TECHNICAL MEMORANDUM #2

OR Highway 126 Corridor Facility Plan

Date:	December 31, 2010	Project #: 11168
To:	PPMT and PAC Members	
From:	Marc Butorac, PE, PTOE; Joe Bessman, PE, PTOE, and Casey Bergh, PE	
Subject:	Draft Existing Conditions Analysis	

INTRODUCTION

The purpose of the existing conditions analysis is to document the following characteristics of OR 126 that may impact future highways users and local residents:

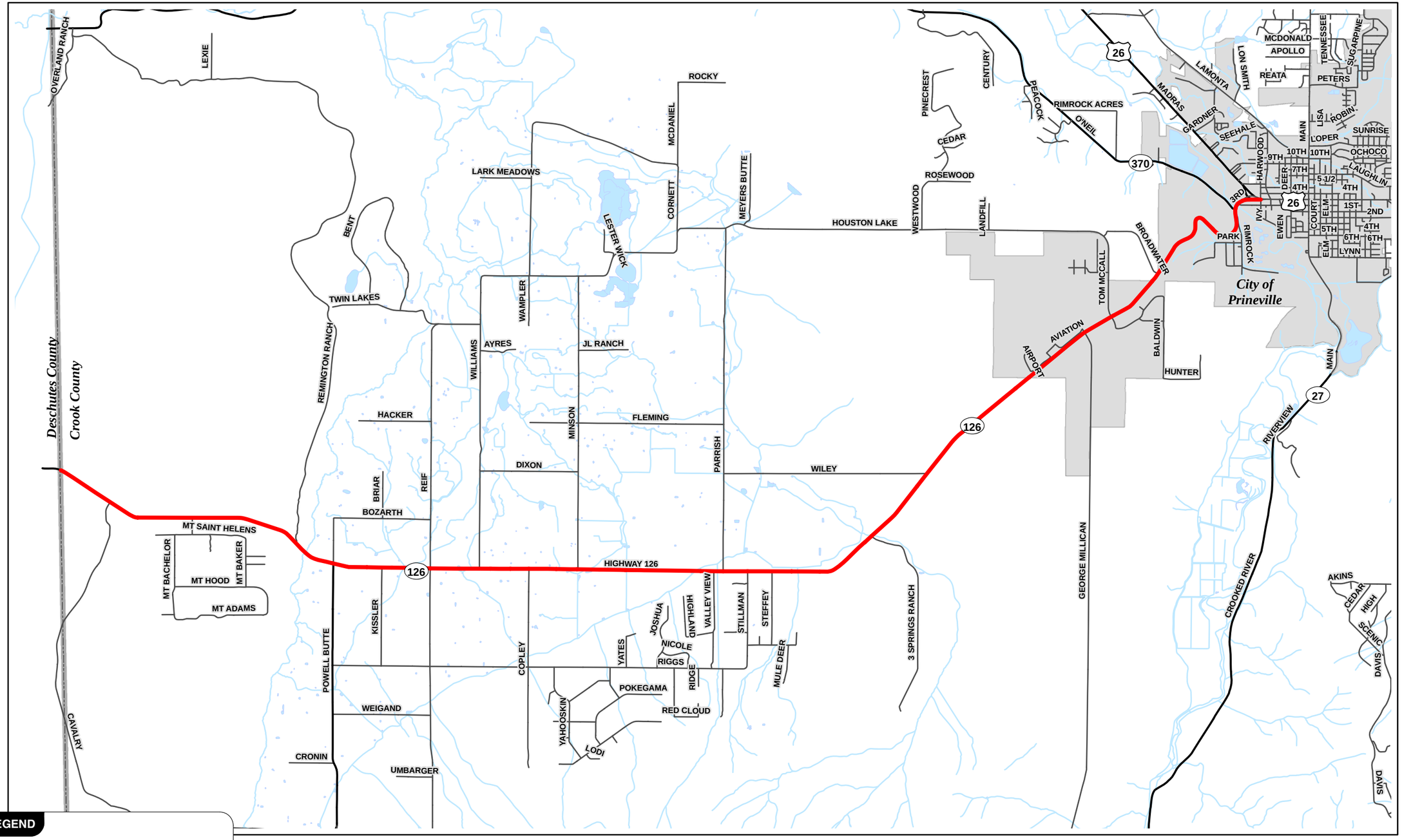
- roadway characteristics and surrounding land use;
- highway access type and location;
- roadway safety; and,
- operational performance.

This technical memorandum will provide context on the purpose of this segment of the OR 126 corridor, identify the range and acuity of existing system needs, and will be used to prioritize future highway and non-highway improvements.

This corridor study will assess an approximately 15-mile segment of OR 126 (ODOT Highway 41: *Ochoco Highway*) from the Crook County line (milepost 3.58) east through the Prineville "Y" junction with US 26 (ODOT Hwy 360: *Madras-Prineville Highway*, milepost 18.24), as shown in Figure 2-1.

ROADWAY CLASSIFICATION AND MANAGEMENT OBJECTIVES

OR 126 in Crook County is classified as a *Statewide Highway*, a *Freight Route*, a *Truck Route*, and is considered a part of the National Highway System (NHS). ODOT has an obligation to ensure that OR 126 adequately serves inter-regional travel as part of the interconnected system of principal arterial routes that makes up the NHS system in Oregon. OR 126 is also classified as an *Expressway* from the Crook County boundary east to the O'Neil Highway (milepost 17.92). Expressways are intended to carry a high volume of traffic, at high speeds, safely and efficiently. Given its *Freight Route* designation, recommended future improvements to OR 126 should improve the efficiency of operations to facilitate the movement of goods, while at the same time be balanced against the needs of other users of the highway.



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STUDY AREA
CROOK COUNTY, OREGON

FIGURE 2-1

OR 126 is part of the arterial roadway system that provides a vital route between Prineville and the Redmond/Bend area and access to the rural residential areas in the western part of the County. While the City has established economic development goals to provide employment within the City for residents, many will continue to find employment in Bend or Redmond and will rely on OR 126.

The US 26/OR 126 junction, the western "gateway" to Prineville, is also very important for the City of Prineville. The "Y" junction is currently controlled by two stop signs and yield indicators and is congested; the congestion is exacerbated by truck traffic. While the "Y" junction is the eastern end of the study area, the corridor planning project will need to account for the functional transition of this facility - from mobility and safety in traffic movements of two highways intersecting to the movement of local traffic as OR 126 becomes Third Street, a primary commercial corridor and designated Special Transportation Area (STA)[1] through Prineville.

SURROUNDING LAND USES

OR 126 provides direct access to the land around the Prineville Airport, which is one of the region's major industrial employment areas. The Prineville Airport is a general aviation airport with two paved runways and is used by the United States Forest Service and most of the large local business, commercial, and heavy industrial firms in the area. This area includes: the Tom McCall Industrial Park; over 100 acres owned by the County and private developers; the Prineville Industrial Park (also known as the Tom McCall Expansion, which comprises 118 acres of privately-owned land); and, the Prineville Airport Business/Industrial Park, which has sites available for industrial and commercial development (lease only).

Development around the airport is a top local priority for infrastructure planning and economic expansion incentives. As such, the Tom McCall Industrial Park has been certified by the State of Oregon as a shovel-ready site. A second certified shovel-ready site is currently being developed by Vitesse, LLC for Facebook. The City's economic analysis concludes that there is a need for additional industrial lands that are situated near the airport, which in turn will require that adequate public facilities be planned, funded, and installed to serve employment areas.[2]

OR 126 also is the main transportation route that enables residents of the Powell Butte area and other rural residential areas south of the highway to reach goods, services, and employment in Prineville and the Bend/Redmond area.

Five approved destination resorts are located within Crook and Deschutes County, surrounding the corridor, and will affect the Powell Butte Highway traffic volumes as well as those along OR 126. These resorts include Remington Ranch, Brasada, Pronghorn, Hidden Canyon, and Crossing Trails. At this time Remington Ranch has basic infrastructure in place but limited on-site development, Pronghorn has roads and utilities installed with several units occupied, and

[1] Third Street from Locust Street to Knowledge Street is a designated STA.
[2] See Chapter 5, Economy, of the City of Prineville Urban Area Comprehensive Plan (2007).

the remaining sites have not yet begun to develop. Full build-out of these resorts could create approximately 7,000 residential units throughout the area, but are not likely to fully build out for over 20 years.

The City of Prineville's Land Use Code implements the goals, policies, and objectives expressed in the City's Comprehensive Plan. Sections 153.045 through 153.064 (Use Zones) specify the allowed uses and associated regulations for each zoning district in the City. Nine different zoning designations are found along the OR 126 right-of-way within City limits, including various airport zones and Industrial Park zoning near the airport; Park Reserve around the State Park just west of downtown; General Residential southwest of downtown; Limited Industrial on the north side of the highway just west of downtown; and General Commercial on the south side of the road where it reaches downtown.

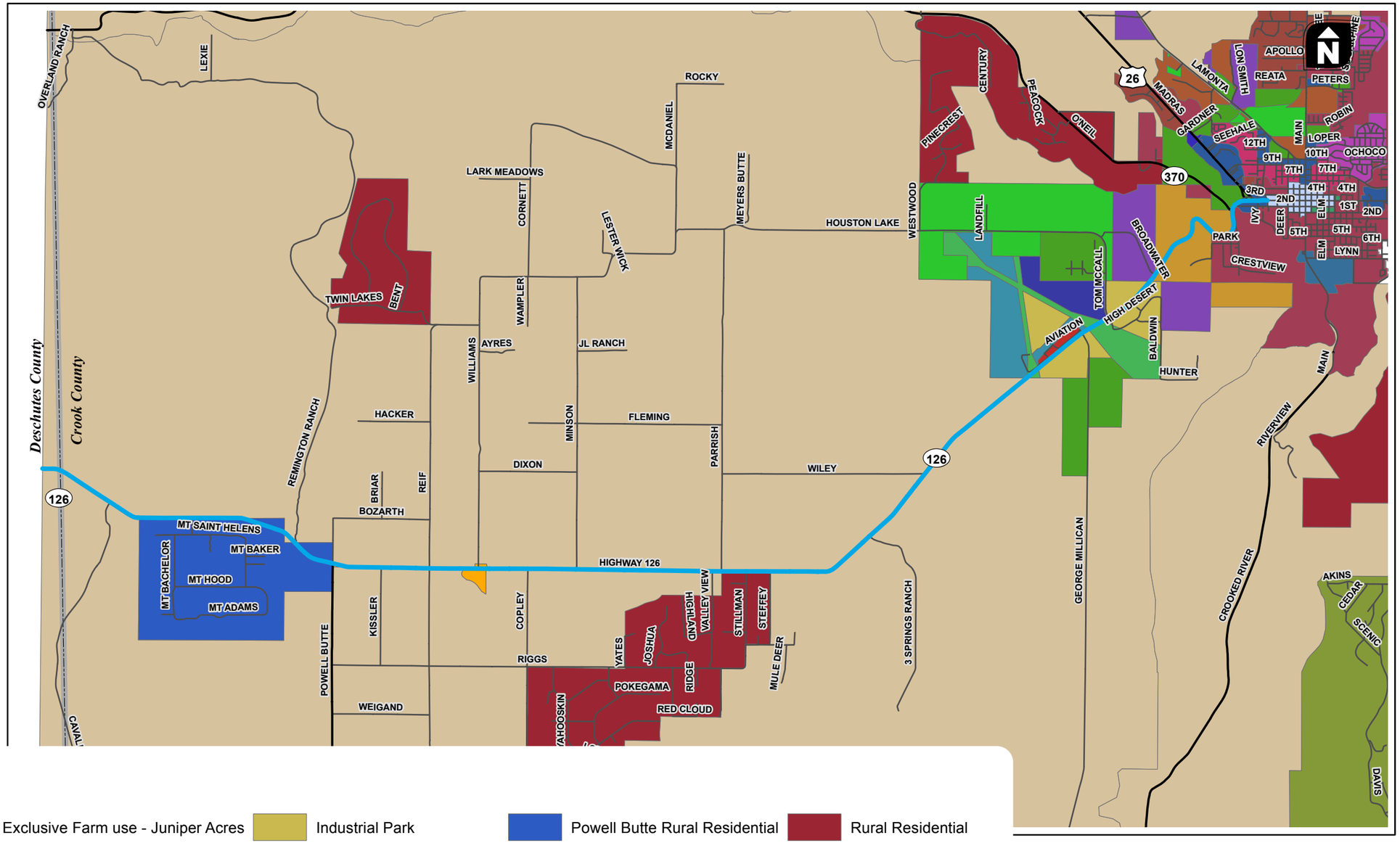
The majority of the property adjacent to OR 126 from the Crook County/Deschutes County line to the City of Prineville is zoned EFU-3, as shown in Figure 2-2. Farm parcels are required to contain more than 160 acres within this area. Crook County code allows a parcel less than 160 acres but larger than 80 acres to be approved as a farm unit. The Powell Butte area is also zoned EFU-3, with R-5 (five-acre residential parcels) and R-10 (ten-acre residential parcels) to the south of Powell Butte. In the far western part of the County a portion of land is zoned Powell Butte rural residential, PBR-20. The minimum lot size in the PBR-20 zone is 20 acres and uses are limited to residential homes, farm uses, and public parks and recreational facilities (allowed conditionally).

EXISTING TRANSPORTATION INVENTORY

The existing transportation inventory provides a detailed description of all transportation facilities and travel modes within the study corridor. In addition, the inventory identifies the current operational, traffic control, and geometric characteristics of roadways and other transportation facilities.

STUDY ROADWAY CLASSIFICATIONS

The location and alignment of the study area roadways are illustrated in **Error! Reference source not found.**. Table 2-1 provides a summary of state-owned roadway facilities within the study corridor influence area.



