City of La Pine

TRANSPORTATION SYSTEM PLAN

October 2013

La Pine Transportation System Plan

La Pine, Oregon

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Introduction

INTRODUCTION

In collaboration with the Oregon Department of Transportation (ODOT) and Deschutes County, the City of La Pine initiated the development of its first Transportation System Plan (TSP) in 2012. This TSP is intended to provide the City, County and ODOT with guidance for operating and improving a multimodal transportation system within the La Pine Urban Growth Boundary. The TSP focuses on priority projects, policies and programs for the next twenty years but also provides a vision for longer term projects that could be implemented should funding become available. The TSP is intended to be flexible to respond to changing community needs and revenue sources over the next twenty years and will be updated every 5 – 7 years.

TSP PROCESS

The TSP was developed based on:

- Review of state, regional, and local transportation plans and policies that the La Pine TSP must either comply with or be consistent with.
- Community input gathered through public workshops at key points in the project.
- Working with technical and citizen advisory committees to establish goals and objectives, identify and assess alternatives, and prioritize future needs.
- Using a detailed inventory of existing transportation facilities to serve as a foundation to establish needs near- and long-term.
- Identifying and evaluating future transportation needs to support the land use vision and economic vitality of the urban area.
- Prioritizing improvements and strategies that are reflective of the community's vision and fiscal realities.

PUBLIC ENGAGEMENT

The development of the TSP provided City residents the opportunity to share their visions for the future of a multimodal transportation system to serve both local travel and more regional and statewide travel needs. Several citizens provided feedback via a public open house as well as through on-line commenting forums. These comments were used to refine the TSP goals and policies, as well as the priority projects for inclusion.

In addition to general forums, a Technical Advisory Committee (TAC) and a Citizen Advisory Committee (CAC) helped to guide all aspects of the TSP development. The TAC included staff from the City of La Pine, Oregon Department of Transportation, and Deschutes County. The CAC included community leaders from the City Council and the Public Works Advisory committee.

A summary of the public engagement, TAC and CAC meetings is provided in Table 1-1.

Table 1-1 Plan Development & Adoption Public Involvement Summary

Meeting Event	Date/Location	Meeting Purpose/Objectives
Public Works Advisory Committee Meeting #1	Tuesday, November 13, 2012 La Pine City Hall	Discussed initial TSP tasks including Goals & Objectives and Plan and Policy Review
Public Works Advisory Committee Meeting #2	Tuesday, December 13, 2012 La Pine City Hall	Discussed Inventory Findings, Existing Conditions Memorandum, and Future Conditions/System Needs
Public Works Advisory Committee Meeting #3	Tuesday, February 12, 2013 La Pine City Hall	Discussed transportation system plan alternative concepts including functional classification system
Public Workshop	Wednesday, March 20, 2013 La Pine Events Center	Presented work completed and gathered public feedback and comment
Public Works Advisory Committee Meeting #4	Tuesday, June 11, 2013 La Pine City Hall	Discussed draft code language to support the adoption of the TSP
City Council/Public Works/Planning Commission Work Session	Wednesday, July 24, 2013 La Pine City Hall	Discussed the Draft TSP

REGULATORY CONTEXT

The development of the Transportation System Plan was guided by Oregon Revised Statute (ORS) 197.712 and the Department of Land Conservation and Development (DLCD) administrative rule known as the Transportation Planning Rule (TPR). Through this rule, the State of Oregon requires that the TSP be based on the Comprehensive Plan land uses and that it provide for a transportation system that accommodates the expected growth in population and employment over the next 20 years. The TPR also requires the following elements:

- A road plan for the arterial and collector system, including functional classifications of streets, and standards for the layout of local streets that provide reasonably direct routes for bicycle and pedestrian travel
- A public transportation plan
- A bicycle and pedestrian plan
- An air, rail, water and pipeline transportation plan
- Policies and land use strategies for implementing the plan
- A transportation financing plan

In each of these elements, the TPR requires that the plan consider and incorporate the needs of all users and all travel modes. In addition, the TPR requires that local jurisdictions adopt land use and subdivision ordinance amendments to protect transportation facilities and to provide bicycle and pedestrian facilities between residential, commercial, and employment/institutional areas. Local communities must coordinate their respective plans with the applicable county, regional, and state transportation plans.

The La Pine TSP addresses the state requirements for all affected facilities within its Urban Growth Boundary (UGB). The existing UGB is shown in Figure 1-1.

TSP ORGANIZATION

This TSP is organized in three main parts: the Executive Summary, Volume 1, and Volume 2.

Executive Summary

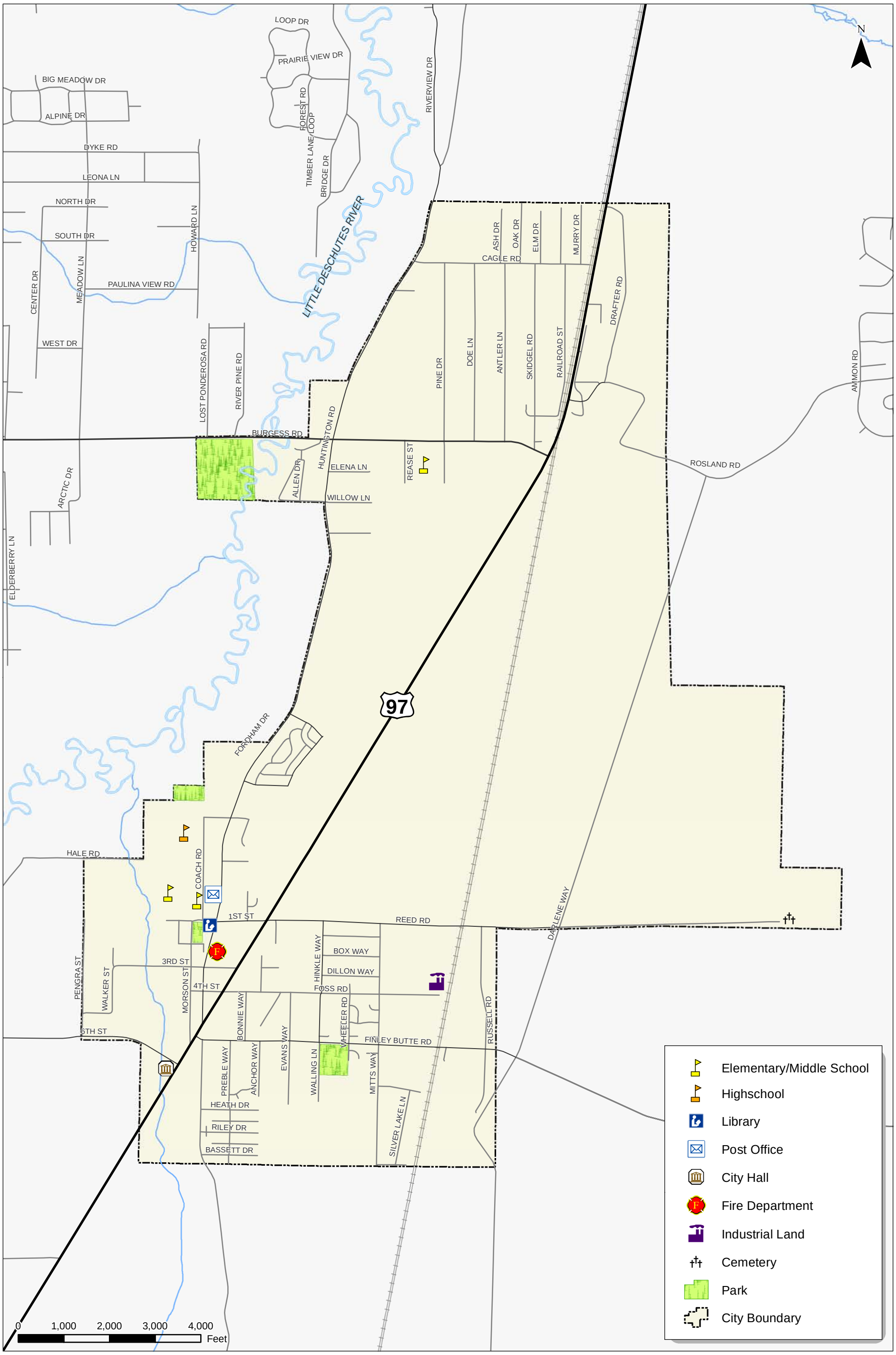
The Executive Summary provides a brief overview of the key recommendations from the TSP. It is designed to be accessible and easy to understand by a wide audience and contains elements of primary interest from Volume 1, including the proposed street network map and the street cross sections. It also summarizes the costs and potential funding strategies for the transportation plan.

Volume 1: Transportation System Plan

Volume 1 includes the executive summary, an overview of the analysis conducted for the existing conditions and future needs, and the "Transportation Plan" for the city, which includes more comprehensive content on the key areas of interest within the Transportation System Plan.

Volumes 2: Technical Appendices

Volume 2 contains the technical information that was used to develop the policies and recommendations in the TSP, as included in Volume 1. All technical memorandums completed throughout the TSP process are included in Volume 2.



Study Area
La Pine, Oregon

Figure
1-1

Coordinate System: NAD 1983 StatePlane Oregon South FIPS 3602 Feet Intl
Data Source: Deschutes County

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Section 2
Executive Summary

EXECUTIVE SUMMARY

The executive summary provides an overview of the key elements of the City of La Pine's Transportation System Plan.

ROADWAY FUNCTIONAL CLASSIFICATION

Roadways are classified using arterial, collector, and local designations, depending on the intended function and the adjacent land use needs. Arterials are intended to provide mobility, while local streets primary function is access. Figure 2-1 shows the functional classification of each roadway in La Pine.

MULTIMODAL IMPROVEMENT PROJECTS

Projects identified as key improvements for the future transportation system in La Pine are discussed below. Each is intended to provide multi-modal options to residents and to serve projected vehicle, pedestrian, and bicycle traffic.

Vehicular Project Priorities

Within La Pine, roadway connectivity and facility upgrades will be the priority for the foreseeable future as the city works to establish a transportation system that will support the future vision of La Pine. The following efforts are near term projects that will help the city start to achieve those goals:

- Establish an "arterial ring" within downtown La Pine. This ring includes 1st Street/Reed Road, Hinkle Way, Finley Butte Road, and Huntington Road. This ring provides mobility for all users through the downtown area.
- Upgrade 3rd Street and 4th Street to Major Collectors in the downtown area, between Morson Street and Hinkle Way to further facilitate mobility downtown and provide facilities for all users.
- Upgrade Cagle Road and Skidgel Road to paved roads to create a network of paved roadways serving the entire residential area in the northwest area of the City.

It should be noted that the TSP relies heavily on the previously completed La Pine Corridor Plan and Wickiup Junction Plan for improvement strategies and projects for US 97 within La Pine. The recommendations of those plans have been incorporated in this TSP.

Pedestrian Projects

All roadway upgrades within the City of La Pine should include pedestrian facilities, as specified in the street design standards, to create a network of continuous sidewalks that enable residents to travel via walking. Priority for pedestrian projects should be given to:

- Providing east-west connections within the Cagle subdivision where roadways are currently unpaved.
- Providing pedestrian access across US 97 within Wickiup and downtown La Pine.
- Creating a connected trail system between the downtown and Wickiup, particularly along the west side of the highway where the majority of developable lands are located.
- Considering pedestrian connectivity for recreational trips, such as those to existing and planned parks and trails.

Design of these facilities should account for roadway maintenance and snow storage in winter months.

Bicycle Projects

A network of continuous bicycle facilities, whether they are bike lanes or shared-use paths, should be developed to encourage bicycling as a form of transportation within the City. Improving bicycle facilities and connectivity will provide more opportunities for bicyclists of all abilities to travel throughout the City. Priority for bicycle facility improvements projects should be given to:

- Providing east-west connections within the Cagle subdivision where roadways are currently unpaved.
- Providing trail system connectivity between the downtown and Wickiup, particularly along the west side of the highway where the majority of the developable lands are located.

Multimodal Project List

The projects identified include needs anticipated within the next twenty years as well as those that may be needed over a much longer planning horizon. The city has discretion to determine the focus of capital investments based on changing circumstances.

Table 2-1 presents the planned urban upgrade improvements projects for the City of La Pine. These projects were identified based on existing or future needs within the City. The projects are intended to relieve future congested routes, provide more direct connections within the transportation system, provide better overall system operations in the future, and to provide better multi-modal connectivity throughout the City. Projects highlighted in gray are considered high priority based on their ability to address the City's needs and their expected cost.

Table 2-1 Multimodal Improvement Projects

Improvement	Miles	Description	Cost (millions)
Huntington Road urban upgrade	3.26	Improve to **Arterial** standards from 1st Street to northern city boundary.	$12.04
Huntington Road urban upgrade – downtown core	0.43	Improve to **Downtown Arterial** standards from US 97 to 1st Street. Would provide improvements for downtown core.	$1.27
Morson Street urban upgrade – downtown core	0.5	Upgrade street to **Downtown Arterial** standard.	$2.40
3rd Street to 6th Street connection	0.72	Upgrade to **Minor Collector** standard from 6th Street to Morson Street, via the existing Walker Street and 5th Street alignments. Curve improvements should be included in the upgrade. An alternative route connection Walker Street perpendicular to 6th Street should be considered if funding becomes available.	$1.330
3rd Street urban upgrade	0.18	Upgrade to **Major Collector** standard from Morson Street to US 97.	$0.70
4th Street urban upgrade	0.13	Upgrade to **Major Collector** standard from Morson Street to US 97.	$0.42
William Foss Road urban upgrade	0.40	Upgrade to **Major Collector** standards from US 97 to Hinkle Way.	$1.48
William Foss Road urban upgrade	0.24	Upgrade to **Industrial Collector** from Hinkle Way to Mitts Way.	$0.53
6th Street urban upgrade	0.42	Upgrade to **Minor Collector** standard from city limits to US 97.	$0.31
Finley Butte Road urban upgrade	0.52	Upgrade to **Arterial** standard from US 97 to Hinkle Way.	$2.27
Finley Butte Road urban upgrade	0.75	Upgrade to **Industrial Collector** standard from Hinkle Way to city limits.	$1.73
South Huntington Road realignment	n/a	Realign Huntington Road intersection with Finley Butte Road to the east to increase spacing from US 97. Could be completed in conjunction with Finley Butte/US 97 improvements.	$2.16*
Hinkle Way urban upgrade	0.50	Upgrade to **Industrial Collector** standard from Reed Road to Finley Butte Road.	$0.77
1st Street/Reed Road urban upgrade	0.31 0.23	Upgrade to **Downtown Arterial** standard from Morson Street to US 97. Upgrade to Arterial from US 97 to Hinkle Way.	$0.86 $0.64
1st Street/Reed Road urban upgrade	0.65	Upgrade to **Industrial Collector** standard from Hinkle Way to Russell Road.	$1.22
Burgess Road urban upgrade	1.47	Upgrade to **Arterial** standard from city limits to US 97.	$4.11
US 97 access consolidation	n/a	Consolidate access along US 97 within downtown La Pine and Wickiup.	n/a

Improvement	Miles	Description	Cost (millions)
Drafter Road urban upgrade	0.78	Upgrade to **Minor Collector** standard from US 97 to Rosland Road. Includes upgrading roadway surface to asphalt. Upgrade can provide backage road facility to assist with access consolidation along US 97 within Wickiup.	$5.16
Cagle Road urban upgrade	0.69	Upgrade to **Minor Collector** standard from Huntington Road to Murry Drive. Includes upgrading roadway surface to asphalt.	$4.74
Skidgel Road	0.77	Upgrade to paved **Local Street** standard from Cagle Road to Burgess Road.	$5.42
Rosland Road urban upgrade	0.18	Upgrade to **Minor Collector** standard from US 97 to Drafter Road.	$0.30
Eastside north-south connection	2.1	Construct a new **Minor Collector** connection between downtown La Pine and the Wickiup area.	$18.00*
Mitts Way urban upgrade	1.0	Upgrade to **Industrial Collector** standard from Reed Road to south city limits.	$1.29
Crescent Creek Subdivision urban upgrade	0.58	Upgrade Findley Drive, Crescent Creek Drive, and Caldwell Drive to **Minor Collector** standard.	$3.00
Wickiup Junction Plan	n/a	Construction of overpass for US 97 and corresponding connection improvements	$35.00

Note: *Indicates that estimates for right-of-way acquisition costs were included in the cost estimate.

Planned Intersection Improvements

Within the City of La Pine there are several intersections that have previously been identified for improvements based on existing or future needs. Improvements to these locations will help support the overall roadway and transportation network. These known deficiencies (or projects where planned improvements have already been identified), the location or project extents, and a brief description are summarized in Table 2-2.

The intersection improvement projects identified in Table 2-2 are intended to guide priorities for improvements in the upcoming years. Specific designs and analysis for each site should be conducted during project development for each improvement to determine the best location-specific alternative that addresses the need.

Table 2-2 Intersection Improvement Projects

Intersection	Improvement	Cost (millions)
US 97 – Ashton Eaton Blvd/Rosland Road	Operational improvement needed. Due to constraints with the Wickiup Junction Plan, this project should be coordinated with that Plan. It is recommended that upgrading Drafter Road be considered as part of the Wickiup Junction Plan as an alternative to the Rosland/US 97 intersection.	Included in Drafter Road Upgrade Project; An additional $350,000 for upgrading US 97/Drafter Road to an improved intersection
US 97 – Ashton Eaton Blvd/Burgess Road (Wickiup Junction Plan)	Wickiup Junction Interchange (previously identified in Wickiup Junction Plan)	Included in Wickiup Junction Plan
US 97 – Ashton Eaton Blvd/1st Street - Reed Road	Realignment, traffic signal installation, and pedestrian improvements, as previously identified in the US 97/La Pine Corridor Plan	Fully Funded
US 97 – Ashton Eaton Blvd/Finley Butte Road – Morson Street	Morson realignment and operational improvement, as previously identified in the US 97/La Pine Corridor Plan	$0.49 for Realignment; $0.35 for Traffic Signal
US 97 – Ashton Eaton Blvd/6th Street	No intersection improvement planned. An improved connection between 3rd Street and downtown is preferred to alleviate congestion at this intersection. See multimodal improvements for more information.	Included in Roadway Improvement projects.
Hinkle Way/William Foss Road	Improve the north-south alignment to provide a more direct, convenient, and comfortable route for travelers on the east side of La Pine.	$0.20

Safety Projects

Review of the last five years of recorded crashes, revealed that nearly half of all crashes within the La Pine urban area occurred on US 97. Future transportation projects will incorporate strategies to improve the long-term safety of the La Pine transportation system. Issues such as traveler speeds, land use access needs, creating comfortable and convenient pedestrian and bicycle crossings of US 97, and addressing the needs of an older population can be incorporated into future project selection and design. Table 2-3 summarizes previously identified safety-related projects to serve long-term multi-

modal needs throughout the community. Several of these improvements are relatively low-cost and can be conducted as part of maintenance projects. Future safety projects will be developed and prioritized based on observed conditions and community input. The location of these projects is shown in Figure 2-2.

Table 2-3 Safety Projects

Facility	Improvement	Note
US 97 – Ashton Eaton Boulevard (1st Street)	Rural to urban speed transition improvements (Southbound)	Improvements were identified in the US 97/La Pine Corridor Plan. Some treatments have been implemented.
US 97 – Ashton Eaton Boulevard (6th Street)	Rural to urban speed transition improvements (Northbound)	Improvements were identified in the US 97/La Pine Corridor Plan.
US 97 – Ashton Eaton Boulevard (1st Street to 6th Street)	Illumination at intersections	Prioritize illumination at pedestrian crossing locations and intersections.
US 97 – Ashton Eaton Boulevard (1st Street to 6th Street)	Large font street signs	Replace signs as part of routine maintenance as needed.
Huntington Road (1st Street north to City limits)	Improve shoulders and clear zones	Could be completed in conjunction with functional upgrades to Huntington Road.
Huntington Road (near 1st Street)	Rural to urban speed transition improvements (southbound)	Improvement will help define urbanized area along Huntington Road in downtown La Pine.
1st Street Rail Crossing	Upgrade to an active crossing	Coordination is needed with BNSF.

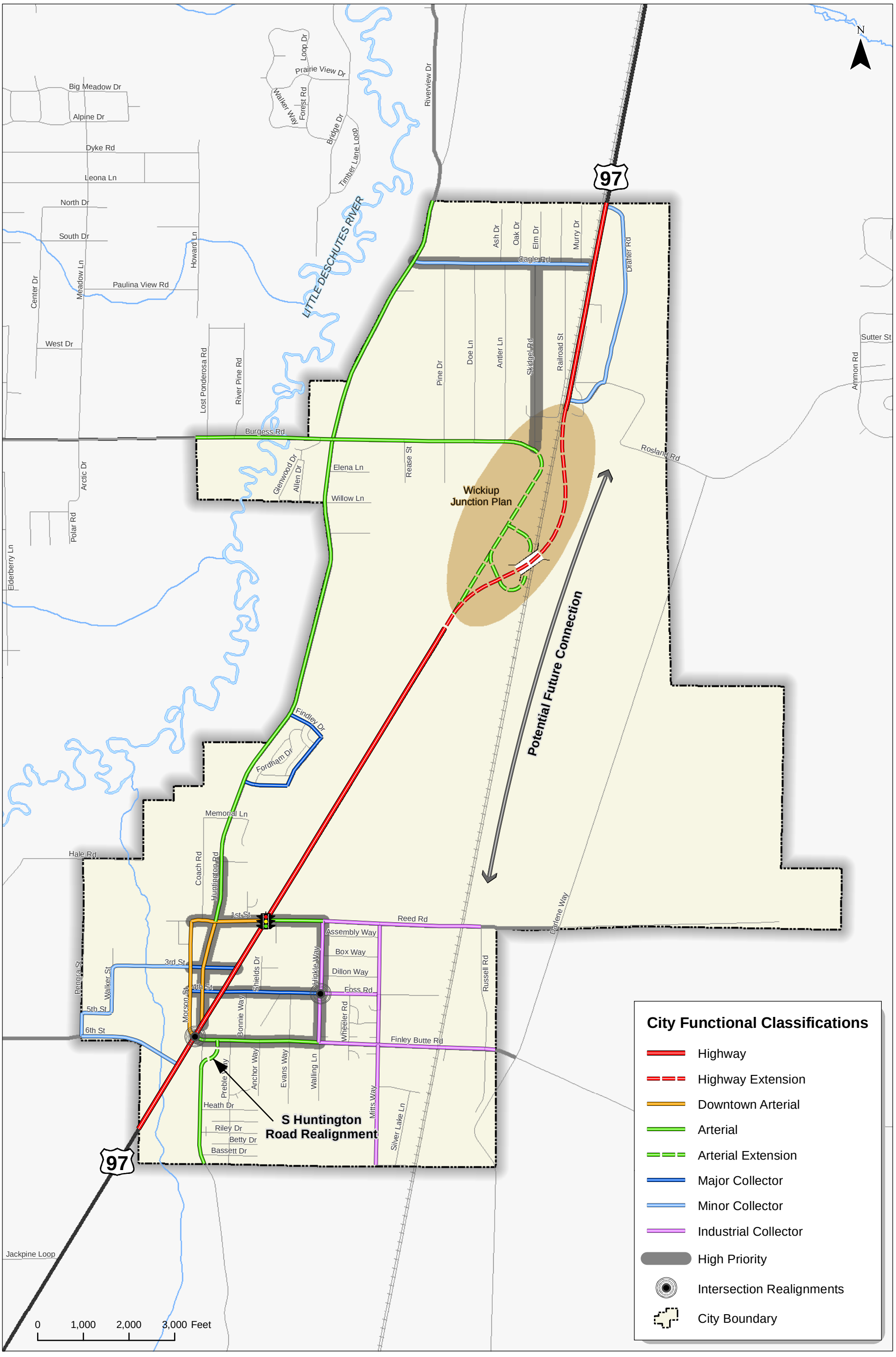
Transit System

Today, transit service within La Pine is limited to a commuter route between a park-and-ride center within Wickiup Junction and the Hawthorne Station in Bend. In addition, demand responsive service that includes the city limits of La Pine and outlining areas is provided. Both services are operated by Cascade East Transit (CET).

Figure 2-3 shows the existing transit service with possible future modifications. A summary of transit improvement options is provided in Table 2-4.

Table 2-4 Transit Improvement

Location	Project Type	Note
Wickiup Junction	Maintain connectivity between the park-and-ride lot and surrounding roadway as part of the Wickiup Junction plan.	Include as an element of the Wickiup Junction plan, along with multimodal connections.
Downtown Area Connection for Service to Bend	Coordinate with CET to provide transit service to the City core. Consider options for a park-and-ride facility within the downtown area.	Would provide closer transit access to Downtown La Pine area.
Increased Service Hours	Coordinate with CET to provide additional trips to/from Bend.	Would require dedicated funding.



