OR 99 Corridor Plan

DRAFT Technical Memorandum

Talent Area Road Diet Analysis

Prepared for

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1. INTRODUCTION

The purpose of this technical memorandum is to evaluate the feasibility of several alternative lane configurations for OR 99 though the City of Talent. A currently programmed STIP project would widen OR 99 from four lanes to five lanes and add sidewalks and bike lanes on both sides of the highway from south of Rapp Road, where the existing five-lane section ends, through Creel Road. The STIP project will also consider access management, right-turn deceleration lanes, and a traffic signal. The City of Talent has requested that ODOT consider a three-lane rather than five-lane cross section in this portion of the corridor. This memorandum expands upon previous analyses to evaluate the feasibility of a "road diet" for this portion of OR 99.

1.1. Study Area

The road diet study area is assumed to extend through Talent from the intersection of OR 99 with Suncrest/Colver Road to the intersection of OR 99 with South Valley View Road. This study area encompasses the links to the two major routes parallel to OR 99: I-5 from West Valley View Road (Exit 21) to South Valley View Road (Exit 19) and Talent Avenue from Colver Road to OR 99.

1.2. Road Diet Scenarios

The two road diet scenarios for OR 99 between Rapp Road and South Valley View Road are described below:

1. The first scenario (RD Scenario 1) assumes that OR 99 is reduced from four lanes to three lanes from just south of Rapp Road to just south of Creel Road, but the four-lane section is maintained from south of Creel Road to South Valley View Road.

2. The second scenario (RD Scenario 2) assumes that OR 99 is reduced from four lanes to three lanes from just south of Rapp Road to just south of Creel Road, and OR 99 is reduced from four lanes to two lanes with some turn lanes from south of Creel Road to South Valley View Road.

Analysis of these two scenarios must be compared to current STIP plans to widen OR 99 to five lanes from south of Rapp Road, where the current five-lane improvements end, to south of Creel Road.

2. EXISTING CONDITIONS ANALYSIS

This section provides a summary of the existing transportation system and traffic conditions through the OR 99 corridor in the Talent area.

2.1. Existing Transportation System Inventory

The OR 99 corridor serves local and regional vehicular and freight traffic as well as transit, bicycles and pedestrians. Table 1 presents a summary of the corridor study area roadways and classifications.

Table 1. Talent Area Roadway Inventory

Roadway/ Highway Name	ODOT[1]/Federal[2] Functional Classification	Local Functional Classification	Posted Speed (mph)	No. of Lanes
ODOT Facilities				
OR 99 – Colver/Suncrest Road to Rapp Rd	District Highway/ Principal Arterial	Major Arterial	40	5
OR 99 – Rapp Rd to Talent South City Limits	District Highway/ Principal Arterial	Major Arterial	40	4
OR 99 – Talent South City Limits to S. Valley View Rd	District Highway/ Principal Arterial	State Highway	55	4
City of Talent[3]		-		
Colver/Suncrest Road	Urban Collector	Major Collector	35/25	2
W. Valley View Road	Minor Arterial	Major/Minor Arterial	40/25	4/2
Rapp Road	Urban Collector	Major Collector	25	2
Arnos Road	Local	Minor Collector	25	2
Creel Road	Urban Collector	Major Collector	30	2
Jackson County[4]				
Talent Avenue/Old Pacific Highway	Rural Major Collector	Collector	NP	2
S. Valley View Rd	Statewide Highway	Arterial	35	2-3

Acronyms: NP = Not Posted
Notes:
1. Oregon Highway Plan, 1999
2. ODOT Transportation Maps, http://www.oregon.gov/ODOT/TD/TDATA/gis/odotmaps.shtml#City_Maps
3. City of Talent Transportation System Plan. March 2007
4. Rogue Valley Metropolitan Planning Organization, 2009-2034 Regional Transportation Plan, April 27, 2009

Through the study area, OR 99 parallels Interstate 5 (I-5) to the west with occasional connections between the two facilities. The OR 99 corridor has one connection to the north, and one connection to the south of the Talent Area Road Diet Analysis:

- **Interchange 21 (W. Valley View)** provides access to the north of the City of Talent via STOP-controlled intersections on W. Valley View Road. The interchange has a gull wing configuration for the northbound freeway ramp terminals and a half-diamond configuration for the southbound terminals.
- **Interchange 19 (North Ashland)** provides the main link between the I-5 corridor and the northern end of Ashland and southern end of Talent via OR-99. Currently a two-lane

facility, S. Valley View Road carries high volumes because of significant intraregional trips between Ashland and Medford. In addition to the heavy movement of intraregional trips, the interchange also serves local residents and businesses in the interchange vicinity. S. Valley View Road is planned for expansion into a five-lane facility between the interchange and the OR 99 intersection.

As a parallel route to I-5, OR 99 serves as a detour route when a section of the freeway is fully or partially closed in response to an incident (i.e., vehicle crash or other event that would block freeway lanes). Maintaining throughput capacity on OR 99 has been an ODOT goal to help reduce delays during these temporary detour traffic conditions.

Table 2 summarizes the physical characteristics of OR 99 within the study area including bicycle and pedestrian facilities along the corridor. Crosswalks are striped at the signalized intersections with Colver/Suncrest Road, W. Valley View Road, and S. Valley View Road.

Table 2. Shoulder, Median, and Lane Width Inventory

Section of OR 99	No. of Travel Lanes	Lane Width	Shoulder Type/ Width	Median Type/Width	Sidewalks
Colver/Suncrest Rd to north of W. Valley View Rd	5 Lanes	Outside: 14’ Inside: 12’	Paved Bike Lane: 6’ (both sides)	Raised: Varies Turn Lanes: 14’	SW side: Continuous NE side: Sporadic
North of W. Valley View Rd to Rapp Rd	5 Lanes	12’	Paved Bike Lane: 6’ (both sides)	Raised: Varies Center Lane: 14’	SW side: Continuous NE side: Sporadic
Rapp Rd to Arnos St	4	12’	Gravel: 4-6’	None	No
Arnos St to Creel Rd	4	12’	Gravel: 4-8’	None	No
Creel Rd to Talent Ave	4	12’	Gravel: 6-8’	None	No
Talent Ave to S. Valley View Rd	4	12’	Gravel: 6-12’	None	No

Source: ODOT Highway Inventory Summary, refreshed on 8/24/2010

2.1.1. Pedestrian and Bicycle Facilities Inventory

In addition to the existing bicycle and pedestrian facilities summarized along OR 99, the Bear Creek Greenway trail is a regional bicycle and pedestrian facility that generally parallels OR 99 to the west of Interstate 5. With recent completion of a segment of the greenway near Interchange 27 as part of the South Medford Interchange project, the multi-use trail is now a continuous 21-mile path between Interchange 35 north of Central Point to Oak Street in Ashland.

Pedestrian volumes through the corridor are shown in Table 3. Overall, pedestrian volumes are concentrated at intersections with transit stops and access to I-5. The volumes through the remainder of the corridor are low.

Table 3. Pedestrian Crossing Volumes

Location	Design Hour/Total for Count Period				Count Period
	East	West	North	South	
OR 99 at Suncrest/Colver Rd	0/2	0/0	0/0	0/7	16 hours
OR 99 at West Valley View Rd	12/92	12/93	12/93	3/38	16 hours
OR 99 at Rapp Rd	0/0	0/3	0/3	0/5	16 hours
OR 99 at Arnos Rd					3 hours
OR 99 at Creel Rd					3 hours
OR 99 at Talent Ave	-	0/11	0/3	0/3	16 hours
OR 99 at South Valley View Rd	2/45	-	0/0	0/3	16 hours

Shading indicates no pedestrian count data captured
- Movement does not exist

Source: 2010 Traffic Counts provided by ODOT, summarized by David Evans and Associates, Inc.

Bicycle volumes through the corridor are shown in Table 4. Bicycle volumes were highest at the north end of Talent and at the south end of the study area, near Ashland. Talent Avenue also had high bicycle volumes as riders traveling to/from Talent accessed OR 99 and the Bear Creek Greenway Trail.

Table 4. Bicycle Volumes

Location	Design Hour/Total for Count Period				Count Period
	Eastbound	Westbound	Northbound	South	
OR 99 at Suncrest/Colver Rd	0/16	0/22	0/12	0/11	16 hours
OR 99 at West Valley View Rd	0/10	0/9	0/13	0/12	16 hours
OR 99 at Rapp Rd	0/4	-	1/6	2/15	16 hours
OR 99 at Arnos Rd	1/1	-	0/0	1/4	3 hours
OR 99 at Creel Rd	0/0	-	0/1	1/2	3 hours
OR 99 at Talent Ave	1/24	-	2/28	0/8	16 hours
OR 99 at South Valley View Rd	-	1/13	3/49	1/48	16 hours

- Movement does not exist

Source: 2010 Traffic Counts provided by ODOT, summarized by David Evans and Associates, Inc.

2.1.2. Transit Inventory

Rogue Valley Transportation District (RVTD) operates one transit route through the study area: Route 10. Route 10 travels the entire length of the corridor Monday through Friday leaving the Front Street Station between 5:00 am and 8:30 pm. Between 7:00 am and 5:00 pm service operates on 20-minute headways, while 30-minute headways are provided during shoulder times (5:00-7:00 am and 5:00 pm-8:30 pm). Recently hourly service for Route 10 was added on Saturdays leaving the Front Street Station between 8:00 am and 4:00 pm. While the route primarily runs along OR 99 in the study area, it deviates from OR 99 in Talent to run along Talent Avenue. There are 23 stops located within the study area (six along OR 99, 17 along Talent Avenue).

Transit stop locations on OR 99 as well as ridership are shown in Table 5. While there was no data provided at the W. Valley View Road intersection, the pedestrian volumes presented in the Pedestrian and Bicycle Facilities Inventory section suggest that ridership is similar to that shown for Jackson Hot Spring (NB), possibly higher.

Table 5. Transit Ridership

Stop Description	Transit Stop ID	Total (Boarding & Alighting)
South of Suncrest Rd	101	NA[2]
North of W. Valley View Rd	100	NA[2]
Talent Ave & OR 99	NA[1]	NA[2]
Jackson Hot Spring (NB)	87	17
Jackson Hot Spring (SB)	37	12
At S. Valley View Rd.	38	2

Notes:
1. No stop ID shown, though labeled online
2. No data was provided for this stop

Source: Ridership Data provided by Rogue Valley Transit District, summarized by David Evans and Associates, Inc.

2.1.3. Highway Freight Inventory

The majority of through freight trips use I-5 through the Rogue Valley. Even shorter distance trips, such as those between Medford and Talent, are more likely to use I-5 rather than OR 99. Localized freight trips which link the agricultural lands to the manufacturing plants tend to use OR 99 and make up a relatively small percentage of the overall traffic volumes for the corridor. More information regarding the truck distribution throughout the study area can be found in the Freight Traffic discussion under the Traffic Conditions of this report.

2.2. Traffic Conditions

The assessment of traffic conditions includes development of existing traffic volumes, traffic operations evaluation, and a review of historical crash patterns.

2.2.1. Traffic Volumes

Traffic volume data collected for this project consist of a mix of turning movement counts and detailed classification counts.

Average Annual Daily Traffic Volumes

The average annual daily traffic (AADT) volumes along OR 99 are currently available through the year 2010. Volumes from years 2001 through 2010 are summarized in Table 6.