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Zone Description

- Airport Approach Overlay
- Airport Business-Industrial
- Airport Commercial
- Airport Development
- Central Commercial
- Exclusive Farm Use
- Exclusive Farm use - Juniper Acres
- Forest
- Forest Recreation
- General Commercial
- General Industrial
- General Residential
- Heavy Industrial
- Industrial Park
- Light Industrial
- Limited Commercial
- Limited Industrial
- Limited Residential
- Neighborhood Commercial
- Park Reserve
- Powell Butte Rural Residential
- Professional Commercial
- Recreational Commercial
- Recreational Residential
- Residential Redevelopment
- Residential Woodlot
- Rural Aviation Community
- Rural Residential
- Rural Service Center
- Suburban Residential

EXISTING ZONING
CROOK COUNTY, OREGON

FIGURE 2-2

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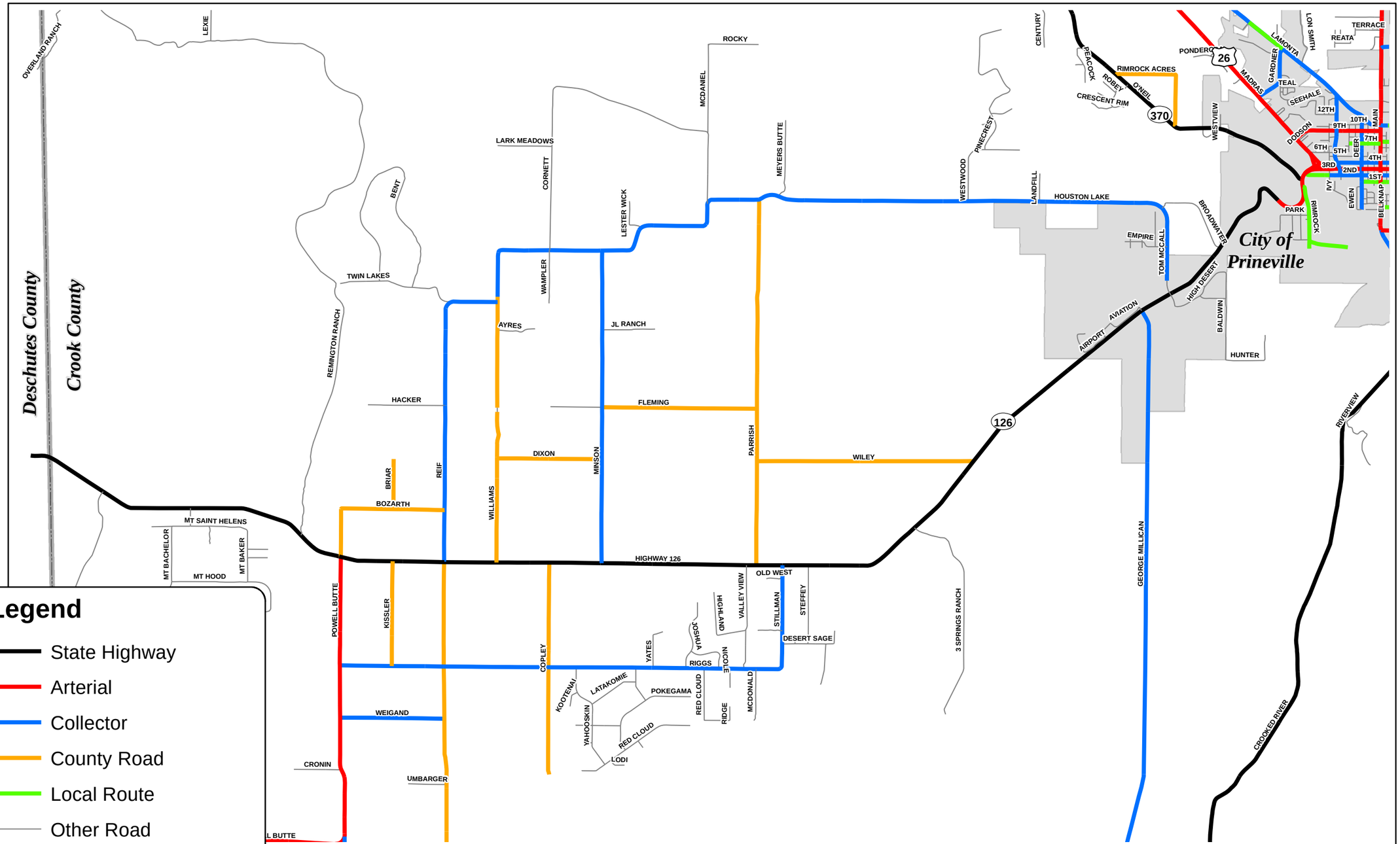

Legend

- State Highway
- Arterial
- Collector
- County Road
- Local Route
- Other Road
- Urban Growth Boundary
- City Boundary
- County Boundary

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Oregon Department of Transportation

ROADWAY CLASSIFICATION
CROOK COUNTY, OREGON

FIGURE 2-3

Table 2-1 Key Study Area Roadway Characteristics

Highway	Classification	Speed (mph)	Sidewalks / Bike Lanes	NHS	Freight Route	Truck Route	Scenic Byway	Special Designation
OR 126 (Ochoco Hwy 041)	Statewide Highway	55[1]	None	Yes	Yes	Yes	No	Expressway[1]
OR 370 (O'Neil 370)	District Highway	55	None	No	No	No	No	-
US 26 (West of OR 126) (Madras-Prineville Hwy 360)	Regional Highway	55	None	No	Yes	Yes	No	-
US 26 (East of OR 126) (Ochoco Hwy 041)	Statewide Highway	30	None	No	No	No	No	STA[2]

[1] Posted speed varies along length of corridor, see Figure 2-4

[2] Expressway from milepost 1.37 (Veteran's Way) to 17.92 (O'Neil Highway)

[3] Special Transportation Area (STA) from milepost 18.24 (Locust Street) to 19.38 (Knowledge Street)

None of the roadways contain sidewalks or bicycle lanes with the exception of OR 126 across the Crooked River Bridge and the new 2nd Street connection to OR 126 immediately west of the "Y". Table 2-2 summarizes roadway classification and characteristics of City and County roads that intersect with OR 126 within the study corridor.

Table 2-2 County and City Roadway Characteristics

Roadway (County #)	Classification	Cross-Section	Comments
Bozarth Road (208)	County Road	Paved 2-Lanes, No Sidewalks No Bicycle Lanes, No Shoulder	Long-Term Access Location for Remington Ranch
Reif Road (349)	Major Collector/ County Road	Paved 2-Lanes, No Sidewalks No Bicycle Lanes, No Shoulder	
Williams Road (206)	County Road	Paved 2-Lanes, No Sidewalks No Bicycle Lanes, No Shoulder	Within the Powell Butte Community and a School Zone
Copley Road (210)	County Road	Paved 2-Lanes, No Sidewalks No Bicycle Lanes, No Shoulder	
Minson Road (104)	Minor Collector	Paved 2-Lanes, No Sidewalks No Bicycle Lanes, No Shoulder	
Parrish Lane (204)	County Road	Paved 2-Lanes, No Sidewalks No Bicycle Lanes, No Shoulder	COID Irrigation Crossing Bridge (mp 3.08) near Powell Butte has weight restrictions – all trucks 3 ton limit.
Stillman Road (319)	Major Collector	Paved north of OR 126, gravel to south. 2-Lanes, No Sidewalks No Bicycle Lanes, No Shoulder	
George Millican Road (305)	Major Collector	Paved 2-Lanes, No Sidewalks No Bicycle Lanes, Narrow Shoulder	
Aviation/Airport Way (115)	Major Collector	Paved 2-Lanes, No Sidewalks No Bicycle Lanes, Narrow Shoulder	
Tom McCall Road (356)	Major Collector	Paved 2-Lanes, No Sidewalks No Bicycle Lanes, Narrow Shoulder	County facility to the south, City facility to the north
Rimrock Road (City of Prineville)	Local Route	Paved 2-Lanes, No Sidewalks No Bicycle Lanes, No Shoulder	Intersection recently reconstructed as part of the Crooked River Bridge project
2nd Street (City of Prineville)	Collector	Paved 2-Lanes with bicycle lanes and sidewalks	Recently connected to OR 126 as an eastbound-only connection

Highway Alignment

OR 126 transitions throughout the study area, but primarily includes a two-lane section with a posted speed of 55 miles per hour. Passing lanes are provided in the eastbound and westbound directions west of the Powell Butte Highway and west of the Prineville Airport. Reduced speeds (45 miles per hour) and a school zone exist within the Powell Butte Community near Williams Road, and a reduced speed is provided along the grade into Prineville eventually transitioning to a posted speed of 20 miles per hour at Meadow Lakes Drive. Information on the posted speeds, alignment, and school zones are illustrated in Figure 2-4.

Raised medians are not present along the corridor, and guardrails exist only along the descent down the grade into the City of Prineville, ending beyond the Crooked River Bridge. Roadway illumination is not provided with exception of decorative luminaires that were recently installed as part of the Crooked River Bridge reconstruction project.

The alignment of OR 126 is mostly straight and follows an east-west orientation from the western Crook County boundary through the Powell Butte Community. Near Milepost 11 (east of Stillman Road) the highway transitions to a northeasterly alignment to the junction with US 26. As illustrated in Figure 2-4 vertical curvature is present along the eastern and western sections of the study segment. West of Powell Butte Highway the vertical curvature results in reduced sight distance and limits the allowable passing areas. East of Milepost 16 the vertical curvature on the eastern corridor segment provides a consistent downgrade toward Prineville; passing lanes are present in the westbound (uphill) direction to allow motorists to pass slow-moving vehicles.

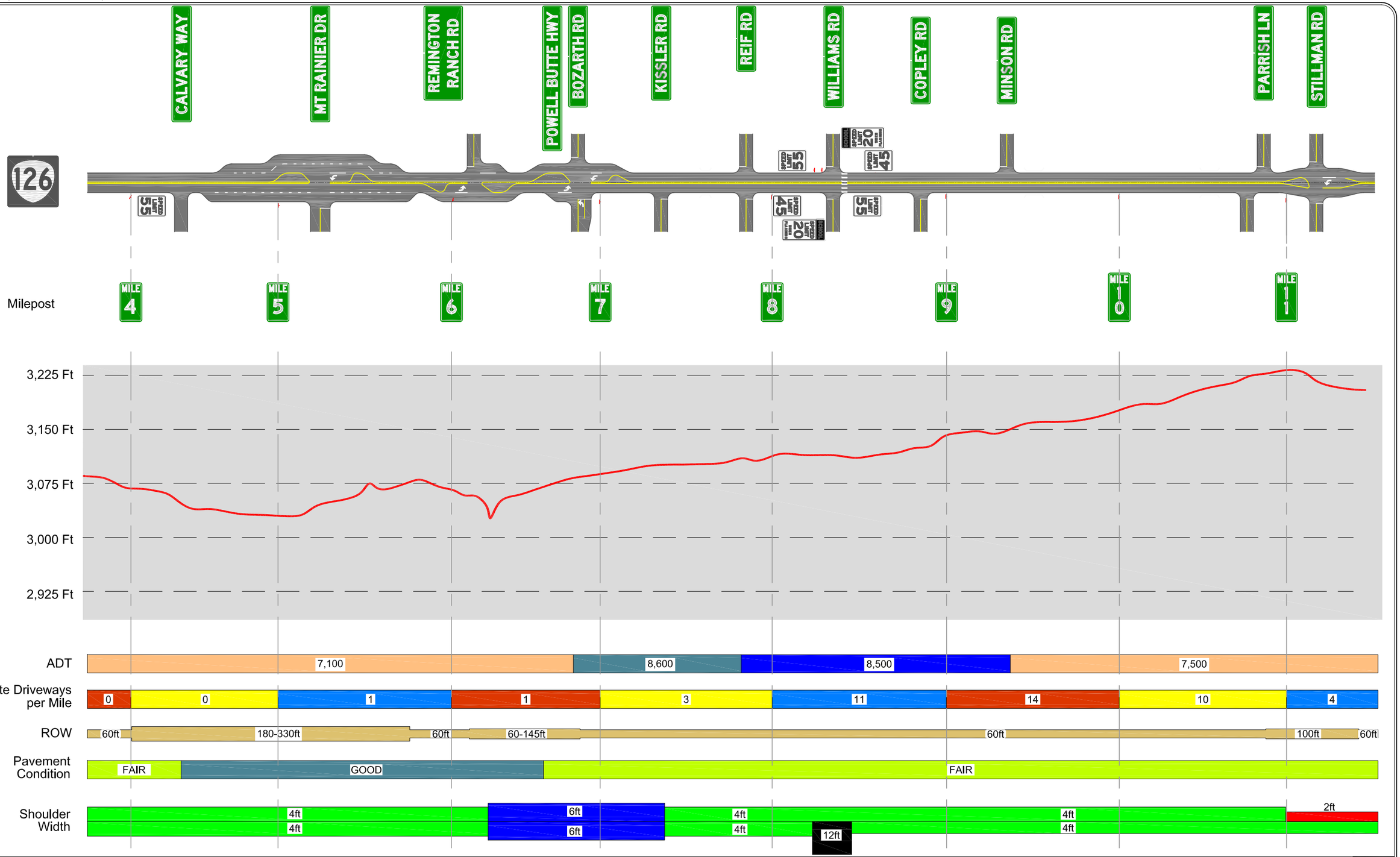
Exhibit 2-1. Vertical curvature along western portion of OR 126.

Pedestrian and bicyclist facilities are not available along the corridor, with exception of limited sidewalks along the recently reconstructed Crooked River Bridge. While redeveloped portions of the highway tend to contain wider shoulders, the shoulder width along the western portion of the corridor is narrow, with further limitations provided by bridge structures narrowing the shoulder to two feet in areas.

