecast shown for the county has been officially adopted, however there is no official breakdown in population for the incorporated cities in the county. The projected population numbers shown for the eight cities are based on the initial OEA forecast, solely for the purpose of producing travel forecasts for these cities..

Umatilla County recently worked with the OEA to increase the official population projections for the county. Even though higher estimates have been adopted for the county than were used for the forecasting

[1] *Umatilla County Population Analysis*, December 16, 1998, produced by David Evans and Associates, Inc.

in this document, the new estimates will not impact travel projections for the TSP. This is because travel forecasts are based primarily on historic traffic levels taking into account population and land use. The difference between the original estimates and new official estimates is not great enough to impact travel projections.

A detailed description of existing and future land use projections, including the methodology and data sources used, is contained in the Umatilla County Population Analysis located in Appendix C. This appendix contains both the original estimates of the OEA and the new official estimates for the county.

As mentioned, Umatilla County has adopted new population estimates for the county as a whole. The new estimates have been disaggregated to determine how much growth is likely to occur in each city.

Historic Growth

The population of Umatilla County has grown since the 1970s, with significantly slower growth in the 1980s, reflecting a general slowdown in the state's economy. Helix, Pilot Rock, and Weston actually experienced a net population loss between 1970 and 1990. During this period, Helix grew by three people from 1970 to 1980, but then lost five people in the next ten years for a total population of 150 people in 1990. In contrast, the number of people residing in Stanfield nearly doubled between 1970 and 1980. This population growth may have been fueled by some significant housing developments and the location of several food processing plants in Helix during this time.

Estimated at 65,500 in 1997, the population of Umatilla County has grown relatively rapidly since the 1990 census, with an average annual growth rate of 1.44 percent. Most of the jurisdictions in Umatilla County have grown at a healthy rate, comparable to the annual growth rate of 1.44 percent for the county overall. Helix has grown at a slightly faster rate, 3.6 percent per year, starting from a population base of 150 in 1990.

Projected Growth

The State Office of Economic Analysis prepared long-term population projections by county, but since the county has not yet allocated adopted population numbers to incorporated cities, preliminary population forecasts for the jurisdictions of Adams, Athena, Echo, Helix, Pilot Rock, Stanfield, Ukiah, and Weston were developed in five-year increments based on the initial OEA population forecast. (See Umatilla County Population Discussion – Appendix C.) This was done only for the purpose of producing the future traffic forecast and should not be used for anything other then the intended purpose.

The population forecast for Helix projects continued growth, although at a significantly slower rate than it experienced in the 1990's. It should maintain an average annual growth rate of 1.04 percent, which will increase its population to 230 people in the next 20 years, which is an increase of 45 people since 1996 (Table 5-1).

Overall, Umatilla County is also expected to experience healthy rates of population growth, averaging nearly one percent annually over the next 20 years. The western portion of Umatilla County is expected to grow faster than the rest of Umatilla County,. However, like much of rural Oregon, the economy of Umatilla County remains largely seasonal, with nearly one-quarter of all employment agriculture-based. This makes population projections difficult, and are not likely to be as stable as the forecasts imply.

TRAFFIC VOLUMES

Traffic volume projections for the year 2018 are based on historic growth trends of highway volumes taking into account current and future land use projections.

Historic

Before projecting future traffic growth, it is important to examine past growth trends on the Helix roadway system. Historic data is only available for the state highway system in Helix; however, these roadways carry far more traffic than any other roads in the City. The Oregon Department of Transportation (ODOT) collects traffic count data on the Havana-Helix Highway (rural and urban sections) every year at the same locations. The only urban counts have been conducted at the south city limits in Helix.

Historical growth trends on the Havana-Helix Highway in and around Helix were established using the average annual daily traffic (AADT) volume information presented in the ODOT Traffic Volume Tables for the years 1976 through 1996. The AADT volumes were obtained for each of these years at selected locations along the highway. Using a linear regression analysis of the average AADT volumes between 1976 and 1996, an average annual growth rate was determined. Table 5-2 summarizes the historic average growth rate on each of these sections.

TABLE 5-2
HISTORIC TRAFFIC GROWTH RATES ON STATE HIGHWAYS

Highway Section	Average Annual Growth Rate 1976-1996	Total Growth 1976-1996
Havana-Helix Highway		
Helix - south city limits	0.47%	9.8%
Rural section - Helix to OR Hwy 11 jct.	2.66%	69.0%

Source: ODOT 1976-1996 Transportation Volume Tables; information compiled by DEA.

Based on volumes from ODOT's annual count locations over the 20-year period from 1976 to 1996, the annual growth rate along the Havana-Helix Highway in Helix has averaged nearly 0.5 percent per year. On the rural section of the highway south of Helix, traffic has been growing at a rate of nearly 2.7 percent per year. The rural highway sections near Helix experienced larger average and total growth over the 20-year period as well as larger net increases in the number trips.

Traffic growth on the highway, although modest, exceeded the population growth in Helix itself, which remained constant from 1970 to 1990. Helix experienced a growth spurt between 1990 and 1996 where population growth averaged 3.6 percent per year (the result of an increase of 35 residents over the six years); however, traffic volumes on the highway remained constant during that period.

Future Traffic Volumes

It was decided that the most appropriate growth rate to project future traffic is that rate which was calculated from the historic traffic growth and not those rates which were calculated from the historic and future population forecasts. Using the same linear regression analysis used to calculate the historic growth rate of traffic, forecasts were made for the years 1996 through 2018. Traffic volumes are expected to grow at a rate of 0.47 percent per year (10.9 percent by the year 2018) to 510 vpd on the highway.

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

The forecast future traffic volumes and total growth from 1996 to 2018 are shown in Table 5-3.

TABLE 5-3
FORECAST TRAFFIC VOLUMES AND TOTAL GROWTH ON STATE HIGHWAYS

Location	1996 ADT (vehicles/day)	2018 ADT (vehicles/day)	Total Growth 1996-2018
Havana-Helix Highway			
Helix- south city limits	460	510	10.9%

Source: ODOT 1976-1996 Transportation Volume Tables; information compiled by DEA.

HIGHWAY SYSTEM CAPACITY

For the year 2018, unsignalized intersection analyses were performed using the overall growth (10.9 percent) expected on the Havana-Helix Highway at the same intersection in Helix for which the existing conditions were analyzed. The analyses indicated that the intersection is expected to exceed ODOT level of service standards over the 20-year forecast period. The results of the unsignalized intersection analyses are shown in Table 5-4. Traffic operations were determined at the intersection using the 1985 Highway Capacity Software for unsignalized intersections. This software is based on the 1985 *Highway Capacity Manual*, Special Report 209, published by the Transportation Research Board.

TABLE 5-4
SUMMARY OF FUTURE OPERATIONS AT HAVANA-HELIX HIGHWAY AND COLUMBIA STREET

Intersection Location	Direction	Movement	1996 LOS (v/c ratio)	2018 LOS (v/c ratio)
Havana-Helix Hwy (N-S) and Columbia Street (E-W)	Northbound	Left	A(< 0.48)	A(< 0.48)
	Southbound	Left	A(< 0.48)	A(< 0.48)
	Eastbound	Left, Through, Right	A(< 0.48)	A(< 0.48)
	Westbound	Left, Through, Right	A(< 0.48)	A(< 0.48)

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

Analysis Results

Traffic movement volumes at the intersection of the Havana-Helix OR 11 and Columbia Street are forecast to increase by nearly 11 percent over the 20-year forecast period. However, all traffic movements at the intersection are expected to continue to operate at LOS A (v/c ratio less than 0.48) throughout the 20-year forecast period.

CHAPTER 6: IMPROVEMENT OPTIONS ANALYSIS

As required by the Oregon Transportation Planning Rule (TPR), transportation alternatives were formulated and evaluated for the Helix Transportation System Plan (TSP). These potential improvements were developed with the input from the TAC Management Team, city officials, and the public. Each of the transportation system improvement options was developed to address specific deficiencies, access, or safety concerns and attempt to address the concerns specified in the goals and objectives (Chapter 2).

The following list includes all of the potential transportation system improvements considered. Improvement Options 2 through 5 are illustrated in Figure 6-1.

1. Revise zoning code to allow and encourage mixed-use development and redevelopment.
2. Construct a sidewalk on the south side of Concord Street from Harrison Street to the bridge west of the city park.
3. Replace bridge on Concord Street.
4. Pave Morton Street.
5. Repave road near the intersection of Harrison Street and Columbia Street.
6. Upgrade Aurora Street and Thurman Street to urban residential street standards between Harrison Street and Vesper Street.
7. Replace bridge on Richmond Lane , north of Heather Court and west of Harrison Street.
8. Upgrade Richmond Lane to urban collector street standards.
9. Implement transportation demand management strategies.

The proposed transportation system improvements evaluated for the Helix TSP include state highway, county, and local road projects. **It should be noted that not all of the transportation improvement options recommended along the county and state systems have identified funding. Therefore, recommended transportation improvements cannot be considered as committed projects, but are subject to the county and ODOT's abilities to meet these current and future needs financially.**

EVALUATION CRITERIA

The evaluation of the potential transportation improvements in the city of Helix was based on a qualitative review of four factors: 1) safety; 2) access; 3) environmental factors, such as air quality, noise, and water quality; and 4) socioeconomic and land use impacts, such as community livability, right-of-way requirements and impacts on adjacent lands.

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

IMPROVEMENT OPTIONS EVALUATION

Through the transportation analysis and input provided from the public involvement program, multiple improvement projects were identified. These options included paving a roadway, replacing a bridge, and providing improved pedestrian and bicycle facilities. Each of these options are evaluated below.

Option 1. Revise Zoning Code To Allow And Encourage Mixed-Use Development And Redevelopment

One of the goals of the Oregon TPR is to reduce the reliance on the automobile. One way city jurisdictions can do this is through amendments in zoning and development codes to permit mixed-use developments and increases in density in certain areas. Mixed-use refers to development that contains more than one type of land-use, e.g. residential and commercial. Specific amendments include allowing neighborhood commercial uses within residential zones and allowing residential uses within commercial zones. Such code amendments can encourage residents to walk and bicycle throughout the community by providing shorter travel distances between land uses.

These code revisions are more effective in medium to large sized cities with populations of 25,000 and over, and in cities such as Helix, they may not be appropriate. Because of Helix's size, the decision of what mode of transportation to use when making a trip inside the City is not influenced by distance. The longest distance between city limit boundaries in Helix is around one mile, a distance short enough to walk, ride a bike, or drive. Distances between different land uses, such as residential and commercial, are even shorter. The city of Helix is also a bedroom community where the bulk of the city's workers commute to other larger cities such as Milton-Freewater, Pendleton, and Umatilla. Because most of these workers travel outside the City in private vehicles, encouraging mixed use developments or increased densities will not affect their choice of travel mode.

Increasing density may have some effect on development in Helix. Population is projected to increase by 24 percent (45 additional residents) in the next 20 years.

No direct costs are associated with making the zoning code amendments.

Revisions to zoning and development codes to allow for increased density are recommended.