Table 6. Historical Average Annual Daily Traffic

Mile-point	Count Location	Average Annual Daily Traffic (AADT) Volume[1]									
		2001[2]	2002[3]	2003	2004[2]	2005[3]	2006	2007[2]	2008[3]	2009	2010[2]
OR 99											
13.76	0.10 mi N of Colver Rd	11,000	11,000	11,300	10,900	12,200	10,800	10,000	9,400	9,700	8,300
14.4	0.20 mi S of W. Valley View Rd	11,000	11,000	11,300	10,900	12,200	10,800	11,000	10,400	10,700	9,200
15.93	**0.33 mi N of Talent Ave**	**9,400**	**9,400**	**9,700**	**9,400**	**10,500**	**9,300**	**9,300**	**8,800**	**9,000**	**8,800**
17.04	0.02 mi S of S. Valley View Rd	19,100	19,100	19,500	19,900	19,300	18,200	18,700	17,600	18,200	17,400
I-5											
11.03	**0.86 mi S of OR 99**	**14,700**	**16,000**	**16,100**	**15,800**	**15,800**	**15,900**	**15,800**	**14,800**	**15,100**	**14,900**
18.6	0.50 mi S of IC 19 (S. Valley View)	24,700	26,800	27,100	27,000	26,000	26,300	26,200	23,500	24,400	24,400
19.87	0.77 mi N of IC 19 (S. Valley View)	37,000	39,800	40,100	41,400	34,900	35,400	35,200	33,400	34,700	34,800
23.9	0.50 mi S of IC 24 (Fern Valley Rd)	40,800	43,200	43,600	44,100	39,200	39,700	39,600	37,100	36,800	37,300
28.33	**0.33 mi S of the Medford Int.**	**46,200**	**48,200**	**48,800**	**49,100**	**47,200**	**48,200**	**48,200**	**45,900**	**46,400**	**45,600**

Notes:
1. The Transportation Systems Monitoring Unit compiles the traffic count information for the state highway system. One third of the state highway system is counted each year and adjusted to reflect AADTs. The AADTs for the remaining two thirds of the system are estimated to reflect area traffic trends.
2. Actual counts were collected for OR 99 in 2001, 2004, 2007 and 2010
3. Actual counts were collected for I-5 in 2002, 2005, and 2008.

Source; 2001-2010 Transportation Volume Tables, ODOT Transportation Data Section, Transportation Systems Monitoring Unit.

Annual growth trends on OR 99 and I-5 generally declined over the ten-year period examined. There are three ATRs between the two facilities, one on OR 99 and two on I-5. The ATR along OR 99 at mile point 15.93 shows consistent AADT volumes between 2001 and 2007, with a slight decline in 2010. The ATRs along I-5 both show declining patterns throughout the count years of 2002, 2005, and 2008. Lower present day traffic volumes on OR 99 and I-5 are consistent with trends throughout the state and likely reflect the economic downturn along with an increase in 2007 gas prices that influenced driver behavior.

Traffic Counts

Traffic volume data collected for this project consist of 3-hour and 16-hour turning movement counts. The 16-hour counts use 15 minute intervals in the 2-6 PM period, and the 3-hour counts use 15-minute intervals for the duration of the count. Table 7 below provides a list of all intersection count locations and includes the type of count.

Table 7. Vehicle Count Locations and Types

Location	Type of Count	Count Date
OR 99		
OR 99 @ Colver/Suncrest Road (Signalized)	16 hr Turning Movement Classification	7/15/2010
OR 99 @ W. Valley View Road (Signalized)	16 hr Turning Movement Classification	7/15/2010
OR 99 @ Rapp Road (Signalized)	16 hr Turning Movement Classification	8/2/2010
OR 99 @ Arnos Road	3 hr PM Turning Movement Classification	7/1/2010
OR 99 @ Creel Road	3 hr PM Turning Movement Classification	7/6/2010
OR 99 @ Talent Avenue/Old Pacific Hwy	16 hr Turning Movement Classification	8/3/2010
OR 99 @ S. Valley View Road (Signalized)	16 hr Turning Movement Classification	10/6/2009
Talent Avenue		
Talent Avenue @ W. Valley View Road	3 hr PM Turning Movement Classification	7/18/2012
Talent Avenue @ Rapp Road	3 hr PM Turning Movement Classification	7/18/2012
Talent Avenue @ Creel Road	3 hr PM Turning Movement Classification	7/18/2012

The traffic volume data were examined to determine a common peak hour among the intersections, which is the one-hour period when the sum of volumes entering at all corridor intersections is highest. The common peak hour for the corridor intersections was found to occur between 4:30 and 5:30 PM. The peak hour at each intersection may or may not correspond to the common peak hour but all peaks generally overlap at least have of the common hour.

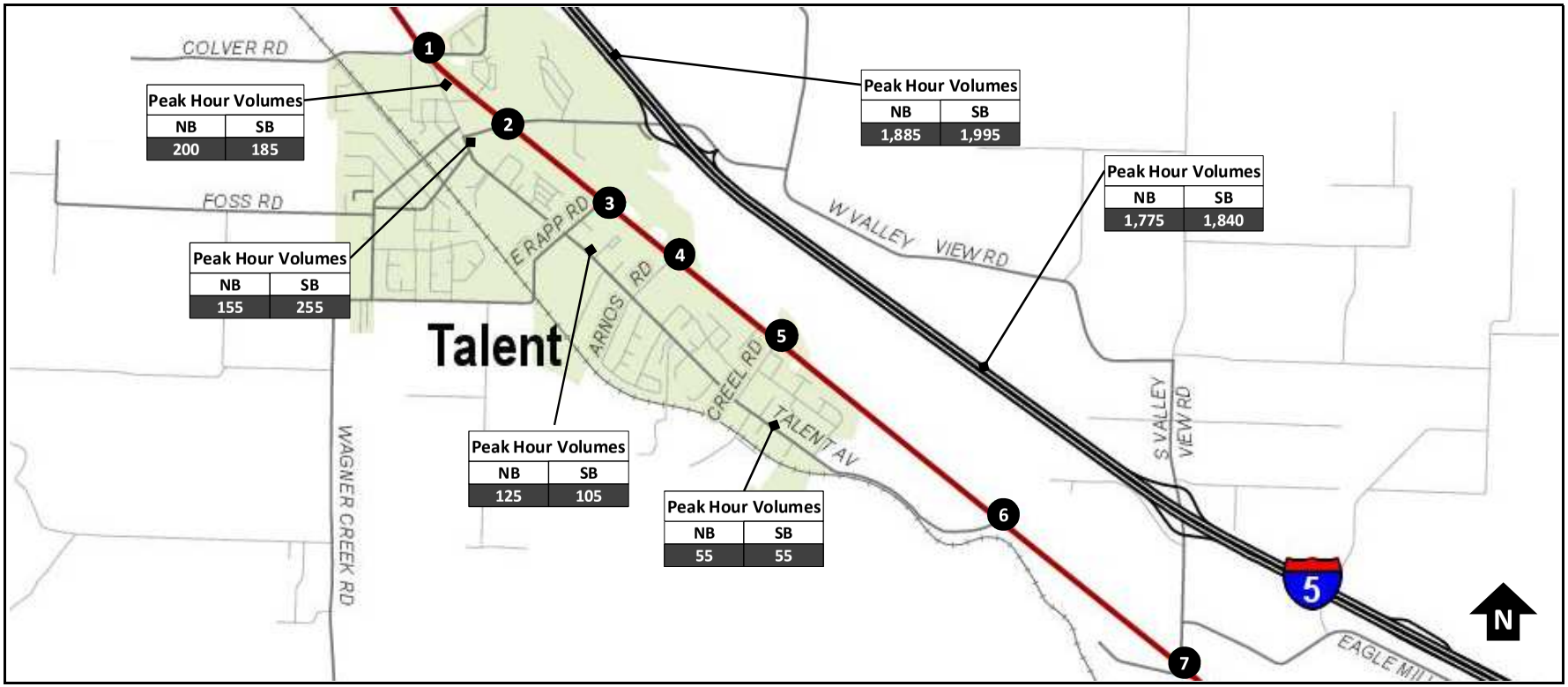
Design Hourly Volumes

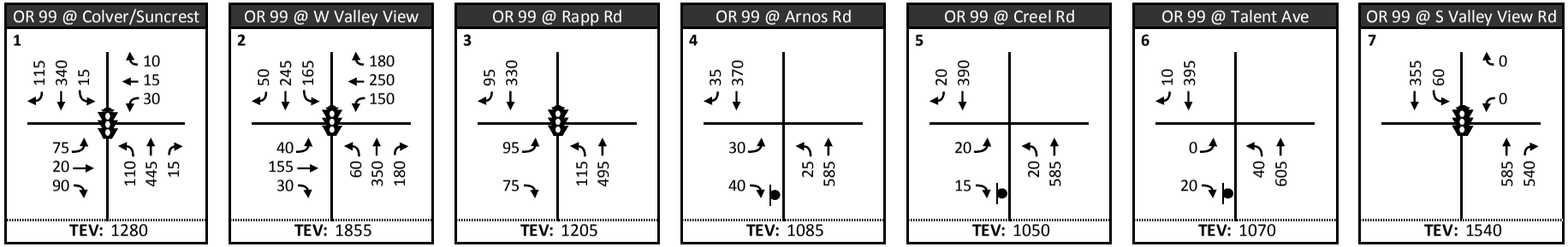
ODOT generally requires that transportation facilities be analyzed under design hourly volumes (DHVs), known as 30th highest hour volumes. The 30th highest hour volumes are used in traffic operations analysis so that results are valid for all but a few hours of the year. The procedure for determining 30th highest hour volumes is specified in ODOT's Analysis Procedures Manual (APM)[1] and the data used in calculating the seasonal factors is included in Appendix A.

Peak hour count data was seasonally adjusted, and volumes were balanced to achieve a uniform dataset for analysis. Because the counts were collected in 2010 (the baseline analysis year), an annual growth adjustment was not applied.

Figure 1 shows the existing balanced PM peak design hour volumes developed for this project. It also shows the PM peak link volumes for the parallel routes (Talent Avenue and I-5).

[1] Analysis Procedures Manual, Oregon Department of Transportation, Transportation Development Division Planning Section, Transportation Planning and Analysis Unit, Salem, Oregon, April, 2006, Section 4.3.





OR 99 Corridor Plan - Road Diet Analysis

Legend

PM Peak Hour Volume

TEV: Total Entering Volume

→ Turning Movement

Signalized Intersection

STOP Controlled Approach

**Diagrams show OR 99 as the north and south legs of the study intersections throughout*

Figure 1

Existing (2010) Volumes
PM Peak Hour

Freight Traffic

Trucks are an important component of traffic for any corridor. According to the classification breakdown for ATR 15-014 on OR 99 (Talent), trucks comprise less than 4% of the total average annual daily traffic in the area. The design hour intersection traffic counts also show relatively low truck percentages. However, this corridor is home to a major agricultural and manufacturing plant, Bear Creek Corporation (also known as Harry and David). Bear Creek Corporation is located between Medford and Phoenix. While it may bring in produce from a variety of sources, it also utilizes the agricultural land located in the Phoenix/Talent area. At harvest time (generally late summer/early fall) truck traffic between the crop sites and manufacturing facility peaks. Table 8 shows the design hour truck volumes and corresponding percentage of total vehicles.

Table 8. Design Hour Truck Traffic

Location	Approach Truck Traffic/Total Traffic (Percent Trucks)			
	Eastbound	Westbound	Northbound	Southbound
OR 99 @ Colver/Suncrest Rd	3/168 (1.8%)	0/52 (0%)	1/491 (0.2%)	0/424 (0.0%)
OR 99 @ W. Valley View Rd	0/202 (0.0%)	0/531 (0%)	1/589 (0.2%)	2/471 (0.4%)
OR 99 @ Rapp Rd	1/150 (0.7%)	-	1/454 (0.2%)	1/435 (0.2%)
OR 99 @ Arnos Rd	0/63 (0.0%)	-	0/453 (0.0%)	0/339 (0.0%)2
OR 99 @ Creel Rd	0/30 (0.0%)	-	4/437 (0.2%)	2/332 (0.3%)
OR 99 @ Talent Ave	0/24 (0.0%)	-	2/481 (0.4%)	1/328 (0.3%)
OR 99 @ S. Valley View Rd	-	1/421 (0.2%)	8/511 (1.6%)	4/376 (1.1%)

Note: Truck traffic includes trucks with 3 axles or more

Source: 2010 Traffic Counts provided by ODOT, summarized by David Evans and Associates, Inc.

2.2.2. Operational Criteria

Transportation engineers have established various methods for measuring traffic operations of roadways and intersections. Most jurisdictions use either volume-to-capacity (v/c) ratio or level of service (LOS) to establish performance criteria. Both the LOS and v/c ratio scenarios require consideration of factors that include traffic demand, capacity of the intersection or roadway, delay, frequency of interruptions in traffic flow, relative freedom for traffic maneuvers, driving comfort, convenience, and operating cost.

Volume-to-Capacity (V/C) Ratio

A comparison of traffic volume demand to intersection capacity is one method of evaluating how well an intersection is operating. This comparison is presented as a v/c ratio. A v/c ratio of less than 1.00 indicates that the volume is less than capacity. When it is closer to zero, traffic conditions are generally good, with little congestion and low delays for most intersection movements. As the v/c ratio approaches 1.00, traffic becomes more congested and unstable, with longer delays.