Highway Right-of-Way

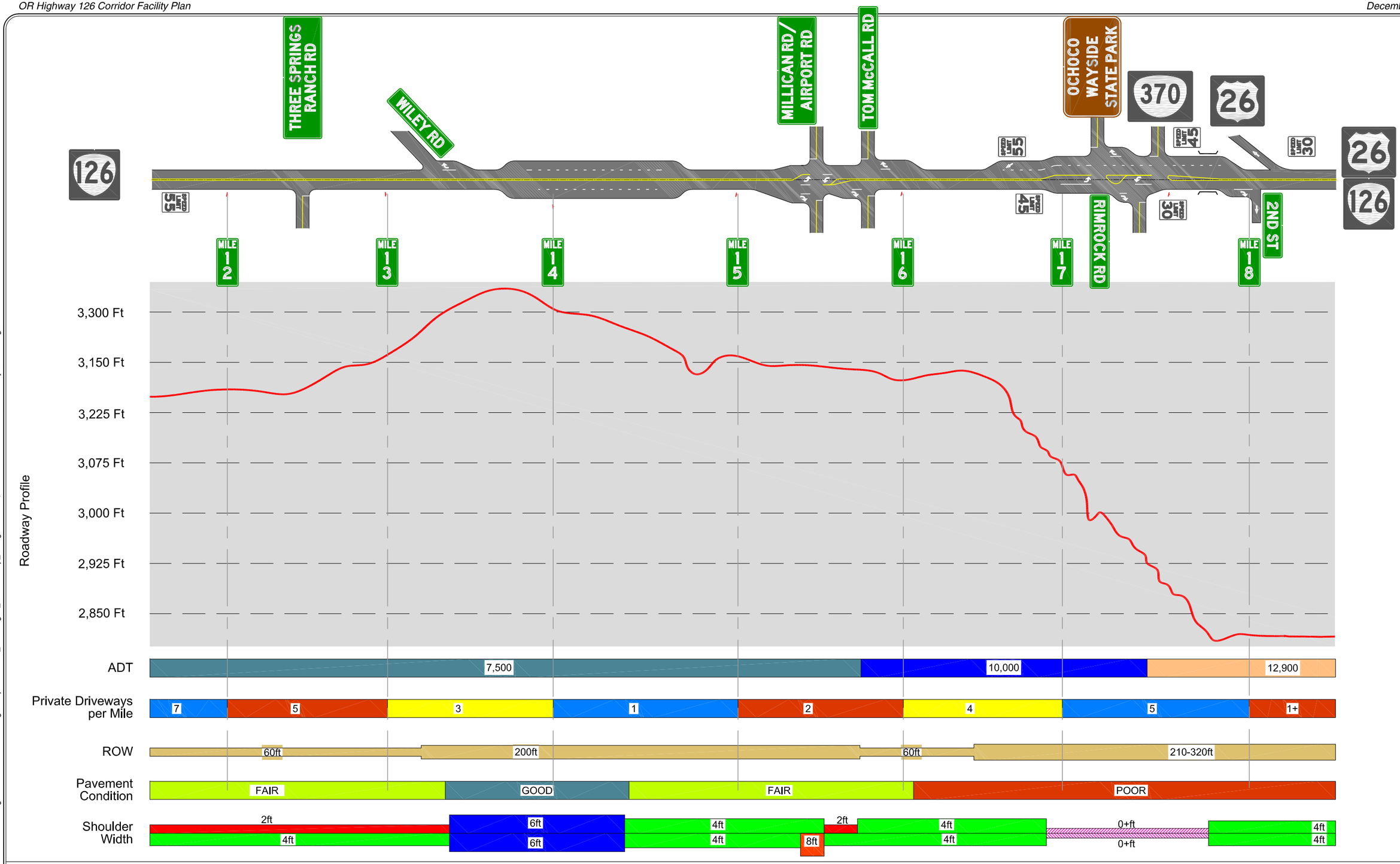
Right-of-way for OR 126 from the Deschutes/Crook County line to the City of Prineville varies from 60 feet to in excess of 330 feet. The as-built construction plans for the original construction of the highway shows a fairly consistent 60-foot right-of-way width. Additional right-of-way has been acquired over time with highway improvements, including the new passing lanes near the western county line, the new passing lanes west of the airport, the new left-turn lane for the Remington Ranch resort, and improvements along the grade into the City of Prineville. Figure 2-4 illustrates the existing right-of-way widths throughout the study segment.

Exhibit 2-2. Limited highway right-of-way approaching the Powell Butte Community.



ROADWAY SECTION INFORMATION
MILEPOST 3.58 TO 11.51
CROOK COUNTY, OREGON

FIGURE **2-4A**



ROADWAY SECTION INFORMATION
MILEPOST 11.51 TO 18.24
CROOK COUNTY, OREGON

FIGURE **2-4B**

There are limited structures located close to the OR 126 right of way as most of the surrounding land uses are agricultural uses with structures set back from the highway. Notable exceptions occur along the highway segment surrounding Powell Butte, as illustrated in Figure 2-2. Within sections containing only a 60-foot right-of-way width additional land would be required to accommodate typical capacity improvements.

Pavement Condition

The pavement condition along OR 126 was reviewed to identify deficient pavement sections that could create safety concerns. Pavement ratings were reviewed to identify areas of the highway that are deficient. ODOT monitors the pavement condition of state highways through the Pavement Management System, which determines whether the pavement is in Very Good, Good, Fair, Poor, or Very Poor condition. The most recent pavement ratings for OR 126 were compiled in 2008, and field observations along the corridor confirm that the ratings are appropriate based on current conditions. Generally, the pavement is rated as "Fair" to "Good" with exception of the grade, which is rated as "Poor." Beyond the grade within the Prineville core the pavement is rated as "Good." Figure 2-4 illustrates the pavement ratings along the corridor, and Exhibit 2-3 illustrates the longitudinal pavement cracking along the grade.

Exhibit 2-3. The existing longitudinal cracks along the Prineville grade. Pavement conditions along this portion of the OR 126 corridor are rated as "Poor".

Highway Shoulders

The purpose of highway shoulders is to provide an area for motorists to safely pull out of the travel lanes in the event of breakdowns, to provide buffer area for evasive maneuvers, and to increase the pavement strength of the travel lanes by minimizing driving on the pavement edge. Along OR 126 the shoulders are also used to accommodate over-dimension and slow-moving vehicles (especially farm vehicles), as well as provide an area for mail carriers to pull out of the travel way.

Highway shoulder widths were reviewed from available ODOT GIS data, which is based on the available paved, or "hard shoulder" dimensions. Highway shoulders are rated on a scale from Very-Poor to Very Good based on the width, with 0 feet rated as very poor and 12 feet and larger rated as very good. Along the study segment OR 126 shoulder widths range between 2 and 6 feet in width, for a rating that ranges from Poor to Good. The ratings along the corridor are summarized in Figure 2-4. Along portions of the corridor a soft shoulder (gravel) clear zone

is provided, though this clear zone is not consistent and in portions of the corridor contains utility poles, rock outcroppings, fences, or guardrails, as illustrated in Exhibit 2-4.

Exhibit 2-4. Existing shoulder along OR 126 highlighting the hard shoulder width, gravel soft shoulder, and presence of rock outcroppings, utility poles, and guardrail within the clear zone.

HIGHWAY ACCESS

The Oregon Highway Plan (OHP) includes access management standards based on roadway classification (Reference 1). Policy 3A of the OHP specifies that rural expressways (as OR 126 is classified) are intended to provide safe and efficient high-speed and volume movements. To achieve this goal private access is discouraged and elimination of existing approaches is encouraged through long-term planning efforts. Public accesses are to be highly controlled and spaced in accordance with current standards.

To evaluate existing access all public and private accesses were inventoried along the corridor. The inventory included existing access spacing and approach permits issued by ODOT.

Access Standards for OR 126

Access management can include limiting the number of accesses and/or the type of access. For example where two access points serve an existing business access management may involve maintaining one full-access driveway and limiting the second driveway to right-in/right-out movements.

ODOT maintains access spacing standards to limit the number of unsignalized access points on Statewide Highways, as outlined in Appendix C, Table 13 of the 1999 OHP. The unsignalized access spacing standards for OR 126 from the Crook County line to milepost 17.92 (O'Neil Highway), designated a Rural Expressway, are 5,280 feet.

From O'Neil Highway east to Meadow Lakes Road OR 126 is not designated as an expressway; therefore, the spacing standard is 770 feet.

Access Inventory

There are a total of 27 public and 56 private access points within the OR 126 study segment, corresponding to an average of 5.7 access points per mile[3]. Figure 2-5 illustrates the locations of existing public and private access points along the corridor.

Within the Powell Butte Rural Service Center several access points exist that have undefined widths. These highway access points are within 500 feet of the intersection with Williams Road and serve the fuel station on the north side of OR 126 and a school, and residential driveway on the south side of OR 126, as shown in Exhibit 2-5. At the OR 126/US 26 junction in Prineville, access to local businesses on the south side of the highway is continuous and undefined, as shown in Exhibit 2-6.

Exhibit 2-5. Parking directly off of OR 126 within the Powell Butte community

Exhibit 2-6. Undefined access along the Prineville "Y"

Compared to the spacing standards for Rural Expressways, 82 of the 83 accesses along OR 126 do not meet the 5,280 foot standard. Access #60 (mp 14.4) which provides access to a quarry, is the only access point that meets the standard.

When future improvements are planned on OR 126 and/or adjacent properties are developed/redeveloped, consolidation and shared access should be considered to reduce the number of accesses along the highway and achieve the ODOT spacing of 5,280 feet.

Permitted Access

ODOT maintains three databases that track permitted access points along state highways. Based on a review of two of the three databases, 23 of the 56 private accesses (41 percent) have current permits on record with ODOT. Additional research will be conducted to identify if any

[3] Private access points include driveways and private streets; public access points include public street crossings (e.g., Minson Road)

additional accesses are permitted and maintained within the third and oldest database maintained by ODOT. *A full summary of accesses inventoried, including a record of those accesses that have current permits on file with ODOT, is provided in Attachment "A".*

TRUCK ROUTES

OR 126 is designated as a *Freight Route* and *Truck Route* in the 1999 OHP. Based on route maps provided for reference by the ODOT Motor Carrier Transportation Division (MCTD), the OR 126 corridor can accommodate a variety of loads. The general limitations for truck travel on OR 126 are shown in **Error! Reference source not found.**. This information is provided to assist in the selection of "design vehicles" for the OR 126 corridor.

Table 2-3 OR 126 Truck Route Limitations

Vehicle	Length Limit	Width Limit (feet)
Truck-tractor and single semitrailer	None	14
Truck-tractor and double semitrailer	40' trailer	14
Pickup Truck and Trailer	70' (53' trailer)	*14
Mobile Homes or Modular Units*	No Limit	14
"Triples" Combinations	None	-

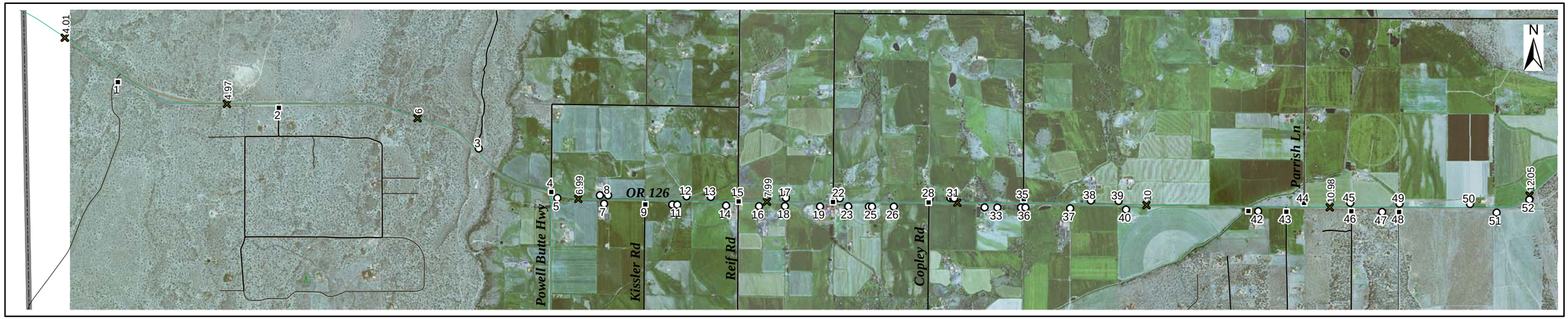
*Under Authority of Special Transportation Permits

PUBLIC TRANSPORTATION

Public transit was reviewed to identify alternative modes that are available to serve commute trips between Prineville and surrounding cities. Cascades East Transit (CET) provides a Community Connector shuttle service on a reservation basis from Prineville to/from Redmond. From Redmond passengers can connect to Bend, Sisters, Madras, and La Pine and Warm Springs. Community Connector trips must be scheduled in advance to use this service, and one-way fares are $6.25 for a day pass (with free transfer to the Bend Area Transit system), and discounts are available for seniors and disabled riders.

The shuttle runs Monday through Friday with the first pick-up in Prineville at 5:00 a.m. and last drop-off at 7:40 p.m. Two shuttle stop locations are within the study corridor:

1. Prineville "Y" Park & Ride Lot – Located in the northwest corner of the US 26/OR 126 junction.
2. Powell Butte Community Church – Located in the northeast corner of the OR 126/Williams Road intersection.



LEGEND

Access Description

- PRIVATE
- PUBLIC
- MILEPOST
- COUNTY BOUNDARY
- CITY BOUNDARY

Oregon Department of Transportation

CROOK COUNTY Serving You EST. 1882

CITY OF PRINEVILLE

EXISTING ACCESS INVENTORY
CROOK COUNTY, OREGON

FIGURE 2-5

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KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

WHPacific

Angelo planning group

Cascades East Transit also provides curb-to-curb service within an eight-mile radius of the Prineville city center between 7:30 a.m. and 5:30 p.m. on weekdays. Normal fare for local trips is $1.25 and trips must also be scheduled in advance. Both curb-to-curb and Community Connector service accommodates two bicycles (available on a first-come first-served basis) and includes accessible ramps.

POSTAL ROUTES

The US Postal Service serves the Powell Butte Community, with a post office located on the southeast quadrant of the Powell Butte Highway serving the surrounding residents. Mail carriers rely on the gravel shoulder area to pull out of traffic while making deliveries. Based on discussions with the mail carrier, typical mail delivery occurs between 1:00 and 4:00 p.m. Two mail routes serve residents and businesses on OR 126. Route 1 starts at Powell Butte Highway and continues east to Reif Road and makes a left-turn. Route 2 starts at Reif Road and continues east down the corridor. Route 1 returns westbound on OR 126 to Reif Road and continues south. Route 2 returns on OR 126 and completes mail delivery from Reif Road to Powell Butte Highway.

Exhibit 2-7. Powell Butte Post Office at the corner of OR 126 and the Powell Butte Highway.

Exhibit 2-8. Mailboxes along the OR 126 corridor. Note the separate mail and newspaper (Bend Bulletin) boxes.

The high speed environment, limited paved shoulder width, and low expectation for turning movements makes deliveries along the corridor difficult. The postal service expressed safety concerns regarding the existing shoulder width.

SAFETY EVALUATION

An evaluation of crash history on OR 126 was performed to identify trends and patterns that may indicate opportunities to reduce crash frequency or severity in the future. The historical crash rates were summarized and compared to statewide averages for similar facilities.

Crash History

A summary of reported crashes was provided by ODOT's Crash Analysis and Reporting Unit. Reports were obtained for 130 crashes that occurred on OR 126 from milepost 3.58 to 18.16 over

a 5-year period from January 1, 2005 to December 31, 2009. Crash records were obtained to identify regional crash trends that may be addressed through engineering, education, and enforcement. Reportable crashes are those that result in an injury or fatality or result in over $1,500 in vehicle or property damage. *Crash history reports obtained from ODOT are included as Attachment "B".*

Crash Severity

Exhibit 2-9 illustrates the number of property damage only (PDO), injury, and fatal crashes reported per year. As shown, the total number of crashes has decreased consistently since 2006. Compared to 2006 the total number of crashes in 2009 was reduced by over 50 percent and injury crashes were reduced by 66 percent. Injury crashes represent approximately 45 percent of all crashes, and PDO crashes represent about 51 percent of the five-year total. While no fatal crashes were reported in 2008 or 2009, over the five-year period there were five fatalities, representing approximately four percent of all crashes along the corridor.