Roadway Functional Classification
La Pine, Oregon

Figure **2-1**

Coordinate System: NAD 1983 HARN StatePlane Oregon South FIPS 3602 Feet Intl

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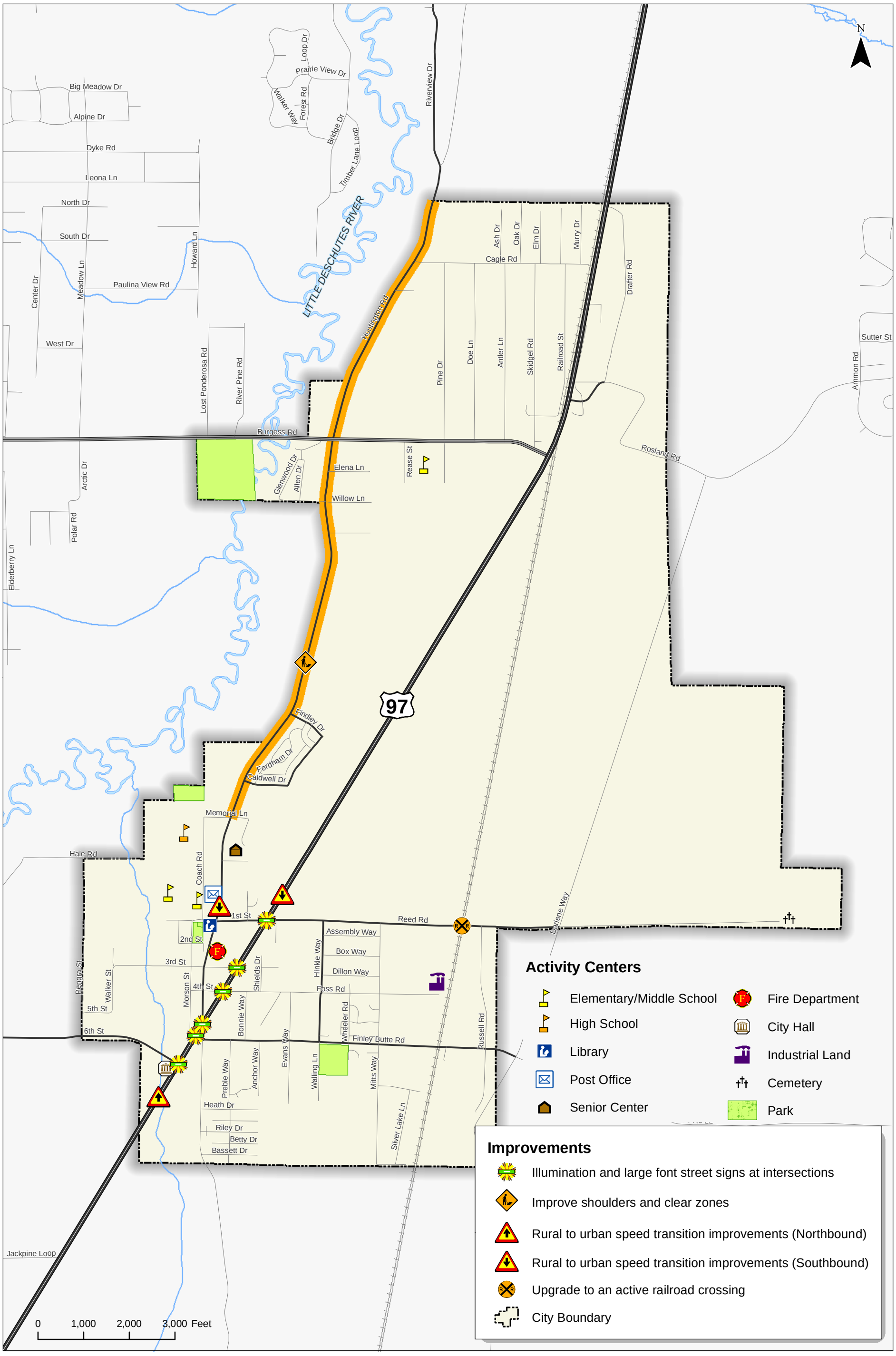
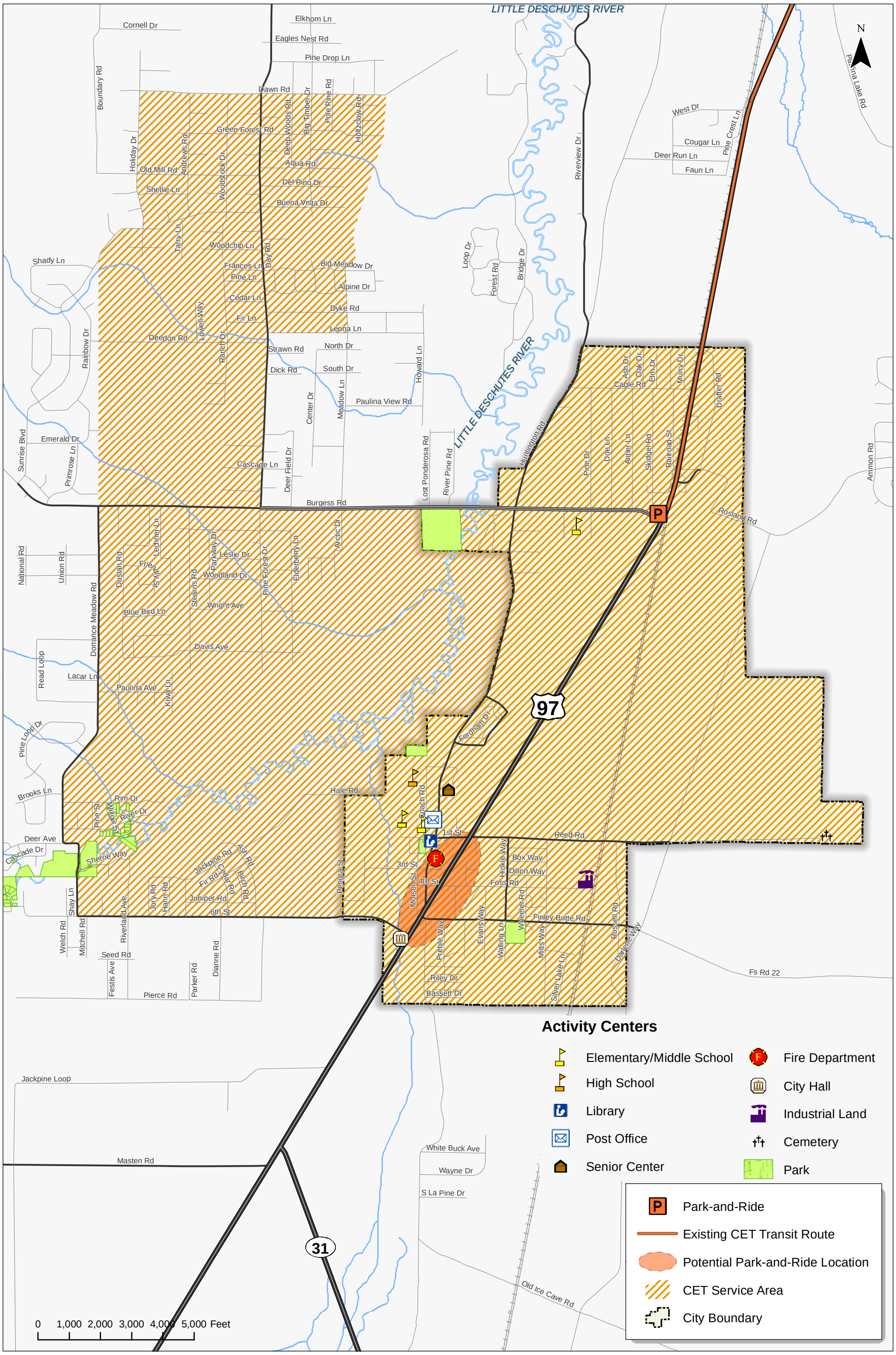


Safety Projects
La Pine, Oregon

Figure
2-2

Coordinate System: NAD 1983 HARN StatePlane Oregon South FIPS 3602 Feet Intl
Data Source: Deschutes County



Existing Transit Service and Future Planned Improvements
La Pine, Oregon

Figure **2-3**

Coordinate System: NAD 1983 HARN StatePlane Oregon South FIPS 3602 Feet Intl
Data Source: Deschutes County

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Section 3
Analysis Background

ANALYSIS BACKGROUND

This section provides information on the technical analysis and infrastructure inventory conducted to support the development of the La Pine Transportation System Plan. The first part of this section summarizes the existing transportation system within La Pine City limits, providing information related to the performance of the City's transportation system, the supporting infrastructure, and population and employment. The second section summarizes existing conditions traffic operations, and the third section summarizes the future conditions analysis and future needs.

This analysis includes the following elements:

- Existing Conditions Inventory
- Access Management Analysis
- Intermodal Connections Analysis
- Existing Conditions Analysis
- Intersection Geometric Review
- Collision History Review
- Future Conditions Analysis

EXISTING CONDITIONS INVENTORY

This section of the report details the existing City population, land use, and supporting transportation infrastructure. This inventory is intended to inform the future identification of TSP alternatives by highlighting system opportunities, gaps, and the relationships that exist between these different elements.

Land Use Inventory

The City of La Pine recently developed a Comprehensive Plan that establishes a land use vision for the City over the next 20 years. As stated within the plan, *"A Comprehensive Plan is a blueprint for community land use decision making to ensure that needs of the community are met as growth occurs over the term of the planning period."* Exhibit 3-1 shows the Comprehensive Plan designations within the city.

As shown, the City is divided into three neighborhoods, each containing some mix of residential, retail, and employment uses. These are generally the Wickiup area (Neighborhood 1), the downtown core (Neighborhood 3), and the area separating the two (Neighborhood 2). Throughout the City, the majority of residential lands are located on the west side of the city, the majority of industrial lands

are located on the east side of the city, and the majority of commercial lands are located along US 97 within downtown La Pine.

Further, as highlighted in Exhibit 7, there are a number of natural and man-made barriers that require additional connectivity considerations within the TSP. These include the floodplains that are located along the Little Deschutes and bordering the west side of the City's commercial lands in the southern neighborhood, US 97, and the BNSF line.

The location of existing activity centers, such as the City's commercial areas, schools, churches, and public service centers, also require special transportation considerations. These and other activity centers within La Pine are shown in Figure 3-1.

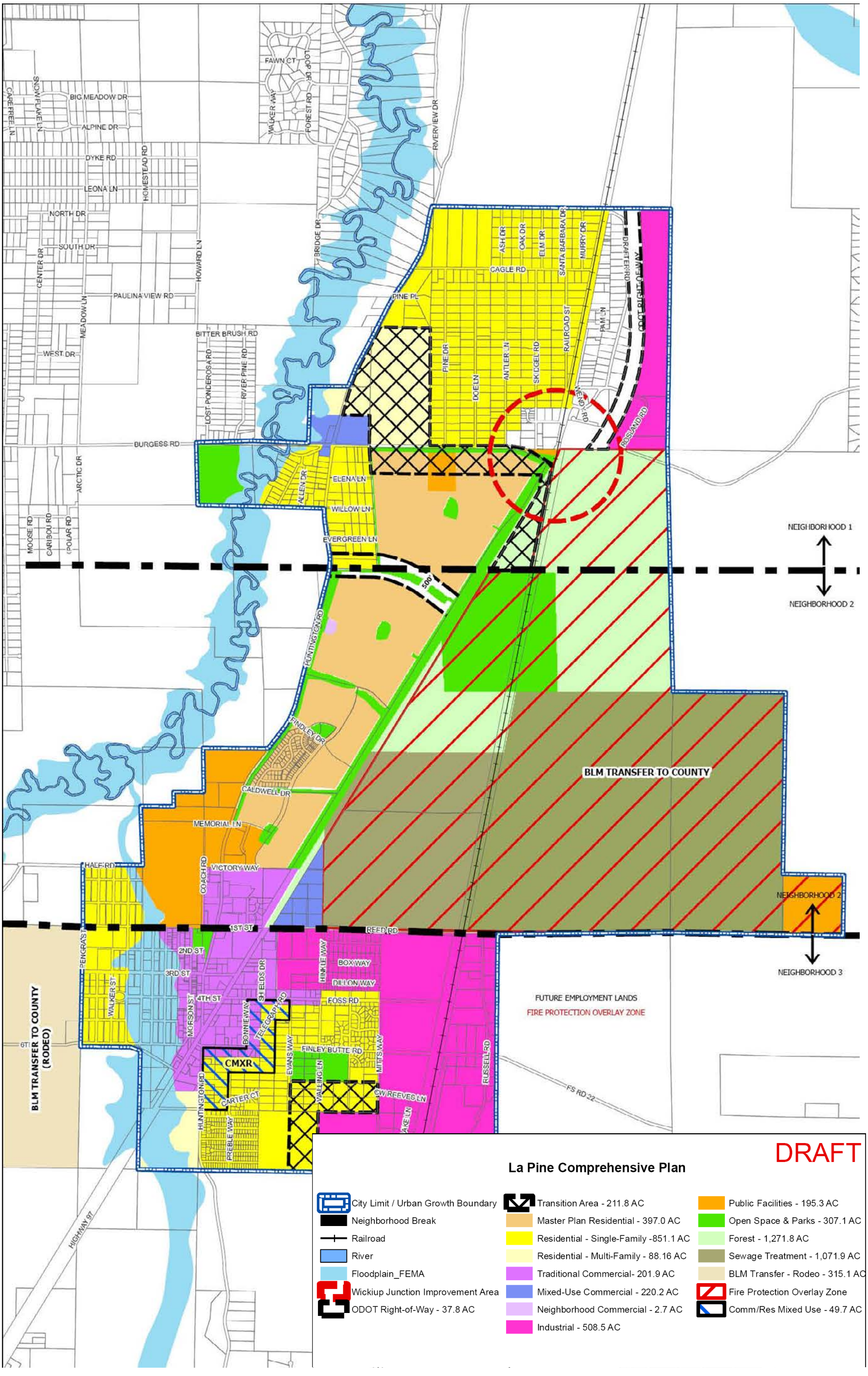
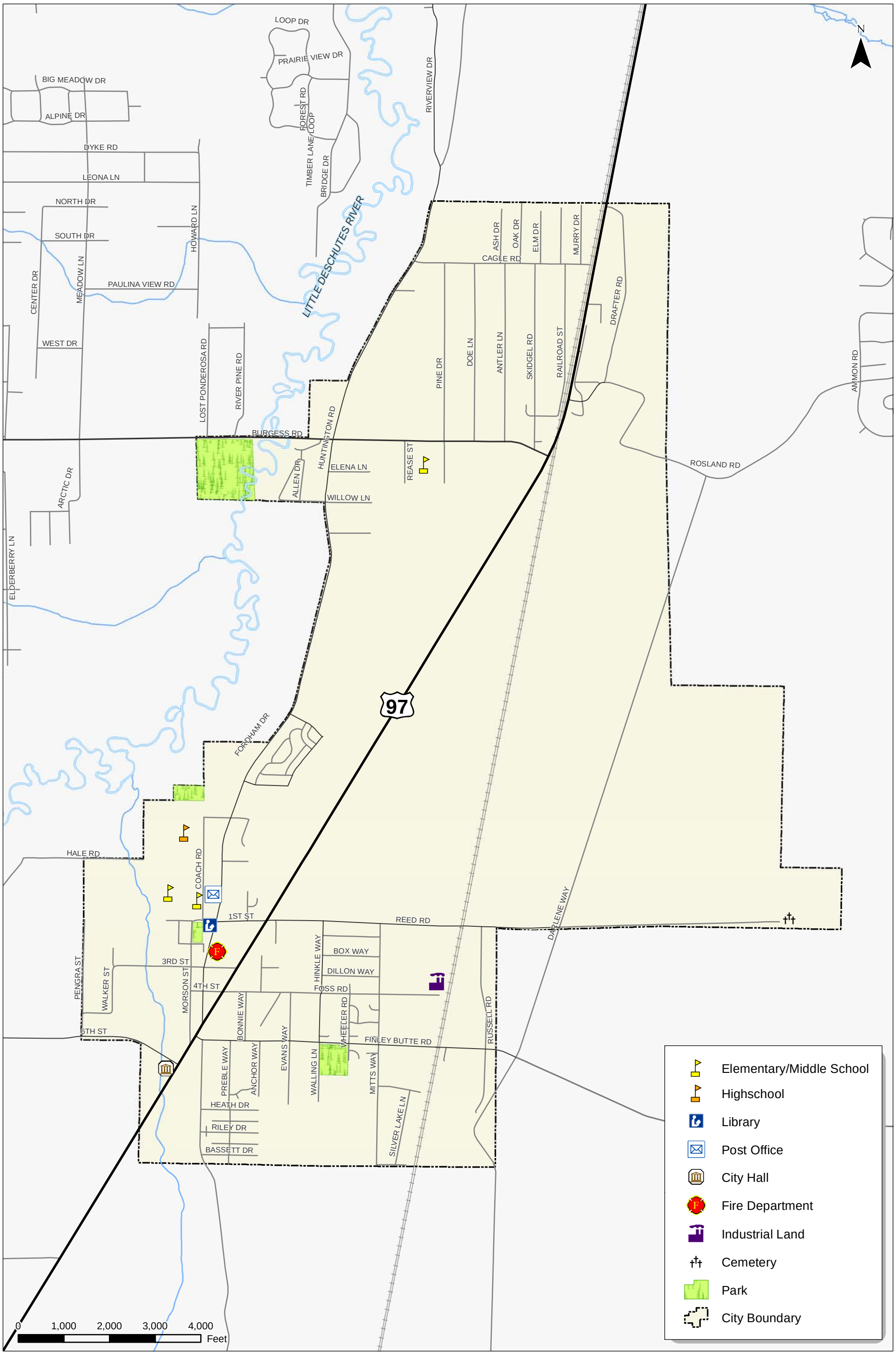


Exhibit 3-1 La Pine Comprehensive Plan Map



City of LA PINE
Small Town - Bright Future

Activity Centers
La Pine, Oregon

Figure
3-1

Coordinate System: NAD 1983 StatePlane Oregon South FIPS 3602 Feet Intl
Data Source: Deschutes County

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The City, County and State have identified an economic development priority for the provision of large lot industrial sites for future development. Within La Pine, these lands are located in the southeast quadrant of the city. This area has been managed by the Deschutes County-funded La Pine Industrial Group (LIGI). Transportation service to these lands and other potential employment areas will be critical to the future growth and prosperity of La Pine. As stated within the Comprehensive Plan:

> *"Community leaders will continue to aggressively focus efforts on attracting large industrial development and reducing barriers to all economic development. It is anticipated that these efforts will bring forth industries that rely on a large number of employees and create additional family-wage jobs in the community. Community leaders have made it clear that large industrial development is needed in addition to the sectors identified in the predicted trend data. Likewise, there is a companion goal to reduce the daily commute for local residents by the creation of additional family wage jobs within the community."*

Population and Demographics

The population of La Pine is relatively small (approximately 1,680 persons based on July 2011 data), but the community serves a much broader area of Deschutes County with goods, services, and employment (approximately 10,000 persons). La Pine has a high proportion of retirement-age residents. A population breakdown by age of the head of household is shown in Table 3-1.

Table 3-1 La Pine Population Demographics

Age of Household	Total	Percent of Total
15 to 24 years	57	2.4
25 to 34 years	239	10.3
35 to 44 years	404	17.3
45 to 54 years	487	20.9
55 to 64 years	400	17.2
65 years and over	744	31.9

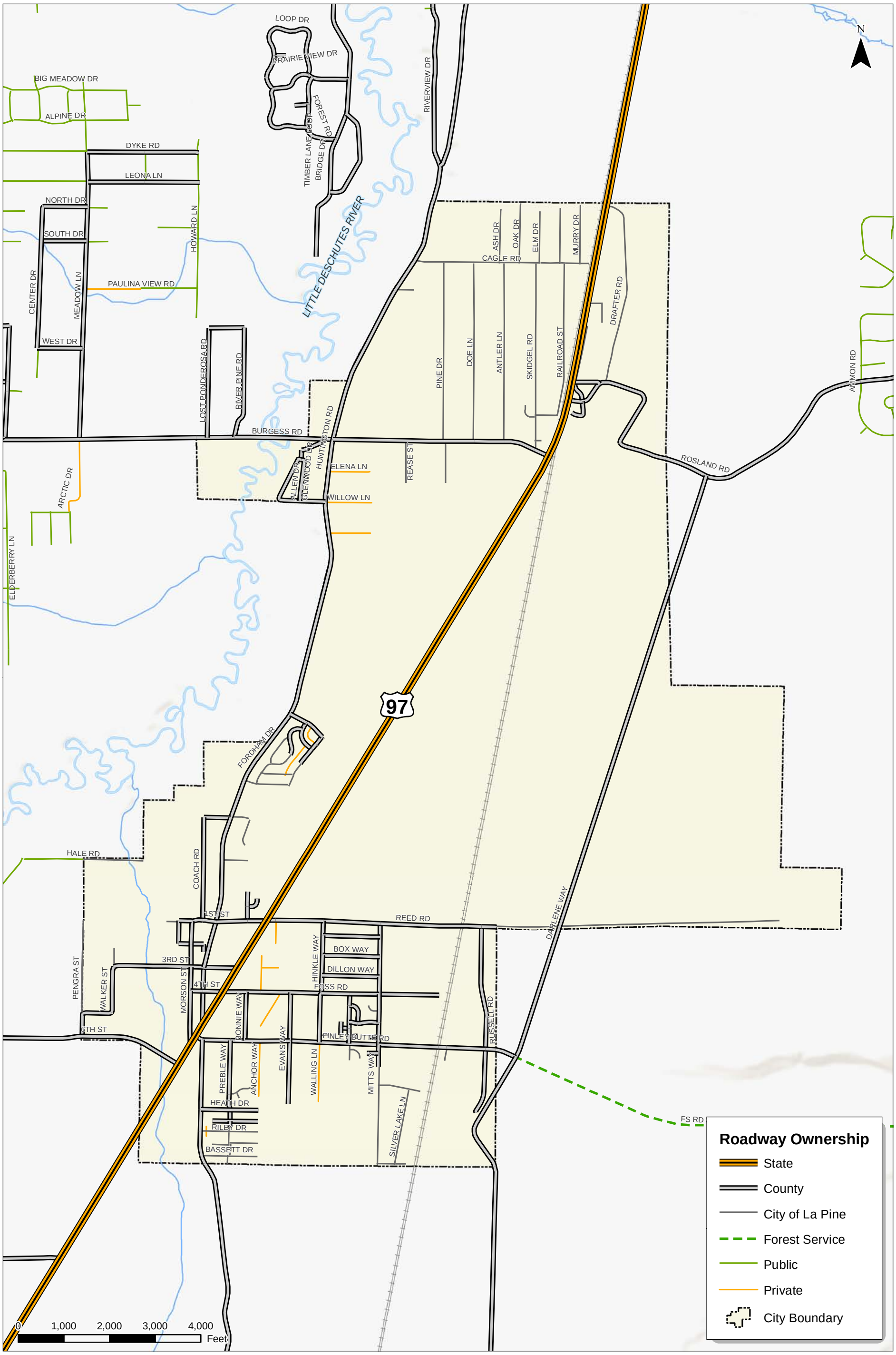
Source: La Pine Comprehensive Plan, 2000 Census

Roadway Ownership Review

The roadways in La Pine are owned by a mixture of State (ODOT), Deschutes County, City of La Pine, Forest Service, and private owners. US 97 (Ashton Eaton Boulevard) is maintained by the State and is the only ODOT facility within city limits. The County has jurisdiction over the majority of the City's arterial and collector system, and the city's ownership is limited to the local roadway system. Roadway jurisdiction is shown in Figure 3-2.

Roadway Surface Review

Throughout the City, road surfaces are a combination of asphalt, gravel, and dirt surfaced. Gravel and dirt surfaced roads accommodate limited vehicle speeds and carrying capacity and are not suitable for classification as higher-order urban facilities without improvements. Figure 3-3 illustrates the City's roadway inventory by surface type.