Level of Service (LOS)

Level of service is also a widely recognized and accepted measure and descriptor of traffic operations. At both stop-controlled and signalized intersections, LOS is a function of control delay, which includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Six standards have been established, ranging from LOS A, where there is little or no delay, to LOS F, where there is delay of more than 50 seconds at unsignalized intersections, or more than 80 seconds at signalized intersections.

It should be noted that, although delays can sometimes be long for some movements at a STOP-controlled intersection, the v/c ratio may indicate that there is adequate capacity to process the demand for that movement. Similarly at signalized intersections, some movements, particularly side street approaches or left turns onto side streets, may experience longer delays because they receive only a small portion of the green time during a signal cycle, but their v/c ratio may be relatively low. For these reasons, it is important to examine both v/c ratio and LOS when evaluating overall intersection operations. Both are reported in the following section.

95th Percentile Queues

In addition to the operational criteria that measure intersection performance, it is also important to examine queuing and where demand may exceed available storage. Queues that spill out of storage bays and into adjacent travel lanes impair intersection performance by reducing capacity and creating potential safety concerns. Queues may also extend from one intersection through another upstream intersection which also impairs performance. The 95th percentile queue length (meaning 95 percent of all queues will be shorter) is used for this analysis.

2.2.3. Traffic Operations

The PM peak design hourly traffic volumes were used to assess the intersection operations in the study area. The standards, methodology, and resulting operations are summarized below.

Mobility Standards

The Oregon Highway Plan (OHP)[2] has established several policies that enforce general objectives and approaches for maintaining highway mobility. Of these policies, the Highway Mobility Standards (Policy 1F) establish maximum v/c ratio standards for peak hour operating conditions for all highways in Oregon based on the location and classification of the highway segment being examined. The OHP policy also specifies that the v/c ratio standards be maintained for ODOT facilities through a 20-year horizon.

Although the corridor resides within Jackson County, none of the study intersections are maintained by the county. The County TSP language states that "where one or more

[2] Table 6: Maximum volume to capacity ratios for peak hour operating conditions, 1999 Oregon Highway Plan, Amendment 05-16, Oregon Department of Transportation.

approaches is maintained by a city or ODOT, the more restrictive of the County's or other agency's performance standards will be applied." The city of Talent does not have mobility standards, but instead defers to the OHP standards. Applicable mobility standards are shown in Table 9, in the existing conditions section.

Traffic Operations Analysis Procedures

All operations were evaluated using the methodology outlined in the *2000 Highway Capacity Manual* (HCM) along with the procedures outlined in ODOT's Analysis Procedures Manual (APM). The Synchro/SimTraffic analysis software was selected to perform the intersection analysis since it can provide the v/c ratio and LOS output of an HCM analysis and consider the systematic interaction of the intersections with regard to queuing and delays.

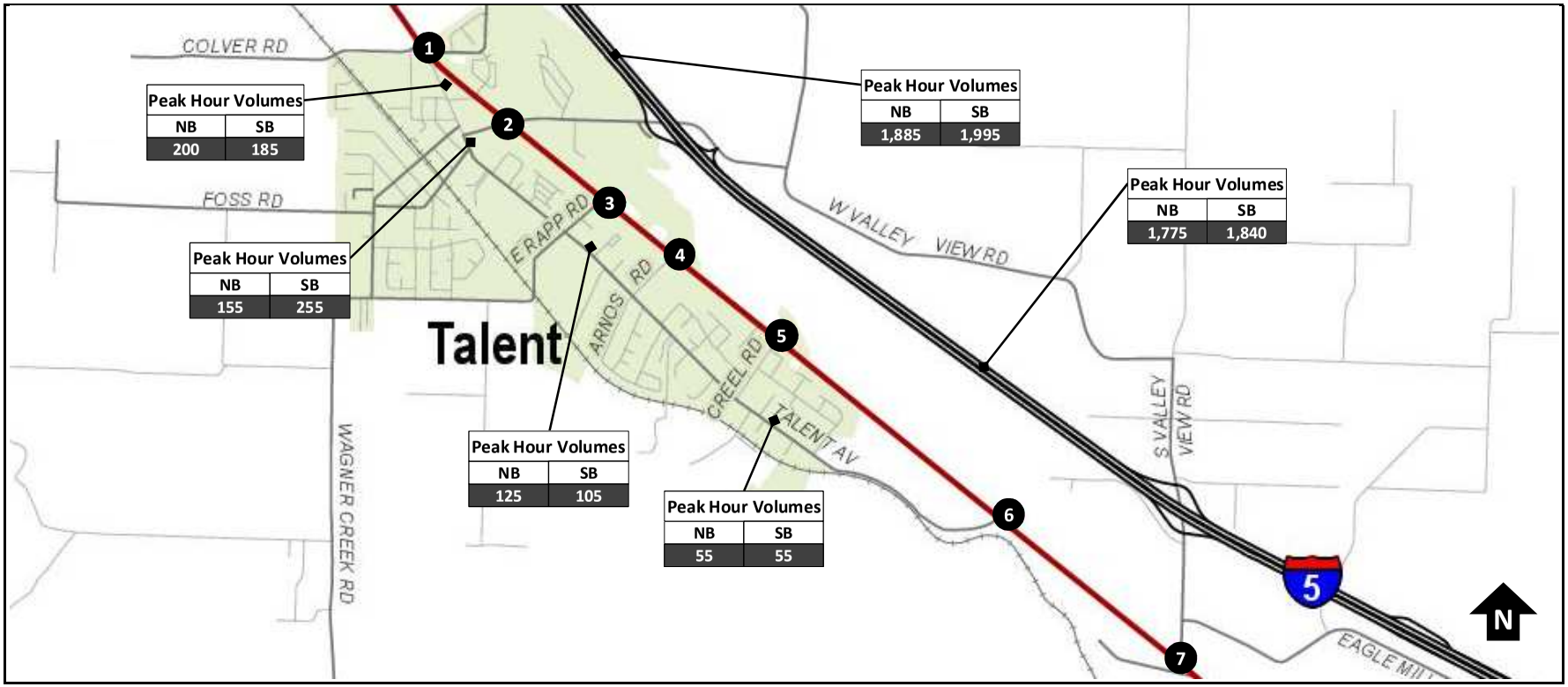
Synchro is a macroscopic model similar to the Highway Capacity Software (HCS), and like the HCS, is based on the 2000 HCM. The Synchro model explicitly evaluates traffic operations under coordinated and uncoordinated systems of signalized and unsignalized intersections. The v/c ratios and LOS presented in this report are based on the Synchro model output.

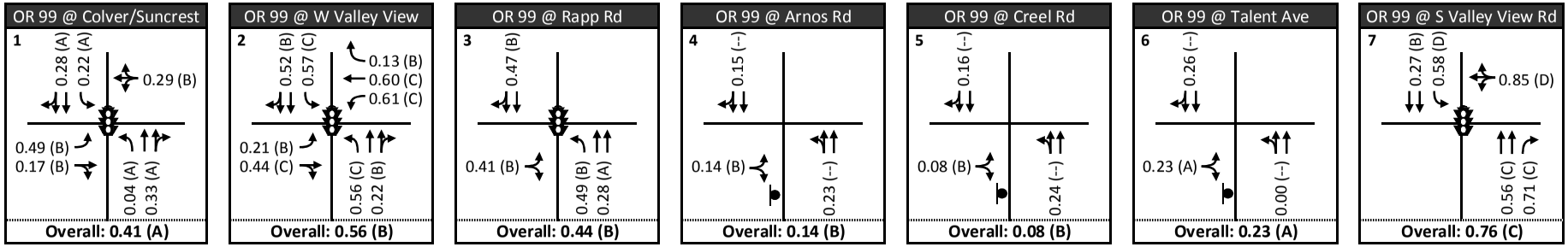
SimTraffic animates traffic flow based on input volumes and signal timing and allows viewing of traffic flow under saturated traffic conditions where traffic may spill over from one intersection to another. It is particularly effective at evaluating closely spaced intersections. The SimTraffic model was run multiple times using different arrival patterns to determine how sensitive traffic operations are with subtle variations in traffic flows. The 95th percentile queues from the SimTraffic model are also considered in this report.

As noted above, the results from both Synchro and SimTraffic were considered in this document. Because these programs evaluate operations using different methodologies, the analysis results sometimes vary; however, the differences are generally minor unless saturated or congested conditions are present. Under saturated conditions, SimTraffic queuing and delays present results that reflect how congested intersections impact each other, while Synchro represents intersection performance in isolation and may reflect better performance results.

Existing Traffic Operations

Table 9 summarizes the results of the traffic operations analysis and Figure 2 presents the v/c ratios and LOS performance, delay, and queuing by lane group for the corridor intersections. These findings reflect the current signal timing plans implemented by ODOT at all signalized corridor intersections. Operations are described in the following sections and the detailed analysis worksheets are presented in Appendix B.





OR 99 Corridor Plan - Road Diet Analysis

Legend

Lane Configuration

0.01 (A) Lane Group V/C (LOS)
Volume-to-Capacity ratio (Level of Service)

(--) LOS only reported for stopped or yielding movement

Signalized Intersection

STOP Controlled Approach

Figure 2

Existing (2010) Operations and Parallel Route Link Volumes PM Peak Hour

Table 9. Existing (2010) Design Hour Intersection Operations

Intersection	Critical[1] Movement	2010 PM Peak Hour		Mobility Standards[3]
		V/C Ratio[2]	LOS[2]	OHP
OR 99 @ Colver/Suncrest Road (Signalized)	Overall	0.41	A	0.95
OR 99 @ W. Valley View Rd (Signalized)	Overall	0.56	B	0.95
OR 99 @ Rapp Road (Signalized)	Overall	0.44	B	0.95
OR 99 @ Arnos Road	EB L/R	0.14	B	0.95
OR 99 @ Creel Road	EB L/R	0.08	B	0.95
OR 99 @ Talent Avenue/Old Pacific Hwy	EB L/R	0.12	C	0.95
OR 99 @ S. Valley View Road (Signalized)	Overall	0.76	C	0.85

Acronyms: For intersection approaches NB = northbound, SB = southbound, EB = eastbound, and WB = westbound. At the intersection approach L = left-turn movement, T = through movement, and R right-turn movement. Some approaches have shared lanes where two or more travel movements may be permitted as indicated with a slash.

Notes:
1. The critical movement at a signalized intersection is the overall operation of the intersection. The critical movement at an unsignalized intersection is the stopped (or yield) movement with the worst v/c ratio.
2. The v/c ratio and LOS are provided from Synchro HCM Intersection Analysis Reports
3. Mobility standards are drawn from Table 6 of the 1999 OHP and corresponding TSPs.

Shaded results indicate where mobility standards are not met

Traffic operations are acceptable under existing conditions throughout the corridor. The highest overall or critical movement v/c ratio throughout the corridor is 0.76, and the worst LOS is C. Furthermore, none of the study intersections currently exceed applicable mobility standards.

2.2.4. Crash Analysis

A crash analysis was conducted to determine whether any significant, documented safety issues exist within the corridor and to help inform the selection of improvements or general strategies for improving overall safety. As part of the crash analysis, historical crash data were reviewed, intersection and segment crash rates were calculated, and the state's Safety Priority Index System (SPIS) was examined.

Crash Rates

Crash rates were calculated for the study area intersections and corridor segments. At intersections, the crash rate is calculated as the number of crashes per million vehicles entering the intersection. Intersections with a crash rate greater than 1.0 crashes per million entering vehicles (crashes/mev) generally warrant closer investigation but are not necessarily indicative of safety concern. For segments, the crash rate is calculated as the number of crashes per million vehicle mi traveled (crashes/mvm). This rate is compared with the 2007-2011 statewide, suburban principal arterial crash rate of 1.30[3].

[3] 2011 Oregon State Highway Crash Rate Tables, p. 5, ODOT, August 2012.

Crash History

The crash analysis included a review of crash history data supplied by the ODOT Crash Analysis and Reporting Unit for the period between January 1, 2005, and December 31, 2011, which were the seven most recent full years for which crash data were available at the time of the analysis. The data is summarized in Table 10 and the reports are contained in Appendix C.