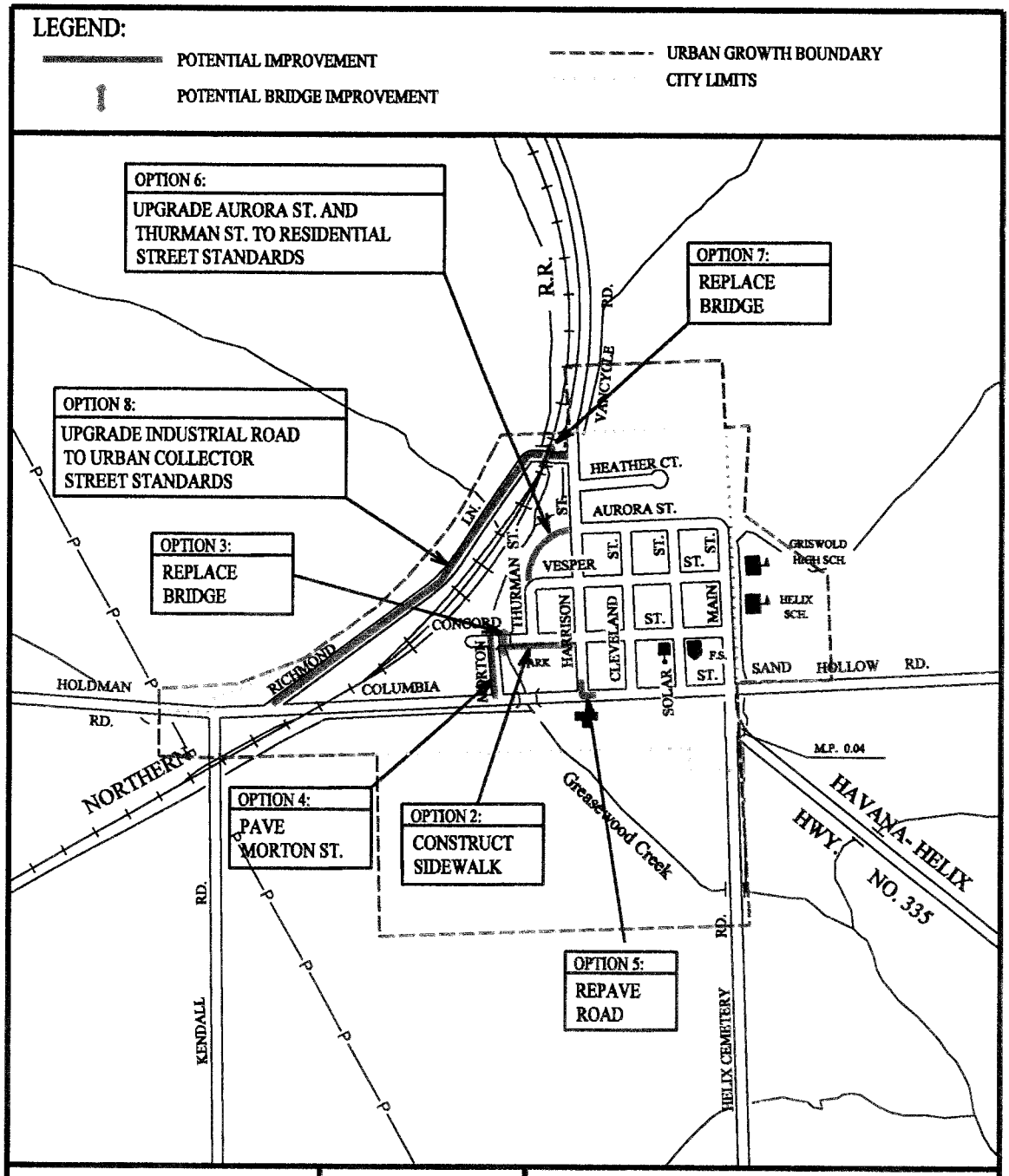
Option 2. Construct Sidewalks Along The South Side Of Concord Street From Harrison Street To The Bridge West Of The City Park

This project would involve the construction of a raised concrete sidewalk along the south side of Concord Street, from Harrison Street to the bridge west of the city park.

Establishing a sidewalk at this location would create a continuous pedestrian connection between the park facilities and the town center. A sidewalk at this location would also provide a safe refuge for pedestrians, allowing them to stay out of the way of traffic on Concord Street. Furthermore, the on-street parking located along the south side of Concord Street will not be affected by this option.

The estimated cost for this project is around $8,700. This cost estimate assumes a 5 foot wide sidewalk consisting of 4-inches of concrete and 2-inches of aggregate, at an estimated unit cost of $25 per linear foot. Funding for the construction of this sidewalk should be provided by the City.

This option is recommended.



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Option 3. Replace Bridge on Concord Street

The existing bridge over Greasewood Creek on Concord Street will need to be replaced within the next 20 years. This bridge is narrow and described by some residents as "rickety." It was constructed using timber beams that are now beginning to show signs of fatigue.

The total cost to remove and replace the existing bridge was determined using 1997 square foot construction cost estimates, supplied by ODOT, which were taken from the latest prospectus' completed for the federal Highway Bridge and Roadway Rehabilitation (HBRR) fund. These estimates assume a cost of $6 per square foot for bridge removal and $54 per square foot for construction of a bridge with a span between zero and 60 feet. Assuming the existing bridge is around 50 feet long by 20 feet wide, the estimated bridge removal cost is around $6,000. Assuming the new bridge will be 50 feet long and 25 feet wide, the estimated bridge construction cost is around $67,500. A bridge width of 25 feet will allow for two 9-foot travel lanes and a 5-foot wide sidewalk along one side of the bridge. The total cost, therefore, for the entire project is estimated at $73,500.

Since this bridge is under local jurisdiction, funding should be provided by the City. Because of the limited funds available for transportation improvements, the City may apply for state or federal grants to secure the funding or devise a plan to construct a less expensive bridge.

Construction of this bridge along with implementing the Morton Street paving project described in Option 4 will improve traffic circulation around the city park and pool area. The current conditions of the Greasewood Creek Bridge and Morton Street discourage local drivers from using this route and force some to make a U-turn on Concord Street.

This option is recommended.

Option 4. Pave Morton Street

Morton Street is currently an unimproved gravel road between Concord Street and Columbia Street. Because of its condition, Morton Street is not very attractive for vehicular travel and may be avoided by some drivers. By paving this roadway drivers would be enticed into using this roadway more frequently.

To allow two travel lanes and on-street parking on both sides of the road, Morton Street should be paved to a width of 34 feet. Sidewalks are recommended along both sides of Morton Street, but may not be feasible due to limited funding sources.

The estimated cost to pave this 300 foot section of roadway is around $8,500. This assumes a total unit cost of $0.83 per square foot of asphalt. The unit cost estimate was obtained from Humbert Asphalt Inc., an asphalt laying company based in Milton-Freewater. This cost also includes cutting and cleaning the edges of streets, patching pot holes, tacking, pre-leveling the entire street with an average of 1-inch of asphalt, and then overlaying the entire street with 2-inches of asphalt, for a total asphalt overlay of around 3-inches.

Since this roadway is under local jurisdiction, funding should be provided by the City.

This option is recommended.

Option 5. Repave Road Near The Intersection Of Harrison Street And Columbia Street

This option includes repaving a section of road near the intersection of Harrison Street and Columbia Street. City officials indicates the concrete roadway has been damaged from heavy truck traffic. The total length of roadway needed for repair is around one-half of a block length, or around 140 feet. Assuming the existing roadway is around 20 feet wide, the estimated cost to pave this damaged section of road is around $2,300. This would include overlaying the existing roadway with 3-inches of asphalt at an estimated unit cost of $0.83 per square foot.

.

This option is recommended.

Option 6. Upgrade Aurora Street And Thurman Street To Urban Residential Street Standards Between Harrison Street And Vesper Street

This option includes upgrading Aurora Street, west one block from Harrison Street, and Thurman Street, north one block from Vesper Street, to urban residential standards. Currently, there is an existing gravel/dirt road along the proposed alignment. The upgrade would consist of widening this road to a 20 foot paved width, and adding 8-foot graveled parking strips and 5-foot wide sidewalks on both sides of the road.

The estimated cost for this project is $75,000. This assumes a unit cost of $150 per linear foot of new road designed to urban residential street standards, for a total distance of around 500 feet.

This upgrade will serve the 2 or 3 existing homes bordering along Aurora and Thurman as well as future homes to come. This option is recommended.

Option 7. Replace Bridge Over Greasewood Creek On Richmond Lane

This option includes the replacement of the bridge over Greasewood Creek on Richmond Lane. Currently, this wooden bridge is only around 8-feet wide and cannot accommodate the passage of more than one vehicle at a time. This bridge has been targeted for replacement not only to improve access to the industrial area from Harrison Street, but to improve flood control along the Greasewood Creek.

Assuming the existing bridge is around 50 feet long, the estimated bridge removal cost is around $2,400. Assuming the new bridge will be 50 feet long and 25 feet wide, the estimated bridge construction cost is around $67,500. A bridge width of 25 feet will allow for two 9-foot travel lanes and a 5-foot-wide sidewalk along one side of the bridge. The total cost, therefore, for the entire project is estimated at $69,900.

Since this bridge is under local jurisdiction, funding should be provided by the City. Because of the limited funds available for transportation improvements, the City may apply for state or federal grants to secure the funding or devise a plan to construct a less expensive bridge.

This option is recommended.

Option 8. Upgrade Richmond Lane To Urban Collector Street Standards

The city of Helix is interested in improving the industrial road extending west of Harrison Street and running parallel to the abandoned Burlington Northern Railroad (BNRR). The City expects to have the remaining sections of BNRR rail line removed to accommodate future business developments in this area.

Improvements to this road would include upgrading the facility to urban collector street standards. This would include widening the road to a 38-foot paved width, to accommodate two-lanes of travel and on-street parking on both sides of the road. As part of the upgrade, 5-foot wide sidewalks should also be constructed along one or both sides, depending on where businesses will locate along this road. Optional planting strips are also possible.

The estimated cost for this project is $630,000. This assumes a unit cost of $300 per linear foot of new road designed to urban collector street standards, for a total distance of around 2,100 feet. Funding for this project should be provided by the City or private developers of the area.

This project is recommended as development occurs in this area.

Option 9. Implement Transportation Demand Management Strategies

Transportation demand management (TDM) strategies change the demand on the transportation system by providing facilities for modes of transportation other than single occupant passenger vehicles, implementing carpooling programs, altering work shift schedules, and applying other transportation measures within the community. The TPR recommends that cities evaluate TDM measures as part of their TSPs.

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

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

Implementing a local carpool program that only serves Helix would not be effective due to the City's geographical size and people living and working in different locations. However, a county-wide carpool program is feasible. Residents who live in Helix and residents who live in other cities and rural areas should be encouraged to carpool with a fellow coworker or someone who works in the same area.

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

Costs associated with implementing TDM strategies were not determined.

SUMMARY

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

TABLE 6-1
TRANSPORTATION IMPROVEMENT OPTIONS: RECOMMENDATION SUMMARY

Option	Recommendation
1. Revise zoning code to allow and encourage mixed-use development and redevelopment	• Implement
2. Construct a sidewalk on the south side of Concord St. from Harrison St. to the bridge west of the city park	• Implement
3. Replace bridge on Concord Street	• Implement
4. Pave Morton Street	• Implement
5. Repave road near the intersection of Harrison Street and Columbia Street	• Implement
6. Upgrade Aurora Street and Thurman Street to urban residential street standards between Harrison Street and Vesper Street	• Implement
7. Replace bridge on Industrial Road, north of Heather Court and west of Harrison Street.	• Implement
8. Upgrade Industrial Road to urban collector street standards.	• Implement as development occurs
9. Implement Transportation Demand Management Strategies	• Implement

CHAPTER 7: TRANSPORTATION SYSTEM PLAN

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

STREET DESIGN STANDARDS

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

Existing Street Standards

The city of Helix has no designated street design standards. There are also no standards for bike or pedestrian facilities.

Recommended Street Standards

The development of the Helix Transportation System Plan provides the City with an opportunity to review and revise street design standards to more closely fit with the future functional street classification, and the goals and objectives of the Transportation System Plan. The future street classification system for roadways in Helix is shown in Figure 7-1, and is described in detail in the street system plan below. The recommended street standards for all types of functional classifications are shown graphically in Figure 7-2 through Figure 7-3, and are summarized in Table 7-1. Further discussion of each type of street standard follows below.

Since the Helix Transportation System Plan includes all land within the Urban Growth Boundary (UGB), the recommended street standards should be applied in the outlying areas outside the city limits and within the UGB as well. Although these outlying areas may presently have a rural appearance, these lands will ultimately be part of the urban area. Retrofitting rural streets in these areas, as well as all rural streets within the city limits to urban standards in the future is expensive and controversial; it is more efficient to build them to an acceptable urban standard.

TABLE 7-1
RECOMMENDED STREET DESIGN STANDARDS

Classification	Pavement Width	Right-of-Way Width	Min. Posted Speed
Residential	20 ft.	50 ft.	15-25 mph
Alley	20 ft.	20 ft.	15 mph
Collector – Option 1	38 ft.	60 ft.	25-35 mph
Collector – Option 2	30 ft.	60 ft.	25-35 mph
Arterial	50 ft.	80 ft.	25-45 mph

Sidewalks should be included on all urban streets as an important component of the pedestrian system. Ideally, sidewalks should be buffered from the street by a planting strip to eliminate obstructions in the walkway, provide a more pleasing design, and provide a buffer from traffic. When sidewalks are located directly adjacent to the curb, they can include such impediments as mailboxes, street light, , and sign poles, which reduce the effective width of the walk. To maintain a safe and convenient walkway for at least two adults, a 5-foot sidewalk should be used in residential areas.