Roadway Ownership
La Pine, Oregon

Figure
3-2

Coordinate System: NAD 1983 HARN StatePlane Oregon South FIPS 3602 Feet Intl
Data Source: Deschutes County

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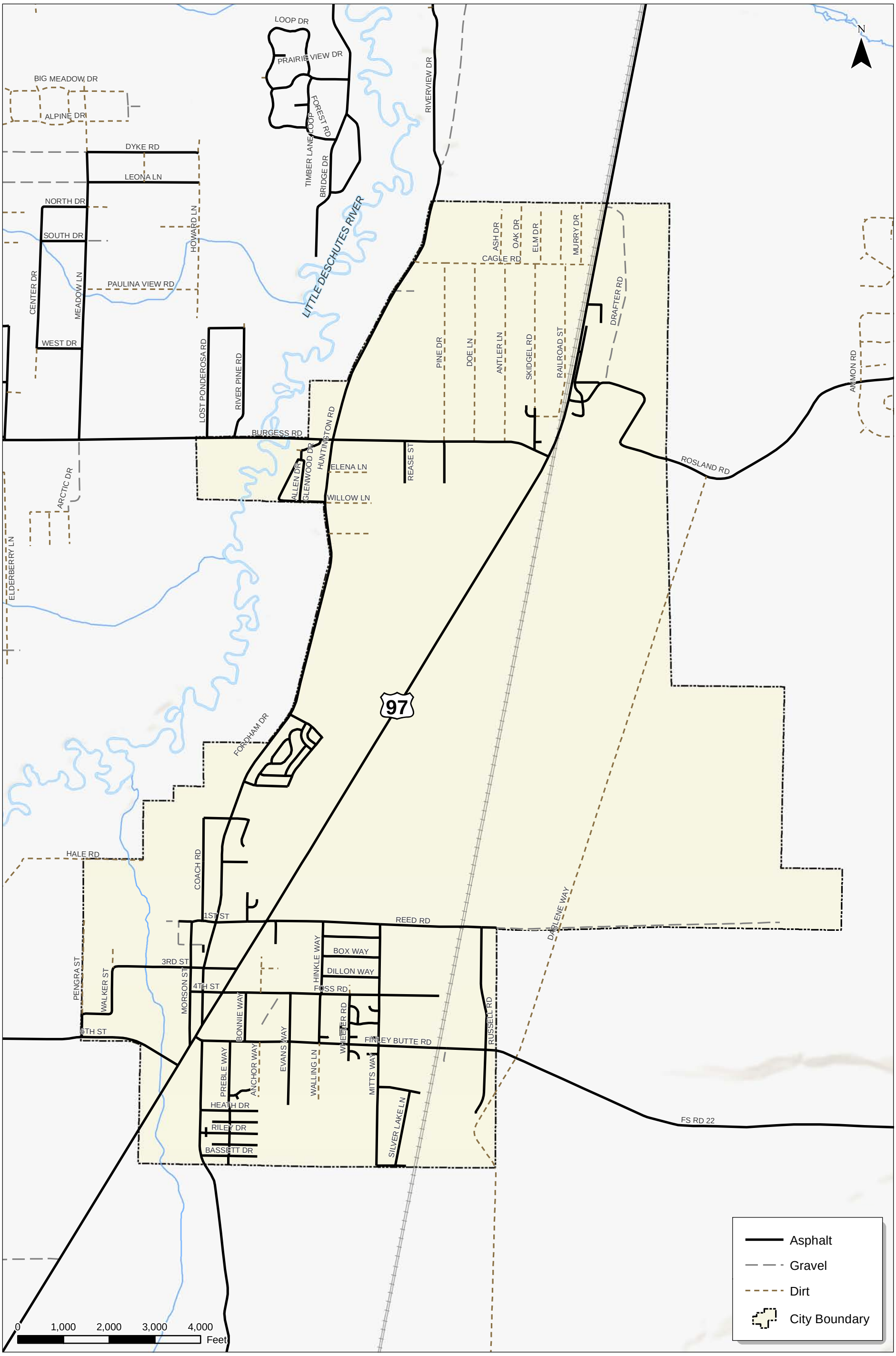


Roadway Surface Material
La Pine, Oregon

Figure
3-3

Coordinate System: NAD 1983 HARN StatePlane Oregon South FIPS 3602 Feet Intl
Data Source: Deschutes County

Pedestrian and Bicycle Facilities

Figure 3-4 illustrates the location of pedestrian facilities throughout La Pine based on a review of aerial photography. While this figure illustrates the presence of sidewalks, it does not convey which facilities are clear of obstacles and obstructions (such as vaults, utilities, storm grates, or poles). As shown, pedestrian facilities within the city are limited and are discontinuous in areas where present.

Dedicated bicycle facilities were recently installed along US 97 through downtown La Pine in the form of buffered bicycle lanes. Other roadways in La Pine contain wide shoulders that can accommodate bicyclists (such as Huntington Road), but no other dedicated bicycle facilities exist.

More refined data collection efforts should be pursued in the future as funds for such activities become available.

Rail Inventory

A Burlington Northern Santa Fe (BNSF) rail line runs through La Pine, mostly on the east side of the city. Within Wickiup, the railway crosses US 97 just north of Burgess Road with an extreme skew angle. ODOT is currently pursuing funding to grade-separate the Wickiup Junction, which would also include modifications to the adjacent roadway network, most notably the rerouting of the Burgess Road and US 97 intersection. All at-grade crossings located within La Pine are summarized in Table 3-2.

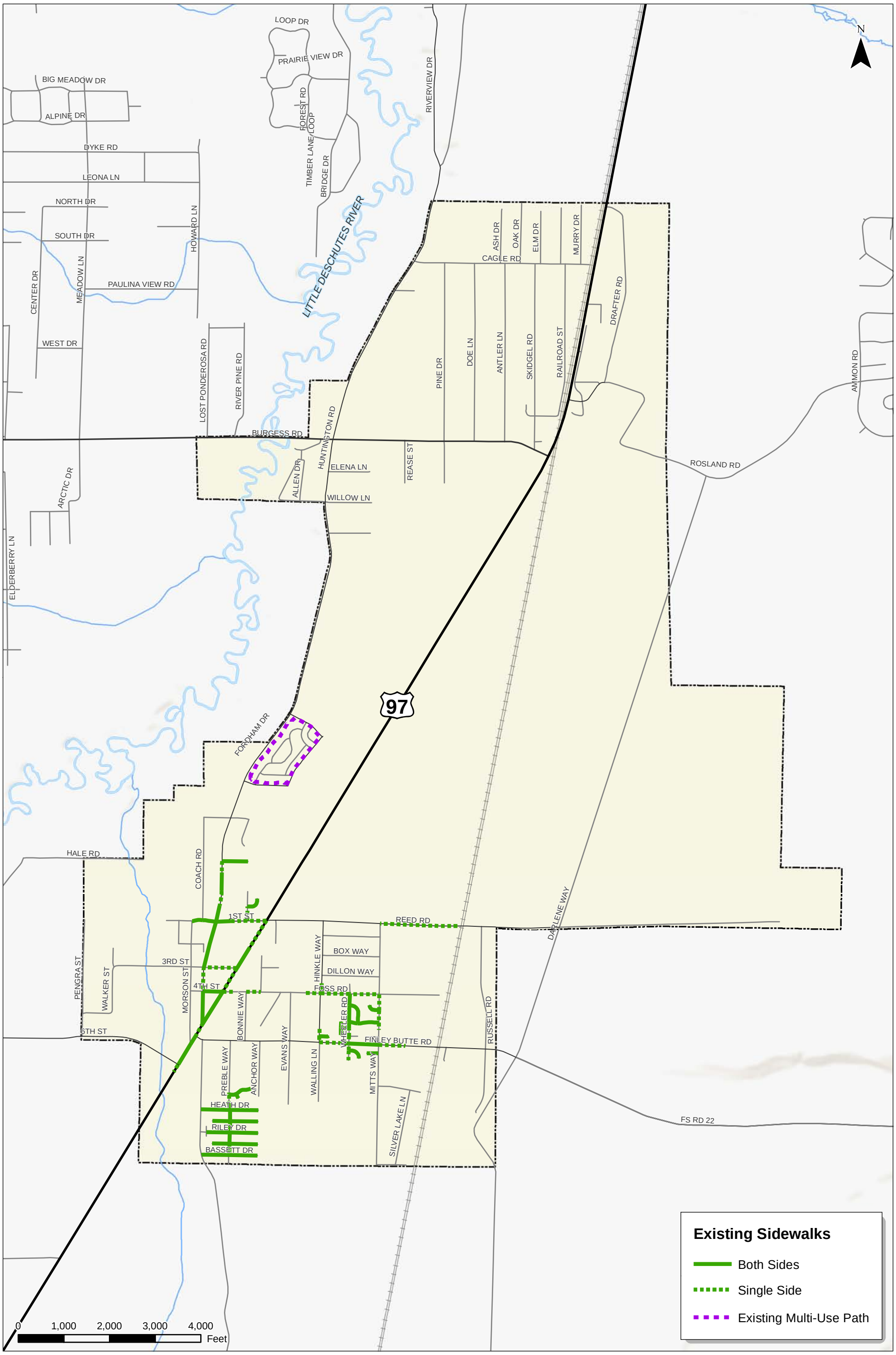
Table 3-2 At-Grade Rail Crossings in La Pine

Road Crossed	Control at Crossing
Finley Butte Road	Active Control (Signal)
Reed Road	Passive Control (Stop sign)
US 97	Active Control (Signal)

No passenger rail service is available within La Pine. The closest passenger rail service is provided through AMTRAK, and is available in Chemult located approximately 35 miles to the south on US 97. From Chemult passenger rail service is provided to Eugene and California.

Air Transportation Inventory

No airport facilities exist within La Pine. The closest commercial airline service is available at Roberts Field in Redmond, Oregon which is approximately 45 miles to the north on US 97. Kingsley Field in Klamath Falls, Oregon is located approximately 100 miles to the south, but also provides commercial services. General aviation airport options are available in Sunriver and also in Bend.



Existing Pedestrian Facilities
La Pine, Oregon

Figure
3-4

Coordinate System: NAD 1983 HARN StatePlane Oregon South FIPS 3602 Feet Intl
Data Source: Deschutes County

Access Management Analysis

Exhibit 3-2 illustrates the relationship between access and mobility. Facilities such as US 97 (generically classified as a Principal Arterial) that have a high mobility purpose allow less access to the system, whereas local streets, such as those in neighborhoods, contain multiple driveways and provide low throughput.

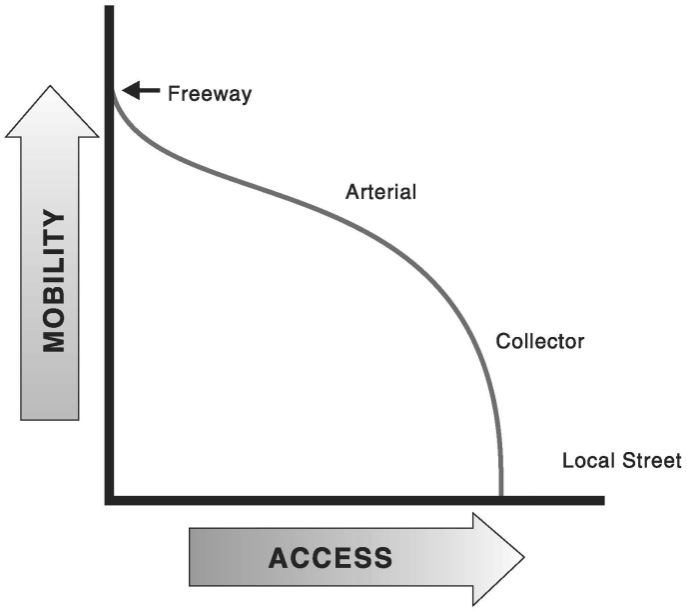


Exhibit 3-2 Roadway classification and function.

Access standards for US 97 are contained within Oregon Administrative Rule 734-051, commonly referred to as Division 51. Temporary access rules have been in effect since January 1, 2012, and were further amended on May 3, 2012. These rules provide access management standards based on functional classification, type of area, posted speed, and segment designation. Table 4 within Division 51 cites an access spacing standard of 2,640 feet (1/2 mile spacing) on urban expressways (such as US 97 north of 1st Street and south of Finley Butte) and a 500-foot spacing standard (approximately 10.5 accesses/mile) in an urban area with a 35 mph posted speed.

Access along US 97 through the downtown core was reviewed based on the inventory conducted as part of the 2005 La Pine Special Transportation Area (STA) Plan between 1st Street and 6th Street. This inventory identified 42 accesses onto the highway along this 0.81 mile section of highway, for a density of 52 accesses per mile, or approximately five times the current access spacing standard.

Many of the driveways within La Pine are ill-defined and wide; limiting the width of driveways would help to define the conflict area between motorists, bicyclists and pedestrians, and inform all types of facility users of how to cross and use the accesses. The County requires that commercial access contain a maximum width of 35 feet, with residential access ranging from 14 feet (single) to 20 feet (double). Based on the La Pine STA Plan inventory, there were fifteen driveways on US 97 that would exceed the current County access width requirements.

Access was also observed along Huntington Road as it serves a key mobility function within the City. Review of this corridor shows access issues near the intersection with US 97 where there are multiple wide accesses to Huntington Road, and the distinction between the accesses, parking area, and sidewalks is not clearly defined. Exhibit 3-3 provides an illustration of this segment.

Exhibit 3-3 Southbound view along Huntington Road near the US 97 intersection.

Existing Transit Service Analysis

La Pine is served by Cascades East Transit (Route 30). This route runs from the Wickiup Junction Park/Ride at the intersection of Burgess Road and US 97 in La Pine to the Hawthorne Station in Bend. One intermediate stop is made at River Woods Baptist Church in Bend at the intersection of Baker Road and Cinder Butte Road.

The route is served by three northbound and three southbound buses on weekdays; no weekend service is provided. The arrival and departure times for the buses are shown in Table 3-3. Current fares for this route are as follows:

- Single Ride: $3.75 (Adult & Youth), $3.00 (Senior)
- Day Pass: $6:25 (Adult & Youth), $5.00 (Senior)

Ridership information for this route is shown in Exhibit 3-4. It should be noted that within the ridership data local Dial-a-Ride customers were required to provide increased notice for trips due to budget constraints, which has impacted ridership.

Table 3-3 La Pine-Bend Transit Service Schedule

Northbound			Southbound		
Wickiup Junction Park/Ride	River Woods Baptist Church	Bend	Bend	River Woods Baptist Church	Wickiup Junction Park/Ride
6:55 a.m.	7:23 a.m.	7:35 a.m.	7:40 a.m.	-	8:20 a.m.
8:25 a.m.	8:53 a.m.	9:05 a.m.	-	-	-
-	-	-	3:42 p.m.	3:54 p.m.	4:22 p.m.
4:27 p.m.	-	5:07 p.m.	5:20 p.m.	5:32 p.m.	6:00 p.m.

Source: Cascades East Transit (CET)

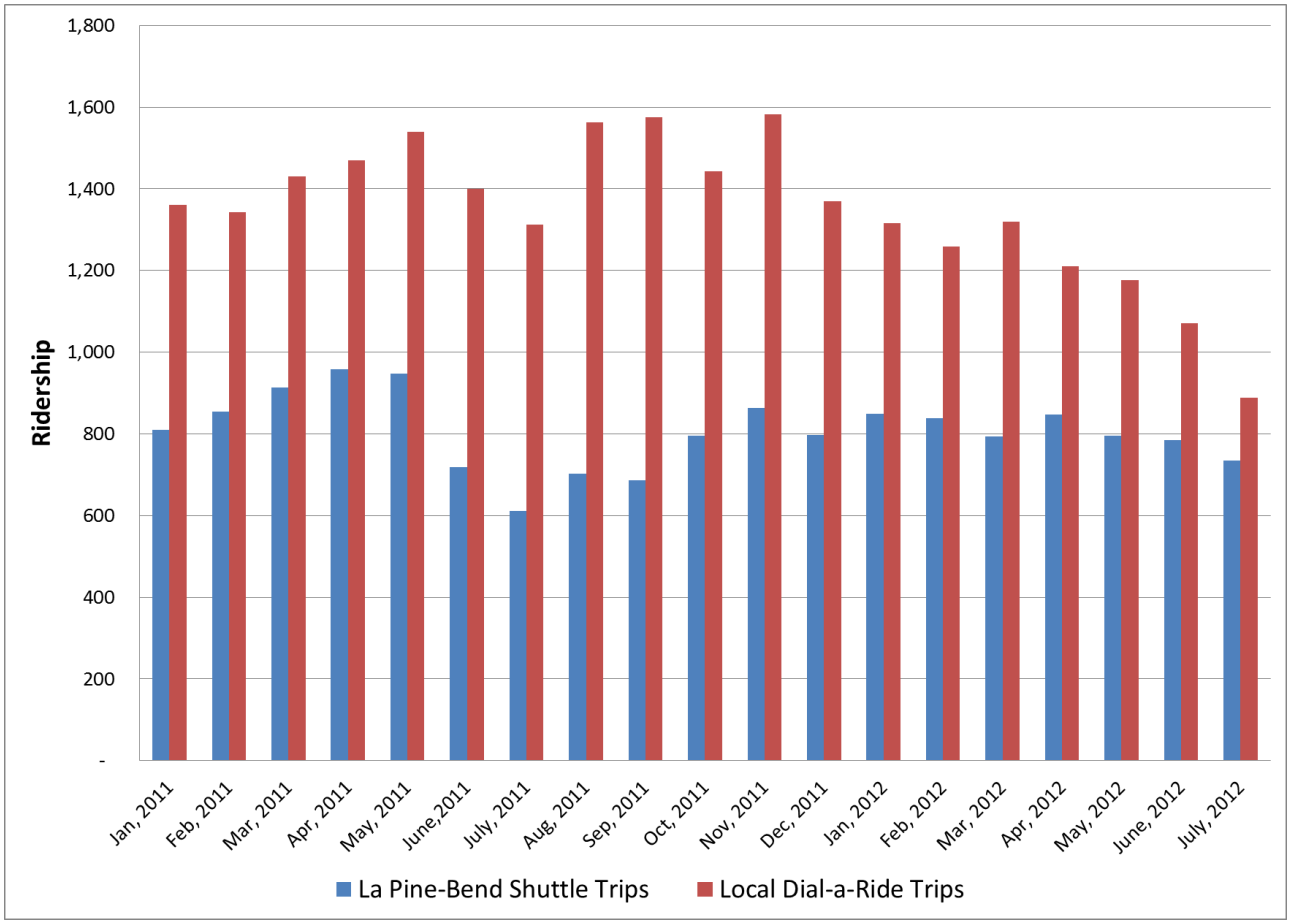
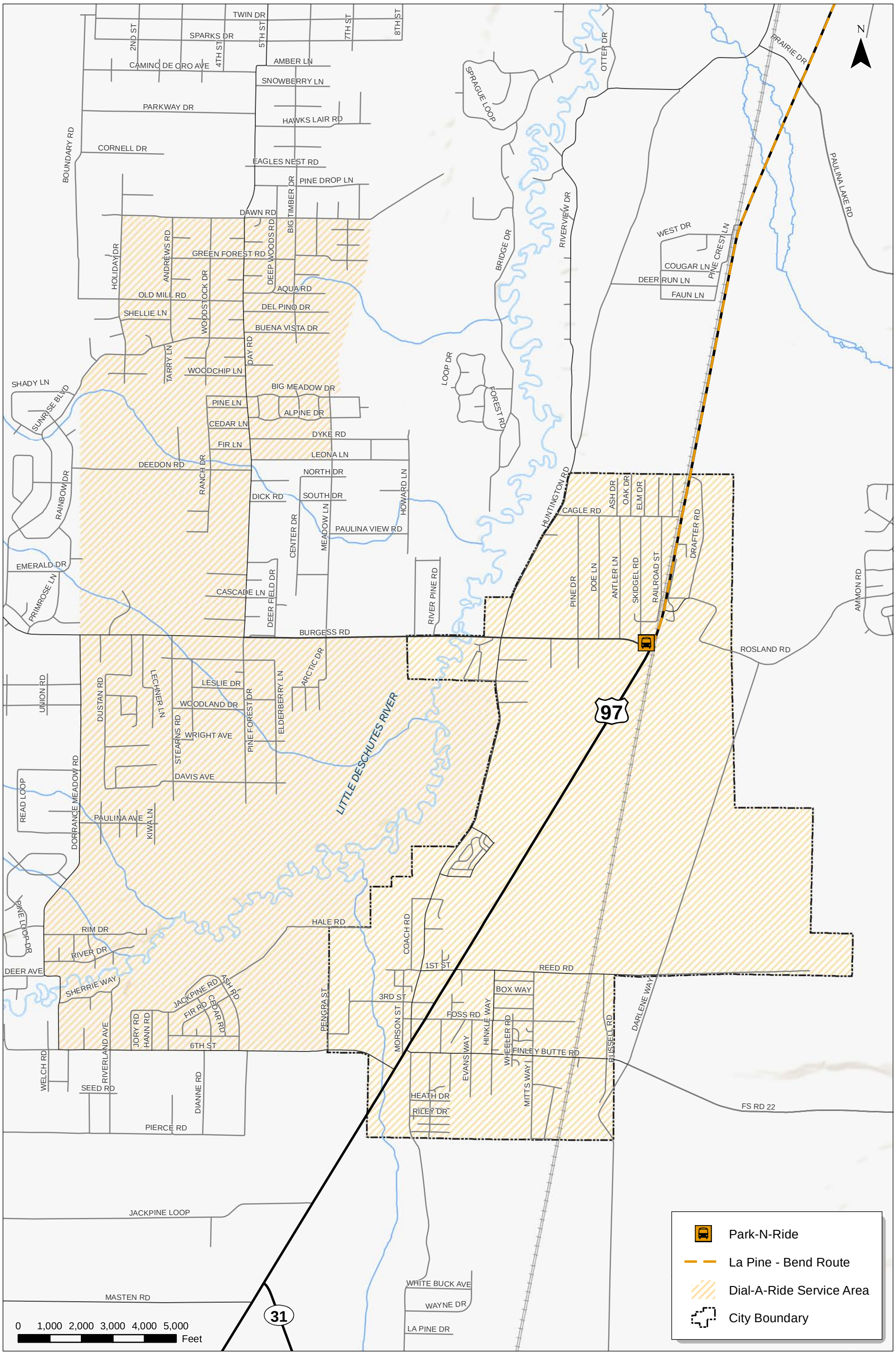


Exhibit 3-4 La Pine Monthly Transit Ridership Data.
Source: Central Oregon Intergovernmental Council

Figure 3-5 shows the Dial-a-Ride service area in La Pine and the location of the La Pine Park-and-Ride lot near the Wickiup Junction.



Intermodal Connections
La Pine, Oregon

Figure
3-5

Coordinate System: NAD 1983 HARN StatePlane Oregon South FIPS 3602 Feet Intl
Data Source: Deschutes County

EXISTING CONDITIONS ANALYSIS

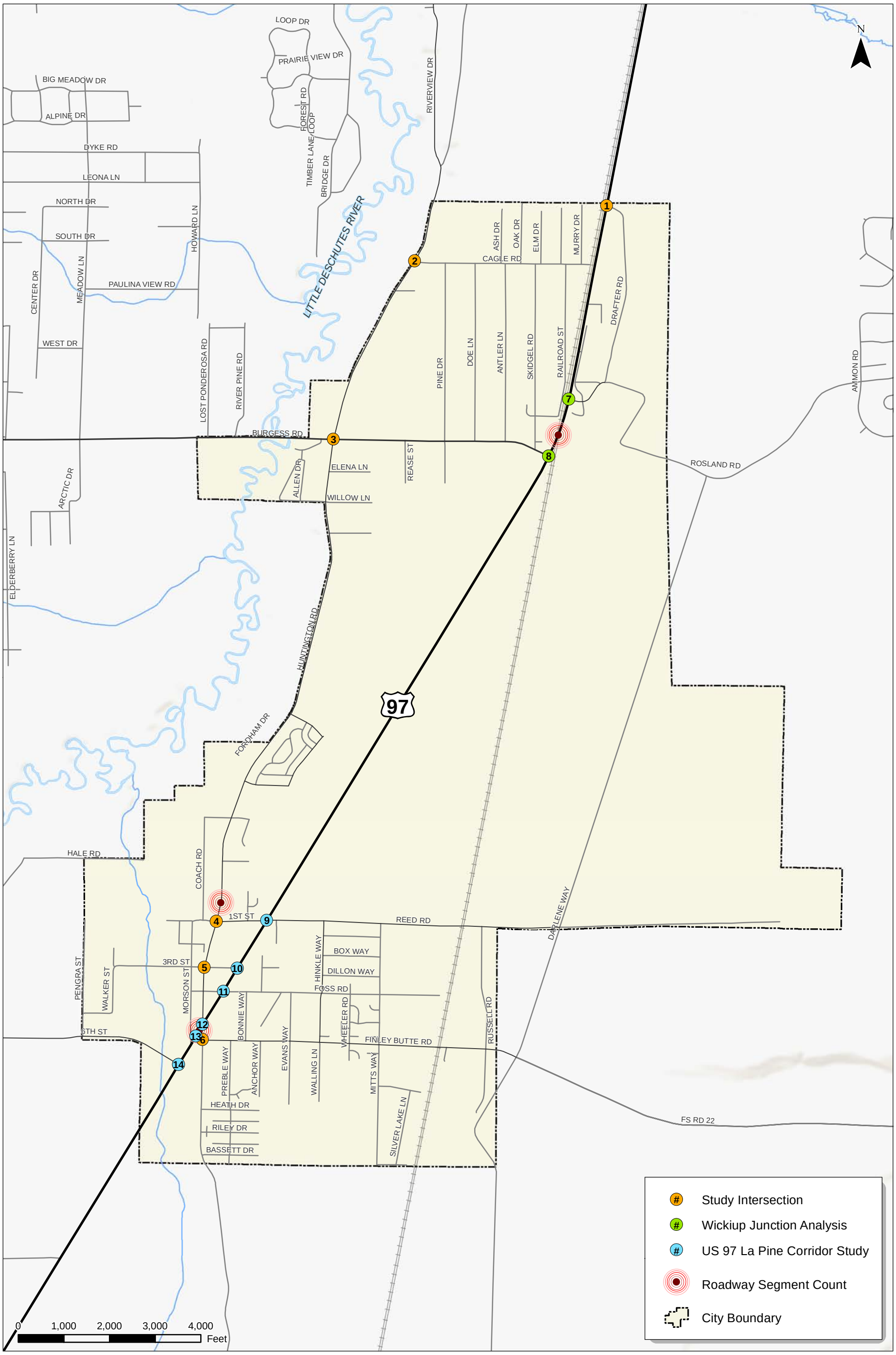
This section summarizes the performance of the City's existing transportation network. The section includes traffic volume inventory, a summary of the operations analysis for the existing network, and a review of the collision history to identify key safety trends.