Table 10. Summary of Collision Types (January 1, 2005 through December 31, 2011)

	Collision Type													Severity			
Study Location, Along Hwy OR 99	**Rear End**	**Fixed Object**	**Angle**	**Other**	**Backing**	**Turning**	**Sideswipe Opposite**	**Sideswipe Meeting**	**Head On**	**Non-Collision**	**Parked**	**Pedestrian**	**Total Crashes by Location**	**Fatal & Injury A**	**Injury (B-C)**	**PDO**	**Crash Rate**
Colver/Suncrest Road	5	2	1	1	0	5	0	0	0	0	0	0	14	0	2	12	0.43
Between Colver & W. Valley View	*1*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*2*	*0*	*0.54*
W. Valley View Road	9	1	5	0	0	9	3	0	0	0	0	0	27	1	5	21	0.58
Between W. Valley View & Rapp	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*2*	*0.42*
Rapp Road	4	0	1	0	0	2	0	0	0	0	0	0	7	0	2	5	0.24
Between Rapp & Arnos	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0.00*
Arnos Road	6	2	0	0	1	2	0	0	0	0	0	0	11	0	1	10	0.42
Between Arnos & Creel	*0*	*1*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*2*	*0.34*
Creel Road	1	4	1	0	0	6	0	0	0	0	0	0	12	2	1	9	0.48
Between Creel & Talent/Old Pacific	*0*	*1*	*0*	*3*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*4*	*0*	*1*	*3*	*0.23*
Talent Avenue/Old Pacific Hwy	2	1	0	0	0	0	0	0	0	0	0	0	3	0	1	2	0.12
Between Talent & S. Valley View	*2*	*1*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*4*	*0*	*1*	*3*	*0.28*
S. Valley View Road	*7*	*0*	*0*	*2*	*0*	*8*	*0*	*0*	*0*	*0*	*0*	*1*	*18*	*0*	*5*	*13*	*0.35*
South of S. Valley View	*1*	*5*	*0*	*0*	*0*	*5*	*0*	*0*	*0*	*0*	*0*	*0*	*11*	*0*	*0*	*11*	*0.36*
Totals	38	18	8	7	1	41	3	0	0	0	0	1	117	3	29	85	
% Crashes by Type	32%	15%	7%	6%	1%	35%	3%	0%	0%	0%	0%	1%		3%	25%	73%	

Note: Crashes listed in this table include all reported collisions within 265' of the listed facility along side streets.

Source: ODOT Crash Analysis and Reporting Unit, January 1, 2005 through December 31, 2011.

The ODOT database includes records for 117 crashes in the Road Diet section of the corridor. Of these crashes, approximately 3 percent resulted in a fatality or incapacitating injury (Type A), 25 percent resulted in minor injuries, and the remaining 73 percent resulted in property damage only. The majority of reported crashes occurred during the day, in dry conditions. Turning-related collisions (35 percent) and rear-end collisions (32 percent) were the most common types, followed by fixed-object (15 percent), angle (7 percent) and sideswipe (3 percent) collisions.

Fatal or serious injury crashes were reported at 2 different locations throughout the Road Diet corridor. One fatal or serious injury crash was reported at W. Valley View Road, and 2 were reported at Creel Road.

Safety Priority Index System (SPIS)

The SPIS is a method used in Oregon to identify safety problem areas along state highways. Highways are evaluated in approximately one-tenth mile increments (often grouped into larger segments). Each year these segments are ranked by assigning a SPIS score based on the frequency and severity of crashes observed, while taking traffic volume into account. When a

segment is ranked in the top 10% of the index, a crash analysis is typically warranted and corrective actions are considered. There are no segments identified in the top 10% of the most recent (2012) SPIS rankings within the corridor.

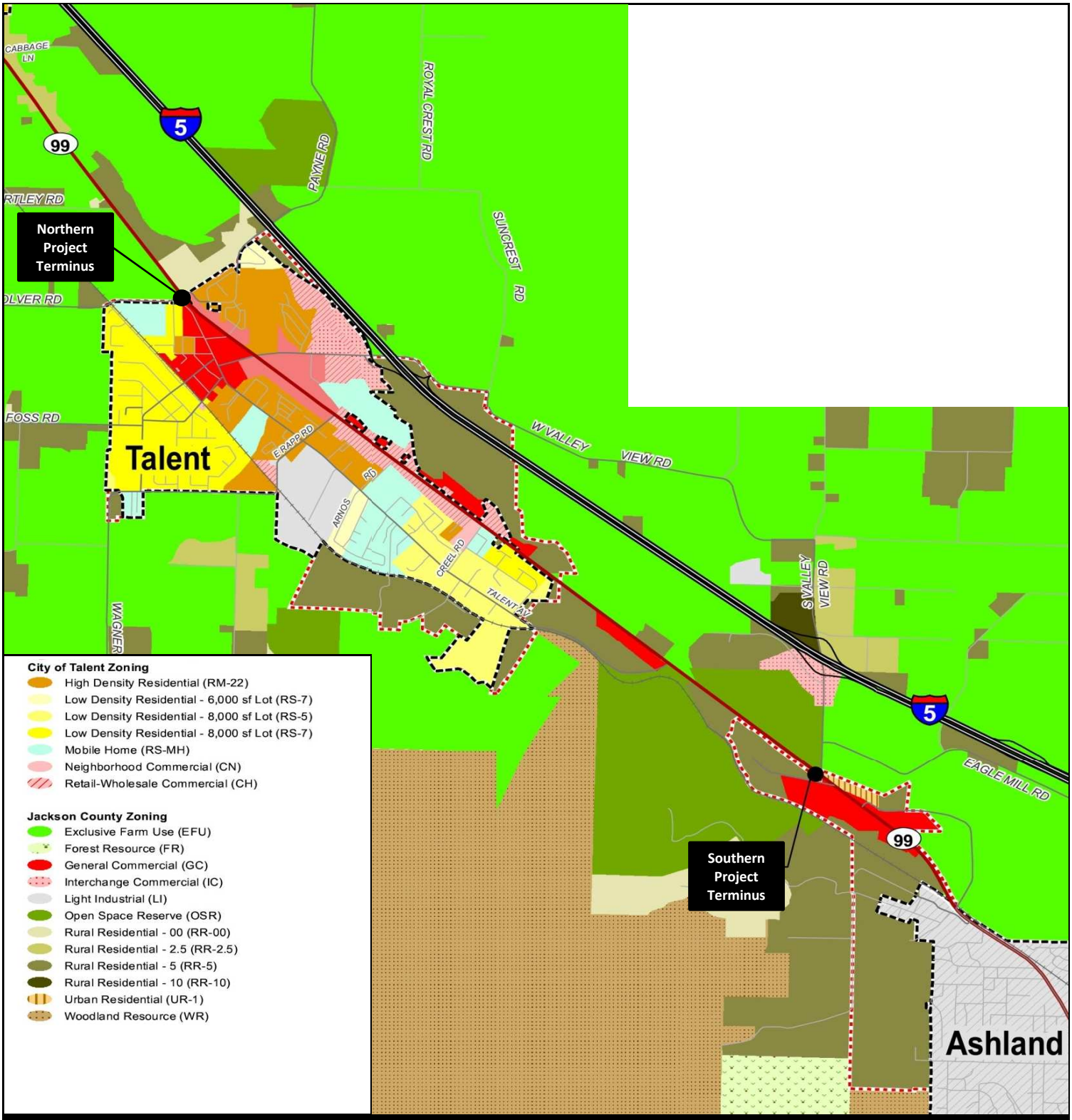
2.3. Existing Land Uses

This section summarizes existing land use conditions within the study area. Figure 3 shows the zoning designations in the study area. Figure 4 shows the Comprehensive Plan designations. The information in this section is taken primarily from published documents, maps, GIS data, city and county websites, and other Internet websites.

The northern end of Talent serves High-Density Residential and the Central Business District (CBD). Land use designations adjacent to the OR 99 corridor through Talent are commercial in nature, specifically Highway Commercial (CH), Interchange Commercial (CI), and Highway Central Business District (CBH). Past the commercial areas, the designated land uses change to residential, mainly Mobile Homes (RS-MH), High Density Residential (RM-22), Low Density Residential - 8,000 (RS-8), Low Density Residential - 5,000 (RS-5). There are several districts, area plans, and overlays in the corridor area as well:

- The purpose of the Old Town District Design Standards is "to respect and enhance the character of Talent's original core areas while maintaining the city's traditional, rural, vernacular architectural heritage."
- The Floodway, Parks, Greenway Overlay zone is intended to protect significant resources located within its boundaries that contribute to the unique character of the community. This zone sets minimum standards applicable to new development in or adjacent to areas designated as floodplains, greenways, wetlands, and riparian areas.
- The Historical Overlay is intended to protect historical resources because they contribute to the unique character of the community. Therefore, any projects that may affect these resources must go through design review.
- A supplement to the City of Talent's Comprehensive Plan, the West Valley View Vision Master Plan aims to, among other things, create an accessible, multimodal community. The foundation of the plan is reconfiguring and aligning some of the major streets that provide an entry into Talent, such as OR 99.
- The Wagner Creek Greenway Connector Plan provides a key means, via the Wagner Creek Greenway Trail, to connect the downtown to the existing Bear Creek Trail for pedestrians and bicyclists. A portion of the Wagner Creek Greenway Trail has been constructed. The entire completed trail will be approximately 1.5 miles long and will cross OR 99.

Key sites along the highway include the Talent Work Release Center, the Southern Oregon Education Services District, and the Fire District No. 5 headquarters. The RPS Plan designates this area as a rural buffer to preserve existing zoning and protect the separate identities of the two communities.



OR 99 Corridor Plan - Road Diet Analysis

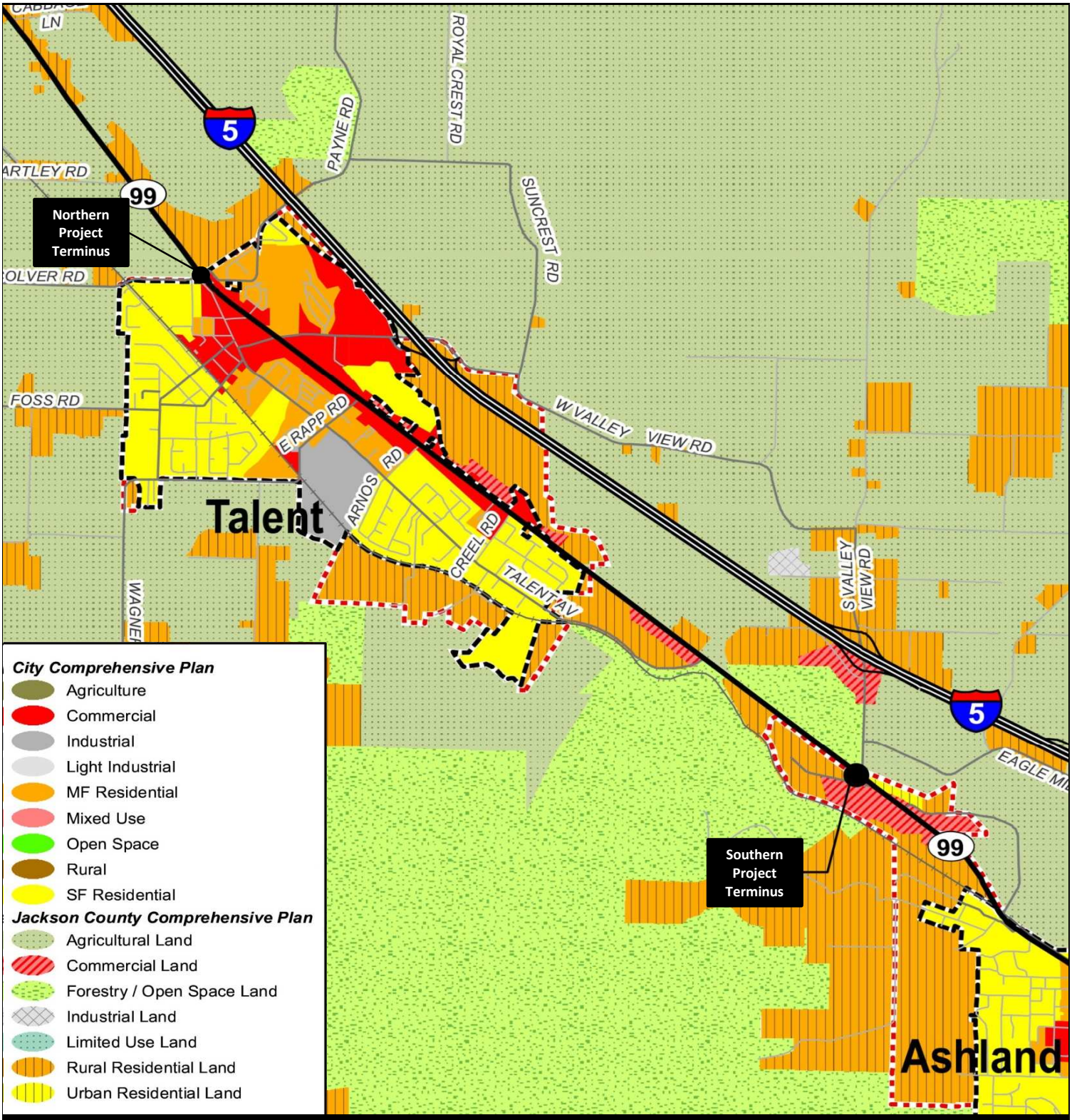
City Boundary
Urban Growth Boundary

0 3,000
Feet

Figure 3

Zoning

Source: Jackson County



OR 99 Corridor Plan - Road Diet Analysis

City Boundary
Urban Growth Boundary

0 3,000
Feet

Figure 4

Comprehensive Plan

Source: Jackson County

An abundance of multiple-unit housing and manufactured dwelling parks cause Talent to have one of the lowest percentages of single-family dwellings in Jackson County, trailing only White City. In 2000, about 46 percent of homes were single-family dwellings, compared to 63 percent for the county. Talent also has a cluster of industrial uses on Rapp Road near the railroad.