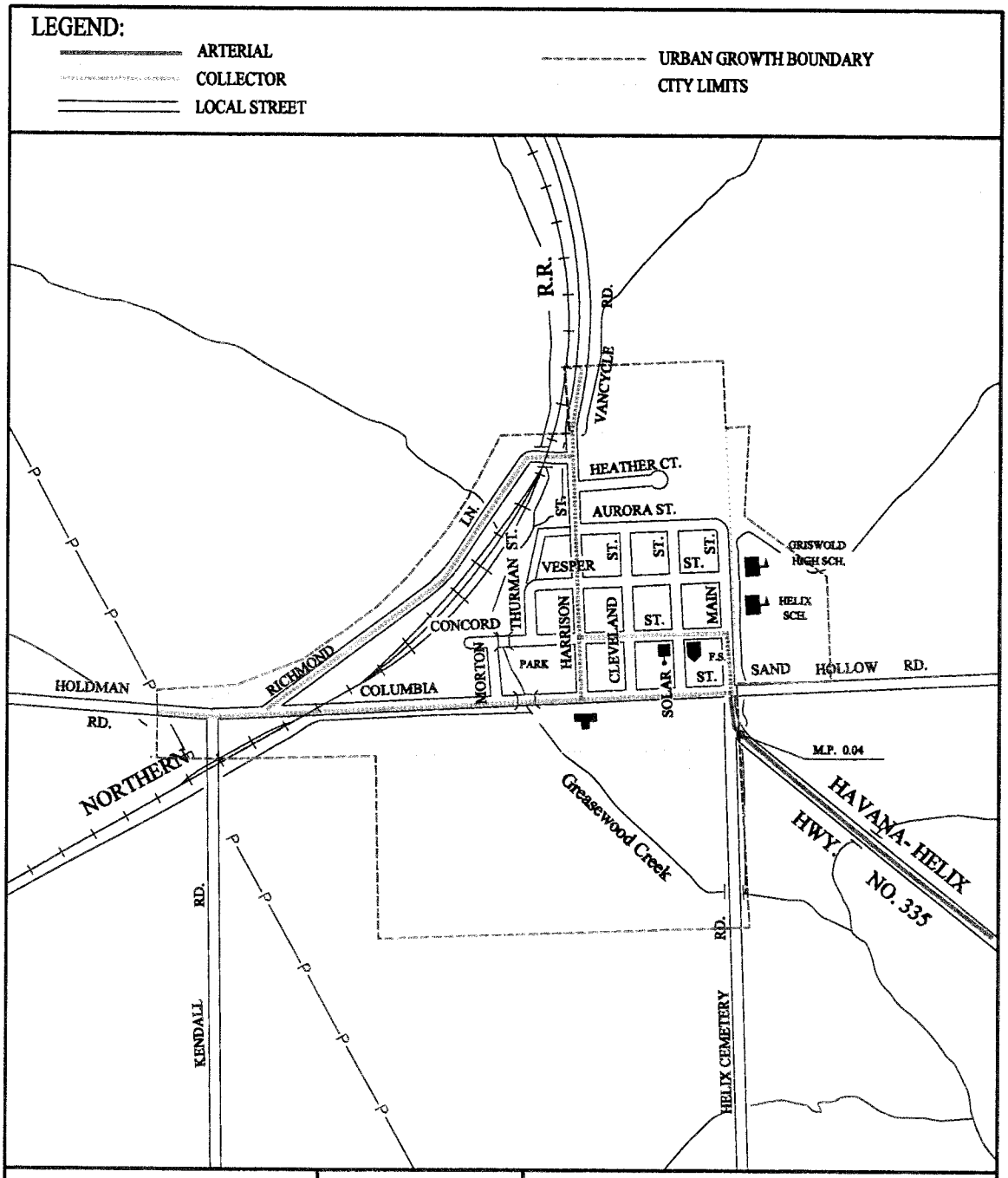
Residential Streets

The design of a residential street affects its traffic operation, safety, and livability. The residential street should be designed to enhance the livability of the neighborhood while accommodating less than 1,200 vehicles per day. Design speeds should be 15 to 25 mph. When traffic volumes exceed approximately 1,000 to 1,200 vehicles per day, the residents on that street will perceive the traffic as a noise and safety problem. To maintain neighborhoods, local residential streets should be designed to encourage low speed travel and to discourage through traffic. Narrower streets discourage speeding and through traffic as well as improve neighborhood aesthetics. They also reduce right-of-way needs, construction costs, storm water run-off, and the need to clear vegetation.

The recommended residential street standard, as shown in Figure 7-2 provides 20 feet of paved roadway surface within a 50-foot right-of-way. This standard will accommodate passage of one lane of moving traffic in each direction, with 8-foot wide gravel shoulders on both sides of the street for parking. Five-foot sidewalks should also be provided on each side of the roadway.

Alleys

Alleys can be a useful way to diminish street width by providing rear access and parking to residential, commercial, and industrial areas. Including alleys in a residential subdivision allows homes to be placed closer to the street and eliminates the need for garages to be the dominant architectural feature. This pattern, once common, has been recently revived as a way to build better neighborhoods. In addition, alleys can be useful in commercial and industrial areas, allowing access by delivery trucks off the main streets. Alleys should be encouraged in the urban area of Helix. Alleys should be 20 feet wide, with a 20-foot right-of-way (see Figure 7-2).



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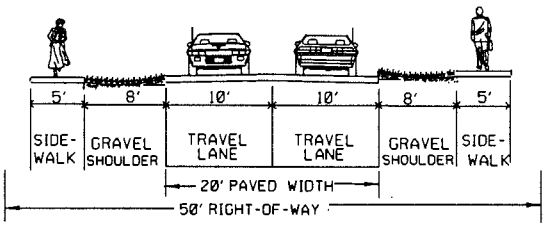
NORTH
(not to scale)

FIGURE 7-1

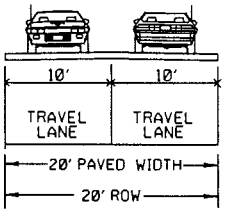
Future Roadway Functional Classification -Helix

HELIX TSP

UMC00001/HELIX7-1.DGN/bjd/12-18-98



TWO TRAVEL LANES, NO ON-STREET PARKING, GRAVEL SHOULDERS



ALLEYS

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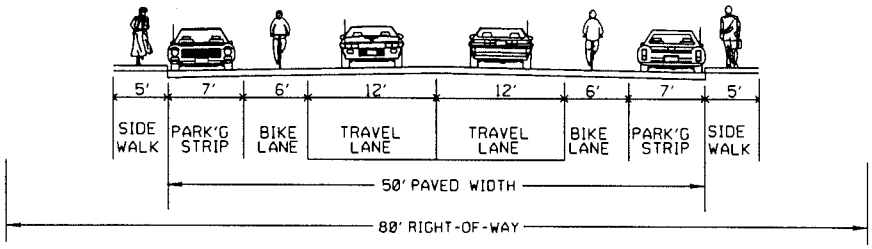
FIGURE 7-2

Street Standards
Local Residential and Alleys

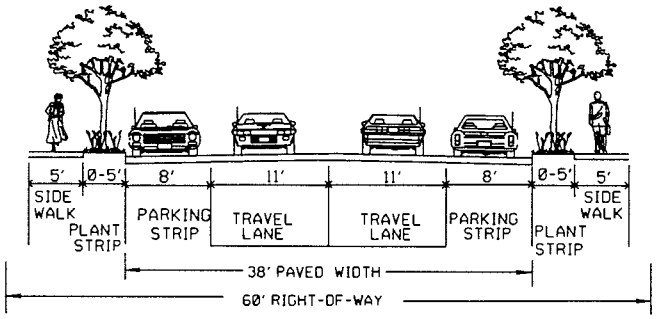
HELIX TSP

Arterial Street

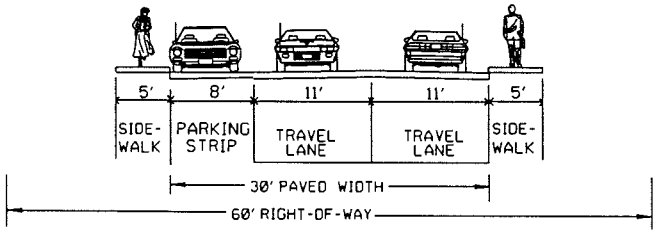


TWO TRAVEL LANES, BICYCLE LANES, ON-STREET PARKING ON BOTH SIDES

Collector Street



OPTION 1: TWO TRAVEL LANES WITH ON-STREET PARKING ON BOTH SIDES



OPTION 2: TWO TRAVEL LANES WITH ON-STREET PARKING ON ONE SIDE ONLY

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FIGURE 7-3

Street Standards
Arterial and Collector Streets

HELIX TSP

Cul-de-Sac Streets

Cul-de-sac, or "dead-end" residential streets are intended to serve only the adjacent land in residential neighborhoods. These streets should be short (less than 400 feet long) and serve a maximum of 20 single-family houses. Because the streets are short and the traffic volumes relatively low, the street width can be narrower than a standard residential street, allowing for the passage of two lanes of traffic when no vehicles are parked at the curb and one lane of traffic when vehicles are parked at the curb.

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

Collector Streets

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

Two recommended street standard options are provided for collectors, as shown in Figure 7-3. Both options provide one lane of moving traffic in each direction and can also be striped to provide two travel lanes plus left-turn lanes at intersections or driveways by removing parking for short distances. The City should choose one of these options for each collector based on the existing right-of-way and neighborhood character.

Option 1

This option provides a 38-foot paved roadway surface within a 60-foot right-of-way. This standard will accommodate one lane of moving traffic in each direction, with curbside parking on both sides of the street. Five-foot sidewalks should be provided on each side of the roadway. An optional planting strip has been included with a width up to 5 feet.

Option 2

This option provides a 30-foot roadway surface within a 60-foot right-of-way. This standard will accommodate one lane of moving traffic in each direction, with curbside parking on one side. Five-foot sidewalks should be provided on each side of the roadway, adjacent to the curb.

Arterial Streets

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

The recommended standard for an arterial street provides a 50-foot paved roadway surface within an 80-foot right-of-way. This will allow for two 12-foot travel lanes, two 6-foot bike lanes, and curbside parking along

both sides of the roadway at 7-feet wide. Sidewalks, at least 5-feet in width, should also be provided on each side of the roadway.

Bike Lanes

In cases where a bikeway is proposed within the street right-of-way, 5- to 6-feet of roadway pavement should be striped on each side of the street and reserved for bike lanes. The striping should be done in conformance with the State Bicycle and Pedestrian Plan (1995). In cases where curb parking will exist with a bike lane, the bike lane will be located between the parking and travel lanes. In some situations, curb parking may have to be removed to permit a bike lane.

Bikeways should be added when a new street is built or improvements are made to existing streets.

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

Sidewalks

A complete pedestrian system should be implemented in the urban portion of Helix. Every urban street should have sidewalks on both sides of the roadway as shown on the cross sections in Figure 7-1 through Figure 7-3. Sidewalks on residential streets should be at least 5-feet wide. In addition, pedestrian and bicycle connections should be provided between any cul-de-sac or other dead-end streets.

Another essential component of the sidewalk system is street crossings. Intersections must be designed to provide safe and comfortable crossing opportunities. Tools to accomplish this include crosswalks, signal timing (to ensure adequate crossing time) when traffic signals are present, and other enhancements such as curb extensions, which are used to decrease pedestrian crossing distance and act as traffic calming measures.

Curb Parking Restrictions

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

Street Connectivity

Street connectivity is important because a well-connected street system provides more capacity and better traffic circulation than a disconnected one. Developing a grid system of relatively short blocks can minimize excessive volumes of motor vehicles along roads by providing a series of equally attractive or restrictive travel options. Short block sizes also benefit pedestrians and bicyclists by shortening travel distances and making travel more convenient. The average block size within the city's grid system is around 275 feet square, which is an ideal block size. To ensure that this pattern of development continues into the future, a maximum block perimeter of 1,200 feet is recommended. This feature is critical to Helix's continued livability.