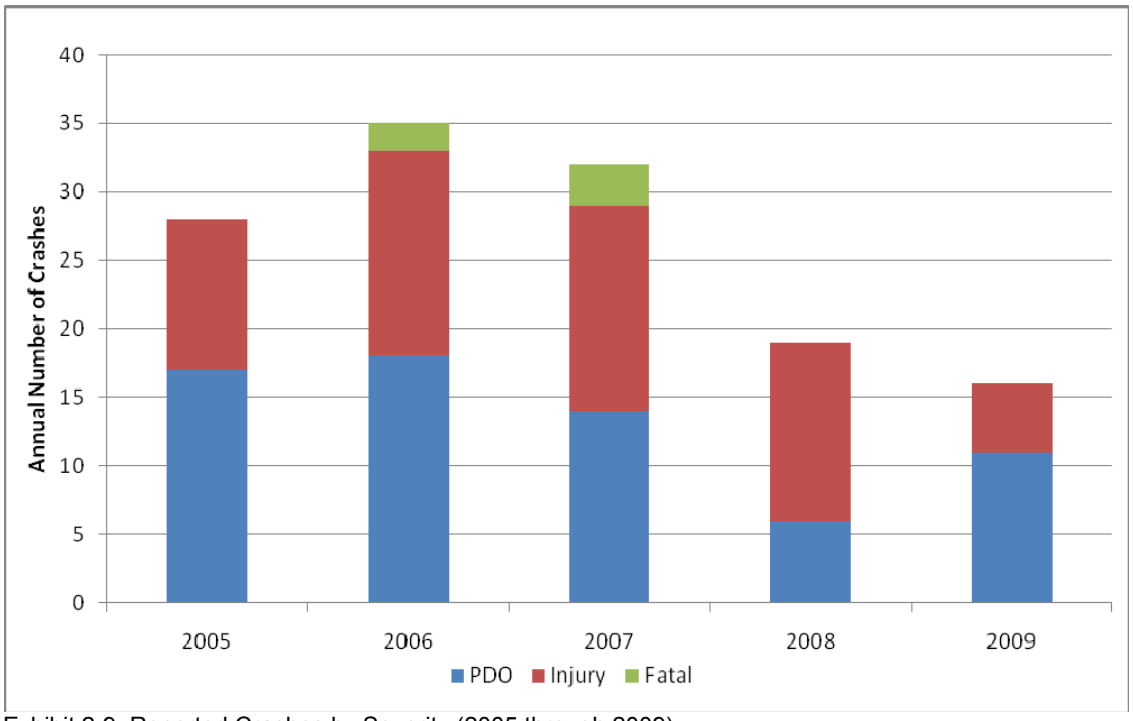


Exhibit 2-9. Reported Crashes by Severity (2005 through 2009)

Five fatal crashes occurred in 2006 and 2007 at four locations along the corridor. The circumstances of each fatality are detailed in Table 2-4.

Table 2-4 Fatal Crash Details

Date / Time of Crash	Location	Action / Cause	Conditions
June, 2006 – 4 p.m.	Milepost 7.74	Straight, head-on, related to another separate crash, following too closely	Cloudy, daylight
November 2006 – 2 p.m.	Milepost 6.26	Alcohol involved, vertical curve, head on	Cloudy, dawn
April 8, 2007 – 12 midnight	Milepost 13.00	Alcohol involved, Straight, off-roadway, fixed object (tree, stump, shrub), fire or explosion.	Clear, dark
June, 2007 – 6 a.m.	Milepost 6.20, within a work zone	Straight, off-roadway, fixed object	Clear, daylight
November 2, 2007 – 6 a.m.	Milepost 18.14, Intersection, Posted speed is 30 mph	Angle, Ditch, overturned vehicle, occupant fell/jumped/was ejected, passed stop sign	Clear, dawn

As shown in Table 2-4, the fatal crashes reported within the study segment each varied in terms of the circumstances that likely contributed to the crash. Alcohol was involved in two crashes and one crash occurred within a construction work zone under temporary traffic control.

Based on the review of the fatal crash details, there are no notable trends identified that could reduce the frequency or severity of crashes.

Roadway Surface Conditions

Review of roadway surface conditions showed that of the total crashes, approximately 68 percent occured on dry roadways, approximately 15 percent occured on wet roadways, and approximately 17 percent of the crashes occurred on a snowy or icy roadway surfaces. Review of weather trends for Prineville and Powell Butte indicates that snowy or icy highway conditions appear to be over-represented within the crash records, indicating that drivers are not adjusting to a safe speed or are unaware of the ice.

Roadway Illumination

Roadway illumination was reviewed to identify whether a high proportion of crashes were occurring in dark conditions that could be corrected if lighting were provided. Limited illumination is present along the OR 126 corridor, including decorative lighting along the Crooked River Bridge. At the Millican Road intersection and other cross streets nearby there is illumination on the minor street that partially covers OR 126. Review of the crashes showed that approximately 25 percent of all crashes occurred in low-light or dark conditions. Illumination at select locations, especially within the Powell Butte community or near Tom McCall Road, could assist with the rural to urban transition, better highlight pedestrians, and help increase driver awareness of the upcoming conflicts.

Crash Types

Exhibit 2-10 illustrates the types of crashes that have occurred on the corridor over the study period. As shown, fixed object and rear-end crashes make up the majority of all reported crashes. Of the 21 crashes identified as "unclassed/other", 13 were associated with a collision with a deer or elk. Twelve of the 13 deer/elk crashes occurred between milepost 11.1 and 18.0. Review of crash types by year shows that turning movement crashes appear to be declining over the five-year period while fixed-object crashes do not show signs of declining.

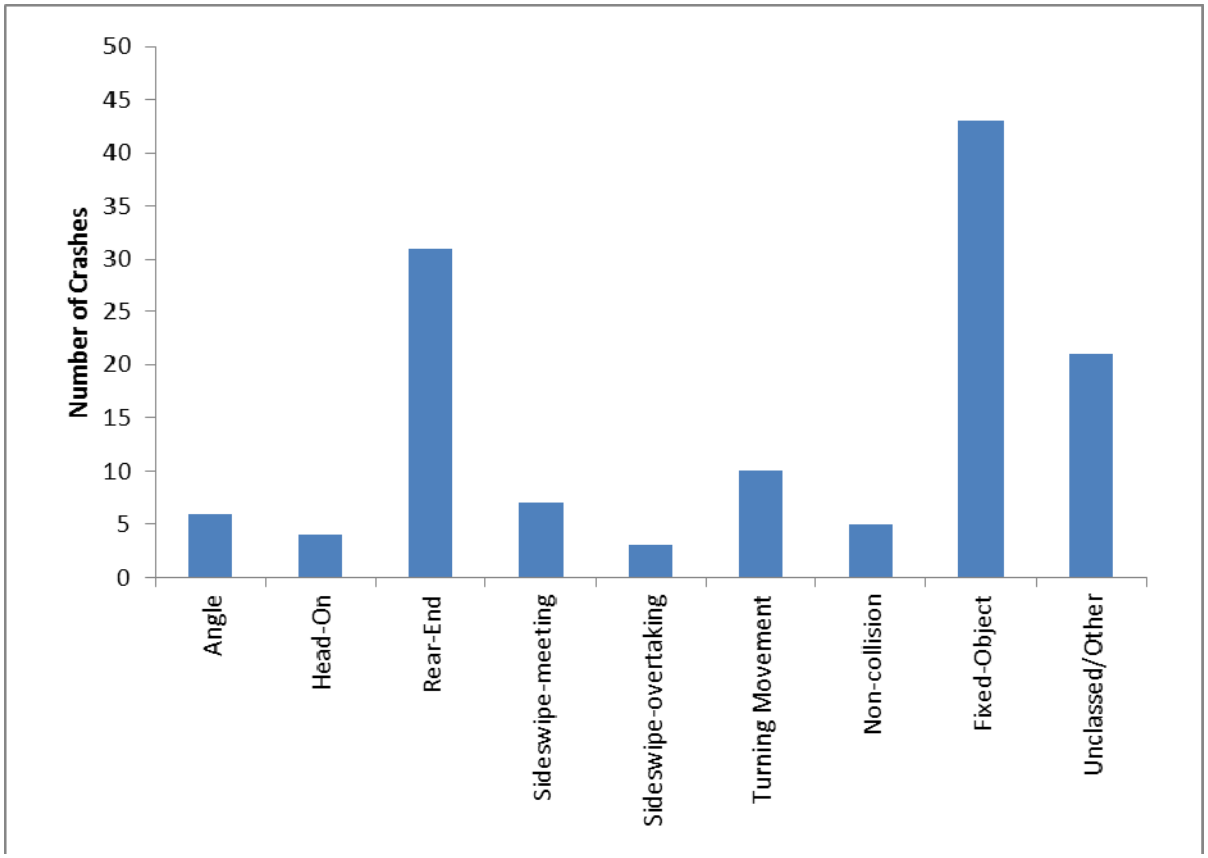


Exhibit 2-10. Frequency of crash types throughout the OR 126 study corridor between 2005 and 2009.

Based on crash-type trends observed over the study period, further evaluation will be conducted to identify countermeasures that will help reduce fixed-object crashes, such as installing guardrail or removing obstacles in the roadside.

School Zone

The Crook County Sheriff's office provides an officer to monitor traffic near the OR 126 pedestrian crossing at Williams Road in the Powell Butte school zone.

Crash Location

The frequency of crashes by location was evaluated based on milepost data recorded in the crash reports, and is illustrated in Exhibit 2-11 by 0.10 mile segments.

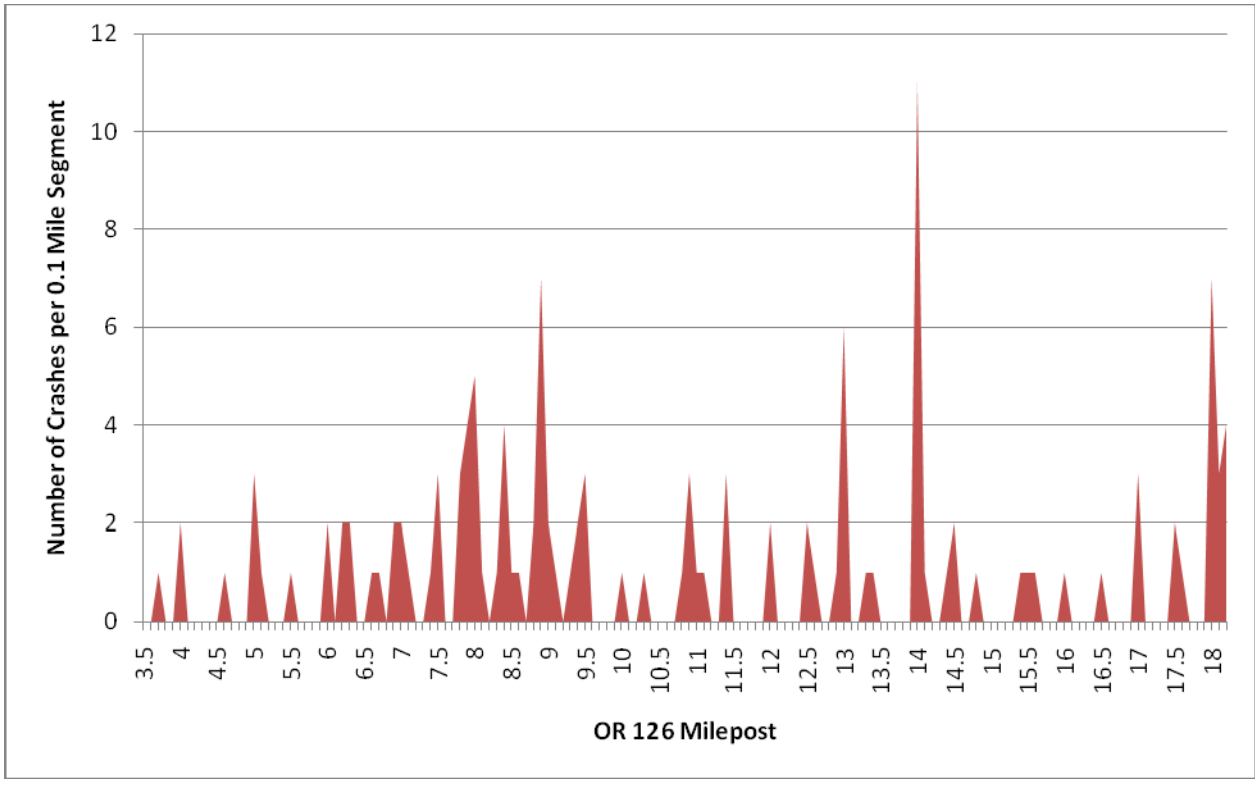


Exhibit 2-11. Crash frequency along the OR 126 corridor illustrated by 0.1 mile segments.

As shown in the exhibit, the highest frequency of crashes was reported from mileposts 7.7 to 8.0, 8.8 to 8.9, 12.9 to 13.0, 13.9 to 14.0, and 17.9 to 18.2. Crash report details within each of these segments were evaluated to identify crash patterns or trends. In some cases the segment area was expanded to include nearby crashes that were expected to be related.

Milepost 7.7 to 8.0

Reif Road intersects OR 126 at milepost 7.84 along a relatively straight and flat highway section. This section of highway is the narrowest section along the corridor, with utility poles and private fencing located near the edge of the shoulder and limited recovery space along both sides of the highway. Passing in one or more directions is permissive surrounding the Reif Road intersection. Crash records show that four of the 12 crashes were associated with the intersection and five of the 12 crashes involved a vehicle that left the roadway. There was a fatality reported within this corridor segment, five injury crashes, and six non-injury collisions.

Milepost 8.7 to 9.0

Copley Road intersects OR 126 at milepost 8.9, with passing permissible in both the eastbound and westbound directions due to the straight and flat roadway section. Within the vicinity of this intersection 11 crashes were reported on OR 126 over the five-year period, including six PDO and five injury crashes. Crash reports indicate that three of the 11 crashes were associated with the intersection and four involved a vehicle that left the roadway. The predominant crash

types were fixed-object crashes (4), and rear-end crashes (3). Other crash types reported include turning movement (2) and angle (1); one crash type was unknown.

Based on a review of the crash reports within this segment there does not appear to be any one factor that has contributed to the observed frequency of crashes. The observed crash types are not uncommon for unsignalized intersections on high-speed facilities. Further evaluation, including a field review, will be conducted and potential countermeasures will be suggested as part of project recommendations.

Milepost 13.0 to 14.0

Twenty crashes were reported at mileposts 13.0, 13.3, 14.0, or 14.0, representing the highest density of crashes within a one-mile segment of the study corridor. The section does not include any significant intersections and includes a four-lane section with passing lanes in each direction. Six of the crashes in this segment resulted in a vehicle leaving the roadway. Five crashes involved a fixed-object, five others were sideswipe type crashes (3 opposite direction, 2 same/overtaking), three involved a rear-end crash, and one was reported as a turning movement crash.

Eight injury crashes and one fatality were reported along this segment, and the remaining 11 crashes were PDO. The fatality occurred at midnight in April 2007 when a vehicle left the roadway; the crash report indicated that alcohol was involved.