The area between Talent and Ashland is primarily rural, with forest and commercial land uses. The area along the corridor is zoned Woodland Resource (WR), Rural Residential - 5 (RR-5), Open Space Reserve (OSR), Exclusive Farm Use (EFU), and General Commercial (GC).

An RPS community buffer begins near the Talent Avenue intersection with OR 99 to preserve the separate identity of Talent and Ashland. A grade separation between the highway and the railroad exists between the two cities. Land uses align to the highway, while the railroad crosses undeveloped hillside. Automobile dealers, tourist facilities, and other commercial uses abut the highway. The northern freeway access to Ashland connects to OR 99 in this area.

3. FUTURE CONDITIONS ANALYSIS

This section provides a summary of the 2034 Future Baseline (no-build) transportation conditions through the OR 99 corridor, as well as two road diet scenarios. The analysis examines conditions where the transportation system has been improved by projects with likely funding sources and population and employment in the region surrounding the corridor and traffic volumes continue to grow. The long-range regional growth forecasts are consistent with currently-planned land use zoning. The analysis identifies anticipated operational deficiencies and serves as the basis for later evaluation to compare scenarios that address deficiencies.

3.1. Future Traffic Volume Development

Future Baseline traffic volume forecasts were developed using the regional travel demand forecasting model, which is based on long-range land use assumptions. These forecasts are consistent with the Rogue Valley Metropolitan Planning Organization (RVMPO) Regional Transportation Plan (RTP) through the year 2034. The travel demand forecasting process is briefly described below.

3.1.1. Travel Demand Forecasting Models

The future traffic volumes are developed from travel demand forecasting models. Travel demand models have been in use since the 1950s and employ a market-based approach by considering both transportation supply and travel demand for producing traffic forecasts. The model relies on socioeconomic data (e.g., households and employment) to determine travel demand and system attributes (e.g., roadway capacity, speeds, and distances) to represent the transportation supply. The RVMPO currently uses the EMME computer program for estimating travel demand.

Regional Transportation Plan Model

The travel demand model (named RVMPO v1) for the RTP was developed for a base year of 2002 and a forecast year of 2030. While there are currently newer versions of the travel demand model (RVMPO v2 and RVMPO v3), the v1 model appears to provide the most reliable results for the OR 99 study area.

Traffic forecasts for the study area intersections were developed from the 2002 and 2030 RVMPO v1 forecasting models and the 2010 existing traffic data for the future baseline scenario. The process followed the procedures from ODOT's Analysis Procedures Manual (APM)[4]. The forecast year for this corridor study is 2034, which coincides with the RVMPO's 2009-2034 Regional Transportation Plan (RTP); thus, model volumes were extrapolated to 2034.

[4] Analysis Procedures Manual, Oregon Department of Transportation, Transportation Development Division Planning Section, Transportation Planning and Analysis Unit, Salem, Oregon, April, 2006, Section 4.3.

Future -15% Sensitivity Scenario

As a result of recent fluctuations in the economy, traffic volumes have seen a decline over the past several years, with only a small recovery. Because of this trend, developing traffic volume forecasts based on the existing year counts and the travel demand model forecasts may result in lower volumes than would have been estimated just a few years ago. As such, a second future baseline scenario was evaluated that applies a fifteen percent upward adjustment to the baseline scenario volumes to allow for a sensitivity analysis. This allows for an analysis of operations under the assumption that we experience an economic rebound that results in an increase in traffic volumes, to examine the possibility of other system deficiencies.

3.1.2. Future Transportation Network

The network used in the forecasts for the OR 99 corridor is a future network that includes projects from the financially-constrained Tier 1 project lists in the RTP, which was approved in March 2009 (amended April 2009). These projects have known funding sources or are likely to be funded in the next 20 years. Table 11 summarizes the projects assumed in the baseline scenario analysis. Some of these improvements may not be reflected in the travel demand model because travel mode choices are assumed outside of the traffic volume assignment process. However, this corridor plan examines all modes of travel; thus they are appropriate assumptions that should be included for analysis purposes.

In addition to the Tier 1 RTP project list, a planned project in north Ashland was assumed in the baseline scenario. This project is titled Lithia Springs, and includes development to the southwest of South Valley View Road at OR 99, which would incorporate a south leg to the study intersection.

Table 11. RTP Tier 1 Project List for Study Area

RTP Project Number	Location	Description
Talent		
717	Rapp Rd., R/R X-ing to Wagner Creek Rd.	Rebuild and upgrade to urban major collector standard
722	Rogue River Parkway, OR 99 to Talent Ave.	Construct new street or upgrade existing street to major collector
Jackson County		
857	Bear Creek Greenway Reconstruction	Reconstruct damaged trail segments: Ashland, Talent, Medford
ODOT		
932	OR 99: Rapp Rd to Valley View Paving	Grind/Inlay and Overlay pavement

Source: Amended 2009 RTP Project List (2034)

Future Baseline

The Baseline scenario assumes all of the improvements in Table 11, as well as the current STIP plans to widen OR 99 from four lanes to five lanes from south of Rapp Road, where the current

five-lane improvements end, to south of Creel Road. Potential five-lane cross-sections are illustrated in Figure 5.

Future Road Diet (RD) Scenario 1

The first concept assumes that OR 99 is reduced from four lanes to three lanes from just south of Rapp Road to just south of Creel Road, but the four-lane section is maintained from south of Creel Road to South Valley View Road. Potential urban three-lane cross-sections are illustrated in Figure 5.

Future Road Diet (RD) Scenario 2

The second concept assumes that OR 99 is reduced from four lanes to three lanes from just south of Rapp Road to just south of Creel Road, and OR 99 is reduced from four lanes to two lanes with some turn lanes from south of Creel Road to South Valley View Road. A potential rural two-lane cross-section and a potential rural three-lane cross-section are illustrated in Figure 5.

3.1.3. Forecast Turning Movement Volumes

Traffic volumes for the future scenarios and the future sensitivity (+15%) scenarios are presented in Figure 6. Volumes show turning movements at seven study area intersections and link volumes on parallel routes are illustrated. The detailed volume development worksheets are presented in Appendix D.

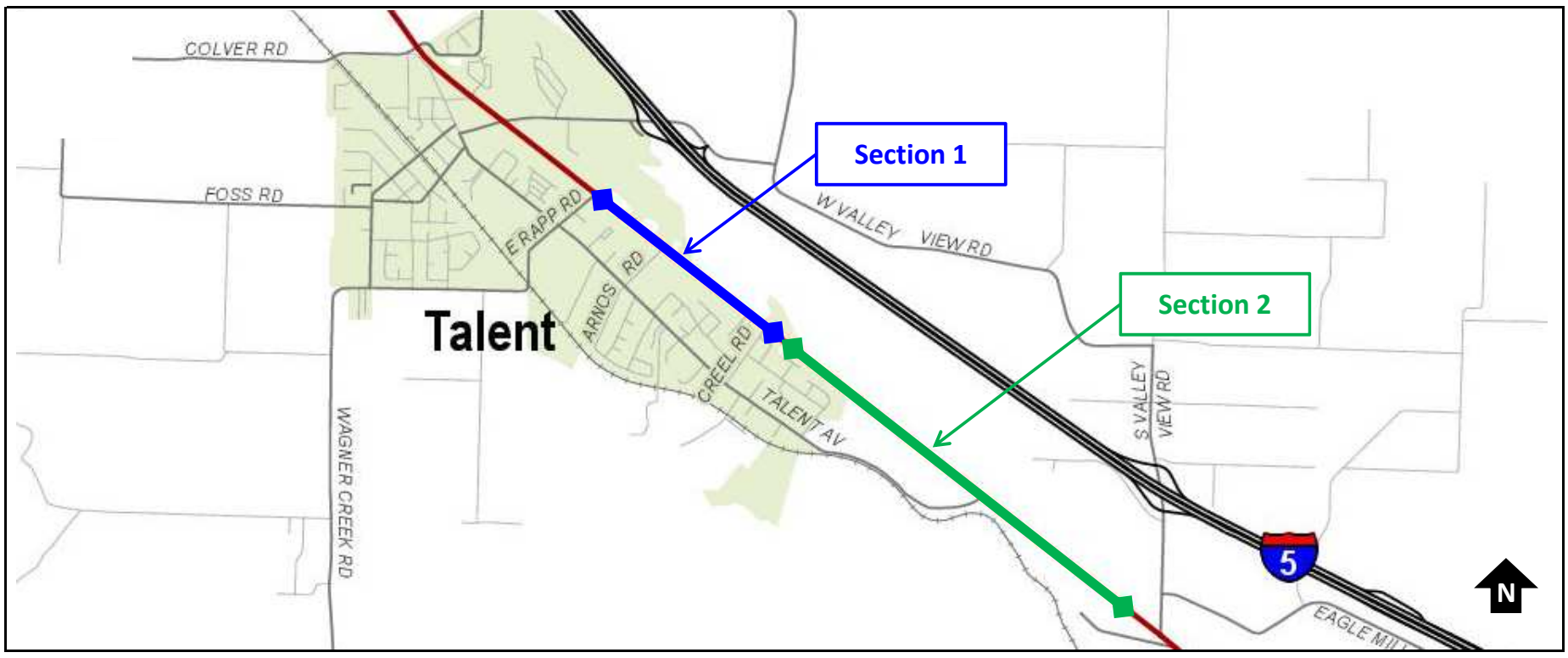
All three future roadway scenarios (Baseline, RD Scenario 1, and RD Scenario 2) were modeled using the 2030 RVMPO v1 regional travel demand model. The forecasts were virtually unchanged from one scenario to the next because the forecasting model indicates areas that are considered for the road diet are not anticipated to have any congestion that would result in trip diversions. Therefore, the volumes illustrated in Figure 6 also represent the volumes for the two Road Diet scenarios and are not repeated again.

3.1.4. Traffic Diversion to Parallel Routes

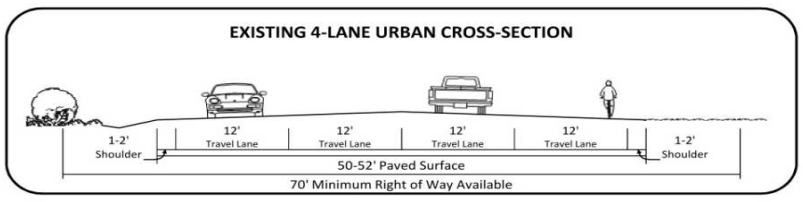
Traffic diversion to nearby, parallel routes such as I-5 or Talent Avenue was considered as part of the road diet analysis for each scenario. The STIP project scenario would increase the capacity along OR 99 and therefore no traffic diversion is expected; although, no increase in traffic volumes would be expected as a result of these improvements either.

Road Diet Scenario 1 would reduce capacity along OR 99 between Rapp Road and Creel Road. As noted above, the projected demand (traffic volume) based on forecast model output would remain well below link capacity; therefore, traffic diversion to nearby, parallel routes is not expected.