ACCESS MANAGEMENT

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

The Transportation Planning Rule (TPR) defines access management as measures regulating access to streets, roads and highways from public roads and private driveways and requires that new connections to arterials and state highways be consistent with designated access management categories. As the city of Helix continues to develop, the arterial/collector/local street system will become more heavily used and relied upon for a variety of travel needs. As such, it will become increasingly important to manage access on the existing and future arterial/collector street system as new development occurs.

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

Access Management Techniques

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

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

Recommended Access Management Standards

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

TABLE 7-2
RECOMMENDED ACCESS MANAGEMENT STANDARDS

Functional Classification	Intersections			
	Public Road		Private Drive[2]	
	Type[1]	Spacing	Type	Spacing
Arterial				
Havana-Helix Highway (Hwy. 335)	See Access Management Spacing Standards, Appendix C of the 1999 Oregon Highway Plan			
Other Arterials Within UGB	at-grade	250 ft.	L/R Turns	100 ft.
Collector[3]				
Concord St.	at-grade	250 ft.	L/R Turns	100 ft.
Columbia St.				
Harrison St.				
Main St.				
Industrial St.				
Residential Street	at-grade	250 ft.	L/R Turns	Access to Each Lot
Alley (Urban)	at-grade	100 ft.	L/R Turns	Access to Each Lot

Notes:
(1) For most roadways, at-grade crossings are appropriate.
(2) Allowed moves and spacing requirements may be more restrictive than those shown to optimize capacity and safety. Also, see section below on "Access Control Rights" along state highways.
(3) Some sections of these roads are designated as residential streets, where the corresponding access management standard is applicable.

Application

The access management guidelines above apply mainly to new development accesses. They are not intended to eliminate existing intersections or driveways. It is important to note, however, that existing developments and legal accesses on the transportation network will not be affected by the recommended access management techniques until either a land use action is proposed, a safety or capacity deficiency is identified that requires specific mitigation, a specific access management strategy/plan is developed, existing properties along the highway are redeveloped, or a major construction project is initiated on the street.

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

State Highways

Access management is important to promoting safe and efficient travel for both local and long distance users along the Havana-Helix Highway in Helix. The *1999 Oregon Highway Plan* (OHP) specifies an access management classification system and standards for state facilities. Although Helix may designate state highways as arterial roadways within their transportation system, the access management for these facilities follow the Access Spacing Standards of the *1999 Oregon Highway Plan*. These spacing standards are based on highway classification, type of area and speed, which are shown in the appendix to this document. This section of the Transportation System Plan describes the state highway access management objectives and specific highway segments where special access standards apply.

The Havana-Helix Highway is categorized as a District Highway in the 1999 Oregon Highway Plan. The primary function of District Highways is to provide connections and links to inter-community movements. They also serve local access and traffic. In urban areas the access management objective is to provide the highest and safest performance operation consistent with the identification function of roadway. Access mangement for district urban highways recognizes the balanced demands of traffic movement and access needs. There are no special highway segments identified in the 1999 Oregon Highway Plan that apply to the Havana-Helix Highway in Helix.

ACCESS CONTROL RIGHTS

Historically, owners of property abutting public roadways have enjoyed a common law abutter's right of access to the roadway. However, in order to provide for a transportation system that would accommodate changing public needs, legislation has been passed to modify the rights of access. Oregon Revised Statutes specify among other property rights, the right of access can be purchased or condemned as deemed necessary for rights-of-way. The Oregon Department of Transportation has purchased access control rights from many properties along state highways.

Once the state has acquired the access rights to a property, road approach permits can only be issued at locations on the property where the right of access has been reserved. These "reservations of access" give the property owner the common law right of access to the state highway only at specific locations and they are clearly identified in the deed where the property owner sold the right-of-way to the State. If the owner wants to gain additional access rights to the highway, they must apply for a "grant" of access.

There may be local street connections shown in this Transportation System Plan that will require modifying the existing access rights or gaining additional access rights to the state highway system. Review of this TSP by ODOT does not imply tacit approval to modify or grant additional access rights. This must be accomplished by applying to ODOT for such modification or grant.

- An "indenture of access" is used to modify existing access rights such as moving or widening the reservation or lifting other restrictions that may have been placed on it. A "grant of access" is required to gain an additional access point to the highway and, depending on the circumstances, may require payment to the State for the market value of the grant. Application for both the indenture and grant of access is made to local ODOT district office.

MODAL PLANS

The Helix modal plans have been formulated using information collected and analyzed through a physical inventory, forecasts, goals and objectives, and input from area residents. The plans consider transportation system needs for Helix during the next 20 years assuming the growth projections discussed in Chapter 5. All transportation system needs identified in this section have been assigned a project number in consecutive order, beginning with the projects identified in the street system plan. The timing of these projects will be guided by the changes in land use patterns, growth of the population in future years, and available funds. Specific projects and improvement schedules may need to be adjusted depending on when and where growth occurs in Helix.

Street System Plan

The street system plan recommends any changes necessary to the current street classification system and outlines a series of improvements that are recommended for construction within the city of Helix during the next 20 years. These options have been discussed in Chapter 6 (Improvement Options Analysis). Projects which make up the proposed street system plan are summarized in Table 7-3.

Street System Functional Classification

Street system functional classifications relate the design of a roadway to its function. The function is determined by operational characteristics such as travel demand, street capacity, and the operating speed of the roadway. The city of Helix currently classifies all streets within the Urban Growth Boundary as either arterial, collector, or local streets. A review of the existing street system inventory, the recommended street design standards, and all new projects recommended in the street system plan indicates only one change is necessary at this time to the existing roadway functional classification. This is to classify Industrial Street as a collector road, in anticipation of future business developments that may occur along the road. The future street classification for Helix is shown in Figure 7-1 and described as follows:

- Havana-Helix Highway – classified as an arterial roadway, as it is a highway of District level of importance, it carries the highest traffic volumes in and out of the City, and it is the primary route to other cities in the county and state.
- Concord Street (Harrison Street to Main Street) – classified as a collector street, as its function is to connect local neighborhoods with the downtown area.
- Columbia Street (West UGB to Havana-Helix Highway) – classified as a collector street, as its function is to connect local neighborhoods with the Havana-Helix Highway to the east and Holdman Road (County Road) to the west.
- Harrison Street (North UGB to Columbia Street) – classified as a collector street, as its function is to connect local neighborhoods with Columbia Street which accesses the Havana-Helix Highway and with Vancycle Road (County Road) to the north.
- Main Street (Concord Street to Columbia Street) – classified as a collector street, as its function is to connect local neighborhoods to the downtown area and to Sand Hollow Road, and a county road leading north out of town.
- Industrial Street (Harrison Street to Columbia Street) – classified as a collector street, as its function will be to provide access to businesses locating along this road.
- All other roads – classified as local streets.

Street Improvement Projects

Table 7-3 presents all street and bridge improvement projects within the urban area that compose the street system plan.

It should be noted that the inclusion of a project in the TSP does not constitute a commitment by ODOT or the county that either agency will participate in the funding of the project. ODOT's participation will be determined via the biennial updates of the multi-year STIP process, and the construction of any project is contingent upon the availability of future revenues. The county's participation

will be according to project prioritization as indicated in the Capital Improvement Plan, and contingent upon available funding.

TABLE 7-3
RECOMMENDED STREET SYSTEM PROJECTS

Project Number	Location/Description	Cost
1.	Repave road near the intersection of Harrison Street and Columbia Street	$2,300
2.	Replace bridge on Concord Street	$73,500
3.	Pave Morton Street	$8,500
4.	Upgrade Aurora Street and Thurman Street to urban residential street standards between Harrison Street and Vesper Street	$75,000
5.	Replace bridge on Industrial Road, north of Heather Court and west of Harrison Street	$69,900
6.	Upgrade Industrial Road to urban collector street standards	$630,000
Total		**$859,200**

Pedestrian System Plan

A complete interconnected pedestrian system should be implemented in the City when feasible. A sidewalk inventory revealed that sidewalks are abundant in the downtown core, but are lacking along roadways in outlying areas such as along Columbia Street, Aurora Street, and local streets west of Harrison Street. Every paved street should have sidewalks on both sides of the roadway, to meet the recommended street standards, except in extenuating circumstances. Continuous pedestrian access on walkways should be provided between businesses, parks, and adjacent neighborhoods. (Ordinances specifying these requirements are included in Chapter 9.)

Because of the small size of Helix and the limited public resources available for transportation system improvements, sidewalk construction on a large scale may not be feasible. However, the City should require sidewalks to be constructed as part of any major roadway improvements, or as adjacent land is developed.

The primary goal of establishing a pedestrian system is to improve pedestrian safety; however, an effective sidewalk system has several qualitative benefits as well. Providing adequate pedestrian facilities increases the livability of a city. When pedestrians can walk on a sidewalk, separated from vehicular street traffic, it makes the walking experience more enjoyable and may encourage walking, rather than driving, for short trips. Sidewalks enliven a downtown and encourage leisurely strolling and window shopping in commercial areas. This "main street" effect improves business for downtown merchants and provides opportunities for friendly interaction among residents. It may also have an appeal to tourists as an inviting place to stop and walk around.

The cost to construct a concrete sidewalk facility is approximately $25 per linear foot. This assumes a sidewalk width of 5 feet with curbing. The cost estimate also assumes the sidewalks are composed of 4-inches of concrete and 6-inches of aggregate. As an alternative, asphalt walkways could be provided instead of a concrete sidewalk at a lower initial cost. Construction costs for this type of facility are typically about 40 percent of the costs for concrete sidewalks; however, maintenance, such as sealing and resurfacing the asphalt, must occur more frequently.

All new sidewalk construction in the City should include curb cuts for wheelchairs at every street corner to comply with the Americans with Disabilities Act (ADA). The addition of crosswalks should also be considered at all major intersections. As improvements are made to the existing street system, projects involving the construction of new sidewalks may require implementation of on-street parking in place of parking on grass or gravel shoulders.

In Chapter 6 of this plan, an improvement option relating specifically to a pedestrian facility along Concord Street was identified as a need and was recommended. This project has been adopted into the pedestrian plan as Project No. 7 and includes a new sidewalk along the south side of Concord Street, from Harrison Street to the bridge west of the city park. Construction of this sidewalk is estimated to cost $8,700. The timing for this project is not critical.

The City has indicated a desire to construct sidewalks along all city streets where sidewalks are not already provided. The City is also interested in replacing sections of old sidewalk and filling in intermittent sidewalks. As part of the pedestrian system plan, Project No. 8 includes the construction of continuous sidewalks along all city streets where sidewalks are not already provided. It is estimated that roughly 12,400 feet of city street frontages have no sidewalks at this time. At an estimated cost of $25 per linear foot to construct a sidewalk, this equates to a total cost of approximately $310,000. This estimate does not include areas where an urban roadway improvements, which include sidewalks, have been recommended. It also does not include filling in intermittent sidewalks.

Bicycle System Plan

On the collector and local streets in Helix, bicyclists share normal vehicle lanes with motorists. Due to low travel speeds and traffic volumes observed in the City, shared usage of the roadway between bicyclists and automobiles is appropriate.

At the present time, conditions along the Havana-Helix Highway allow bicyclists to safely share the roadway with auto traffic. The posted speed limit along the highway is 25 mph within the UGB and traffic volumes are low at around 460 vehicles per day (vpd). With traffic volumes expected to reach only 510 vpd by the year 2018, an exclusive bikeway facility along the highway is not critical.

Bicycle parking is lacking in Helix. Bike racks should be installed in front of downtown businesses and all public facilities (schools, post office, library, city hall, and parks). Typical rack designs cost approximately $50 per bike plus installation. An annual budget of approximately $1,500 to $2,000 should be established so that Helix can begin to place racks where needs are identified and to respond to requests for racks at specific locations. Bicycle parking requirements are further addressed in Chapter 9 (Policies and Ordinances).

Transportation Demand Management Plan

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

In Helix, because traffic volumes are low, capacity of the local street system is not an issue. Therefore, implementing TDM strategies may not be practical in most cases. However, the sidewalk improvements

recommended earlier in this chapter are also considered TDM strategies. By providing these facilities, the city of Helix is encouraging people to travel by modes other than the automobile.