A majority of the crashes (18 of 20) along this segment were reported prior to 2008, which indicates that an improvement may have been made or travel patterns may have changed late in 2007 or early in 2008. The crash reported in 2008 indicated that the crash occurred on a four-lane section of the highway, while all other crash reports indicated two lanes. Further evaluation will be conducted to identify if the roadside could be made more forgiving in order to reduce the frequency and severity of off-roadway and fixed-object crashes.

Milepost 17.9 to 18.2

Within the approximately 0.3 mile segment spanning from Rimrock Road to the Prineville "Y" a total of 14 crashes were reported. There are several prominent public intersections along this highway segment (Rimrock Road, O'Neil Highway, 2nd Street, and the Prineville "Y") and a rural to urban speed transition between the grade and the downtown city core.

Crash reports show that over half (8 of 14) of the crashes were reported to be related to intersections and four others involved a vehicle that ran off the road. There were five fixed-object, four angle, and four turning movement crashes reported, as well as one uncoded crash. Half of the crashes were non-injury collisions, though a fatality was recorded in November 2007 near milepost 18.14 (east of the Crooked River Bridge). The crash report indicated that the fatality occurred from an overturned vehicle that ran a stop sign.

Recent projects were completed within this segment that are likely to reduce the frequency of crashes. These changes include the reconstruction and widening of the Crooked River Bridge, the connection of 2nd Street (OR 126 egress connection only), and improvements at the Rimrock

Road intersection. The 2nd Street improvements at OR 126 may improve safety in the section where the fatality occurred.

Crash Rates

Crash rates reflect the number of crashes per million vehicle-miles traveled and take into account crash exposure in terms of the number of vehicles and length of roadway. Exposure was measured based on Average Annual Daily Traffic (AADT) reported by ODOT for the segment between Powell Butte Highway and the western Prineville City Limits, as reported in ODOT's *2009 Crash Rate Book* (Reference 2). Crash rates were calculated for the study segment, as summarized in Table 2-5.

Table 2-5 OR 126 and Statewide Roadway Segment Crash Rates

Segment	Mile Post	Crash Rates				
		2005	2006	2007	2008	2009
OR 126 from western Crook County limits to US 26	3.58 – 18.16	0.65	0.69	0.64	0.41	0.35

The crash rates for the study period were compared to other similar facilities in rural areas of Oregon. ODOT publishes annual statewide roadway segment crash rates in the *Crash Rate Book*. Data was extracted from the *Crash Rate Book* for all rural areas on the Ochoco Highway (#41) and for statewide, Other (non-freeway) Principal Arterials in rural areas. Exhibit 2-12 illustrates the crash rates for the study segment with respect to comparable segments in the state.

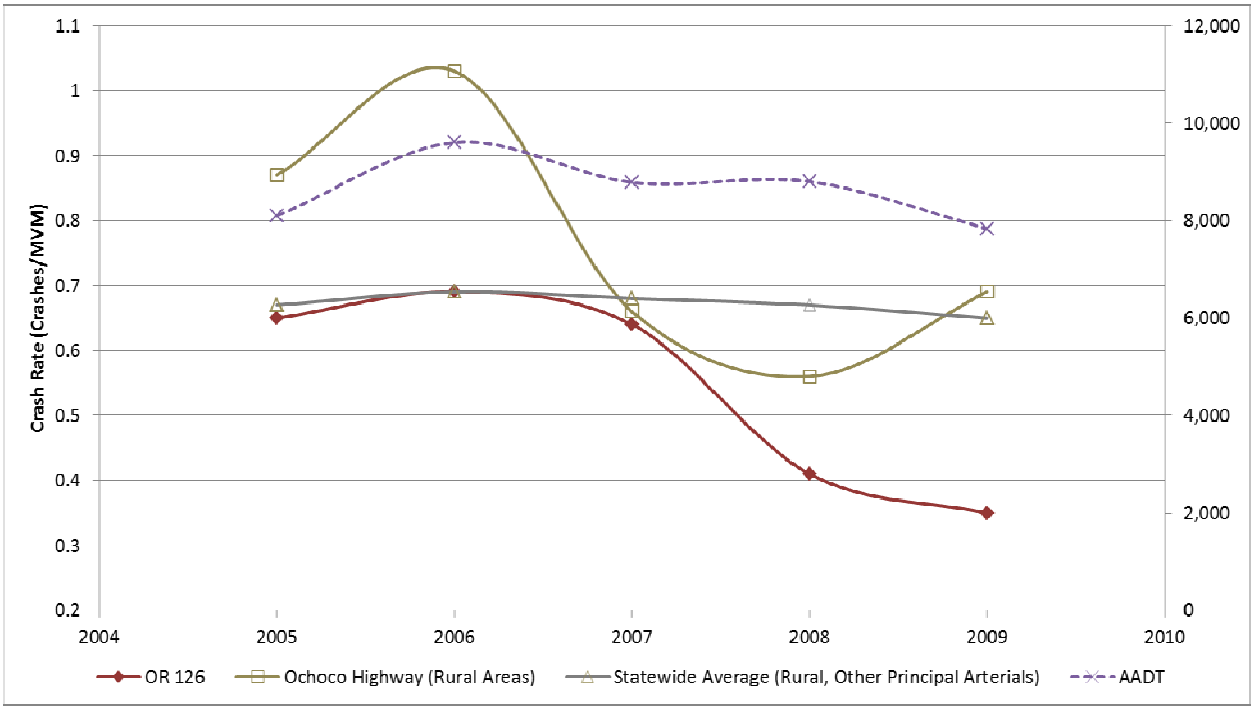


Exhibit 2-12. Comparison of annual crash rates along the study segment of OR 126 to the overall corridor and Statewide average.

As shown in the exhibit, the annual crash rates from 2005 to 2009 for OR 126 do not exceed the statewide average crash rate for similar facilities in rural areas. In 2006 the crash rate was the highest, which corresponds to 35 reported crashes. The majority of crashes in 2006 were related to rear-end or fixed object crash types, which is consistent with other years studied.

Safety Priority Index System

ODOT developed the Safety Priority Index System (SPIS) to identify and prioritize sites where a countermeasure or multiple countermeasures could be implemented to potentially reduce the number of crashes. Roadway segments are ranked based on the number of fatal and serious injury crashes reported over a three year period within five mile segments. Intersections are ranked based on the number of crashes.

In 2010 the OR 126/Powell Butte Highway intersection and the junction of US 26 and OR 126 intersections were ranked in the 85-89.9 percentile of all SPIS sites based on 2007-2009 crash data. No roadway segments along the study segment of OR 126 were reported in the 95th percentile of SPIS sites.

EXISTING TRAFFIC CONDITIONS

A permanently installed Automatic Traffic Recorder (ATR) station was installed along the OR 126 corridor in 2008 (ATR Station 07-002) approximately 0.35 miles west of the Crook County boundary. Complete annual data from this station is only available for 2008 and 2009; 2010 data through October was reviewed and no changes in trends or overall volumes were noted. Due to the location west of the Powell Butte Highway traffic the patterns primarily reflect Redmond to Prineville commute patterns; Bend to Prineville trips rely heavily on the Powell Butte Highway though patterns are expected to be similar to those captured.

Annual Traffic Volume Patterns

A plot of the daily traffic volumes from ATR Station 07-002 throughout 2009 is provided in Exhibit 2-13. As shown, the volumes generally increase from January through mid-summer, then gradually decline into the fall with a marked decrease in winter. The chart also shows the recurring weekly pattern of increasing traffic between Monday and Friday with a significant drop on Saturday and additional decline on Sundays. The peak date on the chart below (Friday, July 30th) coincided with the kick-off of the Deschutes County Fair and Rodeo and evening concert at the Deschutes County Fairgrounds.

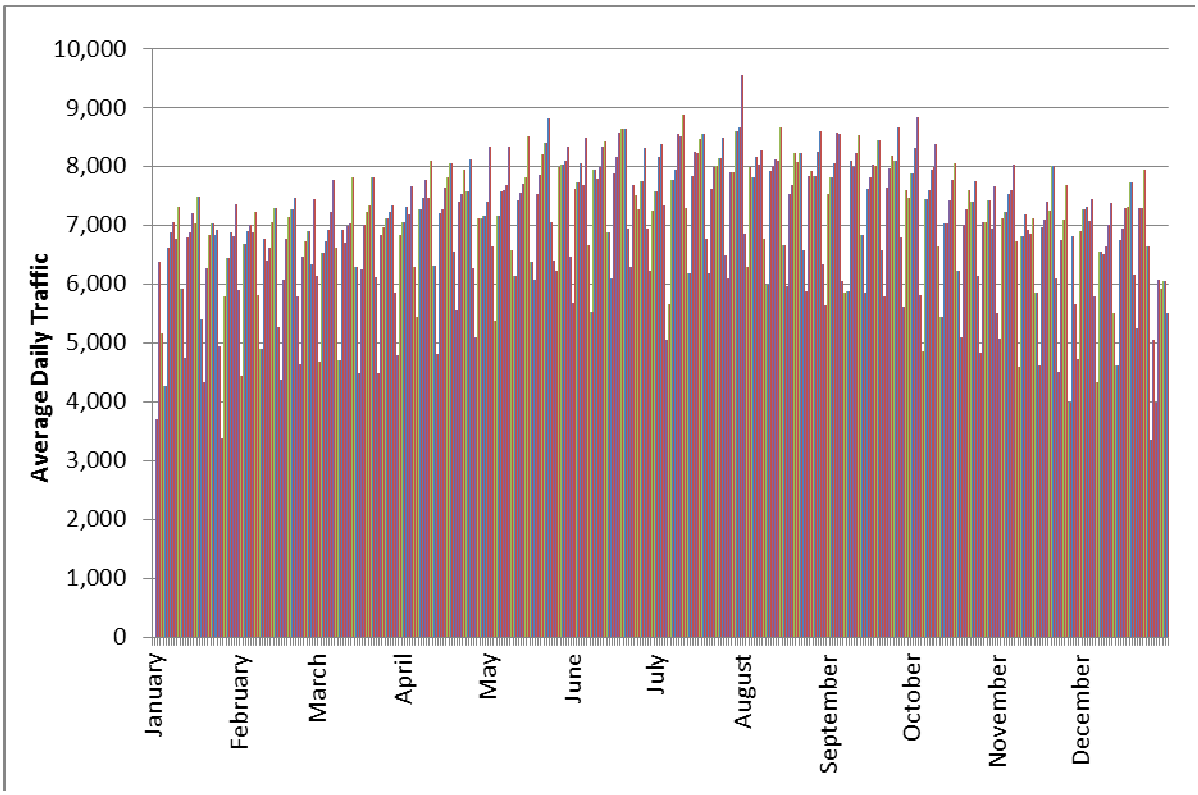


Exhibit 2-13. Average daily traffic patterns throughout 2009 based on data from the Automatic Traffic Recorder located along OR 126 west of the Crook County line (ATR 07-002).

Monthly Traffic Volume Patterns

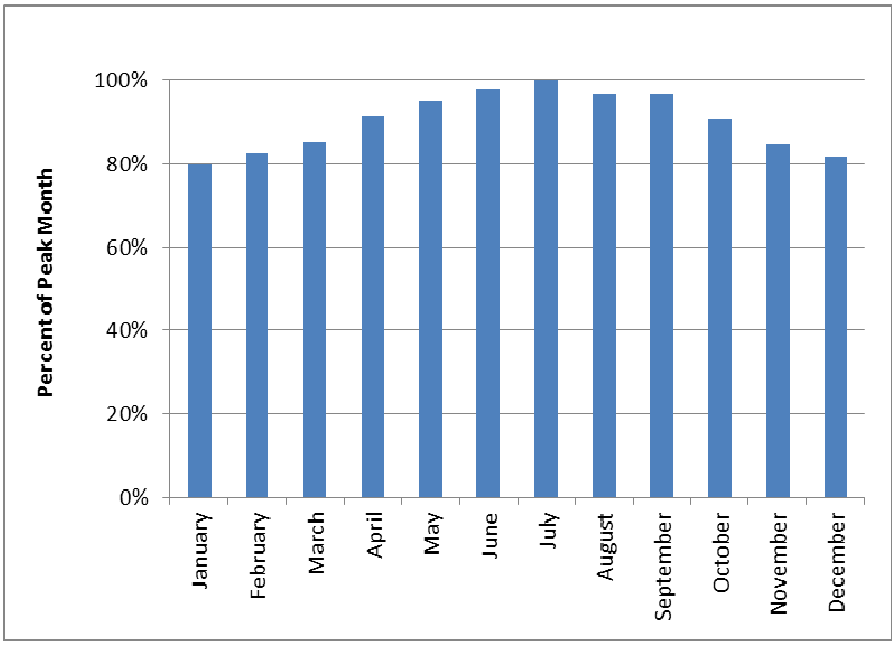


Exhibit 2-14. Illustration of the averaged monthly volume patterns based on data from the Automatic Traffic Recorder located west of the Crook County line.

Monthly seasonal variations were further reviewed by averaging the daily traffic volumes throughout each month and dividing by the number of days. Exhibit 2-14 highlights the monthly volume trends as a percentage of the peak July volumes. This assessment forms the basis of the seasonal volume adjustments detailed within the analysis methodology memorandum.

Weekly Traffic Volume Patterns

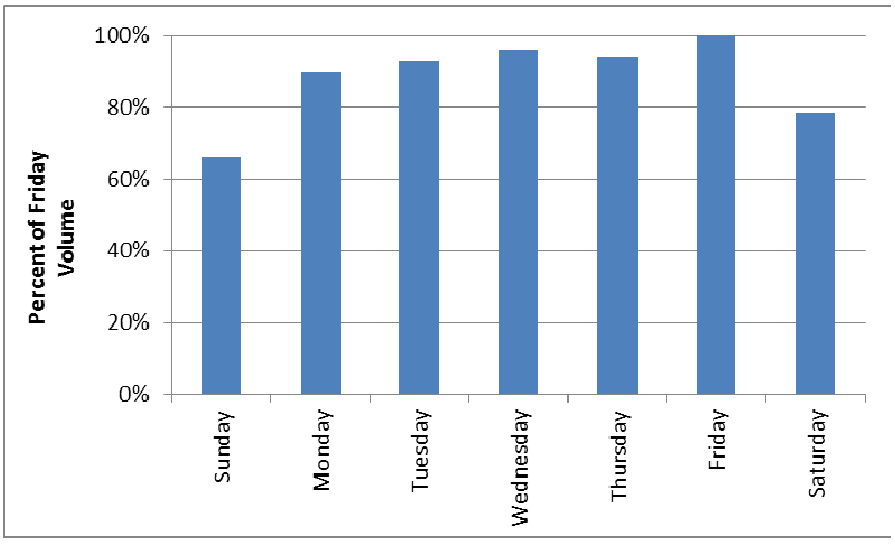


Exhibit 2-15. Average weekly volume trends based on data from the Automatic Traffic Recorder located west of the Crook County line.