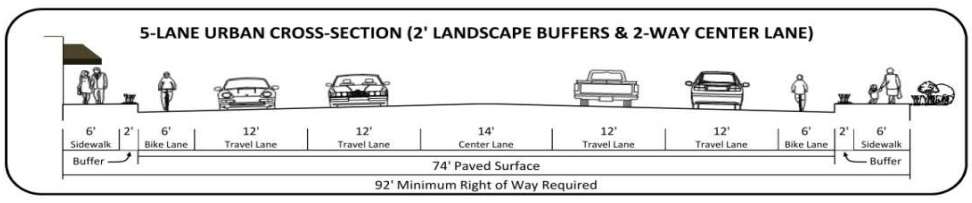
Road Diet Scenario 2 would reduce capacity between Rapp Road and Creel Road (similar to Road Diet Scenario 1), but would include further reduction in capacity along OR 99 between Creel Road and S. Valley View Road. Again, the projected demand (traffic volume) based on

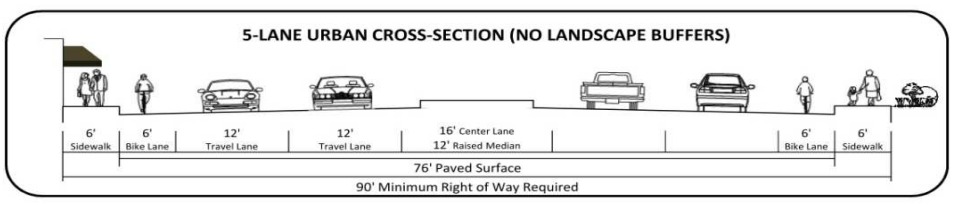


Section 1 - South of Rapp Rd to South of Creel Rd

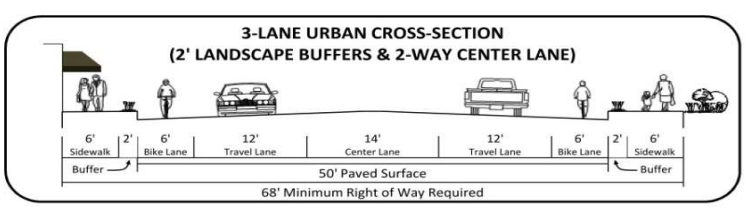


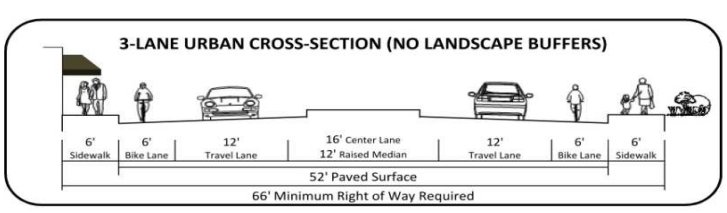
Existing Cross-Section



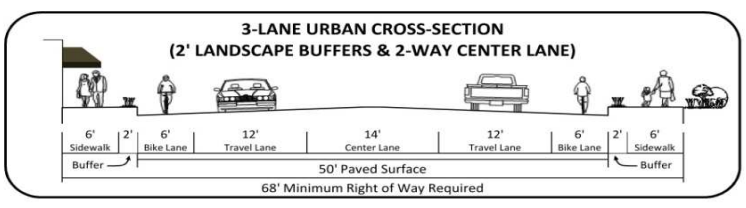


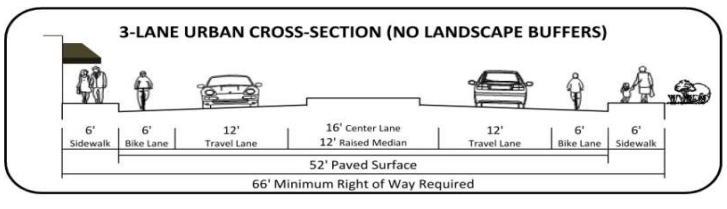
Baseline: 5-Lane Cross-Section Concepts (STIP Project)





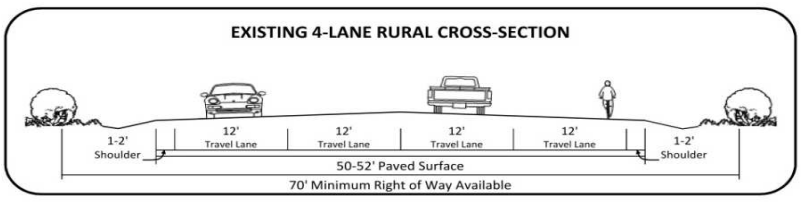
Road Diet Scenario 1: 3-Lane Cross-Section Concepts



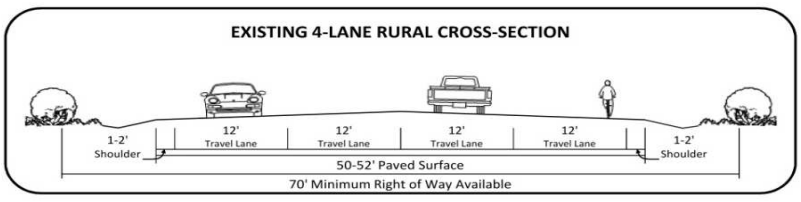


Road Diet Scenario 2: 3-Lane Cross-Section Concepts

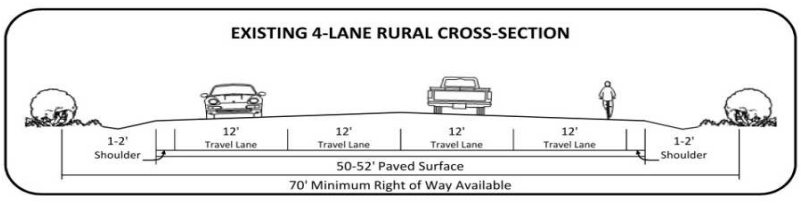
Section 2 - South of Creel Rd to North of S. Valley View Rd



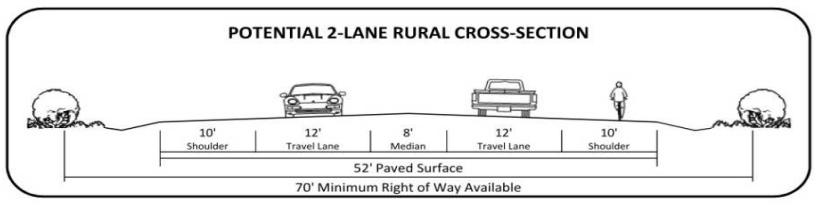
Existing Cross-Section

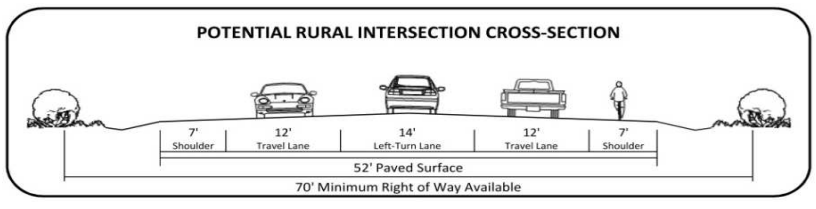


Baseline: 4-Lane Cross-Section (Same as Existing)



Road Diet Scenario 1: 4-Lane Cross-Section (Same as Existing)



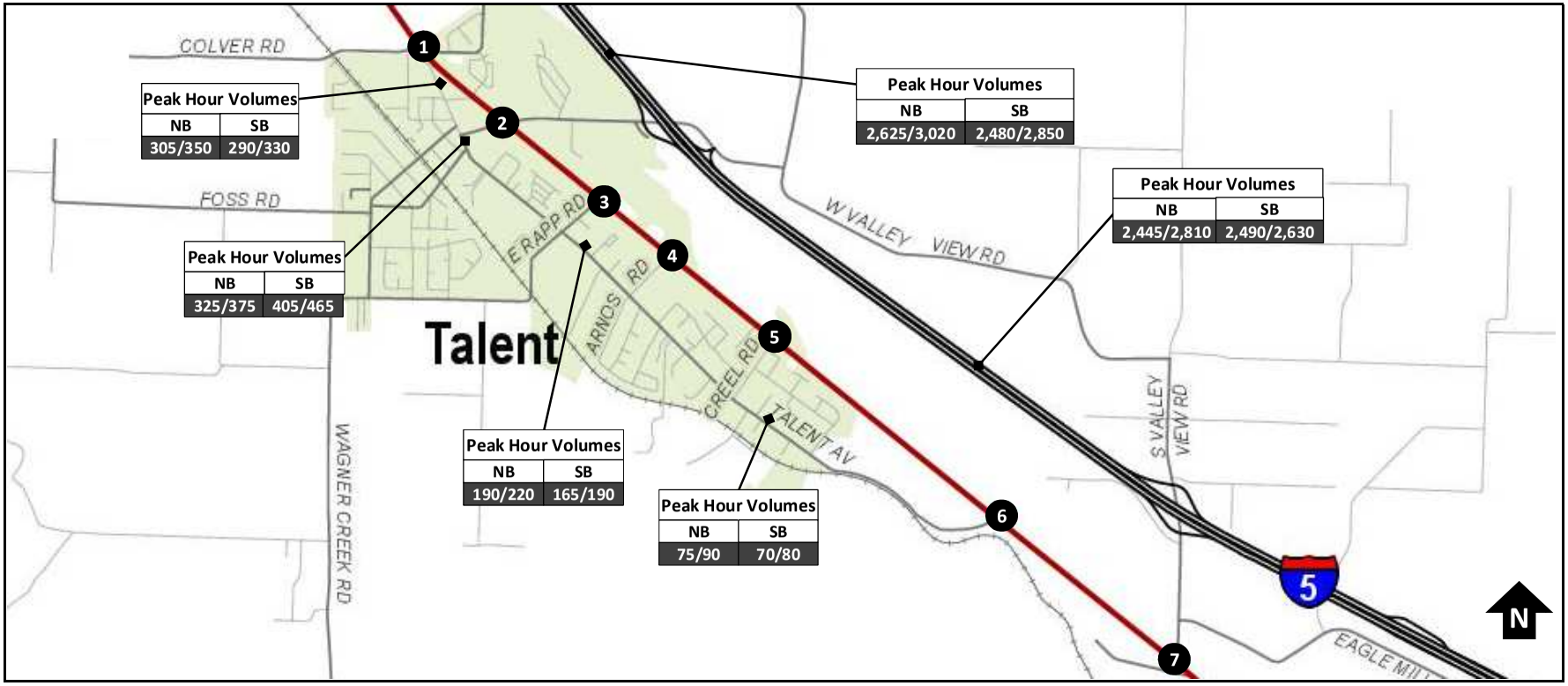


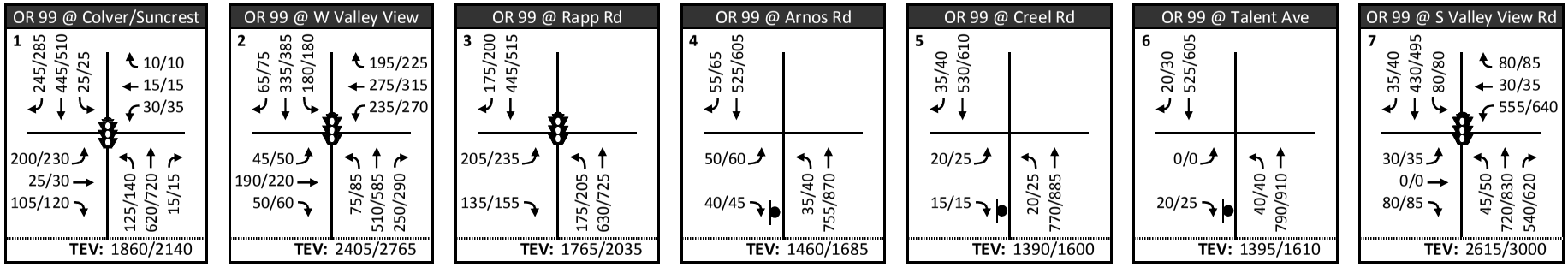
Road Diet Scenario 2: 3-Lane Cross-Section Concepts

OR 99 Corridor Plan - Road Diet Analysis

Figure 5

Existing and Potential Cross-Section Concepts





OR 99 Corridor Plan - Road Diet Analysis

Legend

Baseline/Baseline+15% PM Peak Hour Volume

TEV: Baseline/Baseline+15% Total Entering Volume

→ Turning Movement

Signalized Intersection

STOP Controlled Approach

**Diagrams show OR 99 as the north and south legs of the study intersections throughout*

Figure 6

Future Baseline (2034) Volumes
PM Peak Hour

forecast model output would remain well below link capacity; therefore, traffic diversion to nearby, parallel routes is not expected.