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

No costs have been estimated for the TDM plan. Grants may be available to set up programs; other aspects of transportation demand management can be encouraged through ordinances and policy.

Public Transportation Plan

As described in Chapter 3, the only intercity bus service in Umatilla County is provided by Greyhound bus lines which provides service along I-84, US 395, and OR 11 within Umatilla County. Greyhound has terminals located in Hermiston and Pendleton which connect these cities to each other and major population centers outside of the county. The Hermiston terminal has two departures heading southeast (with stops in Pendleton, La Grande, Boise, and Salt Lake City); three buses running west to Portland; and two buses heading north on US 395 to Pasco and Spokane daily. The Pendleton terminal has three departures southeast (with stops in La Grande, Boise and Salt Lake City); three departures west to Portland; and two departures north to Seattle via Walla Walla, Pasco, and Spokane daily.

Because of the small size of Helix, ridership demand is not high enough for Greyhound bus lines to feasibly provide service to the City. Bus service may be provided in the future to the city of Milton-Freewater, but Helix is located almost equidistant to Milton-Freewater as it is to the city of Pendleton, where service is already provided.

Although Pendleton, Hermiston, Pilot Rock, and the Umatilla Indian Reservation have dial-a-ride type service available for the transportation disadvantaged, Helix does not have this service. Dial-a-ride service is defined as door-to-door service initiated by a user's request for transportation service from his/her origin to specific locations on an immediate or advance reservation basis. These services are provided by the Pendleton Senior Center in Pendleton, the Confederated Tribes of the Umatilla Indian Reservation on the Umatilla Indian Reservation, the Hermiston Senior Center in Hermiston, and the Pilot Rock Lions Club in Pilot Rock. A similar kind of service could be appropriate for Helix.

Helix has no local fixed-route transit service at this time. The small size and low traffic volumes on city streets indicate that mass transit is not necessary nor economically feasible at this time. The Transportation Planning Rule exempts cities with a population of less than 25,000 from developing a transit system plan or a transit feasibility study as part of their Transportation System Plans.

Rail Service Plan

Helix has no passenger or freight rail service. Until recently, AMTRAK service was available in Hermiston and Pendleton along the rail line which follows the I-84 corridor from Portland to Boise, Idaho and points east. Amtrak is currently experiencing a funding crisis. As a result, passenger service between Portland and Denver, including service to cities within Umatilla County, was discontinued in May 1997. This line now serves only freight traffic.

The Burlington Northern Railroad tracks located on the western fringes of town were recently removed in 1992. The future of the abandoned rail line right-of-way is uncertain, with the recent increase in industrial-agribusiness activity. The nearest freightline to Helix is the Union Pacific mainline which runs through Pendleton. There is also a major freight line owned and operated by Union Pacific Railroad, a Class I line-haul freight railroad, which stops in Hermiston. In addition, there is a switch line out of Pendleton which hauls freight from Pilot Rock two to three days per week, and a line between Milton-Freewater and Weston on the Blue Mountain Railroad consisting of one freight train per day (maximum) or some local switching.

Air Service Plan

Helix does not have its own air service within the City. However, there are many airport facilities nearby. Eastern Oregon Regional Airport is located in Pendleton, approximately 25 miles southwest of Helix, and provides commercial air service. Hermiston Municipal Airport is located in Hermiston, approximately 40 miles west of Helix, and provides chartered flights. Other small nearby airports in the county include: Barrett Field northwest of Athena, the Pea Growers' Field south of Athena, and Curtis Airfield northwest of Pendleton. These airports are small, private, uncontrolled airstrips mainly used for crop dusting operations.

Pipeline Service

There are currently no pipelines serving Helix. However, there is an oil pipeline that runs through the area southwest of the City. There are no plans at this time to expand or relocated this pipeline.

Water Transportation

Helix has no water transportation services.

TRANSPORTATION SYSTEM PLAN IMPLEMENTATION PROGRAM

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

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

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

20-Year Capital Improvement Program

Table 7-4 summarizes the CIP and provides cost information. The cost estimates for all the projects listed in the CIP were prepared on the basis of 1998 dollars. These costs include design, construction, and some contingency costs. They are preliminary estimates and generally do not include right-of-way acquisition, water or sewer facilities, or adding or relocating public utilities. The following schedule is not a prioritized list and scheduled implementation of these projects is at the discretion of the city and/or county, depending upon jurisdiction over the projects.

Helix has identified a total of eight projects in its CIP with a total cost of $1,178,000.

TABLE 7-4
CAPITAL IMPROVEMENT PROGRAM (1998 DOLLARS)

		Costs ($ X 1,000)				
Project #	Location /Description	City	County	State	Private	Total
1.	Repave road near the intersection of Harrison Street and Columbia Street		$2.3			$2.3
2.	Replace bridge on Concord Street	$7.35		$66.15		$73.5
3.	Pave Morton Street	$8.5				$8.5
4.	Upgrade Aurora Street and Thurman Street to urban residential street standards between Harrison Street and Vesper Street	TBD	TBD	TBD	TBD	$75.0
5.	Replace bridge on Industrial Road, north of Heather Court and west of Harrison Street.	$6.99		$62.91		$69.9
6.	Upgrade Industrial Road to urban collector street standards.	TBD	TBD	TBD	TBD	$630.0
7.	Construct sidewalk along south side of Concord Street, between Harrison and bridge west of city park	$8.7				$8.7
8.	Construct sidewalks along city streets where they are not already provided.	TBD	TBD	TBD	TBD	$310.0
Total		**$31.54**	**$2.3**	**$129.06**	**$0.0**	**$1,178.0**

CHAPTER 8: FUNDING OPTIONS AND FINANCIAL PLAN

The Transportation Planning Rule requires Transportation System Plans to evaluate the funding environment for recommended improvements. This evaluation must include a listing of all recommended improvements, estimated costs to implement those improvements, a review of potential funding mechanisms, and an analysis of existing sources' ability to fund proposed transportation improvement projects. Helix's TSP identifies over $1.1 million in eight specific projects over the next 20 years. This section of the TSP provides an overview of Helix's revenue outlook and a review of some funding and financing options that may be available to the city of Helix to fund the improvements.

Pressures from increasing growth throughout much of Oregon have created an environment of estimated improvements that remain unfunded. Helix will need to work with Umatilla County and ODOT to finance the potential new transportation projects over the 20-year planning horizon. The actual timing of these projects will be determined by the rate of population and employment growth actually experienced by the community. This TSP assumes Helix will grow at a rate comparable to past growth, consistent with the county-wide growth forecast. If population growth exceeds this rate, the improvements may need to be accelerated. Slower than expected growth will relax the improvement schedule.

HISTORICAL STREET IMPROVEMENT FUNDING SOURCES

In Oregon, state, county, and city jurisdictions work together to coordinate transportation improvements. Table 8-1 shows the distribution of road revenues for the different levels of government within the state by jurisdiction level. Although these numbers were collected and tallied in 1991, ODOT estimates that these figures accurately represent the current revenue structure for transportation-related needs.

TABLE 8-1
SOURCES OF ROAD REVENUES BY JURISDICTION LEVEL

	Jurisdiction Level			All
Revenue Source	State	County	City	Funds
State Road Trust	58%	38%	41%	48%
Local	0%	22%	55%	17%
Federal Road	34%	40%	4%	30%
Other	9%	0%	0%	4%
Total	101%	100%	100%	99%

Source: ODOT 1993 Oregon Road Finance Study.

At the state level, nearly half (48 percent in Fiscal Year 1991) of all road-related revenues are attributable to the state highway fund, whose sources of revenue include fuel taxes, weight-mile taxes on trucks, and vehicle registration fees. As shown in the table, the state road trust is a considerable source of revenue for all levels of government. Federal sources (generally the federal highway trust account and federal forest revenues) comprise another 30 percent of all road-related revenue. The remaining sources of road-related revenues are generated locally, including property taxes, LIDs, bonds, traffic impact fees, road user taxes, general fund transfers, receipts from other local governments, and other sources.

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

Transportation Funding in Umatilla County

Historically, sources of road revenues for Umatilla County have included federal grants, state revenues, intergovernmental transfers, interest from the working fund balance, and other sources. Transportation revenues and expenditures for Umatilla County are shown in Table 8-2 and Table 8-3.

TABLE 8-2
UMATILLA COUNTY TRANSPORTATION-RELATED REVENUES

	1992-1993 Actual	1993-1994 Actual	1994-1995 Actual	1995-1996 Actual	1996-1997 Budget	1997-1998 Budget
Beginning Balance	$1,187,957	$992,044	$903,997	$1,762,230	$1,600,000	$1,300,000
DMV License & Gas Tax Fees	$2,956,777	$3,145,649	$3,258,762	$3,356,616	$3,400,000	$3,400,000
Misc. State Receipts			$635,655	$222,990	$209,000	$219,000
National Forest Rental	$1,061,341	$589,248	$534,150	$189,902	$180,000	$180,000
Mineral Leasing 75%				$125		
Misc. Federal Receipts	$1,968	$1,670	$1,208	$77,681		
Interest on Invested Funds	$72,834	$38,672	$77,885	$92,220	$75,000	$75,000
Refunds & Reimbursements		$75		$338		
Sale of Public Lands	$20,144	$14,363	$5,443	$102	$15,000	$5,000
Rentals/Sale of Supplies	$15,318	$16,565	$51,748	$74,498	$45,000	$27,000
BLM Maintenance Agreement		$2,000				
Misc. Receipts-Local	$26,662	$102,916	$143,691	$48,997		
Service Center	$46,996	$55,961	$53,361	$61,189	$58,500	$64,000
Rural Address fund					$30,000	
	$5,389,996	$4,959,163	$5,665,900	$5,886,887	$5,612,500	$5,270,000

Source: Umatilla County.

As shown in Table 8-2, revenues remained relatively stable (between a low of just under $5 million in 1993-1994 to a high of nearly $5.9 million in 1995-1996). Approximately $3 million of the annual revenues come from the state highway fund, rising slightly from $3 million in 1992-1993 to an estimated $3.4 million in 1996-1997. A declining amount has come from federal apportionment (mostly federal forest receipts). Twenty-five percent of federal forest revenue (the 25 percent fund) is returned to the counties based on their share of the total acreage of federal forests. Westside national forests in Oregon and Washington are subject to the Spotted Owl Guarantee, which limits the decline of revenues from these forests to three percent annually. Oregon forests under the Owl Guarantee include the Deschutes, Mt. Hood, Rogue River, Siskiyou, Siuslaw, Umpqua, and Willamette National Forests. Forest revenues distributed to Umatilla County are from the Umatilla and Whitman forests, not subject to the Owl Guarantee and, therefore, are more difficult to predict. With a healthy working capital balance, the county has also been able to generate between $40,000 and $90,000 annually in interest on its invested funds.

TABLE 8-3
UMATILLA COUNTY TRANSPORTATION-RELATED EXPENDITURES

	1992-1993 Actual	1993-1994 Actual	1994-1995 Actual	1995-1996 Actual	1996-1997 Budget	1997-1998 Budget
Personal Services	$1,908,211	$1,878,969	$1,956,968	$2,077,603	$2,260,676	$2,304,704
Materials and Services	$1,897,273	$1,961,106	$1,564,591	$1,735,853	$2,131,925	$1,972,800
Capital Outlay	$601,846	$225,074	$385,176	$404,357	$400,000	$400,000
Contingency					$568,840	$334,224
Transfer to Road Improvement Fund					$11,555	
Transfer to General Fund						$58,272
	4,407,330	$4,065,149	$3,906,735	$4,217,813	$5,372,996	$5,070,000

Source: Umatilla County.

As shown in Table 8-3, Umatilla County has spent between $225,000 and $600,000 annually in capital improvements. The county also transfers money to a road improvement fund for larger-scale capital improvements. The bulk of expenditures in the road fund are for personal services and materials and services relating to maintenance.

In addition to the road department fund, Umatilla County has a separate bicycle path fund. Its revenues and expenditure history are shown below in Table 8-4. Like the road fund, the bicycle path fund is developing a healthy working capital balance, supporting additional interest income, thereby reducing its dependence on the gas taxes collected through the state highway fund.