The ATR data was further reviewed to highlight the weekly traffic fluctuations along the corridor. Review of the annual averaged data as a percentage of peak Friday conditions, as shown in Exhibit 2-15, shows the relatively constant but slightly increasing trends throughout the weekdays culminating in peak Friday traffic conditions. Saturday and Sunday traffic volumes were respectively 79 and 67 percent of the peak Friday conditions. *ATR data is included within Attachment "C".*

Vehicle Composition

Turning movement counts and classification counts were conducted along OR 126 from the western Crook County boundary to the Prineville "Y" in October 2010 to identify the current traffic volumes and peaking characteristics along the corridor. The turning movement counts were conducted at 12 intersections; six locations were counted for 16 hours (6:00 a.m. to 10:00 p.m.) and another six were conducted for three hours (3:00 p.m. to 6:00 p.m.). The 16-hour counts were conducted at locations where minor street volumes are highest along the corridor to identify daily traffic patterns. These data collection efforts were supplemented with automated tube counts that were in place for 72 hours to capture mainline volume, vehicle types, and speeds. The locations of the manual turning movement counts and the tube counts are illustrated in Attachment "D", and the averaged (non-seasonally adjusted) 72-hour traffic profile from the tube counts are shown in Exhibit 2-16.

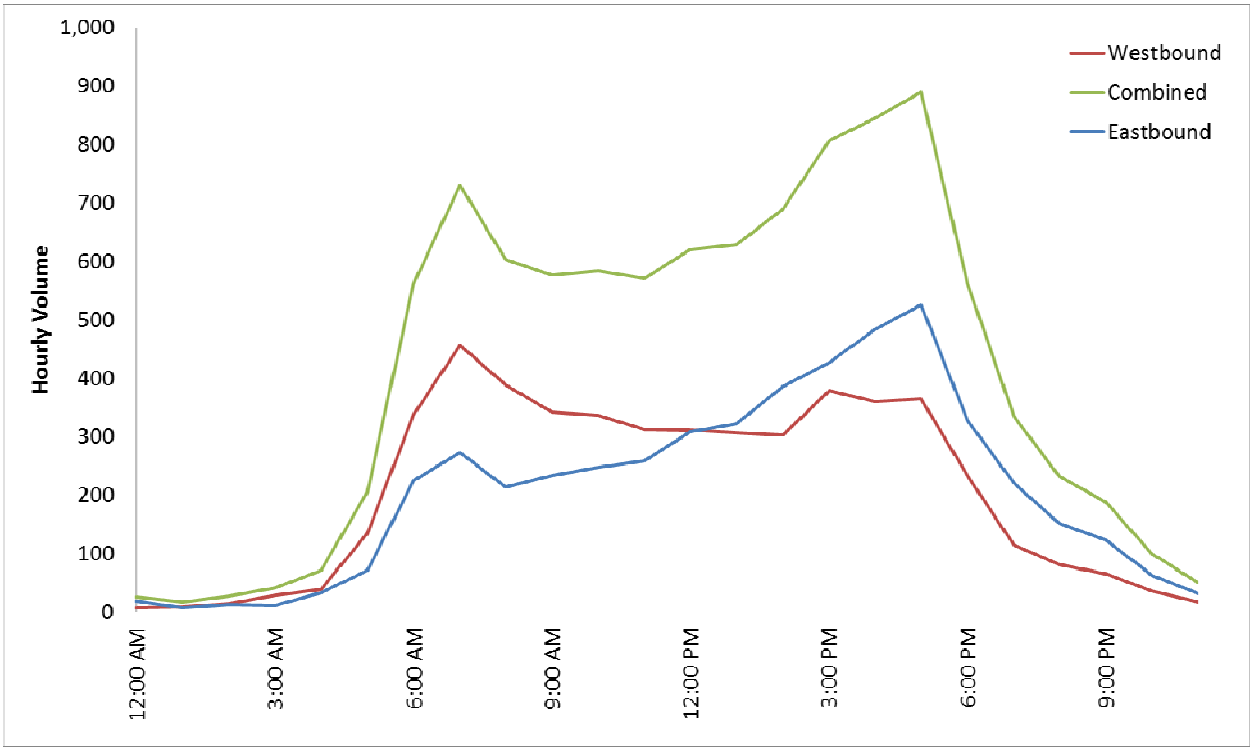


Exhibit 2-16. Midweek volume profile of OR 126 east of the Powell Butte Highway.

As shown in Exhibit 2-16, in the morning the corridor peaks in the westbound direction (Prineville to Redmond commute traffic), and the return trip results in the more critical eastbound volumes during the evening commute period. The "Combined" line shows that the overall traffic volumes on the corridor are more critical during the weekday evening commute period, with the actual peak hour noted to occur between 5:00 and 6:00 p.m. and including approximately 20 percent higher traffic volumes in comparison to the weekday a.m. peak hour (7:20 to 8:20 a.m.). The average (mid-October) daily traffic volume (ADT) along OR 126 east of the Powell Butte Highway is approximately 10,000 vehicles per day. Review of the ATR data showed similar midweek trends throughout the year, with weekend flows containing less volume and more balance between the eastbound and westbound directions throughout the day.

Vehicle classification data was also obtained from the 72-hour midweek tube counts. The volume of trucks (defined as vehicles with three or more axles) varies significantly throughout the day with peak truck traffic occurring around the noon hour with approximately 30 to 50 trucks per hour. Exhibit 2-17 illustrates the volume of trucks and highlights the minimum and maximum truck volumes throughout the three-day count period.

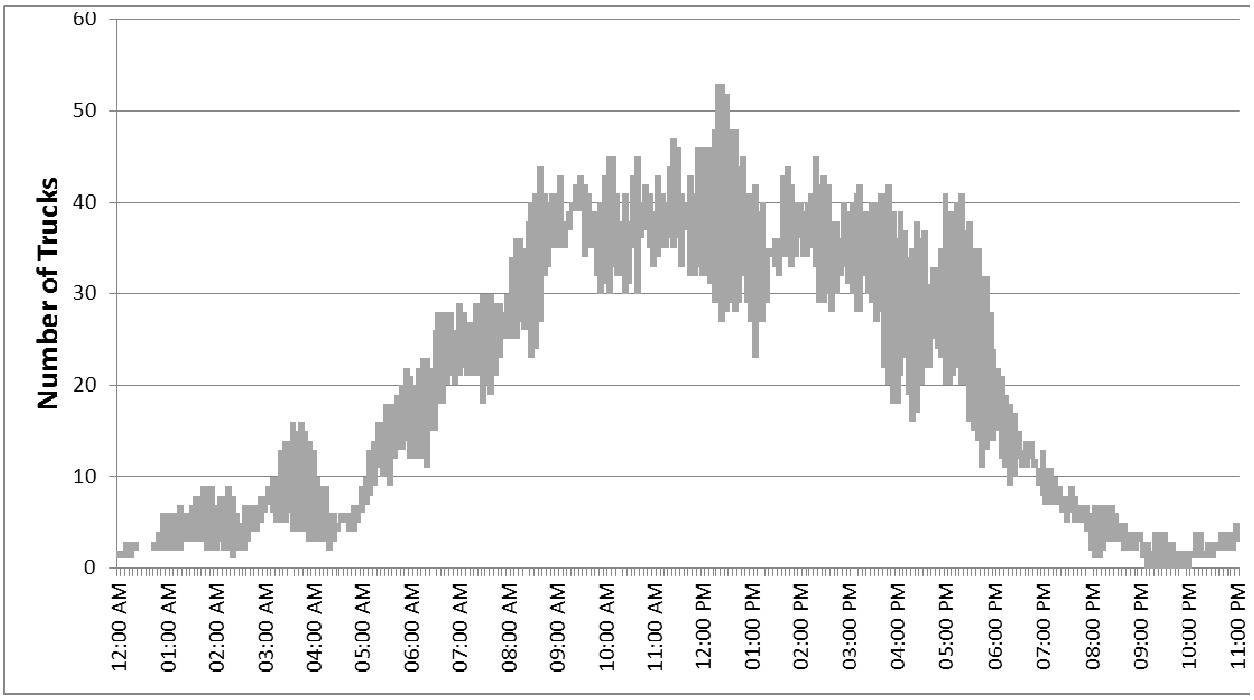


Exhibit 2-17. Range in bi-directional hourly truck volume along OR 126 from tube count data

Overall, approximately 92.3 percent of the measured vehicles were classified as passenger vehicles and 4.6 percent classified as three-axle single unit and larger trucks, with the remaining 3.1 percent unclassed. Truck percentages are highly variable prior to 4:00 a.m. and range as high as one in three vehicles due to the low overall traffic volumes, as shown in Exhibit 2-18. As volumes increase truck percentages drop significantly. Trucks increase along the highway into the late morning, then taper off into the evening hours. It was noted that consistently higher truck percentages were observed throughout the study area with the more refined manual turning movement counts collected at the intersections. It was also noted that the volume of turning movements along the corridor was generally low but a contained high truck percentages. *Manual and automated tube count worksheets are included within Attachment "D".*

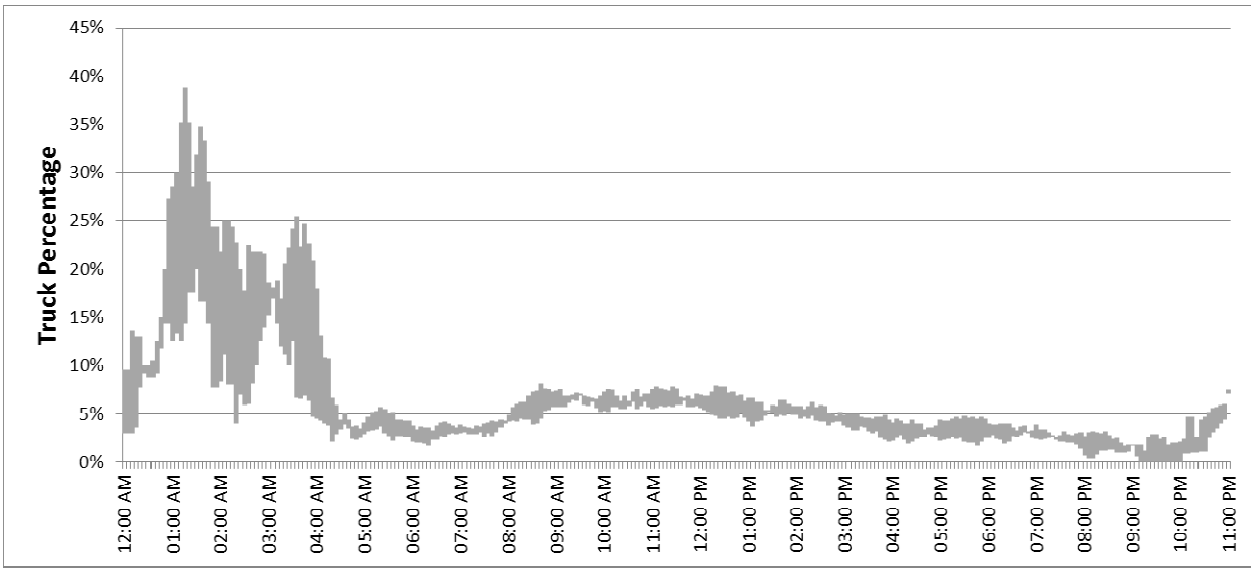


Exhibit 2-18. Range in bi-directional hourly truck percentages along the OR 126 corridor from tube count data

Highway Travel Speeds

Speed measurements were also reviewed to identify the current through speeds along the corridor. Posted highway speeds are based on the 85th percentile speed, or the speed at which 85 percent of motorists travel below. The tube count data shows that approximately 87 percent of all motorists travel between 55 and 60 miles per hour along the rural two-lane highway section, consistent with the posted 55 mile-per-hour speed.

Non-Vehicular Travel

Study intersections along the corridor were videotaped, with critical locations recorded for 16-hours (4:00 a.m. through 10:00 p.m.) and less critical (lower classification) roadways recorded for three hours coinciding with the evening commute peak (3:00 p.m. to 6:00 p.m.). The manual data collection enabled the recording of pedestrian, bicyclist, and farming equipment on the highway.

Review of the counts showed negligible pedestrian and bicyclist activity throughout the corridor with exception of Williams Road, where 41 pedestrian crossings were observed through the 16-hour count period. Pedestrian crossing data was not recorded on the Locust Avenue school crossing. With the low-density agricultural land uses along the corridor it is unlikely that there would be pedestrian demand outside of the urban areas even if adequate pedestrian and bicyclist facilities were provided.

INTERSECTION PERFORMANCE STANDARDS AND OPERATIONS

Intersection Performance Standards

The OHP outlines specific performance measures to be maintained along ODOT facilities as part of adopted Highway Mobility Standards. These standards are based on volume to capacity

(v/c) ratios and are aimed at maintaining mobility along important road corridors and vary according to functional classification, location, and role within the National Highway System (NHS).

Intersection performance standards vary based on jurisdictional authority, posted speed, the location within a UGB or unincorporated community, intersection control, freight route designation, highway classification, and other special business classifications. The applicable OR 126 corridor performance standards vary throughout the corridor.

As all of the study intersections are currently stop-controlled with no delay provided to through movements along OR 126, the relevant performance threshold from the Oregon Highway Plan is based on the classification of the minor street. Table 2-6 summarizes the relevant characteristics in the selection of the appropriate highway mobility standard, and also presents City of Prineville and Crook County performance thresholds. It should be noted that the intersection of OR 126/Tom McCall Road will be required to meet City, County, and ODOT performance criteria.