3.2. Intersection Operational Results

Traffic operations were evaluated at the seven study area intersections. Operations are described in the following sections for the two future baseline scenarios and the detailed analysis worksheets are presented in Appendix B. These findings reflect optimized signal timing plans at all signalized corridor intersections.

Future Baseline

The future baseline and future baseline sensitivity (15%) analyses intersection results are summarized below in tabular form and compared to the Oregon Highway Plan (OHP) mobility standards. Table 12 presents the results of the future baseline traffic operations and Figure 7 illustrates the results for all study area movements.

Note: These results reflect the five-lane STIP improvement from Rapp Road through Creel Road.

Table 12. Future (2034) Baseline Scenario - Design Hour Intersection Operations

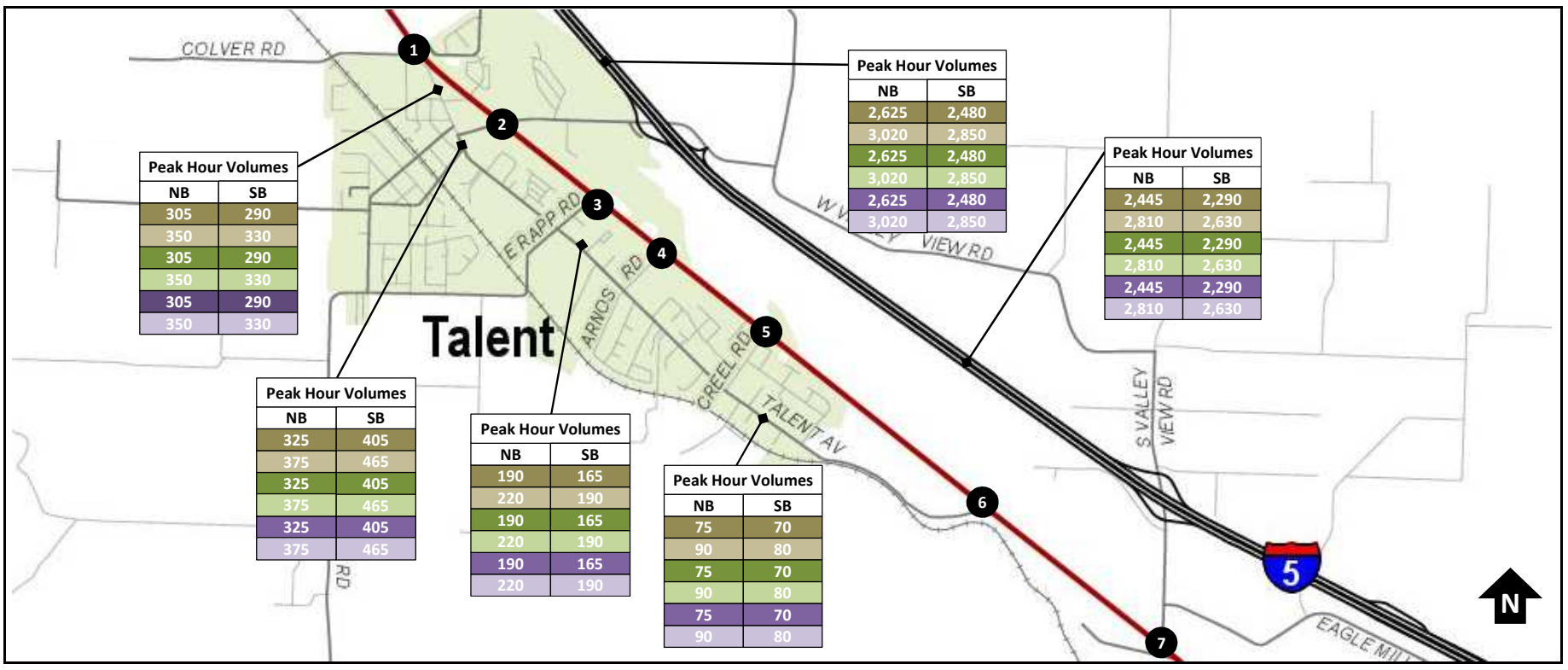
Intersection	Critical[1] Movement	Baseline		15% Sensitivity		Mobility Standards[3]
		V/C Ratio[2]	LOS[2]	V/C Ratio[2]	LOS[2]	OHP
OR 99 @ Colver/Suncrest Rd (Signalized)	Overall	0.57	B	0.63	B	0.95
OR 99 @ W. Valley View Rd (Signalized)	Overall	0.80	C	0.93	C	0.95
OR 99 @ Rapp Rd (Signalized)	Overall	0.67	B	0.76	C	0.95
OR 99 @ Arnos Rd	EB L/R	0.29	C	0.39	D	0.95
OR 99 @ Creel Rd	EB L/R	0.11	C	0.18	C	0.95
OR 99 @ Talent Ave/Old Pacific Hwy	EB L/R	0.04	B	0.03	B	0.95
OR 99 @ S. Valley View Rd (Signalized)	Overall	**0.87**	D	**1.01**	E	0.85

Acronyms: For intersection approaches NB = northbound, SB = southbound, EB = eastbound, and WB = westbound. At the intersection approach L = left-turn movement, T = through movement, and R right-turn movement. Some approaches have shared lanes where two or more travel movements may be permitted as indicated with a slash.

Notes:
1. The critical movement at a signalized intersection is the overall operation of the intersection. The critical movement at an unsignalized intersection is the stopped (or yield) movement with the worst v/c ratio.
2. The v/c ratio and LOS are provided from Synchro HCM Intersection Analysis Reports.
3. Mobility standards are drawn from Table 6 of the 1999 OHP and corresponding TSPs. All study area intersections are within the UGB and MPO. There are no applicable City standards within the study area

Shaded results indicate where mobility standards are not met

For the Baseline scenario, traffic operations would be acceptable throughout the corridor, with one exception. The signalized intersection of OR 99 at S. Valley View Road would exceed OHP mobility standards with a v/c ratio of 0.87 and an LOS of D. None of the other intersections would fail to meet v/c ratio standards.



Baseline

Intersection	Overall
1 OR 99 @ Colver/Suncrest	Overall: 0.57 (B)
2 OR 99 @ W Valley View Rd	Overall: 0.80 (C)
3 OR 99 @ Rapp Rd	Overall: 0.67 (B)
4 OR 99 @ Arnos Rd	Overall: 0.29 (C)
5 OR 99 @ Creel Rd	Overall: 0.11 (B)
6 OR 99 @ Talent Ave	Overall: 0.04 (B)
7 OR 99 @ S Valley View Rd	Overall: 0.87 (D)

Baseline +15% Sensitivity

Intersection	Overall
1 OR 99 @ Colver/Suncrest	Overall: 0.63 (B)
2 OR 99 @ W Valley View Rd	Overall: 0.93 (C)
3 OR 99 @ Rapp Rd	Overall: 0.76 (B)
4 OR 99 @ Arnos Rd	Overall: 0.39 (C)
5 OR 99 @ Creel Rd	Overall: 0.18 (B)
6 OR 99 @ Talent Ave	Overall: 0.03 (B)
7 OR 99 @ S Valley View Rd	Overall: 1.01 (D)

Road Diet (RD) Scenario 1

Intersection	Overall
1 OR 99 @ Colver/Suncrest	Overall: 0.57 (B)
2 OR 99 @ W Valley View Rd	Overall: 0.80 (C)
3 OR 99 @ Rapp Rd	Overall: 0.67 (B)
4 OR 99 @ Arnos Rd	Overall: 0.22 (C)
5 OR 99 @ Creel Rd	Overall: 0.09 (B)
6 OR 99 @ Talent Ave	Overall: 0.04 (B)
7 OR 99 @ S Valley View Rd	Overall: 0.87 (D)

RD Scenario 1 +15% Sensitivity

Intersection	Overall
1 OR 99 @ Colver/Suncrest	Overall: 0.63 (B)
2 OR 99 @ W Valley View Rd	Overall: 0.93 (C)
3 OR 99 @ Rapp Rd	Overall: 0.76 (C)
4 OR 99 @ Arnos Rd	Overall: 0.26 (C)
5 OR 99 @ Creel Rd	Overall: 0.14 (C)
6 OR 99 @ Talent Ave	Overall: 0.03 (B)
7 OR 99 @ S Valley View Rd	Overall: 1.00 (E)

Road Diet (RD) Scenario 2

Intersection	Overall
1 OR 99 @ Colver/Suncrest	Overall: 0.57 (B)
2 OR 99 @ W Valley View Rd	Overall: 0.80 (C)
3 OR 99 @ Rapp Rd	Overall: 0.67 (B)
4 OR 99 @ Arnos Rd	Overall: 0.22 (C)
5 OR 99 @ Creel Rd	Overall: 0.09 (B)
6 OR 99 @ Talent Ave	Overall: 0.05 (B)
7 OR 99 @ S Valley View Rd	Overall: 0.87 (D)

RD Scenario 2 +15% Sensitivity

Intersection	Overall
1 OR 99 @ Colver/Suncrest	Overall: 0.63 (B)
2 OR 99 @ W Valley View Rd	Overall: 0.93 (C)
3 OR 99 @ Rapp Rd	Overall: 0.76 (C)
4 OR 99 @ Arnos Rd	Overall: 0.26 (C)
5 OR 99 @ Creel Rd	Overall: 0.14 (C)
6 OR 99 @ Talent Ave	Overall: 0.04 (C)
7 OR 99 @ S Valley View Rd	Overall: 1.00 (E)

OR 99 Corridor Plan - Road Diet Analysis

Legend

Lane Configuration

0.01 (A) Lane Group V/C (LOS)
Volume-to-Capacity ratio (Level of Service)

(--) LOS only reported for stopped or yielding movement

Signalized Intersection

STOP Controlled Approach

**Diagrams show OR 99 as the north and south legs of the study intersections throughout*

Figure 7

Future (2034) OR 99 Operations and Parallel Route Link Volumes PM Peak Hour

Baseline traffic operations for the 15% Sensitivity scenario would be acceptable under future baseline sensitivity conditions throughout the corridor, with one exception. The signalized intersection of OR 99 at S. Valley View Road would exceed OHP mobility standards and capacity with a v/c ratio of 1.01 and an LOS of E. None of the other intersections would fail to meet v/c ratio standards.

Table 13 presents the 95th percentile queuing estimates for movements that exceed available storage distances. Three signalized intersections are expected to have 95th percentile queues that would exceed the storage bay length or reach/surpass a public access point for both scenarios. **None of these intersections would be impacted by the five-lane STIP improvement from Rapp Road through Creel Road.**

Table 13. Future (2034) Baseline Scenario - 95th Percentile Queues Exceeding Available Storage

Intersection	Approach & Movement	Baseline 95th Percentile Queue[1] (ft.)	15% Sensitivity 95th Percentile Queue[1] (ft.)	Available Storage (ft.)
OR 99 @ Colver/Suncrest Road (Signalized)	EB L	125	125	100 [3]
OR 99 @ W. Valley View Road (Signalized)	NB L	n/a	450	350 [3]
OR 99 @ S. Valley View Road (Signalized)	WB L/T/R	1050	950	900 [2]
	NB T	600	2500	200 [2]
	NB R	250	225	150 [3]

Acronyms: For intersection approaches NB = northbound, SB = southbound, EB = eastbound, and WB = westbound. At the intersection approach L = left-turn movement, T = through movement, and R right-turn movement. Some approaches have shared lanes where two or more travel movements may be permitted as indicated with a slash.

Notes:

1. The 95th percentile queuing values are from SimTraffic simulations.
2. Storage distance reflects spacing to the next public access point.
3. Storage distance reflects length of travel lane or turn bay.

Although queuing issues are expected for the Baseline scenarios, they are all associated with signalized intersections that would not be impacted by the five-lane STIP improvement from Rapp Road through Creel Road. The queuing at the intersection of OR 99 and S. Valley View Road is a result of congestion resulting from the single lane approach on S. Valley View Road. No queuing is anticipated on the southbound approach that would affect the evaluation of the Road Diet scenarios.