TABLE 8-4
UMATILLA COUNTY BICYCLE PATH FUND REVENUES AND EXPENDITURES

	1994-1995 Actual	1995-1996 Actual	1996-1997 Budget	1997-1998 Budget
Beginning Fund Balance	$230,059	$260,652	$299,775	$349,775
Resources				
DMV License & Gas Tax Fees	$32,917	$32,946	$34,000	$34,000
Interest	$13,073	$16,251	$16,000	$18,000
	$45,989	$49,197	$50,000	$52,000
Expenditures				
Materials & Services	$15,396		$150,000	$100,000
Capital Outlay				
	$15,396	$-	$150,000	$100,000

Source: Umatilla County.

Revenues and Expenditures in the City of Helix

Like most jurisdictions in Oregon, the city of Helix funds street operations, maintenance, and improvements through revenue from the state highway fund, interest from its working capital balance, and grants for specific projects. Generally, the state highway fund provides a large proportion of the revenues available for local jurisdiction's roadway moneys. Spending is typically disaggregated in the following categories: personal services, materials and equipment, and capital improvements, with the bulk of the expenditures used for maintenance and operations.

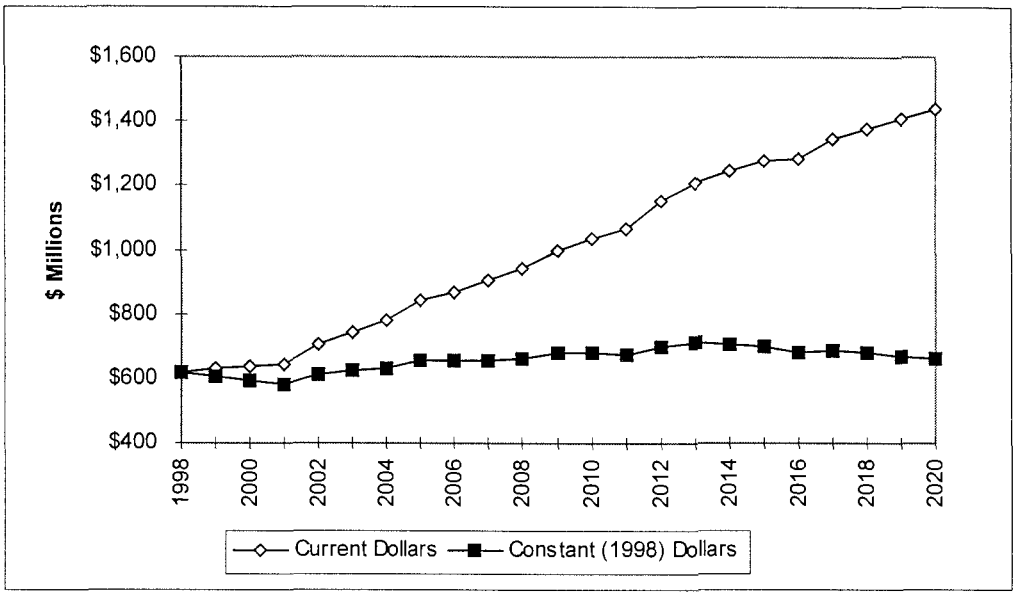
Transportation Revenue Outlook in the City of Helix

ODOT's policy section recommends certain assumptions in the preparation of transportation plans. In its *Financial Assumptions* document prepared in May 1998, ODOT projected the revenue of the state highway fund through year 2020. The estimates are based on not only the political climate, but also the economic structure and conditions, population and demographics, and patterns of land use. The latter is particularly important for state-imposed fees because of the goals in place under Oregon's Transportation Planning Rule (TPR) requiring a 10 percent reduction in per-capita vehicle miles of travel (VMT) in Metropolitan Planning Organization (MPO) areas by year 2015, and a 20 percent reduction by year 2025. This requirement will affect the 20-year revenue forecast from the fuel tax. ODOT recommends the following assumptions:

- Fuel tax increases of one cent per gallon per year (beginning in year 2002), with an additional one cent per gallon every fourth year;
- Vehicle registration fees would be increased by $10 per year in 2002, and by $15 per year in year 2012;
- Revenues will fall halfway between the revenue level generated without TPR and the revenue level if TPR goals were fully met;
- Revenues will be shared among the state, counties, and cities on a "50-30-20 percent" basis rather than the previous "60.05-24.38-15.17 percent" basis; and
- Inflation occurs at an average annual rate of 3.6 percent (as assumed by ODOT).

Figure 8-1 shows the forecast in both current-dollar and inflation-deflated constant (1998) dollars. As highlighted by the constant-dollar data, the highway fund is expected to grow slower than inflation early in the planning horizon until fuel-tax and vehicle-registration fee increases occur in year 2002, increase to a rate somewhat faster than inflation through year 2015, and continue a slight decline through the remainder of the planning horizon.

FIGURE 8-1
STATE HIGHWAY FUND (IN MILLIONS OF DOLLARS)



Source: ODOT Financial Assumptions.

As the state highway fund is expected to be a significant source of funding for Helix, the city is highly susceptible to changes in the state highway fund. In order to analyze the City's ability to fund the recommended improvements from current sources, DEA applied the following assumptions:

- ODOT state highway fund assumptions as outlined above;
- The state highway fund will account for the majority of the city's street fund;
- Interest and other local sources continue to provide stable revenue streams; and
- The proportion of revenues available for capital expenditures for street improvements is estimated to have averaged $1,000 annually.

Communities of similar size to Helix tend to have between $1,000 and $5,000 available annually to fund capital improvements from existing sources. To be conservative, this analysis will assume that the city of Helix has had approximately $1,000 annually from existing sources to fund capital improvements. Applying this and the assumptions about the state highway fund as recommended by ODOT yields total resources between $900 and $1,200 as shown in Table 8-5.

TABLE 8-5
ESTIMATED RESOURCES AVAILABLE TO CITY OF HELIX
FROM STATE HIGHWAY FUND, 1998 DOLLARS

Year	Estimated Funds Available for Capital Outlay
1999	$1,000
2000	$1,000
2001	$1,000
2002	$900
2003	$1,000
2004	$1,000
2005	$1,000
2006	$1,100
2007	$1,100
2008	$1,100
2009	$1,100
2010	$1,100
2011	$1,100
2012	$1,100
2013	$1,100
2014	$1,200
2015	$1,100
2016	$1,100
2017	$1,100
2018	$1,100
2019	$1,100
2020	$1,100

The amount actually received from the state highway fund will depend on a number of factors, including the actual revenue generated by state gasoline taxes, vehicle registration fees, and other sources, and the population growth in Helix (since the distribution of the state highway fund is based on an allocation formula which includes population).

REVENUE SOURCES

In order to finance the recommended transportation system improvements requiring expenditure of capital resources, it will be important to consider a range of funding sources. Although the property tax has traditionally served as the primary revenue source for local governments, property tax revenue goes into general fund operations, and is typically not available for road improvements or maintenance. Despite this limitation, the use of alternative revenue funding has been a trend throughout Oregon as the full implementation of Measures 5 and 47 have significantly reduced property tax revenues (see below). The alternative revenue sources described in this section may not all be appropriate in Helix; however, this overview is being provided to illustrate the range of options currently available to finance transportation improvements during the next 20 years.

Property Taxes

Property taxes have historically been the primary revenue source for local governments. However, property tax revenue goes into general fund operations, and is not typically available for road improvements or maintenance.

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

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

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

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

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

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

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

System Development Charges

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

Local governments have the legal authority to charge property owners and/or developers fees for improving the local public works infrastructure based on projected demand resulting from their development. The charges are

most often targeted towards improving community water, sewer, or transportation systems. Cities and counties must have specific infrastructure plans in place that comply with state guidelines in order to collect SDCs.

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

State Highway Fund

Gas tax revenues received from the state of Oregon are used by all counties and cities to fund road and road construction and maintenance. In Oregon, the state collects gas taxes, vehicle registration fees, overweight/overheight fines and weight/mile taxes and returns a portion of the revenues to cities and counties through an allocation formula. Like other Oregon cities, the city of Helix uses its state gas tax allocation to fund street construction and maintenance.

Local Gas Taxes

The Oregon Constitution permits counties and incorporated cities to levy additional local gas taxes with the stipulation that the moneys generated from the taxes will be dedicated to road-related improvements and maintenance within the jurisdiction. At present, only a few local governments (including the cities of Woodburn and The Dalles and Multnomah and Washington counties) levy a local gas tax. The city of Helix may consider raising its local gas tax as a way to generate additional road improvement funds. However, with relatively few jurisdictions exercising this tax, an increase in the cost differential between gas purchased in Helix and gas purchased in neighboring communities may encourage drivers to seek less expensive fuel elsewhere. Any action will need to be supported by careful analysis to minimize the unintended consequences of such an action.

Vehicle Registration Fees

The Oregon vehicle registration fee is allocated to the state, counties and cities for road funding. Oregon counties are granted authority to impose a vehicle registration fee covering the entire county. The Oregon Revised Statutes would allow Umatilla County to impose a biannual registration fee for all passenger cars licensed within the county. Although both counties and special districts have this legal authority, vehicle registration fees have not been imposed by local jurisdictions. In order for a local vehicle registration fee program to be viable in Umatilla County, all the incorporated cities and the county would need to formulate an agreement which would detail how the fees would be spent on future road construction and maintenance.

Local Improvement Districts

The Oregon Revised Statutes allow local governments to form Local Improvement Districts (LIDs) to construct public improvements. LIDs are most often used by cities to construct localized projects such as streets, sidewalks or bikeways. The statutes allow formation of a district by either the city government or property owners. Cities that use LIDs are required to have a local LID ordinance that provides a process for district formation and payback provisions. Through the LID process, the cost of local improvements are generally spread out among a group of property owners within a specified area. The cost can be allocated based on

property frontage or other methods such as traffic trip generation. The types of allocation methods are only limited by the Local Improvement Ordinance. The cost of LID participation is considered an assessment against the property which is a lien equivalent to a tax lien. Individual property owners typically have the option of paying the assessment in cash or applying for assessment financing through the City. Since the passage of Ballot Measure 5, cities have most often funded local improvement districts through the sale of special assessment bonds.

GRANTS AND LOANS

There are a variety of grant and loan programs available, most with specific requirements relating to economic development or specific transportation issues, rather than for the general construction of new streets. Many programs require a match from the local jurisdiction as a condition of approval. Because grant and loan programs are subject to change and statewide competition, they should not be considered a secure long-term funding source. Most of the programs available for transportation projects are funded and administered through ODOT and/or the Oregon Economic Development Department (OEDD). Some programs that may be appropriate for the city of Helix are described below. The primary contact for information on the following programs is ODOT Region 5, which can be reached at (541) 963-3177.

Bike-Pedestrian Grants

By law (ORS 366.514), all road, street or highway construction or reconstruction projects must include facilities for pedestrians and bicyclists, with some exceptions. ODOT's Bike and Pedestrian Program administers two programs to assist in the development of walking and bicycling improvements: local grants, and Small-Scale Urban Projects. Cities and counties with projects on local streets are eligible for local grant funds. An 80 percent state/20 percent local match ratio is required. Eligible projects include curb extensions, pedestrian crossings and intersection improvements, shoulder widening and restriping for bike lanes. Projects on urban state highways with little or no right of way taking and few environmental impacts are eligible for Small-Scale Urban Project Funds. Both programs are limited to projects costing up to $100,000. Projects that cost more than $100,000, require the acquisition of ROW, or have environmental impacts should be submitted to ODOT for inclusion in the STIP.

Access Management

The Access Management Program sets aside approximately $500,000 a year to address access management issues. One primary component of this program is an evaluation of existing approach roads to state highways. These funds are not committed to specific projects, and priorities and projects are established by an evaluation process.

Enhancement Program

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

jurisdictions have until January 1999 to complete and file their applications for funding available during the 2000-2003 fiscal years that begin October 1999.

Highway Bridge Rehabilitation or Replacement Program

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

Transportation Safety Grant Program

Managed by ODOT's Transportation Safety Section (TSS), this program's objective is to reduce the number of transportation-related accidents and fatalities by coordination a number of statewide programs. These funds are intended to be used as seed money, funding a program for three years. Eligible programs include programs in impaired driving, occupant protection, youth, pedestrian, speed, enforcement, bicycle and motorcycle safety. Every year, TSS produces a Highway Safety Plan that identifies the major safety programs, suggests countermeasures to existing safety problems, and lists successful projects selected for funding, rather than granting funds through an application process.