It should be noted that the TSP relies heavily on the previously completed La Pine Corridor Plan and Wickiup Junction Plan for analysis of intersections along US 97 within La Pine. The analysis results of those two plans are referenced in this section.

Traffic Volume Inventory

Weekday commute period traffic volumes were collected throughout the City to identify the current travel patterns and roadway usage. These counts were collected between 2010 and 2012 at the locations illustrated in Figure 3-6, and were obtained specifically for the City TSP effort as well as from prior analyses.

In addition, 72-hour roadway tube counts were collected on the Huntington Road and US 97 corridors, which provide critical commute, recreation, and service connections north toward Sunriver and Bend. The locations of these tube counts are also illustrated in Figure 3-6.



City of LA PINE
Small Town - Bright Future

Traffic Count Locations
La Pine, Oregon

Figure
3-6

K:\H_Portland\proj\file\12450 - La Pine TSP\gis\Task 8\3-6_Traffic Count Locations.mxd - agriffin - 10:25 AM 8/14/2013

Coordinate System: NAD 1983 HARN StatePlane Oregon South FIPS 3602 Feet Intl
Data Source: Delete if there isn't one.

The 72-hour tube counts are used to highlight the traffic volume changes throughout the day, as shown in Exhibit 3-5 and Exhibit 3-6. As shown in Exhibit 3-5, traffic volumes on US 97 near Finley Butte a relatively consistent between the late morning and early evening commute period.

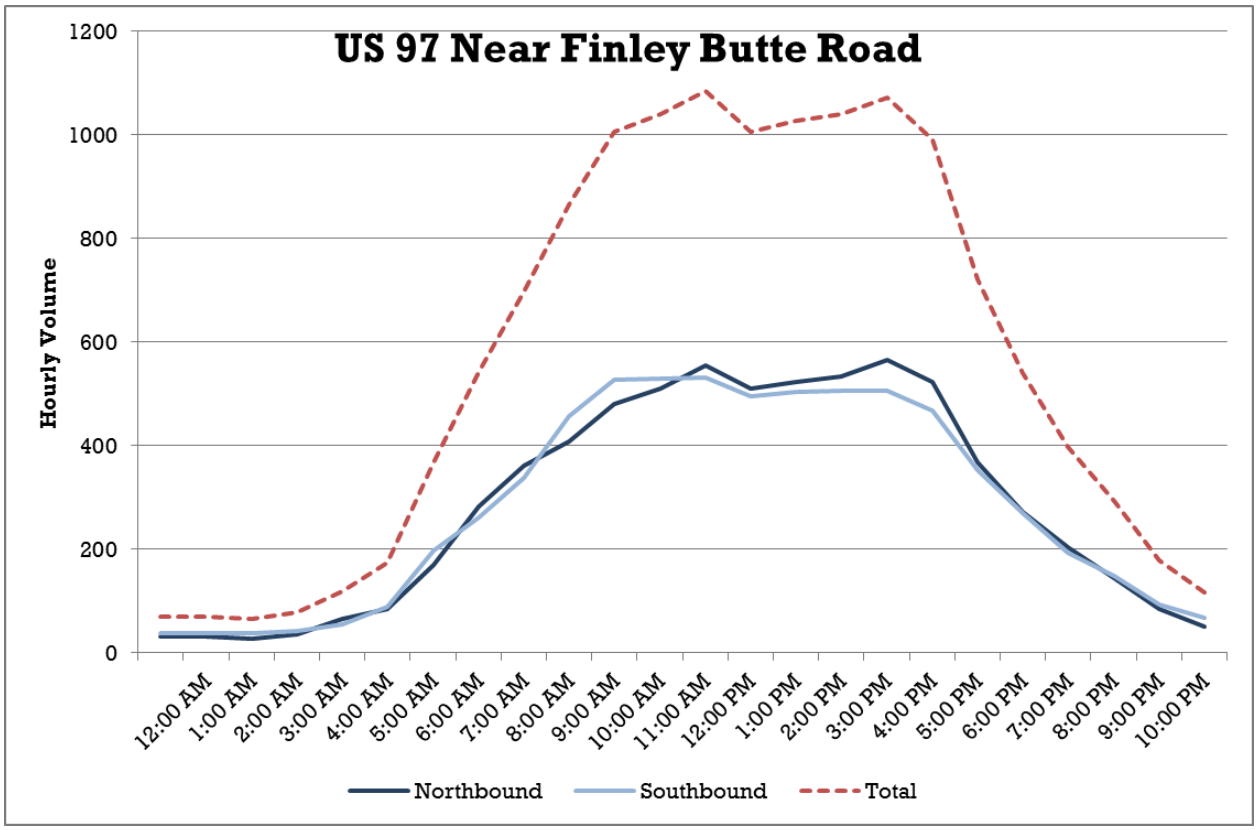


Exhibit 3-5 US 97 Near Finley Butte – Weekday Average Daily Traffic

Exhibit 3-5 and Exhibit 3-6 each highlight the difference in travel characteristics between regional highway trips (predominant near the Wickiup Junction) and intracity trips that occur within the downtown area. It was noted that within the La Pine core area (between 1st Street and 6th Street) peak travel occurs around the noon hour, but shows very minor change throughout the day with only slightly higher travel volumes as compared to the typical 4:00 p.m. to 6:00 p.m. evening peak.

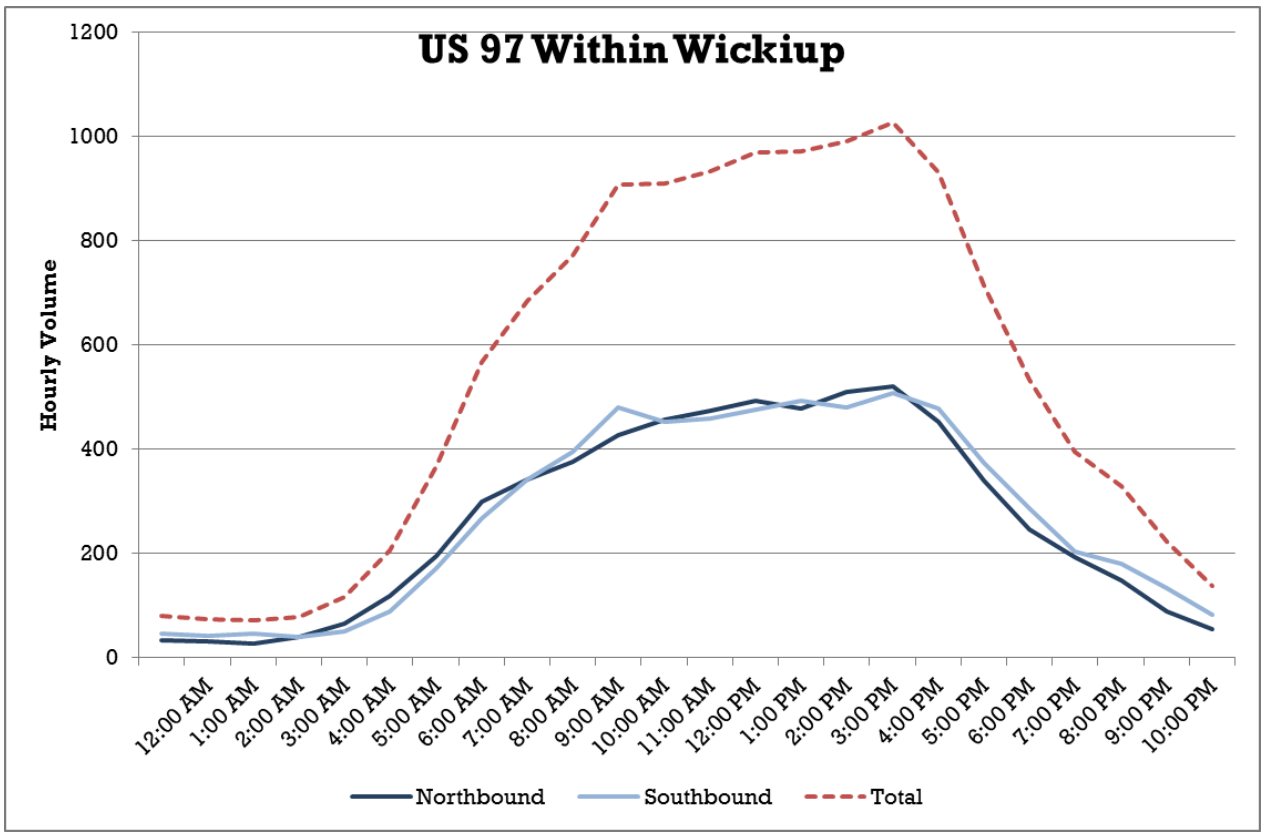


Exhibit 3-6 US 97 Within Wickiup – Weekday Average Daily Traffic

Each of these profiles show that the traffic volumes experienced within La Pine are more influenced by a consistent regional/statewide travel demand that occurs throughout the course of the day rather than a more typical morning and evening commute peaking that is often experienced in other communities. Therefore, the traffic operations that are reported for the weekday p.m. peak hour (as discussed below) are fairly reflective of the conditions that occur between mid-morning and the evening commute period.

Operational Analysis Results

Key intersections within La Pine were reviewed to identify if point or system capacity improvements are needed today. The analysis was conducted at each of the study locations identified in Figure 3-6.

Typically, intersection performance is compared against an adopted standard. However, the City of La Pine has historically deferred to Deschutes County requirements (as contained within Deschutes County Code 17.16). The County requires that its intersections operate at Level of Service “D” or better during the peak fifteen minutes of a weekday peak hour.

State mobility targets for US 97 are summarized within the Oregon Highway Plan and its amendments. The mobility target varies based on the highway classification, location, posted speed, and functional designation. Throughout La Pine, US 97 is a *Statewide Highway* and *Freight Route.* The highway is a designated *Expressway* between Ponderosa Drive in Bend south to 1st Street, with the designation resuming at Finley Butte and continuing south beyond the City boundary to Potter Street in Crescent. This designation places a higher priority for throughput on the highway. In addition, the posted speed on US 97 varies within City limits; the posted speed is 50 mph in Wickiup, 55 mph between Wickiup and the City core, and 35 mph in downtown La Pine.

Previous plans have been developed to address existing and long-term needs along US 97 through La Pine. Where applicable, this work is referenced by the TSP.

Based on the OHP and Deschutes County policy, the applicable performance standards are summarized in Table 3-4. This table also summarizes the existing operational conditions at the study locations.

Table 3-4 Existing Conditions Intersection Results, Weekday PM Peak Hour

Intersection	Jurisdiction	Traffic Control	Standard	Critical Movement	LOS	Delay	V/C	Meets Standard?
1. US 97/ Drafter Rd	ODOT	Side-street Stop	0.90[1]	NBL	C	16.4	0.27	Yes
2. Huntington Rd/ Cagle Rd	La Pine	Side-street Stop	LOS D	WB	A	9.1	0.05	Yes
3. Huntington Rd/ Burgess Rd	La Pine	Signal	LOS D	N/A	B	17.1	0.41	Yes
4. Huntington Rd/ 1st St	La Pine	Signal	LOS D	N/A	C	31.3	0.49	Yes
5. Huntington Rd/ 3rd St	La Pine	Side-street Stop	LOS D	EB	B	14.3	0.13	Yes
6. Huntington Rd/ Finley Butte Rd	La Pine	Side-street Stop	LOS D	NB	B	10.6	0.06	Yes
US 97/La Pine Corridor Study (2010 Conditions)								
7. US 97/1st St/ Reed Rd	ODOT	Side-street Stop	0.95[1]	EB	C	16.8	0.36	Yes
8. US 97/ William Foss Rd – 4th St	ODOT	Side-street Stop	0.95[1]	EB	B	13.2	0.27	Yes
9. US 97/ Huntington Rd	ODOT	Side-street Stop	0.95[1]	EB	B	12.0	0.25	Yes
10. US 97/ Finley Butte Rd	ODOT	Side-street Stop	0.95[1]	WB	B	14.3	0.12	Yes
11. US 97/ 6th St	ODOT	Side-street Stop	0.95[1]	WB	B	12.6	0.10	Yes
Wickiup Junction Study (2005 Conditions)								
12. US 97/ Burgess Rd	ODOT	Side-street Stop	0.90[1]	EB	Not Reported		0.51	Yes
13. US 97/ Rosland Rd	ODOT	Side-street Stop	0.90[1]	WB	Not Reported		0.43	Yes

[1] Operations reflect the relevant threshold for the stop-controlled side-street movement; mainline highway operations vary between 0.80 north of 1st Street and south of Finley Butte (designated expressway segments) and 0.85 within the City core.

As shown in Table 3-4, all of the study intersections currently operate acceptably. As was noted within the US 97/La Pine Corridor Study, the atypical configuration of many of the highway intersections coupled with the high speeds result in queuing and delays that are observed to be longer than those reported. This is further discussed below.

Intersection Geometric Review

Within La Pine the roadway network generally follows a north-south pattern, with US 97 intersecting diagonally across the City. This configuration results in a number of "skewed" intersections that do not cross the highway at right angles. These "skews" result in varying turning speeds for northbound and southbound drivers, require a sharper turn for larger vehicles, and provide an unconventional viewing angle for drivers approaching the intersections. This configuration also increases the pedestrian and bicycle crossing distances and exposure.

Exhibit 3-7 shows the approach angle of Morson Street, presenting one of the most extreme configurations from within the City. At this intersection the northbound left-turn from US 97 onto Morson occurs at a high speed due to the

Exhibit 3-7 Aerial imagery showing the Morson Street alignment with US 97 (prior to the road diet).

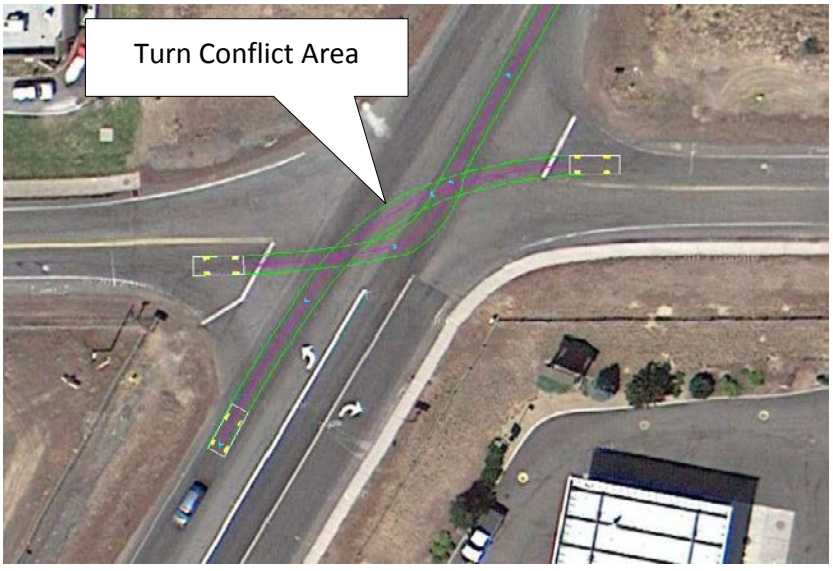


Exhibit 3-8 1st Street – Reed Road example of conflicts that occur due to intersection offset.

flat turning angle, whereas the southbound right-turn from the highway occurs at a low speed.

Intersection offset is another concern in La Pine. The slight mis-alignment of intersection legs can create conflicts for turning vehicles whose paths may cross, as illustrated in Exhibit 3-8. The approximately 15-foot offset at 1st Street – Reed Road (where the east leg is located slightly to the north) is an example of this poor offset.

Collision History Review

Crashes within the City of La Pine were reviewed for the five-year period between 2007 and 2011. Crash data was obtained from reported crashes that are collected and compiled by ODOT. Crash reports are required for crashes exceeding $1,500 in property damage or resulting in any type of injury.

Citywide Crash Trends

Throughout the past five years there have been a total of 132 reported crashes within the City. These crashes have involved 235 vehicles and 264 persons. Annual crashes over the past few years have fluctuated between 21 and 34 with no strong trend noted in the data, as shown in Exhibit 3-9.

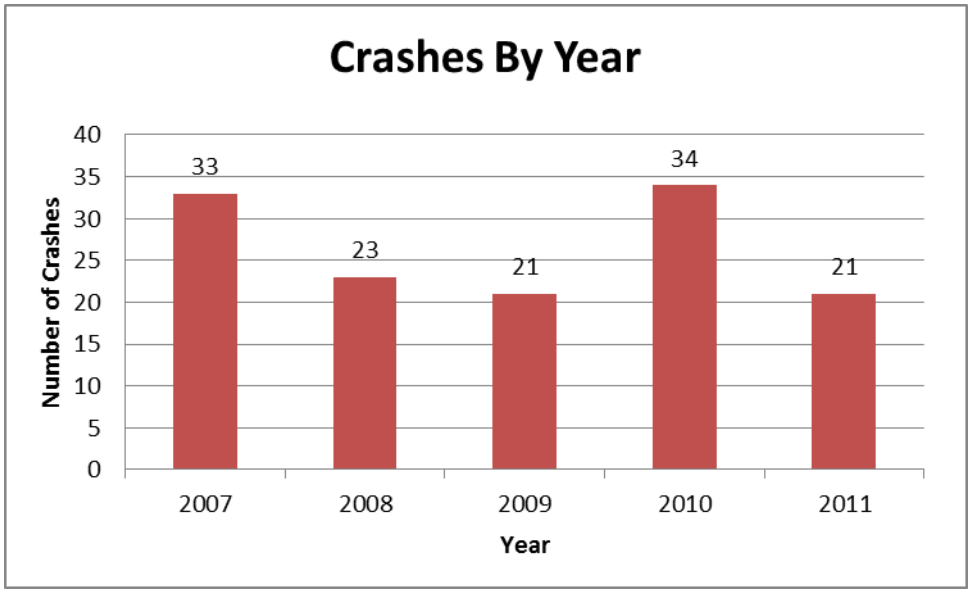


Exhibit 3-9 Annual summary of total City of La Pine crashes.

Crash severity was also reviewed over this period. Of the 132 crashes, two were reported as fatalities, 59 resulted in injuries, and 71 were non-injury (property damage only) collisions. One of the fatal crashes occurred at 8:00 p.m. on December 16, 2010 at the Rosland Road intersection with US 97. The crash reports show that the westbound driver was not wearing a seatbelt and did not yield to highway traffic while turning left from Rosland Road, and was struck by a northbound semi-truck. Alcohol was reported as a contributing factor.

The second fatality occurred at 10:00 p.m. on Sunday, May 29, 2011 approximately 2,000 feet north of 1st Street along US 97. A pedestrianwas on the highway when struck by a southbound vehicle. The crash report shows that neither drugs, alcohol, nor speed were contributing factors in this crash.

Other notable trends that were identified through review of the crash records include the following:

- 48% (64 total) of all reported crashes occur along US 97 (including both fatalities and 26 of the 59 injury crashes)
- December included the highest number of crashes of any month (26 total), with nearly double the number of crashes that occur in June (14 total) when traffic volumes are highest.
- Approximately 17% (23 total) of reported crashes occur on icy roadway conditions.
- There were 11 semi-trucks with trailers involved within the reported crashes.
- Twenty-one percent of crashes involved drivers between the ages of 50 and 59 (21%).
- There were four alcohol-involved crashes, no crashes that were reported as drug-involved.
- Four crashes occurred within a school zone, and one within a work zone.
- Twenty-seven crashes cited excessive speed as a crash cause.
- Turning crashes are the most common crash within La Pine (50 total, 38%), followed by angle crashes (26 total, 20%) and fixed-object collisions (23 total, 17%).

Pedestrian and Bicycle Crashes

Crashes involving pedestrians and bicycles within La Pine were specifically reviewed to help identify facility or crossing needs that enhance the comfort, convenience and safety for pedestrians and cyclists. Over the past five years, there were two pedestrian crashes and one reported crash involving a bicyclist. Further detail of these crashes is discussed below for reference. However, review of these crashes did not reveal any safety-related patterns that require mitigation.

The two pedestrian crashes include the fatality on US 97 north of 1st Street as previously described. The second pedestrian crash occurred at the Finley Butte intersection occurred on Monday, August 8, 2011 at 4:00 p.m. The crash reports indicate that a 19-year old female driver failed to yield the right-of-way to the pedestrian. The weather was reported as clear, dry, and sunny at the time of the crash.

The bicycle-involved crash occurred on at 1:00 p.m. on Friday, July 2, 2009 along a rural portion of Huntington Road about 500 feet north of the Crescent Creek subdivision. Limited data was available regarding the specific conditions of the crash, but the collision was reported as a non-motorist illegally in the roadway, and no error was identified on the part of the driver.

Corridor Crash Trends

Two corridors within La Pine, US 97 and Huntington Road, contain a high proportion of the overall crashes. Each of these corridors was further reviewed to identify roadway-specific safety trends.

US 97

There were 64 reported crashes including 16 crashes within Wickiup Junction, 4 crashes between Wickiup and the City core, and the remainder (44) between 1st Street and 6th Street along US 97 within the five-year period. Twenty-six of these crashes resulted in some type of injuries, including 2 fatalities, 18 non-incapacitating injuries, and 22 possible injuries (as reported). It should be noted that these historical crash records do not reflect the 2012 restriping of US 97 into a three-lane cross-section and other on-going speed treatments.

The following trends were noted for crashes along US 97:

- The crash records show that drivers over the age of 40 are involved in more of the highway crashes and are more often at-fault.
- There were nine crashes that involved trucks with trailers on the highway.
- 20 reported crashes occurred outside of daylight hours (low-light conditions, 31%).
- Nearly 27% of highway crashes occurred on snow or ice.
- The top crash causes cited were the following:
- Failure to yield right-of-way (22)
- Speed too fast for conditions (within legal limits, 14)
- Passed stop sign (12)
- Five of the highway crashes involved a driveway access.

Huntington Road

There were 44 reported crashes along Huntington Road north of US 97 over the past five years, excluding a single crash at the intersection with US 97. Crash trends have generally decreased over the analysis period, with 2011 exhibiting the lowest number of crashes of all five years. None of the reported crashes along this corridor cited drug or alcohol impairment.

Review of crash trends noted the following:

- Driver age was a significant factor in the crashes, with drivers in the 50 to 59 age category at fault in 38% of the crashes on this corridor.
- Over half of all the reported crashes on Huntington Road occurred at the two signalized intersections with 1st Street (9 crashes) and Burgess Road (17 crashes). The Burgess Road intersection was signalized in 2009 so many of these crashes reflect the prior stop-controlled configuration.
- The vast majority of reported crashes occurred with dry roadway surface conditions (35 of 44) and during daylight hours (36).

A summary of crashes at the Huntington Road/Burgess Road intersection is further addressed within the next section.

Intersection Crashes

There were two intersections within the City that experienced a relatively high number of crashes (approximately double all other intersections in the City): Huntington Road/Burgess Road and US 97/1st Street – Reed Road. Crashes at each of these intersections were further reviewed to identify potential crash trends that could suggest some type of geometric deficiency.

US 97/1st Street – Reed Road Intersection

The intersection of US 97 and 1st Street experienced 16 crashes over the past five years, exhibiting a relatively stable number of crashes per year despite recent land use changes in the area. The reported crashes were nearly all turning or angle crashes (13 total) with failure to yield as the primary crash cause. Drug or alcohol impairment was not cited as a factor in any of the crashes, and the majority occurred during daylight hours (14 total). While seven of the crashes involved some degree of injury, all of these injuries were reported as minor (non-incapacitating or possible injury).