Table 2-6 Intersection Performance Standards

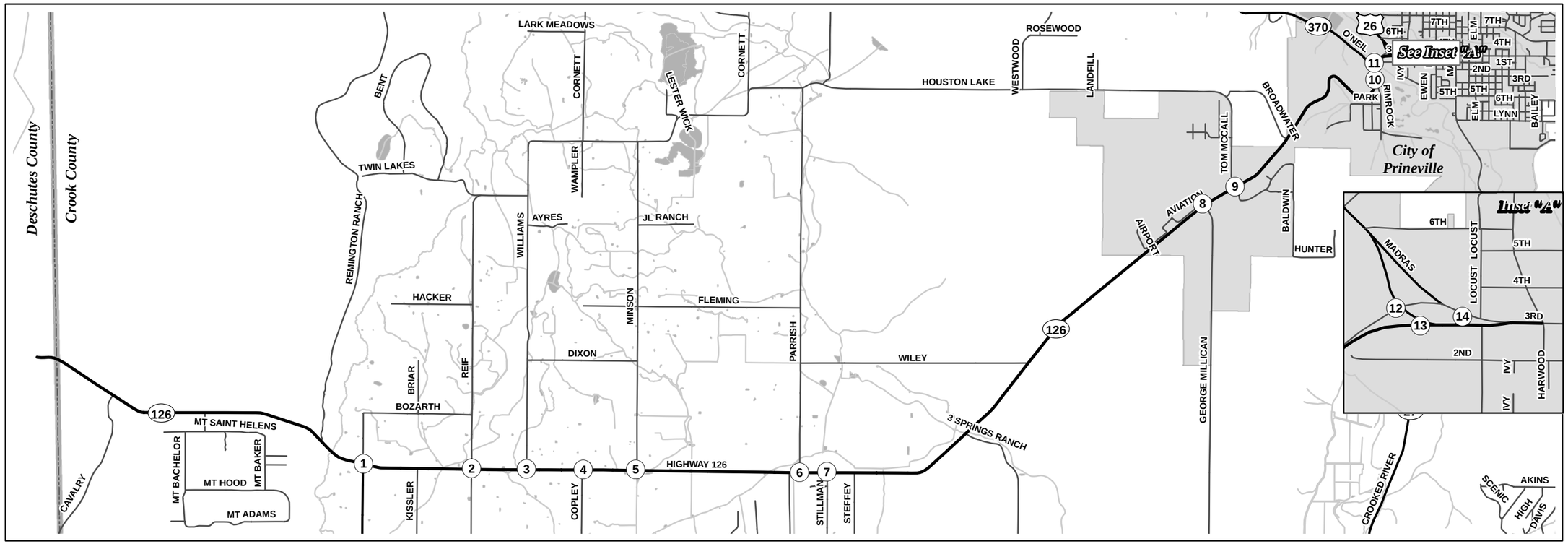
Intersection Name	Posted Speed	Inside UGB?	Unincor-porated Community?	Minor Roadway Classification	ODOT Mobility Standard	City Standard	County Standard
Powell Butte Hwy And OR 126	55 mph	No	No	Local Interest	0.75	-	LOS E
SW Reif Rd And OR 126	55 mph	No	No	Local Interest	0.75	-	LOS E
SW Williams Rd And OR 126	45 mph	No	Yes	Local Interest	0.80	-	LOS E
SW Copley Rd And OR 126	55 mph	No	No	Local Interest	0.75	-	LOS E
Minson Rd And OR 126	55 mph	No	No	Local Interest	0.75	-	LOS E
SW Parrish Ln And OR 126	55 mph	No	No	Local Interest	0.75	-	LOS E
Stillman Rd And OR 126	55 mph	No	No	Local Interest	0.75	-	LOS E
Airport Way And OR 126	55 mph	Yes	No	Local Interest	0.80	-	LOS E
Tom McCall Rd And OR 126	55 mph	Yes	No	Local Interest	0.80	LOS E & v/c < 1.0	LOS E
Rimrock Rd And OR 126	45 mph	Yes	No	Local Interest	0.80	LOS E & v/c < 1.0	-
O'Neil Hwy And OR 126	45 mph	Yes	No	District Highway	0.75	-	-
US 26 And OR 126	30 mph	Yes	No	Statewide Highway	0.70	-	-
US 26 And OR 126	30 mph	Yes	No	Statewide Highway	0.70	-	-
OR 126 And US 26	30 mph	Yes	No	Statewide Highway	0.70	-	-

Intersection Operations

All intersection level-of-service analyses were performed in accordance with the procedures stated in the 2000 *Highway Capacity Manual* (HCM, Reference 3). Through movements along OR 126 and US 26 were adjusted at each of the study intersections to reflect 30th highest hour design volumes. These seasonal adjustment factors are based on 2008 and 2009 data obtained from Automatic Traffic Recorder (ATR) 007-02 located 0.35 miles west of the Deschutes/Crook County boundary. The seasonal adjustment allows the collected October counts to reflect peak summer season (July) conditions. *Attachment "E" describes level-of-service concepts.*

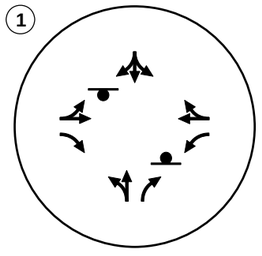
Due to the close proximity of the intersections and limited access, a system-wide peak hour was identified based on the volumes at all study intersections. Review of the detailed count data in five-minute increments identified the peak period between 3:30 to 4:30 p.m., with steady volumes into the 4:00 p.m. to 6:00 p.m. evening commute period.

Figure 2-6 illustrates the existing lane configurations and traffic control devices used in the analysis. Figure 2-7 provides the year 2010 30th highest design hour volumes and the 2010 operational analysis results at all study intersections. *Analysis worksheets are included in Attachment "F".*

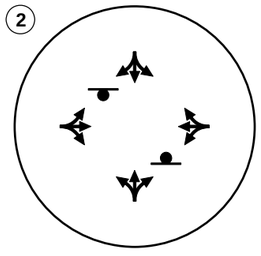


1 in = 1 mile

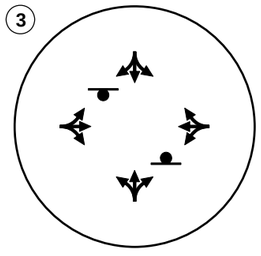
OR 126 & SW Powell Butte Hwy/SW Bozarth Rd (1)



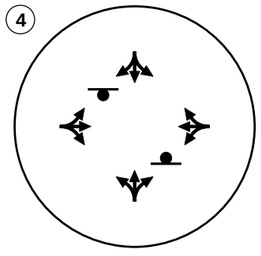
OR 126 & SW Reif Rd (2)



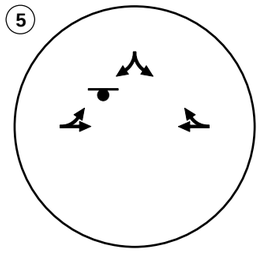
OR 126 & SW Williams Rd (3)



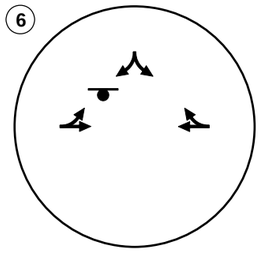
OR 126 & SW Copley Rd (4)



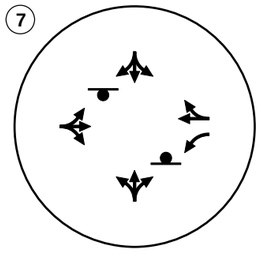
OR 126 & Minson Rd (5)



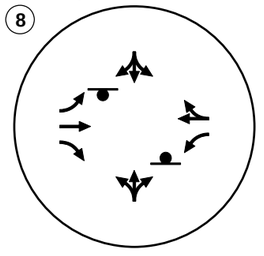
OR 126 & SW Parrish Ln (6)



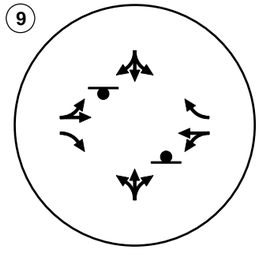
OR 126 & Stillman Rd (7)



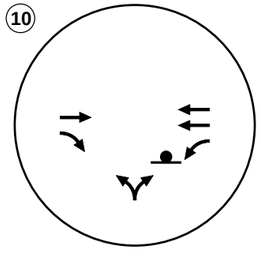
OR 126 & Airport Way (8)



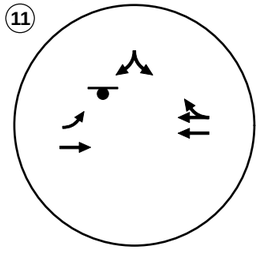
OR 126 & Tom McCall Rd (9)



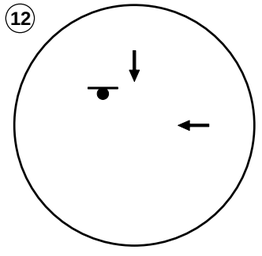
OR 126 & Rimrock Rd (10)



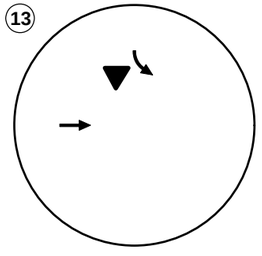
OR 126 & O'Neil Hwy (11)



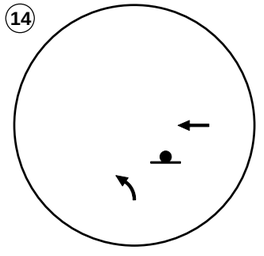
OR 126 Westbound & US 26 Eastbound (12)



OR 126 Eastbound & US 26 Eastbound (13)



US 26 Westbound & OR 126 Westbound (14)



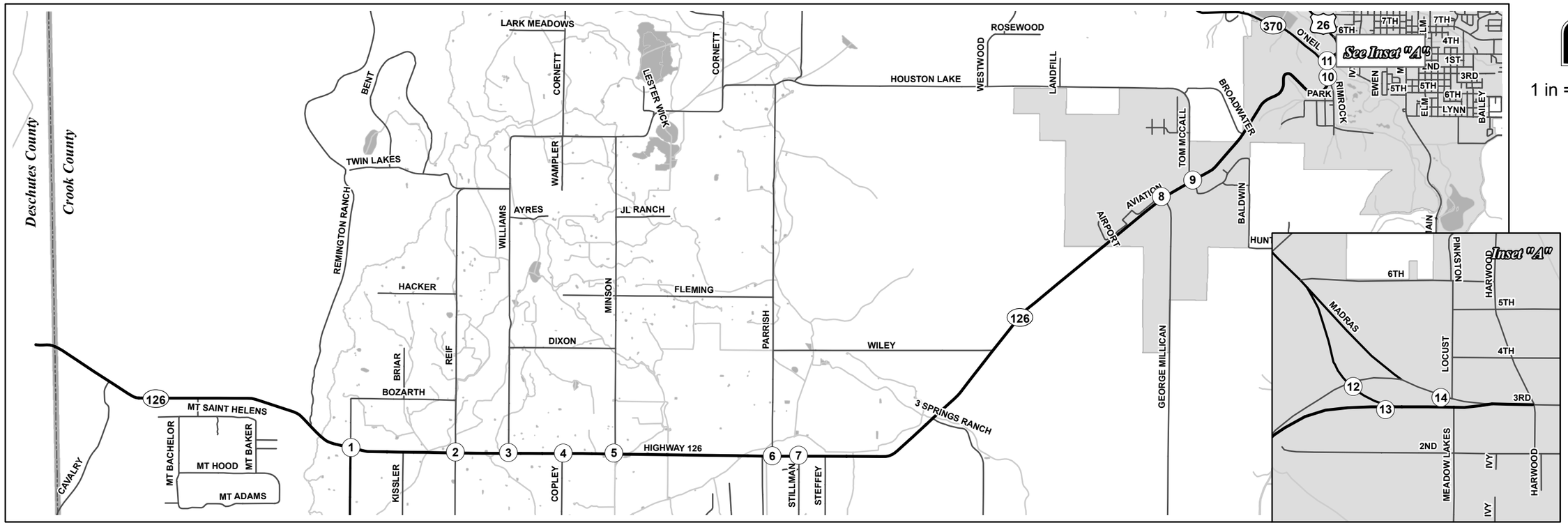
LEGEND

- STOP SIGN
- TRAFFIC SIGNAL
- YIELD

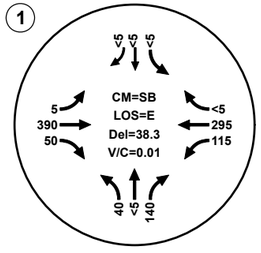
EXISTING LANE CONFIGURATIONS AND TRAFFIC CONTROL DEVICES
CROOK COUNTY, OREGON

FIGURE 2-6

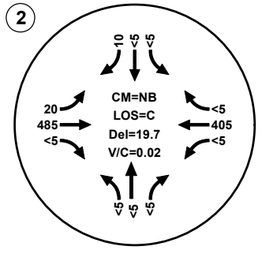
H:\profile\11168 - OR 126 Powell Butte Corridor Evaluation\gis



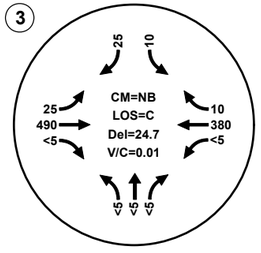
OR 126 & SW Bozarth Rd (1)



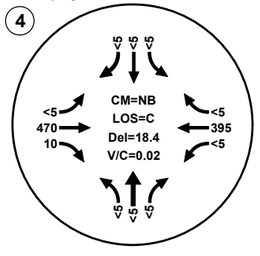
OR 126 & SW Reif Rd (2)



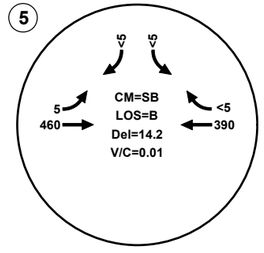
OR 126 & SW Williams Rd (3)



OR 126 & SW Copley Rd (4)



OR 126 & Minson Rd (5)



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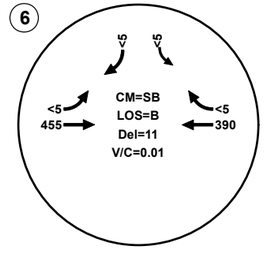

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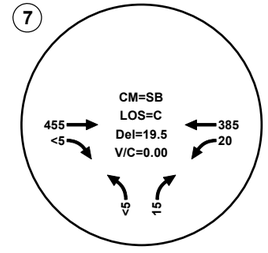
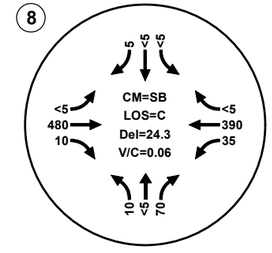
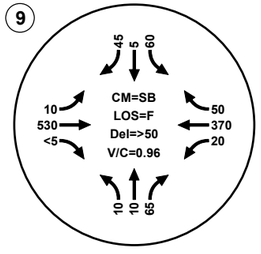


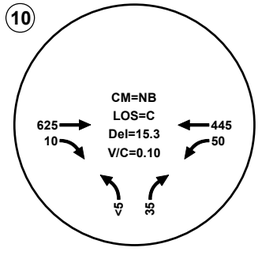
OR 126 & Airport Way (8)



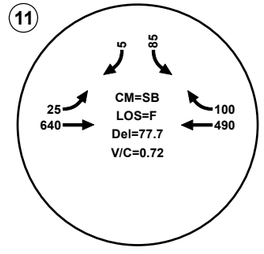
OR 126 & Tom McCall Rd (9)



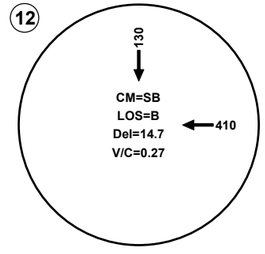
OR 126 & Rimrock Rd (10)



OR 126 & O'Neil Hwy (11)



OR 126 Westbound & US 26 Southbound (12)



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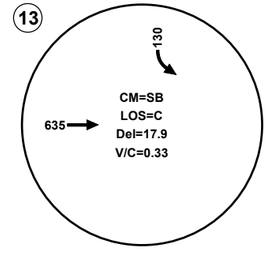
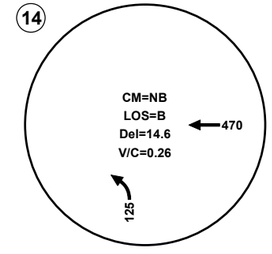


US 26 Westbound & OR 126 Westbound (14)



LEGEND

- CM = Critical Movement
- LOS = Critical Movement Level of Service
- Del = Critical Movement Control Delay
- V/C = Critical Volume-to-Capacity Ratio

EXISTING TRAFFIC CONDITIONS – WEEKDAY DESIGN HOUR
CROOK COUNTY, OREGON

FIGURE 2-7

H:\profile\11168 - OR 126 Powell Butte Corridor Evaluation\gis

Table 2-7 summarizes the existing conditions analysis results, also shown in Figure 2-7.