Federal Transit Administration (FTA) Section 5311-Non-urbanized Area Formula Program

Section 5311 is a federally sponsored program for general public transit services in small urban and rural areas. It supports both capital and operation needs. The ODOT Public Transit Division distributes these funds. In FY00, the cities of Pendleton and Milton-Freewater received these funds to support transportation programs for the general public. The city of Helix would be eligible for these funds if it implemented intercity service or intracity services open to the general public. The recipient of these funds must provide matching funds of up to 50 percent for operating uses and up to 20 percent for capital expenses.

Section 5311(f) – Part of 5311 funds is allocated to intercity services. Intercity transit services connect communities to rail, bus and air hubs. These funds can be used for both capital and operating expenses. Local revenues must match these funds. Match requirements are the same as those for 5311 funds.

Surface Transportation Program (STP) Funds

TEA-21, the Federal Transportation Efficiency Act for the 21st Century, that funds programs for highways and transit, permits surface transportation program funding flexibility between modes. This gives the state more latitude in selecting the modal alternatives that would best address local congestion problems. STP funds are generally limited to capital projects with a few exceptions. In non-urbanized areas ODOT has the responsibility of allocating these funds. In Helix, ODOT Region 5 makes funding decisions with public input.

Department of Labor Welfare-to-Work Program

The US Department of Labor provides grants to communities to give transitional assistance to move welfare recipients into unsubsidized employment. One of the areas applicants are encouraged to consider is the development of responsive transportation systems to move people to work or to career training. These grants must serve at least 100 welfare recipients. The Department of Labor expects the grants to range from one million to five million dollars over a period of three years. Applications must be a coordinated effort between transportation providers and Oregon Adult and Family Services. The funding can be used for capital and operating expenses and will cover up to 50 percent of the cost of a program.

ODOT has submitted a grant application for funding for Oregon programs. ODOT identified the Bend/Redmond area as the first demonstration program. Other areas of the state may be eligible after that. To be eligible for this funding, it is essential that communities bring together local ODOT staff, transit providers and AFS staff to begin the coordination process.

FTA Section 5310 Discretionary Grants

This program funds vehicles and other capital projects for programs that serve elderly and disabled people. In FY99 the city of Pendleton received $36,000 to purchase a new vehicle.

Special Transportation Fund

The Special Transportation Fund (STF) awards funds to maintain, develop, and improve transportation services for people with disabilities and people over 60 years of age. Financed by a two-cent tax on each pack of cigarettes sold in the state, the annual distribution is approximately $5 million. Three-quarters of these funds are distributed on a per-capita formula to mass transit districts, transportation districts, where such districts do not exist, and counties. The remaining funds are distributed on a discretionary basis.

County Allotment Program

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

Immediate Opportunity Grant Program

The Oregon Economic Development Department (OEDD) and ODOT collaborate to administer a grant program designed to assist local and regional economic development efforts. The program is funded to a level of approximately $7 million per year through state gas tax revenues. The following are primary factors in determining eligible projects:

- Improvement of public roads.

- Inclusion of an economic development-related project of regional significance.
- Creation or retention of primary employment.
- Ability to provide local funds (50/50) to match grant.
- Improvement to the quality of the community.

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

Oregon Special Public Works Fund

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

While SPWF program assistance is provided in the form of both loans and grants, the program emphasizes loans in order to assure that funds will return to the state over time for reinvestment in local economic development infrastructure projects. Jurisdictions that have received SPWF funding for projects that include some type of transportation-related improvement include the cities of Baker City, Bend, Cornelius, Forest Grove, Madras, Portland, Redmond, Reedsport, Toledo, Wilsonville, Woodburn, and Douglas County.

Oregon Transportation Infrastructure Bank

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

ODOT FUNDING OPTIONS

The State of Oregon provides funding for all highway related transportation projects through the Statewide Transportation Improvement Program (STIP) administered by the Oregon Department of Transportation. The STIP outlines the schedule for ODOT projects throughout the State. The STIP, which identifies projects for a three-year funding cycle, is updated on an annual basis. In developing this funding program, ODOT must verify that the identified projects comply with the Oregon Transportation Plan (OTP), ODOT Modal Plans, Corridor Plans, local Comprehensive Plans, and federal planning requirements. The STIP must fulfill federal planning requirements for a staged, multi-year, statewide, intermodal program of transportation projects. Specific transportation projects are prioritized based on a review of the TEA-21

planning requirements and the different state plans. ODOT consults with local jurisdictions before highway related projects are added to the STIP.

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

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

An ODOT funding technique that will likely have future application to Helix's TSP is the use of state and federal transportation dollars for off-system improvements. Until the passage and implementation of ISTEA, state and federal funds were limited to transportation improvements within highway corridors. ODOT now has the authority and ability to fund transportation projects that are located outside the boundaries of the highway corridors. The criteria for determining what off-system improvements can be funded has not yet been clearly established. It is expected that this new funding technique will be used to finance local system improvements that reduce traffic on state highways or reduce the number of access points for future development along state highways.

Financing Tools

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

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

General Obligation Bonds

General obligation (GO) bonds are voter-approved bond issues that represent the least expensive borrowing mechanism available to municipalities. GO bonds are typically supported by a separate property tax levy

specifically approved for the purposes of retiring debt. The levy does not terminate until all debt is paid off. The property tax levy is distributed equally throughout the taxing jurisdiction according to the assessed value of property. GO debts are typically used to make public improvement projects that will benefit the entire community.

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

Limited Tax Bonds

Limited tax general obligation (LTGO) bonds are similar to GO bonds in that they represent an obligation of the municipality. However, a municipality's obligation is limited to its current revenue sources and is not secured by the public entity's ability to raise taxes. As a result, LTGO bonds do not require voter approval. However, since the LTGO bonds are not secured by the full taxing power of the issuer, the limited tax bond represents a higher borrowing cost than GO bonds. The municipality must pledge to levy the maximum amount under constitutional and statutory limits, but not the unlimited taxing authority pledged with GO bonds. Because LTGO bonds are not voter approved, they are subject to the limitations of Ballot Measures 5, 47, and 50.

Bancroft Bonds

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

FUNDING REQUIREMENTS

Helix's TSP identifies both capital improvements and strategic efforts recommended during the next 20 years to address safety and access problems and to expand the transportation system to support a growing population and economy. The TSP identifies 8 projects estimated to cost over $1.1 million over the 20-year planning horizon. Seven of these eight projects will require funding from the City, including replacing the Concord Street Bridge, paving Morton Street, and construction of sidewalks along the south side of Concord Street. Estimated costs by project are shown in Table 8-6.

TABLE 8-6
RECOMMENDED PROJECTS AND FINANCIAL RESPONSIBILITY

Project #	Location /Description	Costs ($ X 1,000) City	County	State	Private	Total
1.	Repave road near the intersection of Harrison Street and Columbia Street		$2.3			$2.3
2.	Replace bridge on Concord Street	$7.35		$66.15		$73.5
3.	Pave Morton Street	$8.5				$8.5
4.	Upgrade Aurora Street and Thurman Street to urban residential street standards between Harrison Street and Vesper Street	TBD	TBD	TBD	TBD	$75.0
5.	Replace bridge on Industrial Road, north of Heather Court and west of Harrison Street.	$6.99		$62.91		$69.9
6.	Upgrade Industrial Road to urban collector street standards.	TBD	TBD	TBD	TBD	$630.0
7.	Construct sidewalk along south side of Concord Street, between Harrison and bridge west of city park	$8.7				$8.7
8.	Construct sidewalks along city streets where they are not already provided.	TBD	TBD	TBD	TBD	$310.0
Total		**$31.54**	**$2.3**	**$129.06**	**$0.0**	**$1,178.0**

A portion of the cost to replace the Concord Street Bridge is eligible for funding through the Highway Bridge Rehabilitation and Replacement Fund, as described earlier in this Chapter. Administered by ODOT, this program distributes federal funds for the replacement and rehabilitation of bridges. It requires local and state matches of 10 percent each.

Based on current revenue sources for the city of Helix as estimated in Table 8-5 and the improvements identified in this Transportation System Plan, the City is expected to experience a small budget deficit, as shown in Table 8-7. Other grant funds may also be available to address other specific projects. For example, the sidewalk along Concern Street may be eligible for bike and pedestrian funding as it serves to enhance the pedestrian network.

TABLE 8-7
ESTIMATED CAPITAL FUNDING BALANCE

	Amount
Capital Available from Existing Revenue Sources	$22,500
Capital Needed to Fund Projects Identified as City-Funded Projects	$31,540
Surplus (Deficit)	($ 9,040)

This Transportation System Plan recommends eight projects, estimated to cost over $1.1 million for the Helix area. Based on estimates of existing funding sources, and the estimates of capital outlay required to implement the recommended projects, the city of Helix is not expected to be able to address the capital requirements, and will require assistance from state and federal programs. The city of Helix will need to continue to work with Umatilla County and ODOT in order to fully implement the projects identified in this TSP.

APPENDIX A

Helix Plans

HELIX PLANS

Comprehensive Plan and Growth Report (Adopted 1993)

The City of Helix's Comprehensive Plan was prepared by a joint effort of a planning consultant, Stephen Purcell, and a citizens group. The Plan was updated in 1993.

The plan was developed in accordance with the provisions of Oregon Revised Statutes (ORS) Chapters 92, 197, 227, and 696. The plan provides a statement of the City's goals and policies for guiding the future growth and development of the City. The Plan contains 14 goals two of which strongly impact the development of the Transportation System Plan, the Transportation goal and the Public Facilities and Services goal. The Transportation Goal is, "To provide and encourage a safe, convenient and economic transportation system." Additionally, the City has the objective of providing for easy pedestrian and vehicular movement within the community. Two policies are listed to help achieve the goal: to continue maintenance and paving of city streets, and to encourage provision of transportation alternatives for the elderly and handicapped. The Public Facilities and Services goal is, "To plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban development." This includes cooperating with other agencies to provide and/or coordinate public services and considering pooling with other agencies to provide needed services.

In addition to the goals and policies, the plan contains information, findings, and a growth report. Important findings include:

- The small, rural community character of Helix is one of the city's chief attributes and must be maintained.
- More growth is desired in the community to support the school (Helix has its own school) and accommodate young local couples and other families that would like to live in Helix.
- There is an inadequate housing supply; more rental accommodations and building lots need to be made available.
- Creation of more manufacturing and service jobs in the community is both necessary and desirable.
- There are several unpaved streets in the city.
- The continued maintenance and availability of county roads is vital to the community, as they provide access within Helix's market area and between neighboring cities.
- There is a need for public transit between Helix and nearby communities, especially to help senior citizens reach destinations outside the city.

Helix Growth Report

The growth report is included as an appendix to the Comprehensive Plan. It examines the existing land use, recent growth, growth problems and potentials, and the various growth areas of the community.

Helix is "built-out" for all intents and purposes with all the vacant land built on and any more infill of the existing townsite prohibited due to the septic tank/lot size restrictions. The development of the area is also constrained because the city is built almost entirely in the Greasewood Creek floodplain.

An assessment of buildable lands was conducted for the City. It breaks the lands into three categories--residential areas, commercial areas, and industrial areas. Residential areas are concentrated outside of the city limits but within the urban growth area north and south of the City. The growth report assumes that 314 persons could be accommodated on 121 residential lots.

All buildable commercial areas are located in the Helix downtown area. These lands include vacant or underutilized parcels with access to the Helix water system. Industrial areas include approximately 30 acres of industrial lands adjacent to the Burlington Northern right-of-way. Most of the available sites are small, 2-5 acres in size, and would be suitable for small-scale industries.

Primary employers listed for City include the City of Helix with 27 employees (Griswold School has 24 employees), grain elevators, Agri-Chem, Brogoitti Farm Supply.

Agri-Chem and Brogoitti Farm Supply no longer exist within the City.