ODOT has been working to implement treatments at this intersection to address the high speed rural transition to an urban environment, and recently installed a speed sign with a driver feedback display. Intersection improvements have been planned and are partially funded within the ODOT Statewide Transportation Improvement Program (STIP).

Huntington Road/Burgess Road Intersection

The intersection of Burgess and Huntington Road contained stop-control on the north-south Huntington Road approaches until 2009, when the intersection was signalized. The design of the intersection included LED illumination and battery back-up systems to help maintain signal operations during power failures given the high intersection approach speeds and rural surrounding area.

As shown in Exhibit 3-10, with exception of 2010, crashes have been declining since a peak in 2007. Review of only the 2010 and 2011 crash data shows that the crashes included three fixed object collisions (these involved a tree, mailbox, and ditch), two rear-end crashes, and one incident involving a deer. Review of these crashes did not identify any trends or indicate a need for further review.

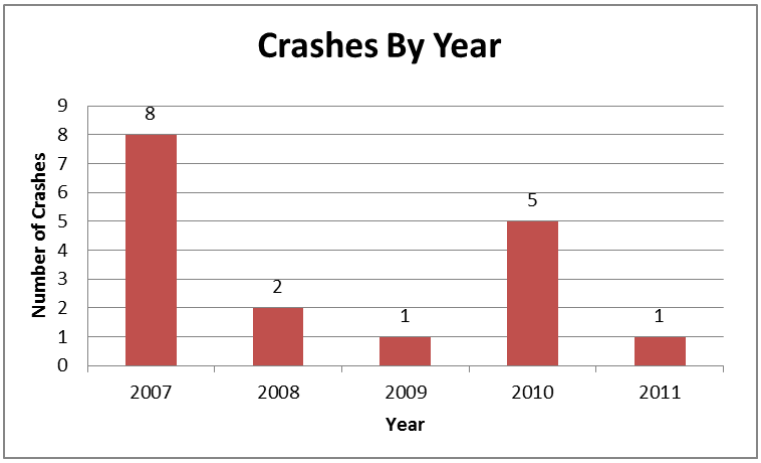


Exhibit 3-10 Huntington and Burgess intersection crash trend

Key Findings

A listing of key findings of the existing conditions and inventory are summarized below:

- Traffic volumes in La Pine are heavily influenced by regional travel, and do not experience the same commute peaks common in other communities.
- Intersections throughout La Pine operate acceptably today, but congestion on the highway is increased by high travel speeds and poor geometrics.
- Nearly half of all crashes in La Pine occur on US 97. The crashes involve a high proportion of older drivers, and increase in the winter months when travel volumes are lower but snow and ice are more common. A relatively high number of crashes occur on US 97 at night.
- The intersections of US 97/1st Street and Huntington Road/Burgess Road have nearly double the crashes of all other intersections in the City. The signalization of Huntington and Burgess in 2009 has helped to reduce crashes from their 2007 peaks. The US 97/1st Street intersection remains a priority, and recent efforts by ODOT are addressing speed and driver expectation issues within this rural to urban transition area.
- Access on US 97 exceeds State standards by a factor of five.
- Inventory information shows a general lack of bicycle and pedestrian facilities to interconnect the City. Transit service is only provided from the Wickiup Junction park-and-ride lot, with no service from the City core.
- Since incorporation Deschutes County continues to maintain all of the City's major roadways with exception of US 97, which is maintained by ODOT.

FUTURE CONDITIONS ANALYSIS

The US 97 corridor through La Pine has been analyzed in recent years by two different studies. The most recent, completed in July 2011, is the US 97/La Pine Corridor Plan, which analyzed the US 97 corridor through downtown La Pine, 1st Street/Reed Road to 6th Street. The second study, completed in September 2012, analyzed US 97 through the Wickiup area and included the Burgess Road and Rosland Road intersections. Each study analyzed a future year of 2032, which is generally consistent with a 20-year horizon period for the La Pine TSP. As such, the analysis results, findings, and recommendations of those studies have been incorporated into the TSP.

Forecasting Methodology

While the US 97 corridor has been analyzed previously, a forecasting approach is needed for the study intersections that are primarily on City and County roadway facilities. The forecasting approach applied to those intersections is described below.

The Deschutes County Travel Demand Model prepared by ODOT's Transportation Planning and Analysis Unit (TPAU) includes the La Pine area on the southern edge of the model. However, as part of the US 97/La Pine Corridor Plan, the model was determined to not be reliable predictor of arterial, collector, and local street travel demand within city limits largely owing to the low resolution within this area and growth assumptions that were prepared prior to adoption of the City's current Comprehensive Plan. As such, the US 97/La Pine Corridor Plan applied a range of growth factors to bound the analysis and determine the potential sensitivity of impacts to the transportation system based on either a low (1 percent/year) or high (2.7 percent/year) growth scenario. This range was selected to capture historical rates at the time of the study (2010, low-growth scenario) and forecasts included in the previously conducted Wickiup Junction Analysis (2005, high-growth scenario). This analysis showed little change in transportation needs regardless of which growth rate was applied within La Pine.

Based on this approach and the of citywide La Pine travel growth identified within the model, the analysis conducted for intersections 1-6 assumed a growth factor of 2 percent per year for all movements. Two areas within La Pine were further reviewed to ensure this approach reasonably assesses the future demands:

- La Pine Industrial Group, Inc. (LIGI) manages industrial-zoned lands on the southeast side of the City. These areas include the Newberry Business Park, Finley Butte Industrial Park, and an 80-acre of shovel-ready industrial site along the BNSF mainline.
- The City is considering incorporation of future Rodeo/fairgrounds lands whose primary access would be provided from 6th Street.

Review of the LIGI property shows that their development could increase traffic demands beyond the projected annual rate of 2 percent. However, as the US 97/La Pine Corridor Plan identifies signalization projects at the 1st Street – Reed Road and Finley Butte intersections with US 97, ample capacity is provided and higher growth would not change the system needs at these locations.

Operational Analysis Results

The operational analysis results conducted or referenced for this analysis are shown in Table 3-5.

Table 3-5 Future Conditions Intersection Results, Weekday PM Peak Hour (2032)

Intersection	Jurisdiction	Traffic Control	Standard	Critical Movement	LOS	Delay	V/C	Meets Standard?
1. US 97/ Drafter Rd	ODOT	Side-street Stop	0.95[1]	NBL	D	26.8	0.40	Yes
2. Huntington Rd/ Cagle Rd	La Pine	Side-street Stop	LOS E	WB	A	9.5	0.07	Yes
3. Huntington Rd/ Burgess Rd	La Pine	Signal	LOS D	N/A	B	18.7	0.59	Yes
4. Huntington Rd/ 1st St	La Pine	Signal	LOS D	N/A	C	32.0	0.64	Yes
5. Huntington Rd/ 3rd St	La Pine	Side-street Stop	LOS E	EB	C	23.8	0.31	Yes
6. Huntington Rd/ Finley Butte Rd	La Pine	Side-street Stop	LOS E	NB	B	12.3	0.11	Yes
US 97/La Pine Corridor Study (2032 Conditions)								
7. US 97/1st St - Reed Rd	ODOT	Side-street Stop	0.95[1]	EB	F	>50	>1.0	**No**
8. US 97/ William Foss Rd – 4th St	ODOT	Side-street Stop	0.95[1]	EB	F	>50	>1.0	**No**
9. US 97/ Huntington Rd	ODOT	Side-street Stop	0.95[1]	EB	D	34.1	0.72	Yes
10. US 97/ Finley Butte Rd	ODOT	Side-street Stop	0.95[1]	WB	D	33.9	0.71	Yes
11. US 97/ 6th St	ODOT	Side-street Stop	0.95[1]	EB	F	>50	>1.0	No
Wickiup Junction Study (2032 Conditions)								
12. US 97/ Burgess Rd	ODOT	Side-street Stop	0.95[1]	EB	Not Reported		>1.0	**No**
13. US 97/ Rosland Rd	ODOT	Side-street Stop	0.95[1]	WB	Not Reported		>1.0	**No**

[1] Operations reflect the relevant threshold for the stop-controlled sidestreet movement; mainline highway operations vary between 0.80 north of 1st Street and south of Finley Butte (designated expressway segments) and 0.85 within the City core.

Intersections 1-6 assumed a 2 percent annual growth from existing conditions.

Intersections 7-11 assumed a 2.7 percent annual growth from existing conditions.

Intersections 12 and 13 applied cumulative analysis growth scenario.

As shown in Table 3-5, the study intersections located on the La Pine local street system are forecast to continue to operate acceptable with ample reserve capacity, whereas along US 97 congestion will increase. The following intersections along US 97 are expected to experience operational issues in the future:

- US 97/Rosland Road
- US 97/Burgess Road
- US 97/1st Street/Reed Road
- US 97/William Foss Road
- US 97/6th Street

These intersections were previously studied as part of the two US 97 corridor studies discussed earlier. As such, mitigation measures have been developed to address most of the deficiencies identified. These improvements, other planned improvements, and overall transportation system needs are discussed in the following sections.

Safety Related Future Needs

Based on the collision history review conducted in the previous section, the following needs were identified to address safety concerns. Future system improvements, design, and policy should consider the following:

- Consider design treatments within La Pine that address the needs of an older population.
- Continue to invest in treatments that inform or enforce appropriate speeds for roadway conditions and context throughout the City.
- Increased emphasis on highway safety from an access, geometrics, and winter maintenance perspective.
    - Implementing illumination along the highway, particularly at intersections within the City core area and rural to urban transitions.
    - Improved speed compliance through design, education, information, and enforcement.
    - Focus on design aspects that will better support an older population such as larger street signs and illumination.

Section 4
Transportation System Plan

TRANSPORTATION SYSTEM PLAN

In 2011, the City of La Pine adopted its first Comprehensive Plan. As a newly incorporated city, the Comprehensive Plan provides the community with the long-term vision and policy framework to guide its transition from a rural Deschutes County community to an incorporated city with a healthy economy and multimodal transportation system. The enclosed Transportation System Plan (TSP) will be incorporated into the Comprehensive Plan to support the transportation-related goals and policies that are already addressed. The TSP is the first for La Pine and will be updated every 7 – 10 years.

STATE AND REGIONAL PLANNING CONTEXT

The La Pine Transportation System Plan (TSP) identifies the transportation-related projects, programs and policies needed over the next 20 to 40 years to serve local, regional and statewide multi-modal travel within the Urban Growth Boundary (UGB). The TSP considers the transportation plans for the county and ODOT facilities and is consistent with the requirements of statewide and regional transportation plans and policies.

State and Regional Facilities

US 97 is the only state highway within La Pine and is the major north-south route through Central Oregon. It serves as a major connection and freight route for motorists and freight traveling north-south between Washington, Oregon, and California. Within La Pine, US 97 has historically served as the main street for the community. As such, many commercial uses front the highway within the city limits.

Huntington Road parallels US 97 to the west and provides a non-highway alternative for north-south travelers. To the north, Huntington Road connects to Century Drive and provides access to the Sunriver area. To the south, the roadway connects to outlying rural areas. However, the vast majority of north-south travel to and from La Pine occurs via US 97.

Related Plans and Policies

Deschutes County Transportation System Plan

The Deschutes County Transportation System Plan identifies $306.2 million in transportation projects that are needed to support an additional 108,000 people within the County between now and the year 2030. The majority of the projects are identified for the State Highway system with the assumption that the incorporated cities address needed projects within their UGBs. Funding has not been identified for any of the County identified projects.

The County TSP contains 18 broad goals that address operations, safety, modal elements, infrastructure, demand management, asset management, standards, classifications, access, and future

plan updates. In addition, the TSP requires level-of-service "D" be maintained at the collector and arterial intersections under county jurisdiction.

The TSP identifies the need for the Wickiup Junction interchange. There are no other projects of significance outlined within the County's TSP within the city of La Pine.

The population forecasts included in the La Pine TSP are consistent with the Deschutes County plan. Additionally, the TSP incorporates the Wickiup Junction improvements plans. The city will continue to collaborate with Deschutes County as roadways are transitioned from County to City jurisdiction.

US 97/La Pine Corridor Plan

The US 97/La Pine Corridor Plan identifies short-term and long-term projects for the transportation system between 1st Street and 6th Street in the downtown. These projects are intended to serve local and statewide multimodal and freight travel. The key recommendations from this plan are outlined in Table 4-1 below.

Table 4-1 Highway 97/La Pine Corridor Plan Recommendations

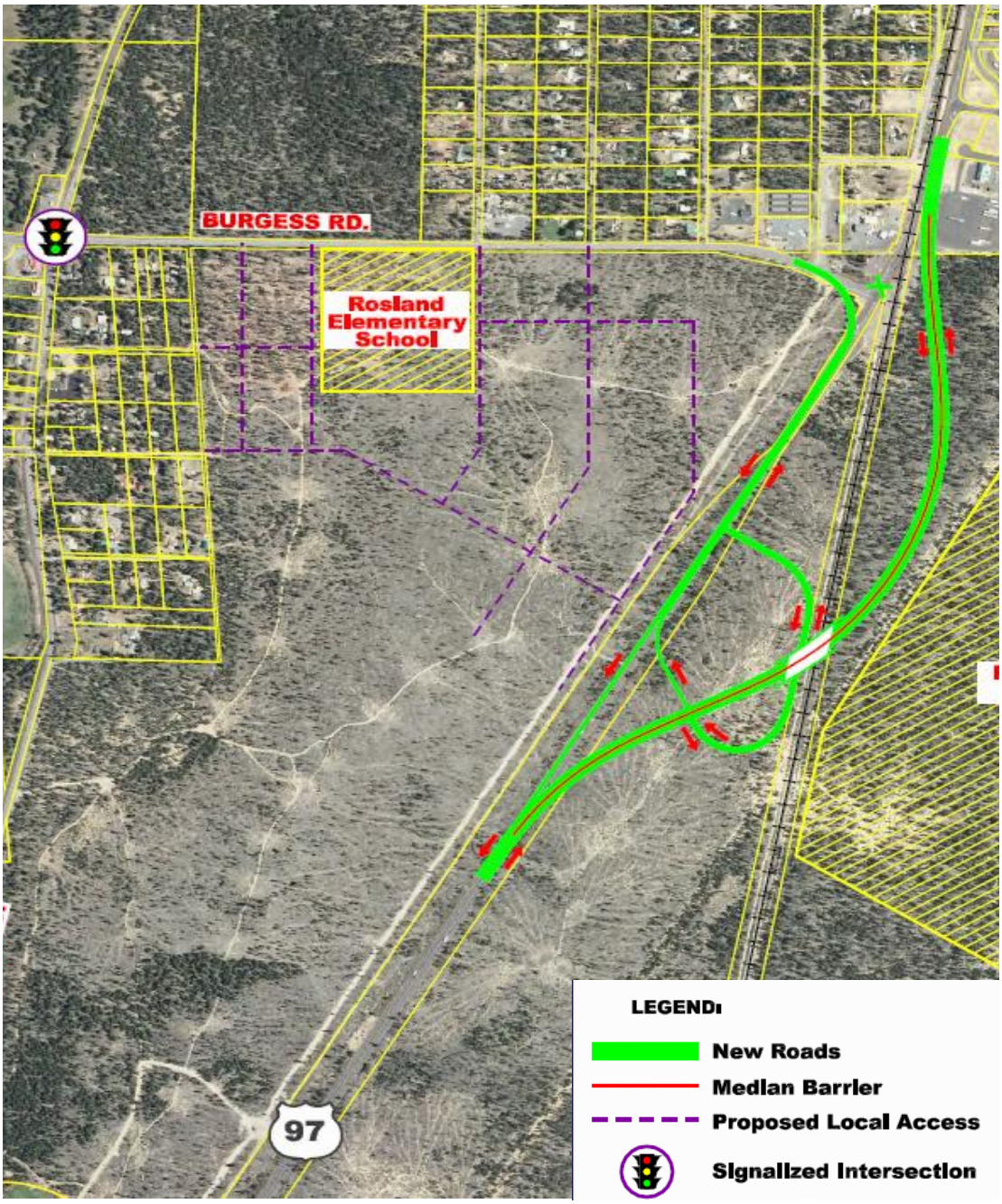
Intersection	Description
US 97 @ 1st St.	• Signalized intersection and realignment • Encourage rural to downtown speed transition • Additional Turn Lanes
US 97 @ 4th St.	• High visibility pedestrian treatments • Pedestrian refuge island in center median
US 97 @ Finley Butte/Morson St.	• Signalized intersection and realignment • Left turn lanes

ODOT recently implemented some near term objectives of the plan, most notably changing the cross-section of US 97 through downtown to 3 travel lanes. The La Pine TSP incorporates the key recommendations from the US 97/La Pine Corridor Plan.

Wickiup Junction Plan

The Wickiup Junction Plan presents transportation options to address a safety issue that has been documented by ODOT. Today, Wickiup Junction is the only at-grade railway/highway crossing on US 97 in the State of Oregon. ODOT, Deschutes County, and the City of La Pine are collaborating to reconstruct Wickiup Junction as an overcrossing of the railroad per recommendations from the Plan. The key aspects of this design are shown in Figure 4-1. Once complete, US 97 will be realigned to the east with a grade-separated rail crossing to the south of its current location. As part of these efforts, the Burgess Road intersection with US 97 will be relocated. The La Pine TSP incorporates the overcrossing design as a priority project for the city.

Figure 4-1 Wickiup Junction Concept Plan, June 2012



Other Relevant Plans

A variety of other state, regional and local planning documents affect specific aspects of future transportation planning in La Pine. A summary of those documents is included in Volume 2 of the TSP.

POLICY/REGULATORY ELEMENTS

A number of transportation-related policy and regulatory elements will guide development review and project development in La Pine in the future. These elements are discussed in more detail below and include:

- Goals and Evaluation Criteria
- Intersection Performance Standards
- Access Spacing Guidelines
- Roadway Functional Classification
- Street Design Standards
- Truck Routes
- Planned Projects

Goals and Evaluation Criteria

The following goals reflect the vision for the long-term transportation system for the city based on guidance from Comprehensive Plan and insights offered by community leaders, residents, business owners, freight representatives and other affected stakeholders.

1. Provide a safe, convenient, and accessible system to support the growth and livability of La Pine.
2. Provide a transportation system that incorporates a range of transportation options for all modes of travel.
3. Optimize the investment in the existing transportation system.
4. Provide a transportation system that supports the economic viability of La Pine and regionally throughout Central Oregon.

Table 4-2 summarizes the goals and relevant evaluation criteria.

Table 4-2 TSP Goals and Evaluation Criteria

Goal #1: Provide a safe, convenient, accessible and economically feasible system to support the growth and livability of La Pine.	
1A	Provides for safe and efficient emergency vehicle access
1B	Minimizes impacts to existing neighborhoods and businesses
1C	Supports safe and efficient use of vehicular and active transportation modes
1D	Is consistent with the La Pine 2010 Comprehensive Plan vision and community development goals
1E	Provides roadway treatments that can help implement a safe bicycle and pedestrian environment
1F	Addresses known safety issues
Goal #2: Provide a transportation system that incorporates a range of transportation options for all modes of travel.	
2A	Supports transportation system improvements that provide access for all users, regardless of age, ability, or mode of transportation
2B	Provides access to the transportation system
2C	Addresses key gaps in the bicycle system
2D	Addresses key gaps in the sidewalk and trail system
2E	Provides access to regional transit, including provision of park-and-rides
2F	Improves access to schools from adjacent neighborhoods
2G	Enhances connectivity within and between major activity centers
2H	Improves connectivity to recreational facilities and areas surrounding the city
2I	Reduces trip lengths for all users
Goal #3: Optimize investment in the existing transportation system.	
3A	Prioritizes roadway upgrades and paving for city streets that provide the highest benefit to the community
3B	Provides a sustainable transportation funding method for future improvements
3C	Optimizes operations and maintenance costs
3D	Emphasizes investments in the existing system
3E	Manages access to move toward standards in city development code and the Oregon Highway Plan
3F	Reduces delay at key intersections
Goal #4: Provide a transportation system that supports the economic viability of La Pine and Central Oregon.	
4A	Balances the needs on Highway 97 with the local community context and priorities
4B	Preserves the critical statewide freight role of Highway 97
4C	Supports multimodal access to major employment centers
4D	Reduces reliance on Highway 97 for local travel
4E	Minimizes impacts to developable parcels
4F	Supports La Pine's ability to implement key state or regional priorities and projects
4G	Provides intermodal connectivity
4H	Supports city efforts to explore creation of a local airport

Intersection Performance Standards

Cities establish minimum performance standards for the transportation system to help guide planning efforts, project development, and land use entitlements. These standards are often a reflection of the amount of delay experienced by a motorist at intersections within the city, which is expressed as "level of service." Cities often require that a proposed development application be accompanied by a study that demonstrates that the transportation system can adequately accommodate the proposed use, as measured against the established performance standards.

Intersection performance standards for intersections within La Pine are as follows:

- Volume-to-capacity ratio less than 0.90 and Level of Service "D" for signalized and all-way stop-controlled intersections.
- Volume-to-capacity ratio less than 0.90 and Level of Service "E" for the critical movement at unsignalized and roundabout-controlled intersections.

Additional details on the application of the performance standards and the Transportation Impact Analysis Requirements can be found in Volume 2.

Access Spacing Guidelines

Access spacing guidelines help the city to identify the minimum desired distance between private and public access points along major roadways. Implementing access spacing guidelines helps the city to minimize the potential for vehicular conflicts between closely-spaced accesses as well as conflicts between vehicles, pedestrians, and cyclists.

In general, local streets are intended to provide access to adjacent lands, and therefore access spacing policies for these facilities allow for the most closely spaced accesses of all of the roadway classifications. Conversely, one of the primary functions of arterials is to provide through traffic mobility, which necessitates the most restrictive access spacing standards.

The following outlines the access spacing guidelines within La Pine. These guidelines pertain to public and private access. When parcels are abutted by multiple roadways, access should be provided from the lowest order facility, where feasible.

- Access points on local streets shall be a minimum of ten feet (10') apart as measured from edge of driveway to edge of driveway.
- Access points on Collector Streets shall be a minimum of one hundred feet (100') apart as measured from centerline of access to centerline of access.
- Access points on Arterial Streets shall be a minimum of three hundred feet (300') apart as measured from centerline of access to centerline of access.

ODOT has jurisdiction over the US 97 alignment through the urban area. As such, access spacing guidelines for this facility are governed by OAR 734-051. Given that the speed, highway designation,

and, potentially, traffic control, are variable along the US 97 alignment within La Pine, the access spacing targets also change. The most current ODOT classifications and guidance should be referenced when considering access modifications along the highway. ODOT's access spacing standards are organized by intersection traffic control and a specific state highway.

In addition to the guidelines listed, the following policies also pertain to access control with the city:

- Access points onto arterials and collectors may have directional restrictions (i.e. right-in/right-out only) depending on the roadway's characteristics, including number of lanes, roadway volume, queuing at nearby intersections/driveways, and locations/type of traffic control, and locations of conflicting accesses.
- Directional restrictions will be determined by the City after a review of the Transportation Impact Analysis provided by the applicant.
- Crossing of multi-use paths by driveways shall not be allowed unless there are no other access options for the site. If allowed, a driveway access crossing a multi-use path shall be constructed to provide priority and adequate visibility to trail users, and should provide shared access to adjacent property, when applicable.
- Driveways shall not be located within 200 feet of an intersection of collector(s) or arterial(s) to avoid conflicts with queued vehicles.
- Only one access is permitted per street frontage (including shared access), however lots may have multiple street access points whereas minimum access spacing requirements are met.
- The centerlines of driveways are required to align across arterials and collectors to minimize conflicting turning movements and allow for adequate turn storage.
- Shared access and access easements to adjacent properties may be required, in order to comply with these access requirements and to allow adjacent lands to also comply.

Constraints may require deviations to these access standards. Where these guidelines cannot be implemented, justification of an alternative should be prepared that demonstrates how safety for all modes will be provided, or how the change will better meet the roadway function. Self-imposed constraints are not justification for an access deviation.

Figure 4-2 on the following page illustrates the application of cross-over easements and conditional access permits that can be implemented over time to achieve the desired access management objectives. The individual implementation steps are described in Table 4-3. As illustrated in the figure and supporting table, through the application of these guidelines, all driveways along city, county, and state roadways can eventually move in the overall direction of the access spacing standards as development and redevelopment occur along a given street.