Table 2-7 Year 2010 Existing Conditions Analysis

Intersection Name	Intersection Performance Metrics				Performance Standard	Meets Standard?
	CM	LOS	Delay (s)	v/c		
SW Bozarth Road/ OR 126	**SB**	**E**	**38.3**	**0.01**	**v/c < 0.75/ LOS E**	**Yes**
SW Reif Road/ OR 126	NB	C	19.7	0.02	v/c < 0.75/ LOS E	Yes
SW Williams Road/ OR 126	NB	C	24.7	0.01	v/c < 0.80/ LOS E	Yes
SW Copley Road/ OR 126	NB	C	18.4	0.02	v/c < 0.75/ LOS E	Yes
Minson Road/ OR 126	SB	B	14.2	0.01	v/c < 0.75/ LOS E	Yes
SW Parrish Lane/ OR 126	SB	B	11.0	0.01	v/c < 0.75/ LOS E	Yes
Stillman Road/ OR 126	SB	C	19.5	0.00	v/c < 0.75/ LOS E	Yes
Airport Way/ OR 126	SB	C	24.3	0.06	v/c < 0.80/ LOS E	Yes
Tom McCall Road/ OR 126	**SB**	**F**	**120.4**	**0.96**	**v/c < 0.80/ LOS E**	**No**
Rimrock Road/ OR 126	NB	C	15.3	0.10	v/c < 0.80/ LOS E	Yes
O'Neil Highway/ OR 126	**SB**	**F**	**77.7**	**0.72**	**v/c < 0.75**	**No**
US 26 Eastbound/ OR 126 Westbound	SB	B	14.7	0.27	v/c < 0.70	Yes
US 26 Eastbound/ OR 126 Eastbound	SB	C	17.9	0.33	v/c < 0.70	Yes
OR 126 Westbound/ US 26 Westbound	NB	B	14.6	0.26	v/c < 0.70	Yes

CM: Critical Movement; LOS: Level of Service; v/c: volume-to-capacity ratio.

As shown in Table 2-7, 11 of the 12 study intersections were found to operate at Level of Service "C" or better on the critical minor-street approach. The OR 126/Tom McCall Road intersection operates at a LOS "F" and a volume-to-capacity ratio of 0.96 during the 30th highest hour exceeding City, County, and ODOT performance thresholds. The OR 126/O'Neil Highway intersection operates within ODOT performance thresholds in terms of the volume-to-capacity ratio, but average delay on the minor-street results in a LOS "F." Similar to O'Neil Highway the OR 126/Powell Butte Highway intersection operates at LOS "E" today. At the intersection of O'Neil Highway and Powell Butte Highway the addition of traffic in the future may require mitigation to maintain acceptable performance.

To better understand the duration of the failing conditions the full 16-hour counts were assessed using the analysis models, as shown in Exhibit 2-19. As shown, the intersection is shown to exceed ODOT mobility standards (v/c ratio > 0.80) between 3:00 and 3:30 p.m., and to exceed City and County standards (delay > 50 seconds) between 2:45 to 3:30 p.m. and again between 4:45 and 5:30 p.m. *Appendix "B" includes the operational analysis worksheets for all study intersections.*

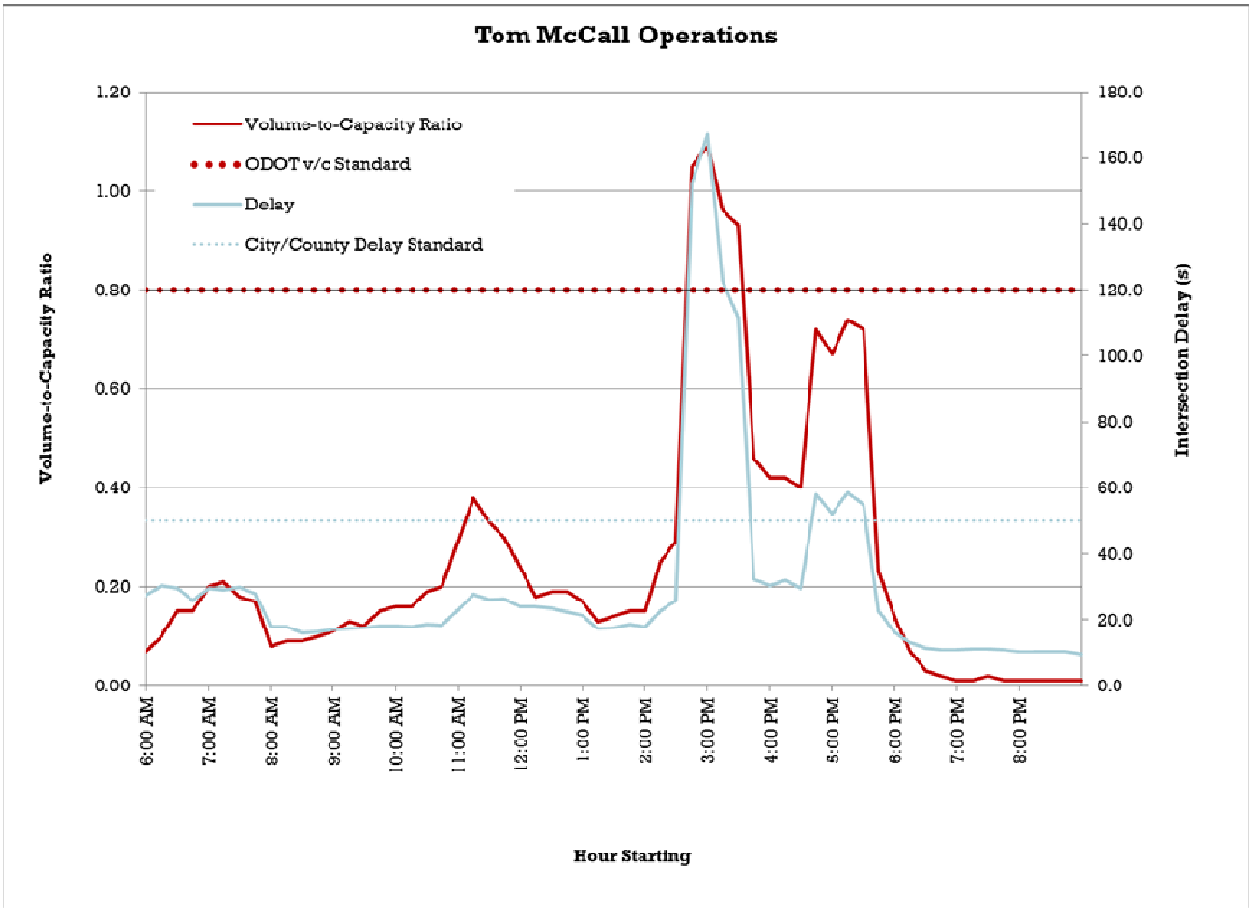


Exhibit 2-19. OR 126 and Tom McCall intersection performance throughout the 16-hour count period.

Two-Lane Highway Segments

An analysis of two-lane highway operations along the corridor was conducted based on procedures outlined in the ODOT Analysis Procedures Manual (APM, Reference 4) and the HCM.

The 1999 Oregon Highway Plan (OHP) outlines specific performance measures to be maintained along ODOT facilities as part of adopted Highway Mobility Standards. These standards are based on volume to capacity (v/c) ratios and are aimed at maintaining mobility along important road corridors and vary according to functional classification, location, and role within the National Highway System (NHS).

Per the OHP, the following intersection performance measures are applicable for ODOT facilities:

- Volume-to-capacity (v/c) ratio of 0.70 for OR 126 outside of the Prineville Urban Growth Boundary (UGB), given its designation as a Statewide Highway and Freight Route.
- Volume-to-capacity (v/c) ratio of 0.70 for OR 126 within the Prineville UGB, given its designation as a Statewide Highway and Freight Route where speed limits exceed 45 mph.

- Volume-to-capacity (v/c) ratio of 0.75 for OR 126 within the Prineville UGB, given its designation as a Statewide Highway and Freight Route where speed limits do not exceed 45 mph.

An analysis of two-lane highway operations along the corridor was conducted based on procedures outlined in the ODOT Analysis Procedures Manual and the HCM.

The peak hour volumes used in the analysis of OR 126 reflect peak hour one-way volumes collected on OR 126 in October and November 2010. The peak hour volumes were adjusted to the 30th Highest Hour volume based on the seasonal adjustment factors determined from ATR 07-002, which was also applied to intersection volumes. All peak hour volumes were also adjusted by a peak hour factor to estimate a two-way demand flow rate during the peak 15-minute period. Table 2-8 provides a summary of capacity analysis results on OR 126 at two locations with two-lane, undivided highways.

Table 2-8 Existing Two-Lane Highway Operations on OR 126

Direction of Traffic Flow and Location on OR 126	Peak Hour Volume	Seasonal Adjustment Factor	One-Way Demand Flow	Critical Flow Rate (pc/h[1])	Mobility Standard (V/C Ratio)	Calculated V/C Ratio
Eastbound (1,900' E of Powell Butte Hwy)	538	1.095	589	1,600	0.70	0.37
Westbound (1900' E of Bozarth Rd)	493	1.095	540	1,600	0.70	0.34
Eastbound (3,650' W of Airport Way)	468	1.15	538	1,600	0.70	0.34
Westbound (3,650' W of Airport Way)	406	1.15	467	1,600	0.70	0.29

[1]pc/h = Passenger cars per hour

As shown in the table, the existing volume-to-capacity ratios at the two study locations along OR 126 are less than 0.40. The calculated volume-to-capacity ratios are compared to ODOT's standard of 0.70 set forth in the OHP, showing that the corridor segments currently meet mobility standards.

FINDINGS

This memorandum summarized the OR 126 existing conditions analysis from the Crook County boundary east to the Prineville "Y". Key findings of the analysis are summarized below.

- OR 126 contains a narrow paved section with limited passing opportunities, narrow shoulders, and limited right-of-way. The clear zones contain rock outcroppings, utility poles, trees, and other obstructions resulted in limited recovery space. The width of the highway limits the allowable size of freight traffic on this designated freight route and increases the difficulty in moving oversized farming equipment between nearby fields.
- Within the study segment OR 126 is classified as a *Statewide Highway* and *Expressway*, containing limited access throughout. Direct highway access for parking is provided within the Prineville "Y" and within the Powell Butte community. There are a total of 27 public and 56 private access points within the OR 126 study segment, corresponding to an average of 5.7 access points per mile. Many of the accesses are used occasionally for farm access. At each access point without a left-turn lane a left-turning vehicle may increase the probability of a rear-end crash or may interrupt traffic flow.
- From a safety perspective the number of crashes within the study segment is less than the statewide average for similar facilities, and is less than the average for the entire Ochoco Highway. Five segments ranging from 0.30 miles to 1 mile have been identified for further evaluation or prioritization for improvements.
- Five fatal crashes occurred in 2006 and 2007 at four locations along the corridor. The fatal crashes reported within the study segment each varied in terms of the circumstances that likely contributed to the crash. Alcohol was involved in two crashes and one crash occurred within a construction work zone (under temporary traffic control). Based on the review of the fatal crash details, there are no notable trends identified that indicate a specific countermeasure could reduce the severity of crashes.
- Two intersections along this segment are included on the 85th to 89.9th percentile ODOT SPIS list based on 2007 to 2009 data: 1) OR 126/Powell Butte Highway and, 2) OR 126/US 26 at the Prineville "Y".
- Traffic volumes along the corridor peak in the summer months. In the month of July, the annual peak month, volumes are approximately 20 percent higher than in January. Throughout the year the weekly traffic pattern shows slightly increasing traffic volumes between Monday and Friday with a significant reduction in traffic on the weekends. On weekdays the westbound traffic peaks in the morning, and the eastbound peaks in the evening, with the evening peak period experiencing the highest combined volumes. The operations analysis shows that during the peak July commute period all of the stop-controlled intersections operate at Level of Service "C" or better, with exception of the Tom McCall intersection which operates with high delays and beyond ODOT mobility standards.
- A priority should be placed on capacity improvements at the Tom McCall intersection based on land use, zoning, and operations analyses conducted on the study corridor. This intersection is critical to the development of industrial lands near the airport and in serving the existing industry that surrounds this location, and is the only intersection on

the corridor currently exceeding performance thresholds. Improvements at Tom McCall should review the offset alignment with Millican Road to form a regional connection.

- The City of Prineville has observed vehicle-vehicle conflicts at the OR 126/Tom McCall and OR 126/Millican Road intersections when through vehicles use the highway shoulder to pass left-turning vehicles. Improvements to the intersections will incorporate modifications to safety to address these concerns.
- Pedestrian improvements should be prioritized at the Williams Road crossing. While the crossing is within a school zone, the posted speed is 45 miles-per-hour and the highway is within a rural to urbanizing transition area with undefined curb locations.
- Paved shoulders along the corridor are between 2 and 6 feet wide. Widening of the paved shoulder or additional clear space within the gravel shoulder would better accommodate farming traffic, emergency stops, bicyclists, and mail routes.

NEXT STEPS

Review comments from the PPMT and PAC are due to Devin Hearing (devin.hearing@odot.state.or.us) on December 20th. The comments will be compiled and sent to the consultant team, integrated into the document, and the document will then be finalized and posted to the project website. Please let us know if you have any questions on these materials at (541) 312-8300.

ATTACHMENTS

Attachment A: Access Inventory

Attachment B: Crash Records

Attachment C: ATR Data

Attachment D: Traffic Count Worksheets

Attachment E: LOS Description

Attachment F: LOS Worksheets

REFERENCES

1. Oregon Department of Transportation. *Oregon Highway Plan*. 1999.

2. Oregon Department of Transportation. *2009 Oregon Traffic Crash Summary*. 2010.

3. Transportation Research Board. *Highway Capacity Manual*. 2000.

4. Oregon Department of Transportation. *Analysis Procedures Manual*. 2009.