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APPENDIX B

1997 Major Streets Inventory

1997 MAJOR STREETS INVENTORY

Helix Transportation System Plan

Roadway Segment Location	Jurisdiction	Level of Importance	Speed Limit (mph)	Street Width (feet)	No. of Travel Lanes	Passing Lanes (direction)	Shoulders Width (feet)	Shoulders Side	Shoulders Paving	On-Street Parking	Curbs	Sidewalks	Bikeway	1997 Pavement Condition*
Arterials														
Havana-Helix Highway														
Columbia Street to MP 0.04	State	District	25	20	2	No	2 - 4	Both	Partial	No	No	No	No	Fair
Collectors (current functioning)														
Columbia Street														
West city limits to east city limits	City	NA	25	22	2	No	No	NA	NA	No	No	No	No	Fair
Concord Street														
Harrison Street to Main Street	City	NA	25	40	2	No	No	NA	NA	No	Yes	Both Sides	No	Fair
Harrison Street														
Columbia Road to Concord Street	City	NA	25	18	2	No	No	NA	NA	No	No	West Side	No	Poor
Main Street														
Concord Street to Columbia Street	City	NA	25	24	2	No	No	NA	NA	No	No	West Side	No	Fair
Also, intermittent sidewalks on Vesper Street, Cleveland Street, and Solar Street														

* Pavement condition information for arterials is from the 1997 ODOT Pavement Condition Report. Condition information for collectors is based on field survey conducted by DEA in November 1997.

APPENDIX C

Umatilla County Population Discussion

Umatilla County Population Discussion

METHODOLOGY AND DATA SOURCES

Population estimates and projections were developed from historical data, official annual estimates, official long-range forecasts, and an impact analysis of four major employers entering or expanding in western Umatilla County. Historical data are compiled as reported by the Census Bureau. Portland State University's Center for Population Research and Census developed annual population estimates for cities and counties for the purpose of allocating certain state tax revenues to cities and counties. The State of Oregon Office of Economic Analysis (OEA) provided long-term (through year 2040) state population forecasts, disaggregated by county, for state planning purposes.

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

These preliminary forecasts were used as a basis for discussion with individuals who have local knowledge and expertise. The projections were then revised based on local input and analysis. One element that had a significant impact on the population analysis was the HUES (Hermiston, Umatilla, Echo, and Stanfield) Growth Impact Study, conducted by the Benkendorf Associates Corporation, Hobson Johnson & Associates, and Martin Davis Consulting, which quantifies the impact of the construction and operation of four major employers.

As required by state policy, this forecast is consistent with the State of Oregon Office of Economic Analysis forecast at the end of the 20-year planning period. Because of the impact of the four large employers, however, the growth of Umatilla County will occur faster in the beginning of the planning horizon, slowing to compensate near the end of the planning period.

These population and employment forecasts were developed to determine future transportation needs. The amount of growth, and where it occurs, will affect traffic and transportation facilities in the study area. This report is not intended to provide a

Umatilla County Population Discussion

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These population and employment forecasts were developed to determine future transportation needs. The amount of growth, and where it occurs, will affect traffic and transportation facilities in the study area. This report is not intended to provide a

complete economic forecast or housing analysis, and it should not be used for any purpose other than that for which it was designed.

CURRENT POPULATION AND EMPLOYMENT LEVEL

Estimated at 65,500 in 1997, the population of Umatilla County has grown relatively rapidly since the 1990 Census, with an average annual growth rate of over one-and-one-half percent. The following table shows the estimated change in population for Umatilla County and the jurisdictions of Adams, Athena, Echo, Helix, Pilot Rock, Stanfield, Ukiah, and Weston for 1990 and 1996.

Umatilla County Population Level
1990 and 1996

			1990-1997 Change	
	1990	1997	Number	CAARG*
Umatilla County	59,249	65,500	6,251	1.4%
Adams	223	265	42	2.5%
Athena	997	1,120	123	1.7%
Echo	499	585	86	2.3%
Helix	150	190	40	3.4%
Pilot Rock	1,478	1,585	107	1.0%
Stanfield	1,568	1,770	202	1.7%
Ukiah	250	240	-10	-0.6%
Weston	606	680	74	1.6%

* *Compound Average Annual Rate of Growth*

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

Most of the jurisdictions in Umatilla County have grown at a healthy rate, comparable to the annual growth rate of 1.4 percent for the county overall. The smaller jurisdictions of Adams and Helix have grown at a slightly faster rate, starting from the smaller population bases of 223 (Adams) and 150 (Helix) in 1990.

Populations with Specific Transportation Needs

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

As stated above, Portland State University's Center for Population and Census estimates the Umatilla County's population as 65,500 in 1997. The Center further estimates that 18,623 of these people, or about 28 percent of the population, is under the age of 18 and that 5,505 are under age 5. Because the purpose of this analysis is to determine the number of people with specific transportation needs, DEA used PSU's age disaggregation to estimate that 16,617 people are under 16, the legal driving age in Umatilla County.

According to the 1990 Census, 16.5 percent of the 57,046 persons living in Umatilla County (for whom poverty status is determined) were below poverty level. Poverty statistics are based on a threshold of nutritionally-adequate food plans by the Department of Agriculture for the specific size of the family unit in question. The distribution of the population below poverty level shows that a larger proportion of younger persons than older populations are affected by this indicator, as shown in the following table.

Poverty Status
Umatilla County--1990 Census

	Below Poverty Level				
	Male	Female	Total Below Poverty Level	Total* Population	Percent of Total Population Below Poverty
11 and under	1,408	1,175	2,583	10,929	23.6%
12 to 17	481	517	998	5,223	19.1%
18 and over	2,300	3,538	5,838	40,894	14.3%
Total	4,189	5,230	9,419	57,046	16.5%

** For whom poverty status is determined.*

Source: U.S. Census Bureau.

The Census Bureau reports that 3.3 percent of the population 16 and older had a mobility limitation in 1990. Persons were identified as having a mobility limitation if they had a health condition (physical and/or mental) that lasted for six or more months and which made it difficult to go outside the home alone. A temporary health problem, such as a broken bone that was expected to heal normally, was not considered a health condition.

Using the proportion of the population with mobility limitations and below the poverty level[1] in 1990, DEA estimated the number of people with specific transportation needs in 1996. The following table shows that an estimated 34.8 percent of the population may have specific transportation needs. (There is likely to be some overlap between the 3.3 percent of the population with mobility limitations and the 14.5 percent below the poverty level; therefore, the sum of the figures may overstate the proportion of the population with specific transportation needs.)

Estimated Population with Specific Transportation Needs
1996, Umatilla County

	Percent of Total Population	Estimated Number
Persons between the ages of 5 and 15	17.0%	11,115
Persons 16 and older under Poverty Level	14.5%	9,480
Persons 16 and older with Mobility Limitation	3.3%	2,130
Total Specific Transportation Needs Population	34.8%	22,725

[1] DEA used the Census Bureau's age disaggregation to estimate that 10.7 percent of the population over the age of 16 was under the poverty level in 1990.

Source: U.S. Census Bureau.

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

HISTORICAL GROWTH

The population of Umatilla County has grown since the 1970s, with significantly slower growth in the 1980s, reflecting a general slowdown in the state's economy. Helix, Pilot Rock, and Weston actually experienced a net population loss between 1970 and 1990. The following table shows the population trend for Adams, Athena, Echo, Helix, Pilot Rock, Stanfield, Ukiah, and Weston, and Umatilla County as a whole.

Umatilla County Historical Population Trend

							1970-1990 Change	
	1970	1980	1985	1990	1995	1997	Number	CAARG*
Umatilla County	44,923	58,855	60,000	59,249	65,200	65,500	14,326	1.4%
Adams	219	240	245	223	260	265	4	0.1%
Athena	872	965	955	997	1,080	1,120	125	0.7%
Echo	479	624	605	499	530	585	20	0.2%
Helix	152	155	155	150	170	190	(2)	(0.1%)
Pilot Rock	1,612	1,630	1,630	1,478	1,560	1,585	(134)	(0.4%)
Stanfield	891	1,568	1,660	1,568	1,700	1,770	677	2.9%
Ukiah	N.A.	249	230	250	270	240	N/A	N/A
Weston	660	719	730	606	655	680	(54)	(0.4%)

** Compound Average Annual Rate of Growth*
Ukiah was incorporated in July 1972.
Source: Portland State University Center for Population Research and Census.

The number of people residing in Stanfield nearly doubled between 1970 and 1980. This population growth may have been fueled by some significant housing developments and the location of several food processing plants in Stanfield during this time.

POPULATION AND EMPLOYMENT FORECASTS

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

The State Office of Economic Analysis prepared long-term population projections by county. Based on these projections and the methodology described above, preliminary population forecasts for the jurisdictions of Adams, Athena, Echo, Helix, Pilot Rock, Stanfield, Ukiah, and Weston were developed in five-year increments.

An ad-hoc HUES (Hermiston, Umatilla, Echo, and Stanfield) Impact Planning Group was formed in early 1997 to lead cooperative efforts to address growth concerns in western Umatilla County arising from four major employers locating or expanding in the region. The HUES Growth Impact Study, conducted by the Benkendorf Associates Corporation, Hobson Johnson & Associates, and Martin Davis Consulting, quantifies the impact of the construction and operation of these four facilities. Employment impacts are translated into household and population impacts, and disaggregated across the four HUES communities, Pendleton, and rural Umatilla County.

Of these four employers (the Two Rivers Correctional Institution, the Umatilla Chemical Agent Disposal Facility, the Union Pacific Railroad Hinkle Locomotive Shop, and the Wal-Mart Distribution Center and Truck Maintenance Facility), only one (the Wal-Mart Distribution Center) had been announced and incorporated in the long-range population and employment forecast prepared by the Office of Economic Analysis. Because the Umatilla County site was selected as the location for the Wal-Mart Distribution Center in 1994, its impacts were already incorporated in the Office of Economic Analysis long-term population and employment forecast. Applying the HUES methodology, DEA, Inc. subtracted out the impact of the Wal-Mart Distribution Center, in order to identify the population impacts resulting from the three "big four" employers otherwise not accounted for in the OEA forecast.

HUES Population Impacts by Community
HUES Study "Scenario One" Less Wal-Mart Distribution Center

	Base Population	Population Impact		
	1996	2000	2005	2007
Hermiston	11,050	1,681	2,354	1,412
Umatilla	3,310	503	705	423
Echo*	530	81	113	68
Stanfield	1,755	267	374	224
HUES communities subtotal		2,531	3,545	2,128
Pendleton		223	313	188
Rural Umatilla County		223	313	188
Total Population Impact		2,978	4,171	2,503

* *The HUES study estimates Echo's base population using utility hook-up data and a 2.5 average household size. However, this methodology yields a base-year estimate inconsistent with the "official" state estimate. As required by state policy, the Transportation System Plan uses the official state estimate as the base population. As appropriate, the TSP uses utility hook-up data as the base number of households.*

Source: HUES Growth Impact Study and David Evans and Associates, Inc.

These estimated impacts were then applied to the original population forecast for Echo and Stanfield by the mathematical model. The resulting population forecast is shown in five-year increments in the table below.

Umatilla County Population Forecast

	1995	2000	2005	2010	2015	2017	1995-2000 CAARG	1995-2017 CAARG
Umatilla County	65,200	72,800	77,000	78,300	79,500	80,073	2.2%	0.9%
Adams	260	270	280	290	300	310	0.7%	0.8%
Athena	1,080	1,160	1,210	1,270	1,330	1,360	1.4%	1.1%
Echo	530	610	640	650	660	660	2.9%	1.0%
Helix	170	190	210	220	230	230	2.7%	1.4%
Pilot Rock	1,560	1,580	1,600	1,610	1,640	1,650	0.3%	0.3%
Stanfield	1,700	2,020	2,130	2,290	2,430	2,490	3.5%	1.8%
Ukiah	270	290	310	320	340	340	1.6%	1.1%
Weston	655	690	700	710	720	730	1.0%	0.5%

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

Overall, Umatilla County is expected to experience healthy rates of population growth, averaging nearly one percent annually over the planning horizon. As shown in the table, the western portion of Umatilla County is expected to grow faster than the rest of Umatilla County, fueled by the four major employers. Of all jurisdictions included in this analysis, Stanfield is expected to grow the fastest, at an annual average of 3.5 percent at the beginning of the planning horizon, slowing somewhat, but still achieving a very rapid average annual rate of 1.8 percent for the 20-year planning period.