Figure 4-2 Example of Cross-over Easement/Indenture/Consolidation/Conditional Access Process

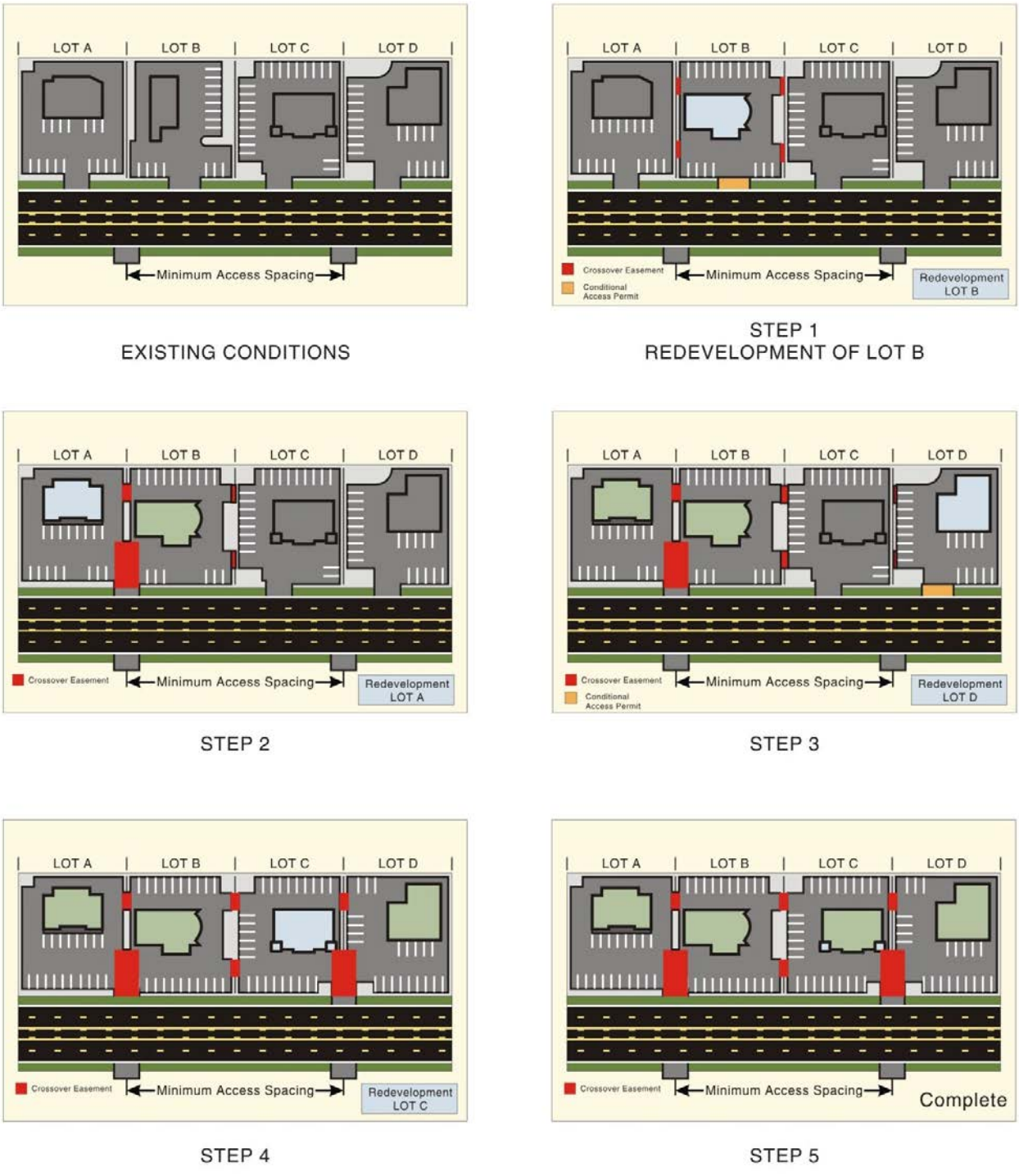


Table 4-3 Example of Crossover Easement/Indenture/Consolidation - Conditional Access Process

Step	Process
1	EXISTING – Currently Lots A, B, C, and D have site-access driveways that neither meet the access spacing criteria of 300 feet nor align with driveways or access points on the opposite side of the roadway. Under these conditions motorists are into situations of potential conflict (conflicting left turns) with opposing traffic. Additionally, the number of side-street (or site-access driveway) intersections decreases the operation and safety of the roadway.
2	REDEVELOPMENT OF LOT B – At the time that Lot B redevelops, the City would review the proposed site plan and make recommendations to ensure that the site could promote future crossover or consolidated access. Next, the City would issue conditional permits for the development to provide crossover easements with Lots A and C, and City would grant a conditional access permit to the lot. After evaluating the land use action, the City would determine that LOT B does not have either alternative access, nor can an access point be aligned with an opposing access point, nor can the available lot frontage provide an access point that meets the access spacing criteria set forth for segment of roadway.
3	REDEVELOPMENT OF LOT A – At the time Lot A redevelops, the City would undertake the same review process as with the redevelopment of LOT B (see Step 2); however, under this scenario the City would use the previously obtained cross-over easement at Lot B consolidate the access points of Lots A and B. The City would then relocate the conditional access of Lot B to align with the opposing access point and provide and efficient access to both Lots A and B. The consolidation of site-access driveways for Lots A and B will not only reduce the number of driveways accessing the roadway, but will also eliminate the conflicting left-turn movements the roadway by the alignment with the opposing access point.
4	REDEVELOPMENT OF LOT D – The redevelopment of Lot D will be handled in same manner as the redevelopment of Lot B (see Step 2)
5	REDEVELOPMENT OF LOT C – The redevelopment of Lot C will be reviewed once again to ensure that the site will accommodate crossover and/or consolidated access. Using the crossover agreements with Lots B and D, Lot C would share a consolidated access point with Lot D and will also have alternative frontage access the shared site-access driveway of Lots A and B. By using the crossover agreement and conditional access permit process, the City would be able to eliminate another access point and provide the alignment with the opposing access points.
6	COMPLETE – After Lots A, B, C, and D redevelop over time, the number of access points will be reduced and aligned, and the remaining access points will meet the access spacing standard.

Roadway Functional Classification

Roadways are classified using arterial, collector, and local designations, depending on the intended function and the adjacent land use needs.

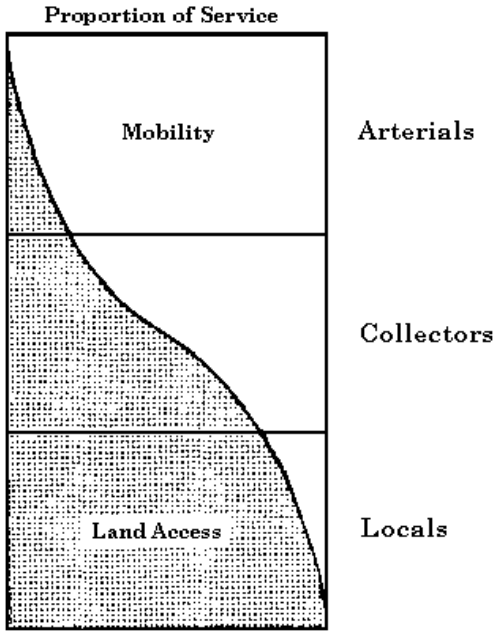


Exhibit 4-1 Functional classification related to access and mobility.
Source: A policy on Geometric Design of Highways and Streets, 2004.

Arterials primarily provide mobility particularly between large population centers or activity generators. Mobility is emphasized over local access connections. Within La Pine, 1st Street serves as an example of an arterial facility. That facility's main function is to provide a connection between the east and west sections of downtown La Pine.

Downtown Arterials are similar to arterials, but emphasize pedestrian travel and street design characteristics more than the traditional arterial designation. Huntington Road south of 1st Steet is an example of a downtown arterial.

Major Collectors provide the connection between local streets and the arterial street system. Trip lengths are generally shorter than on arterials, and provide a link between local traffic generators more regional facilities. Collectors provide access to and circulation within neighborhoods and industrial and commercial areas. Within La Pine, 4th Street is an example of a collector roadway. This facility provides US 97 access from eastern residential and industrial lands.

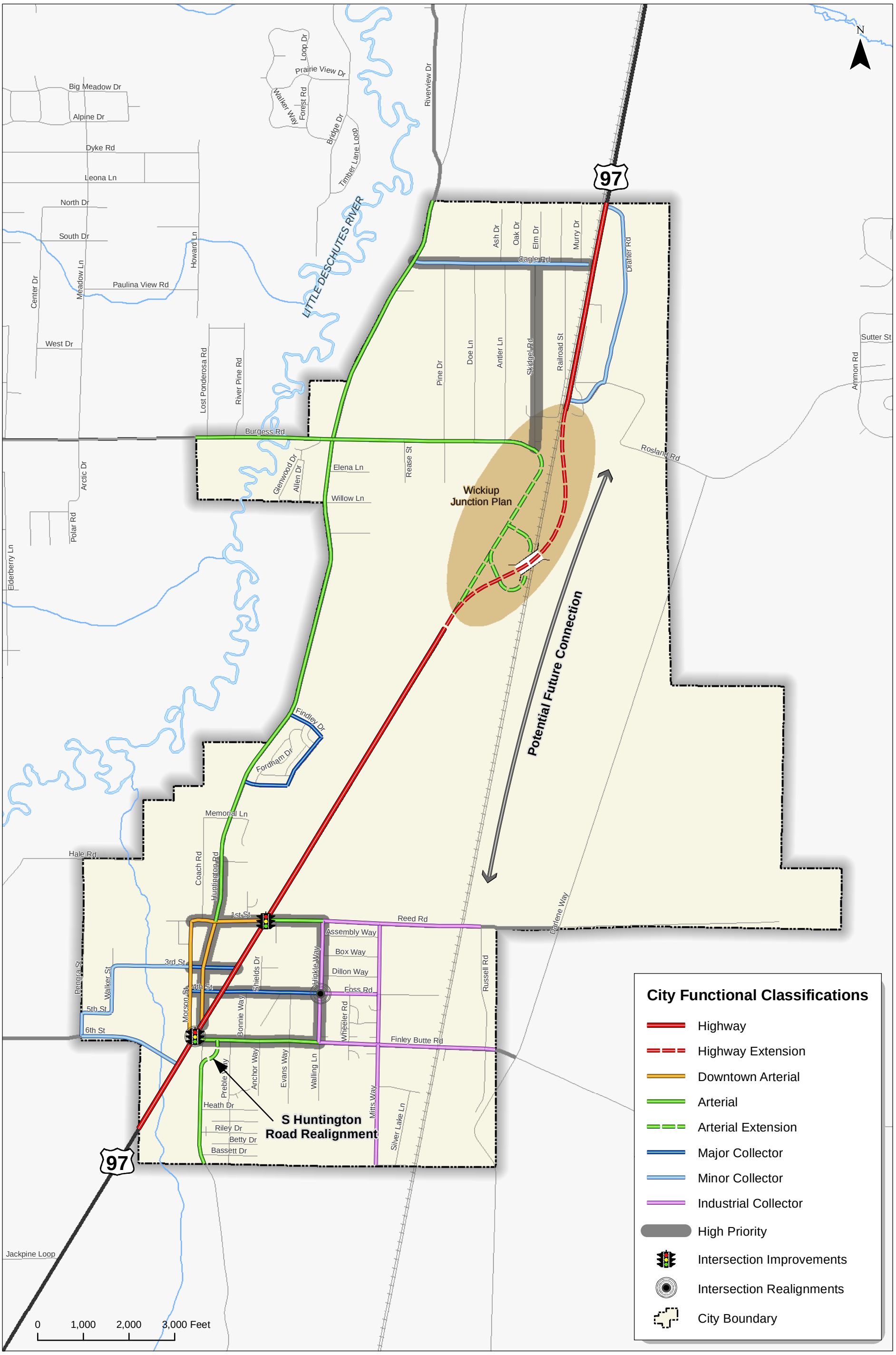
Minor Collectors are similar to arterials, but emphasize mobility more than the traditional collector designation. Within La Pine, this designation is used to classify roadways where urban features such as on-street parking are not feasible or desired.

Industrial Collectors are intended to be constructed within the industrial areas of La Pine, most notably the east side of Downtown La Pine. These facilities emphasis freight mobility while still providing opportunities for travelers using other modes.

Local Streets provide for direct access to land. Shorter trips are common and through trips are discouraged. Travel is generally at lower speeds than on other functional classification roads. La Pine has a number of local streets. These facilities generally connect to collectors.

Exhibit 4-1 illustrates the relationship between through traffic mobility and access as it relates to roadway functional classification.

Figure 4-3 shows the functional classification of each roadway in La Pine. Additional standards related to these designations are described in the following subsection.



Roadway Functional Classification
La Pine, Oregon

Figure **4-3**

Coordinate System: NAD 1983 HARN StatePlane Oregon South FIPS 3602 Feet Intl

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Street Design Standards

Many of the streets in La Pine reflect a rural character as the city has transitioned from an unincorporated community into a city. Streets typically have been designed with two travel lanes and limited facilities for pedestrians and cyclists. As the city urbanizes over the next 20 – 40 years, priority should be given on creating a multimodal transportation system for all users. Existing streets will be upgraded through both public and private investment. When such upgrades are provided (or construction of new facilities takes place), the roadway construction should follow the design standards outlined in this subsection. New streets should be designed, when possible, to the standards presented below.

Roadway Cross Section Standards

Table 4-4 presents the dimensional standards for the five proposed functional classifications in La Pine.

Table 4-4 Roadway Cross-Section Standards

Functional Classification	Features/Dimensions (Each Direction)					Left Turn Lane/ Median	Total Paved Width	Total Right-of-Way Width
	Travel Lane	Bike Lane	On-Street Parking	Sidewalk	Planter Strip			
Arterial	12’	6’	None	6’	8’	Left-Turn Lanes, 14’	36’ to 50’	78’
Major Collector	11’	6’[1]	7’[2]	6’	8’	None	34[1] - 48’	76’
Local Street	11’	None	7’	6’	8’	None	36’	64’
Downtown Arterial	12’	6’	Optional, 7’	8’	8’	Optional Landscaped Median, 14’	50’	82
Minor Collector	11’	6’	None	6’	8’	None	34’	62’
Industrial Collector	14’	6’	None	6’	None	None	40’	52’

[1] On low volume, low speed (>30 mph) facilities, alternative bicycle facilities can be considered at the discretion of the City
[2] On-street parking provide adjacent to commercially zoned properties

Bicycle and Pedestrian Facilities

When improved or when new streets are constructed, all arterials and collectors need to accommodate both pedestrians and bicyclists. Sidewalks are a minimum of 6 feet wide, and must follow Americans with Disabilities Act requirements for design to accommodate all users, including adequate clear widths for people using wheelchairs, sidewalk ramps at all pedestrian crossings, and detectable warnings for the vision-impaired. Bicycle facilities on arterials and collectors can be constructed as bike lanes, or other such facilities, depending on the context. The minimum width for a bike lane is six feet. Multi-use paths are another option for pedestrians and bicyclists, especially in more rural areas. These paths should be designed with adequate width to accommodate bi-directional movement and passing, with a minimum width of 12 to 14 feet.

Context-Sensitive Variation

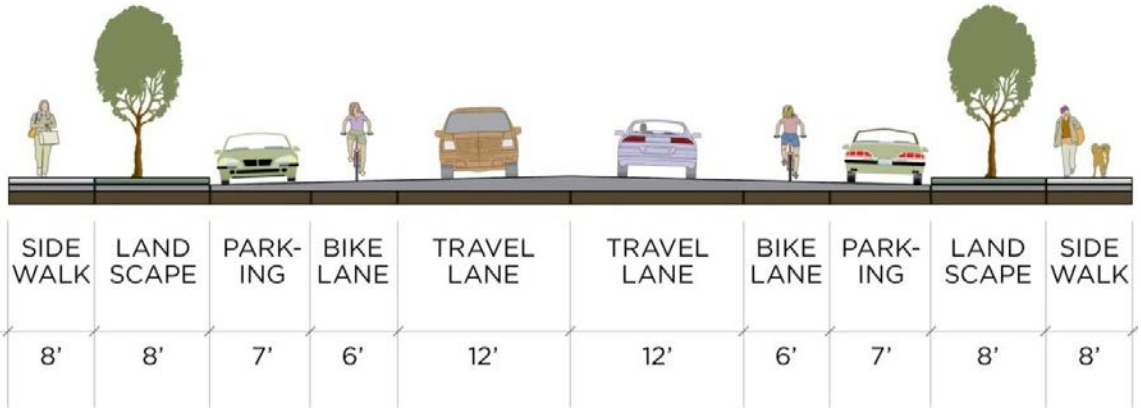
The street sections in the City of La Pine vary depending on whether they are located downtown core areas, residential sections, commercial hubs, or more rural environments. Context-specific considerations include:

- Planter strips outside urbanized areas are optional, due to maintenance costs.
- Constrained roadways in more rural areas can be designed with shoulders to accommodate bikes and pedestrians when the right-of-way is limited.
- On-street parking can be provided or not provided based on the context of the area being served.
- Curbs should be included in the downtown core area. However, they may be optional in areas outside the downtown core when drainage issues warrant such consideration.
- In downtown areas, options are available to replace center turn lanes and medians with on-street parking, as shown by the two figures in the following section.

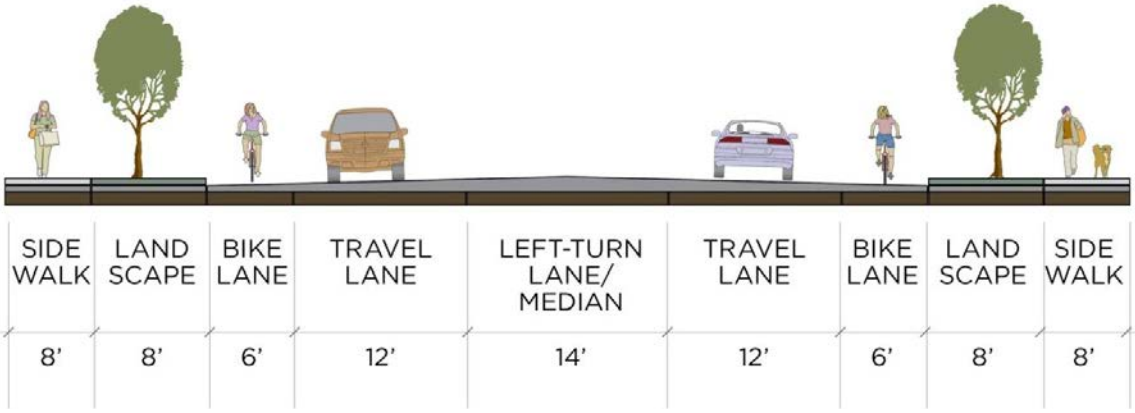
Cross Sections

The following provides visual representations of the cross section standards within La Pine. Two options are provided for the Downtown Arterial cross-section. Future public input will further refine this concept.

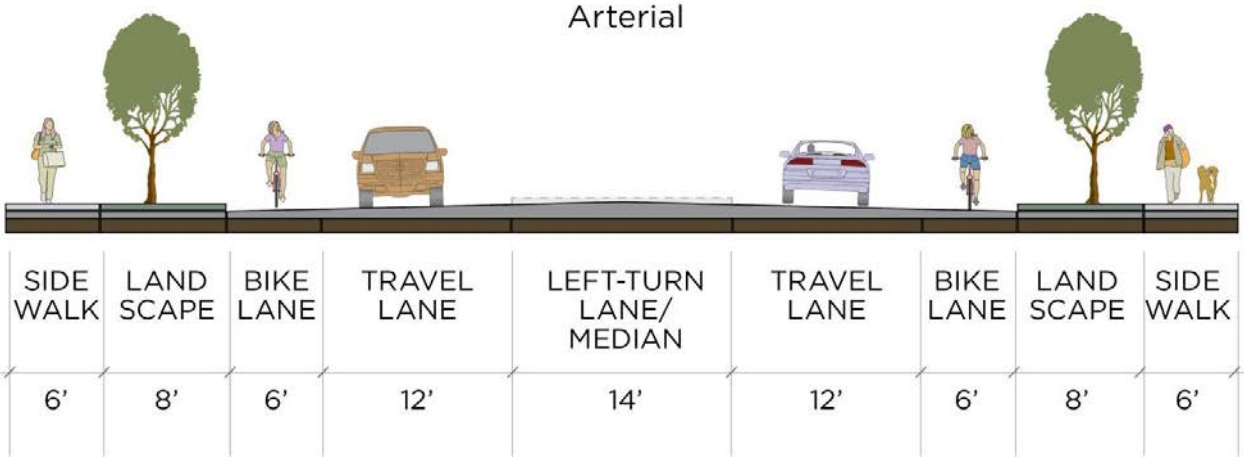
Downtown Arterial: Option 1 (with parking)



Downtown Arterial: Option 2 (no parking)

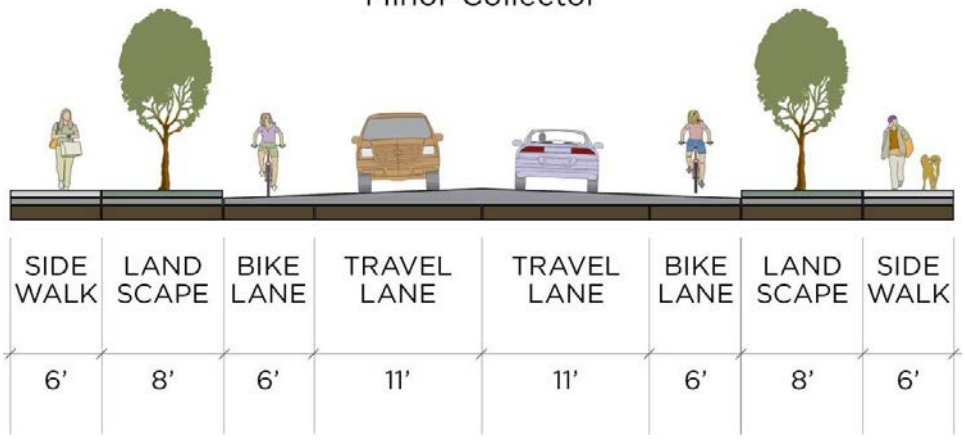


Arterial



Industrial Collector

Minor Collector



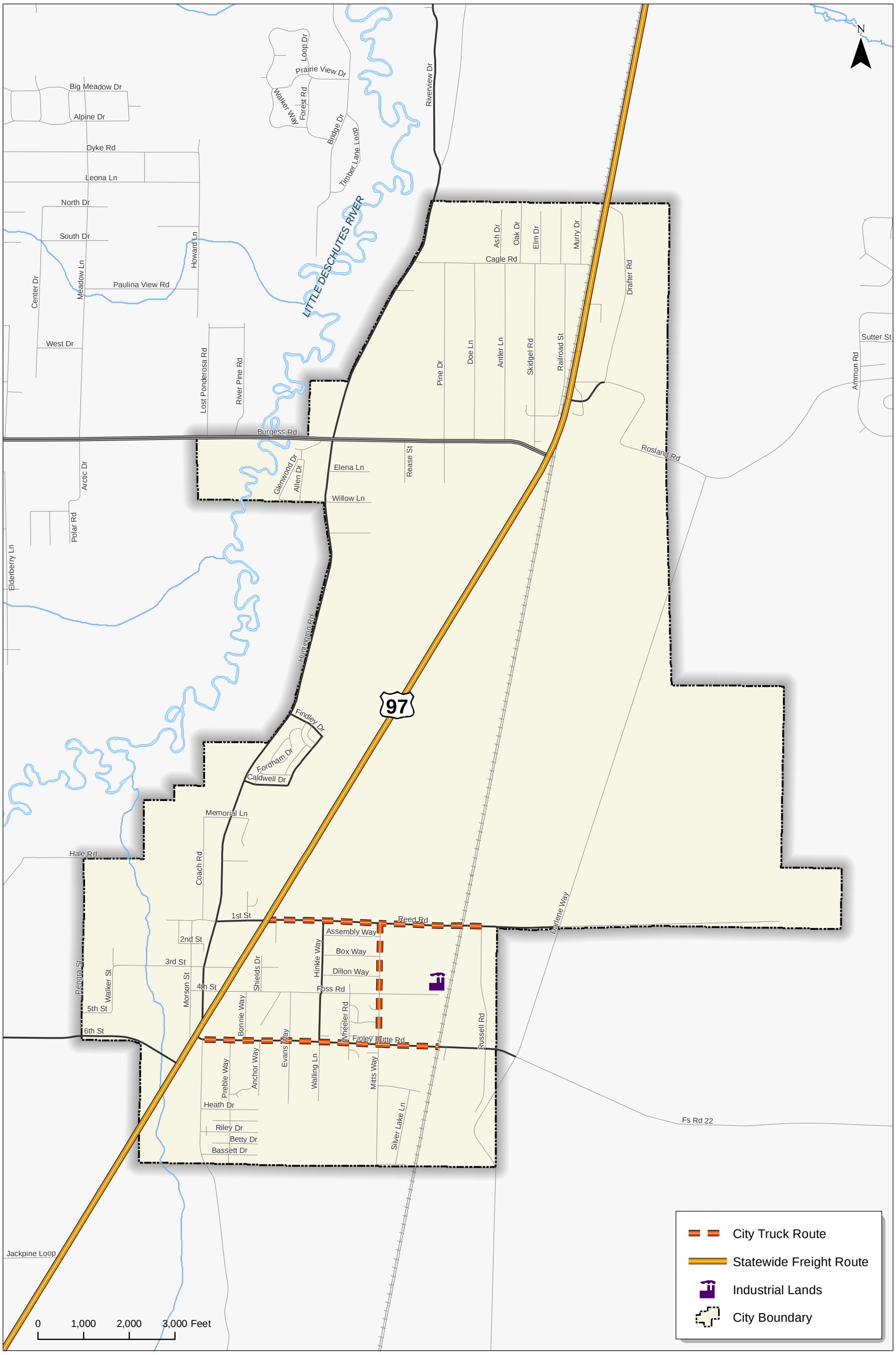
Major Collector

*On-street parking provide adjacent to commercially zoned properties, no on-street parking in other areas.

SIDE WALK	LAND SCAPE	PARKING	TRAVEL LANE	TRAVEL LANE	PARKING	LAND SCAPE	SIDE WALK
6’	8’	7’	11’	11’	7’	8’	6’

Truck Routes

To serve industrial properties and support future economic development efforts, the City of La Pine has designated several roadways as Truck Routes. These designations are shown in Figure 4-4. The truck routes are intended to connect the employment areas with the US 97 corridor, which is a designated Statewide Freight Route, and to minimize the potential for livability impacts between freight and existing/future neighborhoods. Plans to signalize the intersections of US 97/1st Street/Reed Road and US 97/Finley Butte Road will support the access of heavy vehicles onto US 97. The designation of these facilities as Truck Routes does not prohibit local delivery trucks from using other roadways, but is intended to encourage the use of these routes for regional freight needs through design and signage.



Truck Routes
La Pine, Oregon

Figure
4-4

Coordinate System: NAD 1983 HARN StatePlane Oregon South FIPS 3602 Feet Intl
Data Source: Deschutes County, Oregon Department of Transportation

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MULTIMODAL IMPROVEMENT PROJECTS

Projects identified as key improvements for the future transportation system in La Pine are discussed below. Each is intended to provide multi-modal options to residents and to serve projected vehicle, pedestrian, and bicycle traffic.

It should be noted that the TSP relies heavily on the previously completed La Pine Corridor Plan and Wickiup Junction Plan for improvement strategies and projects for US 97 within La Pine. The recommendations of those plans have been incorporated in this TSP.

Vehicular Project Priorities

Within La Pine, roadway connectivity and facility upgrades will be the priority for the foreseeable future as the city works to establish a transportation system that will support the future vision of La Pine. The following efforts are near term projects that will help the city start to achieve those goals:

- Establish an "arterial ring" within downtown La Pine. This ring includes 1st Street/Reed Road, Hinkle Way, Finley Butte Road, and Huntington Road. This ring provides mobility for all users through the downtown area.
- Upgrade 3rd Street and 4th Street to Major Collectors in the downtown area between Morson Street and Hinkle Way to further facilitate mobility downtown and provide facilities for all users.
- Upgrade Cagle Road and Skidgel Road to paved roads to create a network of paved roadways serving the entire residential area in the northwest area of the City.

Pedestrian Projects

All roadway upgrades within the City of La Pine should include pedestrian facilities, as specified in the street design standards, to create a network of continuous sidewalks that enable residents to travel via walking. Priority for pedestrian projects should be given to:

- Providing east-west connections within the Cagle subdivision where roadways are currently unpaved.
- Providing pedestrian access across US 97 within Wickiup and downtown La Pine.
- Creating a connected trail system between the downtown and Wickiup, particularly along the west side of the highway where the majority of developable lands are located.
- Considering pedestrian connectivity for recreational trips, such as those to existing and planned parks and trails.

Design of these facilities should account for roadway maintenance and snow storage in winter months.

Bicycle Projects

A network of continuous bicycle facilities, whether they are bike lanes or shared-use paths, should be developed to encourage bicycling as a form of transportation within the City. Improving bicycle facilities and connectivity will provide more opportunities for bicyclists of all abilities to travel throughout the City. Priority for bicycle facility improvements projects should be given to:

- Providing east-west connections within the Cagle subdivision where roadways are currently unpaved.
- Providing trail system connectivity between the downtown and Wickiup, particularly along the west side of the highway where the majority of the developable lands are located.

Multimodal Project List

The projects identified include needs anticipated within the next twenty years as well as those that may be needed over a much longer planning horizon. The city has discretion to determine the focus of capital investments based on changing circumstances.

Table 4-5 presents the planned urban upgrade improvements projects for the City of La Pine. These projects were identified based on existing or future needs within the City. The projects are intended to relieve future congested routes, provide more direct connections within the transportation system, provide better overall system operations in the future, and to provide better multi-modal connectivity throughout the City. Projects highlighted in gray are considered high priority based on their ability to address the City's needs and their expected cost.

Table 4-5 Multimodal Improvement Projects

Improvement	Miles	Description	Cost (millions)
Huntington Road urban upgrade	3.26	Improve to **Arterial** standards from 1st Street to northern city boundary.	$12.04
Huntington Road urban upgrade – downtown core	0.43	Improve to **Downtown Arterial** standards from US 97 to 1st Street. Would provide improvements for downtown core.	$1.27
Morson Street urban upgrade – downtown core	0.5	Upgrade street to **Downtown Arterial** standard.	$2.40
3rd Street to 6th Street connection	0.72	Upgrade to **Minor Collector** standard from 6th Street to Morson Street, via the existing Walker Street and 5th Street alignments. Curve improvements should be included in the upgrade. An alternative route connection Walker Street perpendicular to 6th Street should be considered if funding becomes available.	$1.330
3rd Street urban upgrade	0.18	Upgrade to **Major Collector** standard from Morson Street to US 97.	$0.70
4th Street urban upgrade	0.13	Upgrade to **Major Collector** standard from Morson Street to US 97.	$0.42

Improvement	Miles	Description	Cost (millions)
William Foss Road urban upgrade	0.40	Upgrade to **Major Collector** standards from US 97 to Hinkle Way.	$1.48
William Foss Road urban upgrade	0.24	Upgrade to **Industrial Collector** from Hinkle Way to Mitts Way.	$0.53
6th Street urban upgrade	0.42	Upgrade to **Minor Collector** standard from city limits to US 97.	$0.31
Finley Butte Road urban upgrade	0.52	Upgrade to **Arterial** standard from US 97 to Hinkle Way.	$2.27
Finley Butte Road urban upgrade	0.75	Upgrade to **Industrial Collector** standard from Hinkle Way to city limits.	$1.73
South Huntington Road realignment	n/a	Realign Huntington Road intersection with Finley Butte Road to the east to increase spacing from US 97. Could be completed in conjunction with Finley Butte/US 97 improvements.	$2.16*
Hinkle Way urban upgrade	0.50	Upgrade to **Industrial Collector** standard from Reed Road to Finley Butte Road.	$0.77
1st Street/Reed Road urban upgrade	0.31 0.23	Upgrade to **Downtown Arterial** standard from Morson Street to US 97. Upgrade to Arterial from US 97 to Hinkle Way.	$0.86 $0.64
1st Street/Reed Road urban upgrade	0.65	Upgrade to **Industrial Collector** standard from Hinkle Way to Russell Road.	$1.22
Burgess Road urban upgrade	1.47	Upgrade to **Arterial** standard from city limits to US 97.	$4.11
US 97 access consolidation	n/a	Consolidate access along US 97 within downtown La Pine and Wickiup.	n/a
Drafter Road urban upgrade	0.78	Upgrade to **Minor Collector** standard from US 97 to Rosland Road. Includes upgrading roadway surface to asphalt. Upgrade can provide backage road facility to assist with access consolidation along US 97 within Wickiup.	$5.16
Cagle Road urban upgrade	0.69	Upgrade to **Minor Collector** standard from Huntington Road to Murry Drive. Includes upgrading roadway surface to asphalt.	$4.74
Skidgel Road	0.77	Upgrade to paved **Local Street** standard from Cagle Road to Burgess Road.	$5.42
Rosland Road urban upgrade	0.18	Upgrade to **Minor Collector** standard from US 97 to Drafter Road.	$0.30
Eastside north-south connection	2.1	Construct a new **Minor Collector** connection between downtown La Pine and the Wickiup area.	$18.00*
Mitts Way urban upgrade	1.0	Upgrade to **Industrial Collector** standard from Reed Road to south city limits.	$1.29
Crescent Creek Subdivision urban upgrade	0.58	Upgrade Findley Drive, Crescent Creek Drive, and Caldwell Drive to **Minor Collector** standard.	$3.00
Wickiup Junction Plan	n/a	Construction of overpass for US 97 and corresponding connection improvements	$35.00

Note: *Indicates that estimates for right-of-way acquisition costs were included in the cost estimate.

Planned Intersection Improvements

Within the City of La Pine there are several intersections that have previously been identified for improvements based on existing or future needs. Improvements to these locations will help support the overall roadway and transportation network. These known deficiencies (or projects where planned improvements have already been identified), the location or project extents, and a brief description are summarized in Table 4-6.

The intersection improvement projects identified in Table 4-6 are intended to guide priorities for improvements in the upcoming years. Specific designs and analysis for each site should be conducted during project development for each improvement to determine the best location-specific alternative that addresses the need.

Table 4-6 Intersection Improvement Projects

Intersection	Improvement	Cost (millions)
US 97 – Ashton Eaton Blvd/Rosland Road	Operational improvement needed. Due to constraints with the Wickiup Junction Plan, this project should be coordinated with that Plan. It is recommended that upgrading Drafter Road be considered as part of the Wickiup Junction Plan as an alternative to the Rosland/US 97 intersection.	Included in Drafter Road Upgrade Project; An additional $0.35 million for upgrading US 97/Drafter Road to an improved intersection
US 97 – Ashton Eaton Blvd/Burgess Road (Wickiup Junction Plan)	Wickiup Junction Interchange (previously identified in Wickiup Junction Plan)	Included in Wickiup Junction Plan
US 97 – Ashton Eaton Blvd/1st Street - Reed Road	Realignment, traffic signal installation, and pedestrian improvements, as previously identified in the US 97/La Pine Corridor Plan	Fully Funded
US 97 – Ashton Eaton Blvd/Finley Butte Road – Morson Street	Morson realignment and operational improvement, as previously identified in the US 97/La Pine Corridor Plan	$0.49 for Realignment; $0.35 for Traffic Signal
US 97 – Ashton Eaton Blvd/6th Street	No intersection improvement planned. An improved connection between 3rd Street and downtown is preferred to alleviate congestion at this intersection. See multimodal improvements for more information.	Included in Roadway Improvement projects.
Hinkle Way/William Foss Road	Improve the north-south alignment to provide a more direct, convenient, and comfortable route for travelers on the east side of La Pine.	$0.20

Safety Projects

Review of the last five years of recorded crashes, revealed that nearly half of all crashes within the La Pine urban area occurred on US 97. Future transportation projects will incorporate strategies to improve the long-term safety of the La Pine transportation system. Issues such as traveler speeds, land use access needs, creating comfortable and convenient pedestrian and bicycle crossings of US 97, and addressing the needs of an older population can be incorporated into future project selection and

design. Table 4-7 summarizes previously identified safety-related projects to serve long-term multi-modal needs throughout the community. Several of these improvements are relatively low-cost and can be conducted as part of maintenance projects. Future safety projects will be developed and prioritized based on observed conditions and community input. The location of these projects is shown in Figure 4-5.

Table 4-7 Safety Projects

Facility	Improvement	Note
US 97 – Ashton Eaton Boulevard (1st Street)	Rural to urban speed transition improvements (Southbound)	Improvements were identified in the US 97/La Pine Corridor Plan. Some treatments have been implemented.
US 97 – Ashton Eaton Boulevard (6th Street)	Rural to urban speed transition improvements (Northbound)	Improvements were identified in the US 97/La Pine Corridor Plan.
US 97 – Ashton Eaton Boulevard (1st Street to 6th Street)	Illumination at intersections	Prioritize illumination at pedestrian crossing locations and intersections.
US 97 – Ashton Eaton Boulevard (1st Street to 6th Street)	Large font street signs	Replace signs as part of routine maintenance as needed.
Huntington Road (1st Street north to City limits)	Improve shoulders and clear zones	Could be completed in conjunction with functional upgrades to Huntington Road.
Huntington Road (near 1st Street)	Rural to urban speed transition improvements (southbound)	Improvement will help define urbanized area along Huntington Road in downtown La Pine.
1st Street Rail Crossing	Upgrade to an active crossing	Coordination is needed with BNSF.

N

Big Meadow Dr
Alpine Dr
Dyke Rd
Leona Ln
North Dr
South Dr
Center Dr
Meadow Ln
Howard Ln
Paulina View Rd
West Dr
Lost Ponderosa Rd
River Pine Rd
Loop Dr
Prairie View Dr
Walker Way
Forest Rd
Bridge Dr
Timber Lane Loop
LITTLE DESCHUTES RIVER
Riverview Dr
Ash Dr
Oak Dr
Elm Dr
Murry Dr
Cagle Rd
Huntington Rd
Pine Dr
Doe Ln
Antler Ln
Skidgel Rd
Railroad St
Drafter Rd
Sutter St
Ammon Rd
Burgess Rd
Arctic Dr
Polar Rd
Elderberry Ln
Glenwood Dr
Allen Dr
Elena Ln
Willow Ln
Rease St
Rosland Rd
97
Findley Dr
Fordham Dr
Caldwell Dr
Memorial Ln
Hale Rd
Coach Rd
1st St
2nd St
3rd St
4th St
5th St
6th St
Pequot St
Walker St
Morson St
Shields Dr
Hinkle Way
Assembly Way
Box Way
Dillon Way
Foss Rd
Reed Rd
Darlene Way
Bonnie Way
Evans Way
Wheeler Rd
Finley Butte Rd
Russell Rd
Preble Way
Anchor Way
Walling Ln
Mitts Way
Silver Lake Ln
Heath Dr
Riley Dr
Betty Dr
Bassett Dr
Jackpine Loop

0 1,000 2,000 3,000 Feet

Activity Centers

- Elementary/Middle School
- High School
- Library
- Post Office
- Senior Center
- Fire Department
- City Hall
- Industrial Land
- Cemetery
- Park

Improvements

- Illumination and large font street signs at intersections
- Improve shoulders and clear zones
- Rural to urban speed transition improvements (Northbound)
- Rural to urban speed transition improvements (Southbound)
- Upgrade to an active railroad crossing
- City Boundary

City of LA PINE
Small Town - Bright Future

Safety Projects
La Pine, Oregon

Figure
4-5

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Coordinate System: NAD 1983 HARN StatePlane Oregon South FIPS 3602 Feet Intl
Data Source: Deschutes County

Transit System

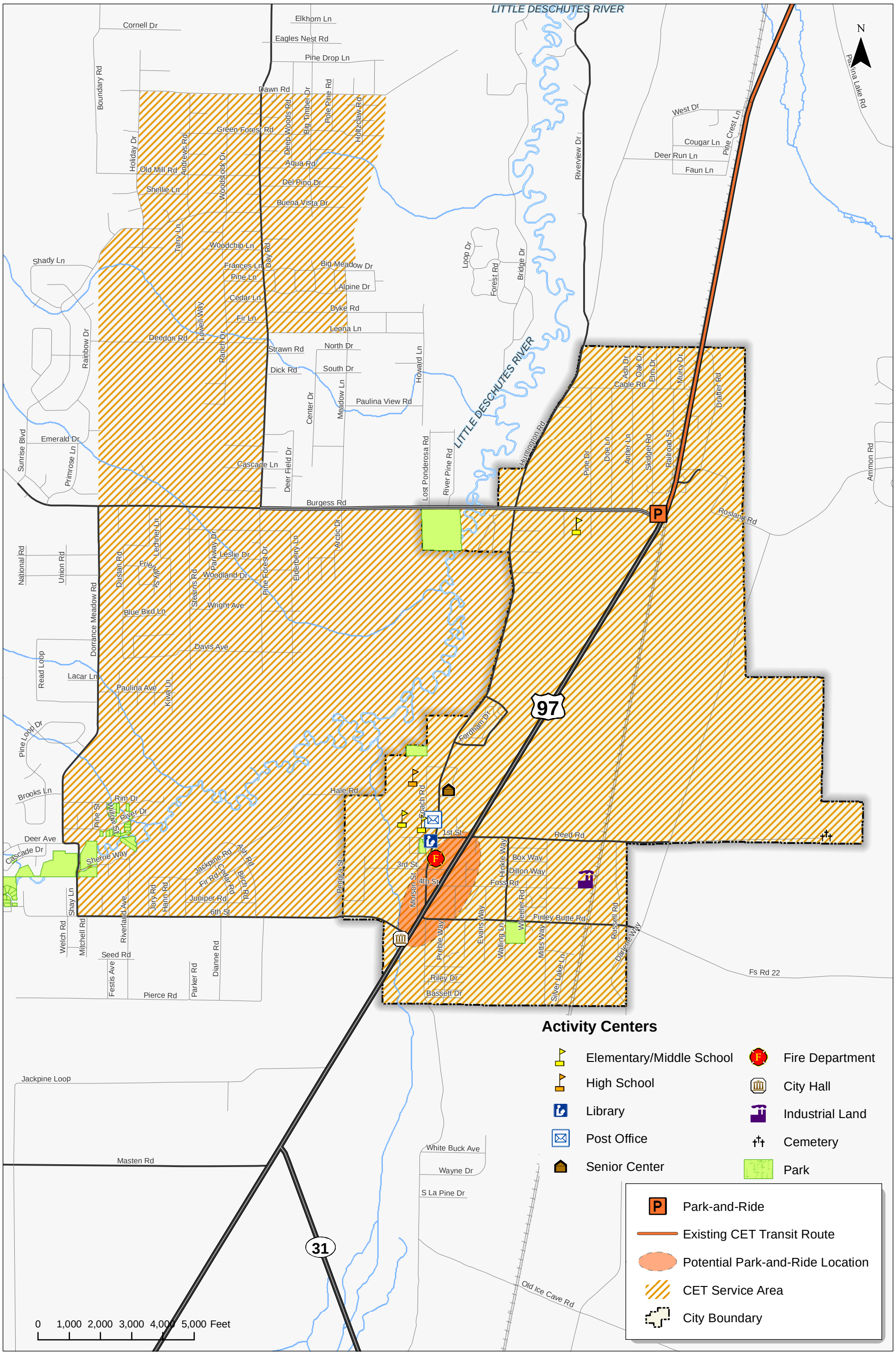
Today, transit service within La Pine is limited to a commuter route between a park-and-ride center within Wickiup Junction and the Hawthorne Station in Bend. In addition, demand responsive service that includes the city limits of La Pine and outlining areas is provided. Both services are operated by Cascade East Transit (CET).

Current improvement plans for US 97 and Burgress Road within Wickiup Junction will require that the park-and-ride lot be relocated. Future modifications to or relocation of the existing park-and-ride should consider pedestrian and bicycle access as well as vehicular access. The same approach should be taken to the siting of future park-and-ride locations. In addition, La Pine will continue to collaborate with CET to provide and enhance transit service to the city, as appropriate.

Figure 4-6 shows the existing transit service with possible future modifications. A summary of transit improvement options is provided in Table 4-8.

Table 4-8 Transit Improvement

Location	Project Type	Note
Wickiup Junction	Maintain connectivity between the park-and-ride lot and surrounding roadway as part of the Wickiup Junction plan.	Include as an element of the Wickiup Junction plan, along with multimodal connections.
Downtown Area Connection for Service to Bend	Coordinate with CET to provide transit service to the City core. Consider options for a park-and-ride facility within the downtown area.	Would provide closer transit access to Downtown La Pine area.
Increased Service Hours	Coordinate with CET to provide additional trips to/from Bend.	Would require dedicated funding.



Existing Transit Service and Future Planned Improvements
La Pine, Oregon

Figure **4-6**

Coordinate System: NAD 1983 HARN StatePlane Oregon South FIPS 3602 Feet Intl
Data Source: Deschutes County

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Roadway Surfaces

The City's gravel and dirt surfaced roads limit the speeds at which vehicles can travel and the capacity of the roads. These roads should be upgraded to paved, higher order roads to facilitate carrying increases in vehicle traffic. When paved, these roads should be constructed to the standards specified in the street design standards and the functional classification map. The highest priority for upgrades include Cagle Road and Skidgel Road in order to create a network of paved roads in the northwest area of the City. The upgrade of some of these roadways to a more durable surface could help improve the overall functionality of the overall transportation system by providing more reliable and efficient conditions.

Roadway Ownership

Currently, the City's roadway ownership primarily consists of portions of the local roadway system which were constructed or accepted by the City after incorporation in late 2006. Oregon Department of Transportation maintains US 97 (Ashton Eaton Blvd) and Deschutes County has jurisdiction over the majority of the City's arterial, collector and most local roadways that were approved and built to county road standards prior to the City incorporation.

The City should work with the County to clearly outline the process by which urban improvements will be made to County maintained facilities within the City of La Pine. Items that need further discussion should include future funding sources, regular maintenance expenses and jurisdictional transfer of improved roadways when an acceptable funding source has been identified and is in place.

RAIL, AIR, PIPELINE, & SURFACE WATER PLANS

The following addresses the rail, air, pipeline, and surface water networks in the City of La Pine. This plan does not include improvement projects for these systems given that the City does not have jurisdiction to make modifications.

Rail Service

A Burlington Northern Santa Fe (BNSF) rail line runs through La Pine, mostly on the east side of the city. Within Wickiup, the railway crosses US 97 just north of Burgess Road with an extreme skew angle. ODOT is currently pursuing funding to grade-separate the Wickiup Junction, which would also include modifications to the adjacent roadway network, most notably the rerouting of the Burgess Road and US 97 intersection. Improvements associated with this proposed project were discussed previously in this plan.

No passenger rail service is available within La Pine. The closest passenger rail service is provided through AMTRAK, and is available in Chemult located approximately 35 miles to the south on US 97. AMTRAK does provide bus service to the train station in Chemult. Service is provided twice daily. From Chemult passenger rail service is provided to Eugene, Washington, and California.

Air Service

No airport facilities exist within La Pine. The closest commercial airline service is available at Roberts Field in Redmond, Oregon which is approximately 45 miles to the north on US 97. Kingsley Field in Klamath Falls, Oregon is located approximately 100 miles to the south and also provides commercial services. General aviation airport options are available in Sunriver and Bend.

Pipeline Service

No information related to existing pipeline service within La Pine could be located as part of this TSP development. Regardless, no modifications to the existing pipeline service are required or proposed to meet the needs of the city through the horizon year of this document.

Surface Water Transportation

No navigable waterways exist within or near La Pine. The Little Deschutes River is located immediately west of the city and briefly enters within city limits. That waterway is used exclusively for recreational opportunities.

Section 5
Transportation Planning Toolbox

TRANSPORTATION PLANNING TOOLBOX

This section summarizes a range of transportation-related strategies and solutions that can guide the city as it grows and develops. These "tool box" measures fall into the following categories:

- "Active" transportation (i.e., walking, cycling, and transit)
- Connectivity of the transportation network
- Intersection control
- Neighborhood traffic management

The solutions in this toolbox are intended to provide guidance to the community as future infrastructure improvement options are developed.

INCREASING "ACTIVE" TRANSPORATION

As La Pine develops more urbanized areas, modal choices, such as walking or biking, will become increasingly viable transportation options. The following subsections outline guidelines and approaches to providing these modal options for transportation system users.

Pedestrian System

Pedestrian facilities are the elements of the network that enable people to walk safely and efficiently between neighborhoods, retail centers, employment areas and transit stops. These include facilities for pedestrian movement along key roadways (e.g., sidewalks, mixed-use trails) as well as for safe roadway crossing locations (e.g., crosswalks, crossing beacons, pedestrian refuge islands). Each plays a role in developing a comprehensive pedestrian network.

Today, pedestrian facilities within La Pine are concentrated in the downtown La Pine area and are at times incomplete or sporadic in nature. In the future, as arterials and collector streets are improved to urban standards, most of these streets will include sidewalks and/or multiuse paths alongside the roadway. In addition, multiuse paths could provide connections between more rural or long distance destinations, such as a connection between the Wickiup and downtown La Pine areas.

As areas of the city become more urban in nature, pedestrian improvements should be prioritized based on their ability to complete connections between places that generate walking trips such as schools and housing; housing and retail centers; and employment areas and potential transit stops.

Sidewalks

Sidewalks are the fundamental building block to enable people to comfortably, conveniently and safely walk from place to place. They also provide an important means of mobility for people with disabilities and families with strollers, and others who may not be able to travel on an unimproved roadside surface. Sidewalks are usually constructed from concrete and they provide an area separated from the

roadway by a curb, landscaping, and/or on-street parking. Sidewalks are widely used in urban and suburban settings.



Sidewalks in a variety of urban and suburban contexts.

Types of Pedestrian Crossings

Crossing facilities enable walkers to safely cross streets, railroad tracks, and other transportation facilities. Planning for appropriate pedestrian crossings requires the community to balance vehicular mobility needs with providing crossing locations that the desired routes of walkers. Within La Pine, pedestrian crossings concerns have been focused on the crossing of high speed facilities, such as US 97 or Huntington Road.

The state of Oregon considers all roadway intersections to be legal crossing locations for pedestrians regardless of whether a painted crosswalk is provided. At these locations, drivers are required to yield the right of way to pedestrians to allow them to cross. Driver compliance to yielding is often inconsistent and pedestrians often have difficulty crossing higher volume and higher speed roadways. There are several different types of pedestrian crossing treatments that can be used in La Pine; each of these is applicable under a different range of considerations.

A brief description of the various pedestrian crossing types and where they can be applied is provided below.

High Visibility Crosswalk	
	Clear, reflective roadway markings and accompanying devices are placed at intersections and priority pedestrian crossing where there is sufficient sight distance and reaction time for motorists to yield. Crosswalks can be used at intersections and at mid-block crossings.

Raised Pedestrian Refuge	
	A raised pedestrian refuge in the median provides a protected area in the middle of a crosswalk for pedestrians to stop while crossing the street. These refuges allow pedestrians to cross one direction of traffic at a time. Pedestrian refuges are often used in areas with high volume traffic volumes and/or at locations with a crash history involving pedestrians.
In-Street Yield	
	"Yield to Pedestrian" signs can be placed in the middle of crosswalks to increase driver awareness of crossing locations and the legal responsibility to yield right-of-way to pedestrians crossing the street. These signs can be effective in areas that experience high volumes of pedestrians making midblock crossings and/or at locations where there is poor motorist yielding rates.
Rapid Rectangular Flashing Beacon (RRFB)	
	These crossing treatments include signs that have a pedestrian-activated "strobe-light" flashing pattern to attract motorists' attention and provide awareness of pedestrians that are intending to cross the roadway. RRFBs are often used in areas with high volumes of pedestrians desiring to cross a street at a mid-block location.

Pedestrian Hybrid Beacon (HAWK)	
	A HAWK is a pedestrian-activated signal, unlit when not in use, that begins with a yellow light alerting drivers to slow, and then a solid red light requiring drivers to stop while pedestrians have the right-of-way to cross the street. HAWKs are often used on wide roadways where mid-block crossings are difficult.

Bicycle System

Bicycle facilities enable cyclists to travel safely and efficiently on the transportation system. Both public infrastructure (bicycle lanes, cycletracks, mixed-use trails, signage and striping) and "on-site" facilities (secure parking, changing rooms and showers at worksites) are important to providing a comprehensive bicycle network.

Many different bicycle facility types are needed to create a complete bicycle network that connects people to their destinations and allows cyclists to feel comfortable and safe while riding. Within La Pine, bicycle lanes are not common. ODOT recently installed buffered bicycle lanes on US 97 through downtown La Pine. Bicycle lane applications on the arterial, collector, and local street system is not common.

Types of Bicycle Facilities

The types of bicycle facilities that can be used by La Pine in the future are discussed below.

Bike Lanes	
	Bike lanes are on-street facilities that provide designated spaces for bicycles, separated from vehicles by pavement markings. Bike lanes are generally used on collector and arterial streets with adequate space to accommodate the bike lane width and with vehicular travel volumes and speeds that make it difficult for drivers and cyclists to "share the road." A bike lane can consist of white striping with a bicycle symbol, or it can be filled with a solid paint color, usually green.

Buffered Bike Lanes	
	Buffered bike lanes are on-street lanes that include a physical separation ("buffer") between the bike lane and the vehicle traffic lane and/or the vehicle parking lane. Buffered bike lanes can be particularly helpful on streets with high vehicle speeds, high vehicle volumes, or relatively frequent parking turnover.
Cycletracks	
	Cycletracks are exclusive bikeways separated from vehicle travel lanes, parking lanes and sidewalks. In these contexts, vehicular parking is provided adjacent to traffic lanes whereas the bikeway is located adjacent to the curb. They can be one- or two-way in direction and can be even with the street, the sidewalk, or somewhere between. On existing streets, cycletracks can be constructed where there is sufficient roadway width and/or in contexts where the number of vehicular travel lanes can be reduced.
Sharrows	
	A shared-lane marking, or sharrow, is a pavement marking that can be used where space does not allow for a bike lane and/or where vehicular travel speeds and volumes allow cyclists to comfortably and conveniently "share the road" with motorists. Sharrows remind motorists of the presence of bicycles and indicate to cyclists where to safely ride within the roadway.

Low-Traffic Bikeway	
	Also known as "bicycle boulevards," streets with low vehicular volumes and speeds can be optimized for bicycle travel by including treatments for traffic calming and traffic reduction, signage and pavement markings, and intersection crossing treatments. Bike boulevards are ideal on local streets that parallel larger, high traffic routes and provide connections to similar destinations.
Wayfinding Signage	
	Wayfinding signs can direct bicyclists and pedestrians towards key destinations both within the city as well as to neighboring communities. These signs often include the distance to the destination and/or average travel times. Wayfinding signs are generally used on primary bicycle routes and multi-use trails.
"Share the Road" Signs	
	"Share the Road" signs can be used to remind drivers to watch for bicyclists on roadways without on-street bicycle lanes. However, the signs are not meant as a replacement for using the other facility types listed in this table.

Bicycle Crossings

Bicycle crossing treatments connect bike facilities at high traffic intersections, trailheads, or other bike routes. Frequently used crossing treatments are shown below.

Marked Bicycle Detectors at Traffic Signals	
Many traffic signals are "actuated", meaning that a green light is provided to a particular intersection approach only when a vehicle is detected on that approach. However, actuating a signal as a cyclist is difficult if no indication is given of the location of detection equipment. Pavement markings can show cyclists where to stand to actuate a signal. Additionally, the sensitivity of all traffic signal loop detectors should be set to allow for bicycle activation. At intersections where bicyclists wait at an area separated from traffic, specific bicycle detectors can be installed.	
Bicycle-only Signal	
Bicycle-only signals can be used at intersections to provide a separate signal phase that is dedicated to bicyclists. They are especially useful at roadway intersections with multi-use trails, where there are high volumes of bicyclists crossing, or at intersections where large numbers of right-turning vehicles have the potential to conflict with through bicycles.	
Preferential Movement for Bicycles	
Some intersections may be designed such that cars cannot make particular movements, but bicyclists can. This type of treatment allows greater connectivity for bicyclists.	

Striping Through Intersections	
At high-vehicle and/or high-bicycle volume intersections, extending bicycle lane striping through the intersection can alert drivers to look out for bicyclists traveling through the intersection and help bicyclists know where to proceed with crossing.	

On-Site Facilities

Bicyclists also benefit from facilities that are located on-site within key employment, commercial and institutional locations. These facilities can include indoor and/or outdoor secure bicycle parking, open or covered U-shaped racks, showers/changing rooms, and storage lockers for clothing and gear. The City can use incentives to encourage developers to include these types of facilities in new buildings.

Multi-use Pathways

Paved, bi-directional multi-use pathways can be designed as part of a Park and Recreational System and/or can be constructed adjacent to roadways where the topography, right-of-way, or other issues don't allow for the construction of sidewalks and bike facilities.

Intersections of multi-use paths and roadways require crossing treatments that are well-marked and highly visible to vehicles and trail users. Multi-use pathways can be used to create longer-distance links within and between communities, provide regional connections and play an integral role in recreation, commuting, and accessibility for residents due to their broad appeal to users of all ages and skill levels.


Multi-use paths provide a comfortable space for pedestrians and bicyclists of all ages.

CONNECTIVITY

A well connected grid network of streets provides for convenient travel for vehicles, pedestrians and cyclists. Given an equivalent number of roadway lane-miles, a connected system generally has more capacity than a disconnected road network and provides the shortest, most direct routes for all users. A grid network can also lessen the effects of congestion along a single route, due to the number of alternate routes available. A connected system also can create easier and more expedient emergency response and can encourage pedestrians and bicyclists, who benefit greatly from having a direct route due to generally slower travel speeds. Exhibit 5-1 shows how someone might travel between their home and school on a well-connected grid network versus one that is a system of cul-de-sacs.

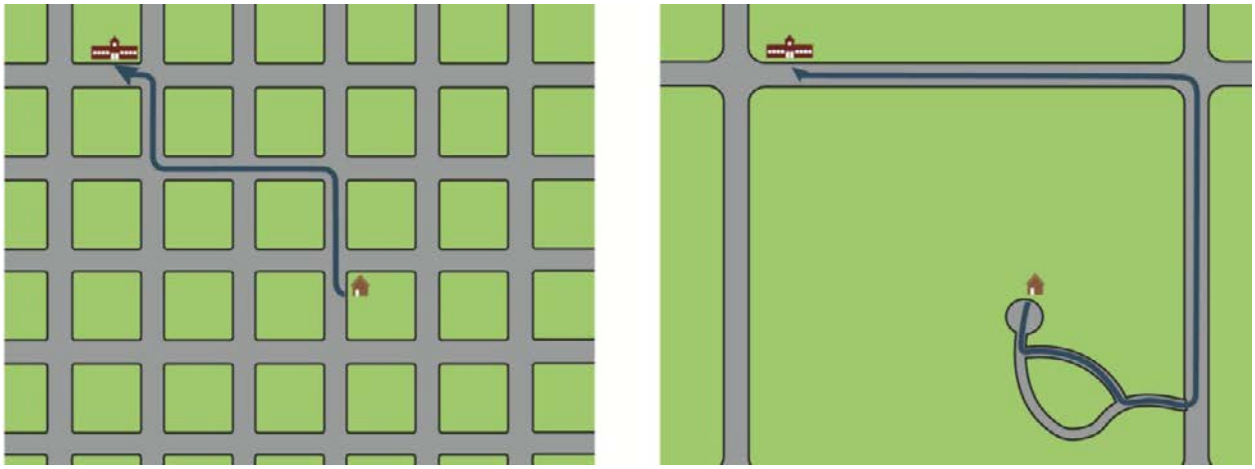

Exhibit 5-1: The left illustration is a connected street grid, on the right is a less connected system. Travel distance from home to school is shorter in a connected system.

Within La Pine, US 97 provides for the most rigid obstacle for a connected transportation system. As such, connections across the highway for local trip use are a critical component of the planned roadway improvements, particularly in the downtown La Pine area.

INTERSECTION CONTROL

Today, the majority of intersections within La Pine are stop-controlled. Currently, two traffic signals exist, both on Huntington Road, with a future traffic signal planned for US 97/1st Street/Reed Road. In the future, increasing traffic volumes may warrant different intersection options, such as roundabouts, traffic signals, and all-way stop control. The type of intersection control and final design for each intersection will need to consider the desired travel speeds, safety, pedestrian and bicycle needs, topography, anticipated traffic volumes, sight distance, available space and other potential constraints and opportunities.

All-way Stop-control

All-way stop control is often used when the two intersecting roads have similar vehicular volumes and where a traffic signal or roundabout is needed. All-way stop controls are relatively inexpensive and can be implemented more easily than traffic signals and roundabouts.

Roundabout

Roundabouts are circular intersections where entering vehicles yield to vehicles already in the circle. They are designed to slow vehicle speeds to 20 to 30 mph or less before they enter the intersection. As shown in Exhibit 5-2, roundabouts have fewer conflict-points and have been shown to reduce the severity of crashes, as compared to signalized intersections. Roundabouts can be more costly to design and install when compared to other intersection control types, but they have a lower operating and maintenance cost than traffic signals. Topography must be carefully evaluated in considering a roundabout, given that slope characteristics at an intersection may render a roundabout infeasible.

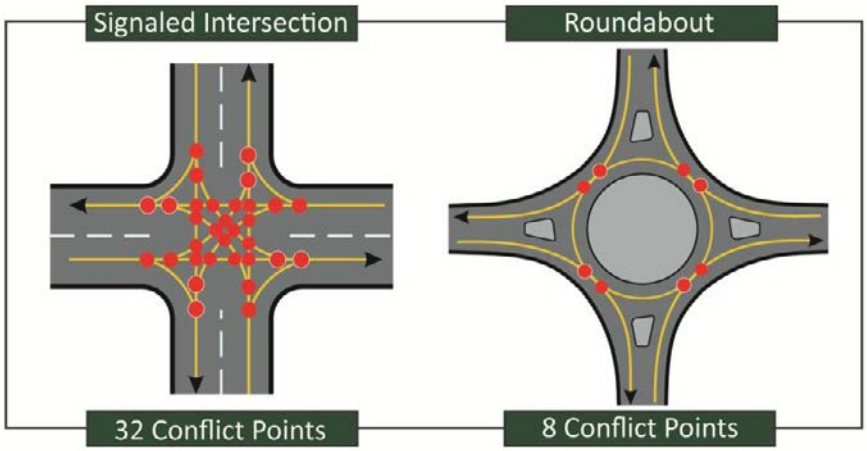

Exhibit 5-2: Roundabouts have fewer conflict points than signalized intersections.

Depending on the design, roundabouts can be more land-intensive than other intersection controls. To maintain the flexibility to construct roundabouts at key intersections, the city may want to ensure adequate right-of-way is provided at intersection locations whenever right-of-way dedication or acquisition activities are undertaken.

Traffic Signals

Traffic signals allow opposing streams of traffic to proceed in an alternating pattern. Both national and state guidance indicates when it is appropriate to install traffic signals at intersections. When used, traffic signals can effectively manage high traffic volumes, and provide for dedicated times in which pedestrians and cyclists can cross roadways. Because they continuously draw from a power source and must be periodically re-timed, signals typically have higher maintenance costs than other types of

intersection control. Signals can improve safety at intersections where signal warrants are met, however, signals may result in a shift to higher levels of rear-end crashes compared to alternatives.

NEIGHBORHOOD TRAFFIC MANAGEMENT

Neighborhood Traffic Management (NTM), also known as "traffic calming," describes traffic control devices typically used in residential neighborhoods to slow traffic or possibly reduce the volume of traffic. Below are illustrations and descriptions of neighborhood traffic management strategies that could be applied in La Pine to address traffic issues that arise over time.

Speed Wagon	Pros	Cons
	• Inexpensive • Low operating costs • Mobile	• Penalties for speeding not enforced • Not permanent • Placement may obstruct bicycle lane or shoulder
Speed Humps	**Pros**	**Cons**
	• Permanent • Can be used to provide raised pedestrian crossings • Can be modified to accommodate emergency vehicles	• Placement of speed humps can be contentious • Requires maintenance
Traffic Circles	**Pros**	**Cons**
	• Can have aesthetic value • Physical barrier encourages lower speeds	• Can impede emergency vehicles or freight/delivery truck movement • Increased maintenance costs

Medians	Pros	Cons
	• Eliminates potential conflict points • Provides pedestrian refuge • Can benefit access management	• Can be more expensive to construct than other NTM measures • Can impede roadway connectivity • Can impact business access
Landscaping	**Pros**	**Cons**
	• Aesthetic value • Provides buffer for pedestrians • Can have traffic calming effect	• Requires additional maintenance, including weed management • Requires additional right-of-way allocation • Can impede sight distance
Curb Extensions	**Pros**	**Cons**
	• Reduces pedestrian crossing distance • Can have a traffic calming effect	• Can be expensive to construct • Can impede freight movements

Choker	Pros	Cons
	• Can be used in conjunction with a midblock pedestrian crossing • Can have traffic calming affect	• Expensive to construct
Narrow Streets	**Pros**	**Cons**
	• Reduces pedestrian crossing distance • Can have a traffic calming effect • Less asphalt to maintain	• Can impede emergency vehicles • Can limit availability of on-street parking
Photo Radar	**Pros**	**Cons**
	• Permanent speed enforcement • Strong deterrent for excessive speeds	• Expensive initial investment required • Not portable

On-Street Parking	Pros	Cons
	• Increases available parking for commercial and/or residential uses • Narrows feel of the street • Potential revenue source when metered	• Adequate right-of-way must exist or be created • Can conflict with bicycle lanes • Can create additional conflict points for vehicles • Can reduce sight distance
Selective Enforcement	**Pros**	**Cons**
	• Mobile • Can target identified problem areas	• Requires allocation of enforcement resources • May only result in temporary improvement in motorist compliance with posted speeds
Partial Street Closures	**Pros**	**Cons**
	• Lack of direct through routes for vehicles can reduce speeds • Maintain connectivity for bicycles and pedestrians	• Can create connectivity issues • May increase speeds on alternative routes • May increase volumes on alternative routes

Traffic calming should be considered in an area-wide manner to avoid shifting impacts between neighborhoods and adjacent streets. Typically, traffic calming receives a favorable reception by residents adjacent to streets where vehicles travel at speeds above 30 miles per hour. However, traffic calming can also be contentious because it may be perceived as just moving the problem from one neighborhood to another rather than solving it. Traffic calming may also be perceived as impacting emergency vehicle travel

Section 6
Transportation Funding & Implementation Plan

TRANSPORTATION FUNDING & IMPLEMENTATION PLAN

The existing transportation facilities in the City of La Pine fall under the jurisdiction of the City, the County, or ODOT. US 97 is the only ODOT facility within city limits. The majority of the remaining collectors and arterials fall under County jurisdiction, and the City has ownership of the local roadway system. Funding for projects in the Transportation System Plan will come from a combination of sources, including state, county, city, and private funds. This section outlines the existing revenue stream for transportation funding in the City of La Pine, estimates the costs of the 20-Year needs and projects, and identifies potential funding sources to complete the plan.

EXISTING FUNDING SOURCES

The City of La Pine Street Fund is currently funded by two sources: State Gas Funds and money transferred from the City's General Fund. The total amount of funding received from these sources in the past three years, as well as the amount budgeted for the current fiscal year, is summarized in Table 6-1. As shown, the total amount of these funds has fluctuated between $78,000 and $165,000 during reported period.

The City of La Pine Street Fund is the City's source of funding for annual snow plowing and grading of gravel roads. In order to save money, the City contracts the maintenance work out to private contractors.

Remaining balance of funds is combined over several years in order to accomplish larger projects. Projects that have been funded by combined sources include sidewalk safety improvements, right-of-way clearing, repairing cracked ceiling of roads, street lighting, and drainage issues.

Table 6-1 Historic Funding Sources for the City of La Pine Street Fund

Funding Source	2010/11	2011/12	2012/13	2013/14 (Budgeted)
State Gas Funds	$78,000	$90,000	$82,000	$85,000
Transfer from General Fund and Other Sources	$0	$65,000	$0	$80,000
Total	$78,000	$155,000	$82,000	$165,000

COST OF 20-YEAR NEEDS

The total cost of the projects identified in the TSP exceed $100 million. As shown in Table 6-1, the City's funding sources have not exceeded $165,000 per year during the past four years. The City expects the Street Funds to fluctuate between $80,000 and $180,000 annually, depending on transfers from the General Fund. The ability to transfer money out of the General Fund into the Street Fund is expected to decrease as pressures on General Fund increase over time. In addition, the City has a tax rate limit of $1.95 per thousand, which is low relative to other jurisdictions within Central Oregon. Therefore, there

is limited to no ability for the City to fund major capital improvements identified in the TSP with the City's Street Fund. The City should consider and pursue other local, state, and federal mechanisms and grants. The following sections summarize potential funding sources that the City should consider pursuing.

LOCAL FUNDING MECHANISMS

At the local level, the City can draw on a number of potential funding mechanisms to help finance the TSP.

As properties with road frontage develop, developers can be required to build the road frontage along their property consistent with the City standards. This allows the transportation system to be developed incrementally at the same time as land develops. Property owners are only required to pay the portion of the improvement that is proportionate to the development's impact on the transportation system. This equates to only a portion of the cost of collectors and arterials.

Table 6-2 outlines other potential funding sources at the local level that could be implemented in the future in the City of La Pine. In general, local funding sources are more flexible than funding obtained from state or federal grant sources.

Table 6-2 Potential Local Funding Mechanisms

Funding Source	Description	Potential Application in La Pine
User Fee	Fees tacked on to a monthly utility bill or tied to the annual registration of a vehicle to pay for improvements, expansion, and maintenance on the street system.	Preliminary street improvements
Street Utility Fees/Road Maintenance Fee	The fee is based on the number of trips a particular land use generates and is usually collected through a regular utility bill.	System-wide transportation facilities including streets, sidewalks, bike lanes, and trails
Systems Development Charges (SDCs)	Sometimes referred to as a transportation impact fee, SDCs are fees assessed on development for impacts created to public infrastructure. All revenue is dedicated to transportation capital improvements designed to accommodate growth. The City can also offer SDC credits to developers that provide public improvements beyond the required street frontage, including those that can be constructed by the private sector at a lower cost. For example, an SDC credit might be given for providing end-of-trip bike facilities within the new development.	System-wide transportation facilities including streets, sidewalks, bike lanes, and trails
Stormwater SDCs, Grants, and Loans	Systems Development Charges, Grants, and Loans obtained for the purposes of making improvements to stormwater management facilities.	Primarily street improvements
Local Gas Tax	A local tax assessed on the purchase of gas within the City. This tax is added to the cost of gasoline at the pump, along with the state and federal gas taxes.	System-wide transportation facilities including streets, sidewalks, bike lanes, and trails

Funding Source	Description	Potential Application in La Pine
Optional Tax	A tax that can be used to fund improvements, and gives the taxpayer the option to pay. Generally paid at the same time other taxes are collected, optional taxes are usually less controversial and easily collected since they give the taxpayer a choice whether or not to pay the additional tax.	System-wide transportation facilities including streets, sidewalks, bike lanes, trails, and transit
Parking In-lieu Fees	Fees that are assessed to developers that cannot or do not want to provide the parking for development.	System-wide transportation facilities including streets, sidewalks, bike lanes, trails, and transit
Public/Private Partnerships	Public/private partnerships have been used in several places around the country to provide public transportation amenities within the public right-of-way in exchange for operational revenue from the facilities. These partnerships could be used to provide services such as charging stations, public parking lots, bicycle lockers, or carshare facilities.	System-wide transportation facilities including streets, sidewalks, bike lanes, trails, and transit
Tax Increment Financing (TIF)	A tool cities use to create special districts (tax increment areas) where public improvements are made in order to generate private-sector development. During a defined period, the tax base is frozen at the pre-development level. Property taxes for that period can be waived or paid, but taxes derived from increases in assessed values (the tax increment) resulting from new development can go into a special fund created to retire bonds issued to originate the development or leverage future improvements. A number of small-to-medium sized communities in Oregon have implemented, or are considering implementing, urban renewal districts that will result in a TIF revenue stream.	System-wide transportation facilities including streets, sidewalks, bike lanes, trails, and transit
Local Improvement Districts (LID)	A local improvement district is a geographic area where local property owners are assessed a fee to cover the cost of a public improvement in that area.	Improvements to the transportation system in a local area where local property owners will benefit from the improvement.

STATE AND FEDERAL GRANTS

In addition to local funding sources, the City of La Pine can seek to leverage opportunities for funding from grants at the State and Federal levels for specific projects. The current Federal transportation bill, MAP-21, expires in September 2014, and funding opportunities may change after that date. Table 6-3 outlines those sources and their potential applications.

Table 6-3 Potential State and Federal Grants

Funding Source	Description	Potential Application in La Pine
Statewide Transportation Improvement Program (STIP)	STIP is the State of Oregon's four-year transportation capital improvement program. Local agencies apply in advance for projects to be funded in each four-year cycle. Capital projects are prioritized based on benefit categories, including (in the 2015-2018 STIP) benefits to state-owned facilities, mobility, accessibility, economic vitality, environmental stewardship, land use and growth management, livability, safety and security, equity, and funding and finance.	Projects on any facility that meet the benefit categories of the STIP.
Transportation and Growth Management Grants (TGM)	TGM Grants are administered by ODOT and awarded on an annual basis. The TGM grants are generally awarded to projects that will lead to more livable, economically vital, transportation efficient, sustainable, pedestrian-friendly communities. The grants are awarded in two categories: transportation system planning and integrated land use & transportation planning.	Multi-use trails, sidewalk, and bicycle facilities.
Transportation Alternatives Program (TAP)	TAP is a federal program that provides funding for pedestrian and bicycle facilities, projects for improving public transit access, safe routes to schools, and recreational trails. Local governments, regional transportation authorities, transit agencies, school districts or schools, natural resource or public land agencies, and tribal governments are all eligible to receive TAP funds.	Bicycle and pedestrian facilities, multi-use trails.
Highway Safety Improvement Program (HSIP)	HSIP is a federal program that provides funding to infrastructure and non-infrastructure projects that improve safety on all public roads. HSIP requires a data-driven approach and prioritizes projects in demonstrated problem areas.	Areas of safety concerns within the city, consistent with Oregon's Transportation Safety Action Plan.