Future RD Scenario 1

The future RD Scenario 1 and future RD Scenario 1 sensitivity (15%) analyses intersection results are summarized below in tabular form and compared to the Oregon Highway Plan (OHP) and Highway Design Manual (HDM) mobility thresholds. Table 14 presents the operational results for both scenarios (RD Scenario 1 and RD Scenario 1 (15%)) while Figure 7 illustrates the results for all study area movements.

Table 14. Future (2034) RD Scenario 1 - Design Hour Intersection Operations

Intersection	Critical[1] Movement	RD Scenario 1		15% Sensitivity		Mobility Standards[3]	
		V/C Ratio[2]	LOS[2]	V/C Ratio[2]	LOS[2]	OHP	HDM
OR 99 @ Colver/Suncrest Rd (Signalized)	Overall	0.57	B	0.63	B	0.95	NA
OR 99 @ W. Valley View Rd (Signalized)	Overall	0.80	C	0.93	C	0.95	NA
OR 99 @ Rapp Road (Signalized)	Overall	0.67	B	0.76	C	0.95	NA
OR 99 @ Arnos Rd	**EB L/R**	**0.22**	**C**	**0.26**	**C**	**0.95**	**0.85**
OR 99 @ Creel Rd	**EB L/R**	**0.09**	**B**	**0.14**	**C**	**0.95**	**0.85**
OR 99 @ Talent Ave/Old Pacific Hwy	EB L/R	0.04	B	0.03	B	0.95	NA
OR 99 @ S. Valley View Rd (Signalized)	Overall	**0.87**	D	**1.00**	E	0.85	NA

Acronyms: For intersection approaches NB = northbound, SB = southbound, EB = eastbound, and WB = westbound. At the intersection approach L = left-turn movement, T = through movement, and R right-turn movement. Some approaches have shared lanes where two or more travel movements may be permitted as indicated with a slash.

Notes:

1. The critical movement at a signalized intersection is the overall operation of the intersection. The critical movement at an unsignalized intersection is the stopped (or yield) movement with the worst v/c ratio.
2. The v/c ratio and LOS are provided from Synchro HCM Intersection Analysis Reports, while delay and queuing values are from SimTraffic.
3. Mobility standards are drawn from Table 6 of the 1999 OHP and corresponding TSPs, as well as Table 10-1 of the HDM. All study area intersections are within the UGB and MPO. There are no applicable City standards within the study area

Shaded results indicate where mobility standards are not met

The reduction of OR 99 to three lanes in RD Scenario 1 would only affect operations for the Arnos Road and Creel Road intersections; all others would be similar to the baseline scenarios. The v/c ratios for the stopped movements on both Arnos Road and Creel Road would improve with the three-lane cross section associated with the road diet. Traffic simulations indicate that delays could be 5 to 15 seconds longer but still under 30 seconds, even with the 15% sensitivity scenario. The improved v/c ratios on the side streets can be attributed to the shorter crossing distance of the three-lane section, which would require a shorter gap in the OR 99 traffic stream. This benefit is offset to some degree by the increased density of traffic in the remaining through travel lane. On OR 99 itself, the v/c ratios (see Figure 7) would increase by 50 to 55 percent in the northbound direction and 55 to 70 percent in the southbound direction with the reduction in through travel lanes, but would still be well below the mobility standards. The v/c ratios on OR 99 would not double with the lane reduction because traffic volumes are generally not distributed evenly across the travel lanes; one usually has more than the other because of turning activity and other characteristics of the roadway.

No measureable changes in queues are expected at any of the intersections in the study area with RD Scenario 1. Locations with excess queuing under baseline conditions would still have queuing issues but **the reduction in travel lanes associated with the road diet is not expected to make queues worse. Queuing at the Arnos and Creel Road intersections would not change significantly.**

Future RD Scenario 2

The future RD Scenario 2 and future RD Scenario 2 sensitivity (15%) analyses intersection results are summarized below in tabular form and compared to the Oregon Highway Plan (OHP) mobility standards. Table 15 presents the operational results for both scenarios (RD Scenario 2 and RD Scenario 2 (15%)) while Figure 7 illustrates the results for all study area movements.

Table 15. Future (2034) RD Scenario 2 - Design Hour Intersection Operations

Intersection	Critical[1] Movement	RD Scenario 1		15% Sensitivity		Mobility Standards[3]	
		V/C Ratio[2]	LOS[2]	V/C Ratio[2]	LOS[2]	OHP	HDM
OR 99 @ Colver/Suncrest Rd (Signalized)	Overall	0.57	B	0.63	B	0.95	NA
OR 99 @ W. Valley View Rd (Signalized)	Overall	0.80	C	0.93	C	0.95	NA
OR 99 @ Rapp Road (Signalized)	Overall	0.67	B	0.76	C	0.95	NA
OR 99 @ Arnos Rd	**EB L/R**	**0.22**	**C**	**0.26**	**C**	**0.95**	**0.85**
OR 99 @ Creel Rd	**EB L/R**	**0.09**	**B**	**0.14**	**C**	**0.95**	**0.85**
OR 99 @ Talent Ave/Old Pacific Hwy	**EB L/R**	**0.05**	**B**	**0.04**	**C**	**0.95**	**NA**
OR 99 @ S. Valley View Rd (Signalized)	Overall	**0.87**	D	**1.00**	E	0.85	NA

Acronyms: For intersection approaches NB = northbound, SB = southbound, EB = eastbound, and WB = westbound. At the intersection approach L = left-turn movement, T = through movement, and R right-turn movement. Some approaches have shared lanes where two or more travel movements may be permitted as indicated with a slash.

Notes:
1. The critical movement at a signalized intersection is the overall operation of the intersection. The critical movement at an unsignalized intersection is the stopped (or yield) movement with the worst v/c ratio.
2. The v/c ratio and LOS are provided from Synchro HCM Intersection Analysis Reports, while delay and queuing values are from SimTraffic.
3. Mobility standards are drawn from Table 6 of the 1999 OHP and corresponding TSPs, as well as Table 10-1 of the HDM. All study area intersections are within the UGB and MPO. There are no applicable City standards within the study area

Shaded results indicate where mobility standards are not met

The reduction of OR 99 to three lanes in RD Scenario 2 would affect operations for the Arnos Road and Creel Road intersections similar to the RD Scenario 1. Additionally the Talent Avenue intersection would be affected as well with the reduction to two lanes with a northbound left-turn lane in this segment. All others in the study area would be similar to the baseline scenarios.

As with RD Scenario 1, the v/c ratios for the stopped movements on both Arnos Road and Creel Road would improve with the three-lane cross section associated with the road diet while the v/c ratios on OR 99 would increase. All movements would meet the mobility standards and delays would be under 30 seconds even with the 15% sensitivity scenario.

The intersection of OR 99 at Talent Avenue would be affected by the two-lane cross-section associated with RD Scenario 2 (see Figure 5). With the reduction in through travel lanes, a separate northbound left-turn lane could be striped on OR 99 at Talent Avenue. PM peak hour analysis shows little difference in the v/c ratio for the stopped movements on Talent Avenue because the volumes are all right-turn movements. On OR 99 itself, the through v/c ratios (see Figure 7) would increase by about 50 percent in the northbound direction and 55 to 65 percent

in the southbound direction with the reduction in through travel lanes but would still be well below the mobility standards. The v/c ratios on OR 99 would not double with the lane reduction because traffic volumes are generally not distributed evenly across the travel lanes; one usually has more than the other because of turning activity and other characteristics of the roadway.

Although RD Scenario 2 does not include lane changes at the OR 99/S. Valley View Road intersection, the two-lane cross-section to the north could have some impact on operations. Drivers traveling northbound may be more inclined to use the leftmost through travel lane at the signal because of the lane taper from two lanes to one lane north of the intersection. The extent of this behavior can be mitigated by installing the taper at least 500 feet north of the intersection.

No measureable changes in queues are expected at any of the intersections in the study area with RD Scenario 2. Locations with excess queuing under baseline conditions would still have queuing issues but **the reduction in travel lanes associated with the road diet is not expected make conditions worse. Queuing at the Arnos Road, Creel Road, and Talent Avenue intersections would not change significantly.**

3.3. Future Traffic Safety Considerations

A safety analysis was conducted using the Highway Safety Manual (HSM) Part C methodology. This analysis includes a comparison of predicted crash frequencies for each of the proposed scenarios. Predictions were made using empirically determined crash characteristics for each facility type, HSM supported crash modification factors, forecast ADTs, and existing crash data for calibration purposes. The findings from this analysis are summarized in Table 16.

Table 16. Summary of Expected Average Crash Frequency per Year

	Expected Crash Rate per Year[1]			
Location	**Existing[2]**	**Baseline[3]**	**RD Scenario 1[4]**	**RD Scenario 2[5]**
Segments				
South of Rapp Rd to South of Creel Rd	1.84	3.10	1.66	1.66
South of Creel Rd to North of S. Valley View Rd	2.17	2.17	2.17	2.28
Intersections				
OR 99 @ Arnos Rd	1.47	1.15	1.15	1.15
OR 99 @ Creel Rd	1.37	0.95	0.95	0.95
OR 99 @ Talent Ave	0.82	0.82	0.82	0.62
OR 99 @ S. Valley View Rd	3.01	3.01	3.01	3.01
Total	**10.68**	**11.20**	**9.76**	**9.67**

Notes:
1. The expected crash rate per year was calculated using the Highway Safety Manual Part C methodology.
2. Existing analysis assumes four lanes from south of Rapp Rd to north of S. Valley View Rd.
3. Baseline analysis assumes five lanes from south of Rapp Rd to south of Creel Rd and four lanes from there to north of S. Valley View.
4. RD Scenario 1 assumes three lanes from south of Rapp Rd to south of Creel Rd and four lanes from there to north of S. Valley View.
5. RD Scenario 2 assumes three lanes from south of Rapp Rd to south of Creel Rd and two lanes from there to north of S. Valley View.

Baseline

The HSM analysis indicates that the five lane cross-section in the Baseline scenario provides a mix of positive and negative effects resulting in a slightly higher overall crash rate. Predicted rates for the intersections (Arnos Road and Creel Road) would be reduced with the addition of turn lanes, but the segment crash rate (south of Rapp Road to south of Creel Road) would be higher when compared with the existing four-lane section. Factors that might contribute to the higher predicted segment crash rate include the wider cross-section and potentially higher speeds with five lanes versus four lanes. Factors that might contribute to the lower predicted intersection crash rate include the turn lanes.

In addition to the vehicular safety implications, there are also bicycle and pedestrian safety benefits. The baseline concept includes the addition of bike lanes and sidewalks with the five-lane roadway improvement. The presence of these facilities would provide a safety improvement when compared to the existing four-lane configuration (without bike lanes or sidewalks). The wider five-lane cross-section would increase the OR 99 crossing distance for pedestrians which would require longer gaps in traffic to travel across the highway. However, pedestrians could benefit from the center refuge lane, which may include the installation of raised medians that could serve as a mid-crossing refuge.

RD Scenario 1

RD Scenario 1 shows benefits for both the three-lane segment (south of Rapp Road to south of Creel Road) and the two intersections (Arnos Road and Creel Road) resulting in an overall lower predicted crash rate than both the existing and baseline configurations. Factors that might contribute to the lower predicted crash rates are the narrower cross-section, potentially lower speeds with three lanes, and turn lanes.

RD Scenario 1 would also offer improved bicycle and pedestrian safety with dedicated facilities. The narrower three-lane cross-section would decrease the OR 99 crossing distance for pedestrians, which would limit their exposure to traffic. Additionally, pedestrians could benefit from the center refuge lane with or without raised medians.

RD Scenario 2

In general, RD Scenario 2 shows the lowest overall crash rate of any of the scenarios. Results are the same as RD Scenario 1 for the segment from south of Rapp Road to south of Creel Road but change with the implementation of a two-lane cross-section from south of Creel Road to north of S. Valley View Road. On this segment, predicted rates for the intersection (Talent Avenue) would be reduced with the addition of a turn lane, but the segment crash rate (south of Creel Road to north of S. Valley View Road) would be higher when compared with the existing four-lane section. Factors that might contribute to the higher predicted segment crash rate include higher density with two lanes versus four lanes. Factors that might contribute to the lower predicted intersection crash rate include the turn lanes.

RD Scenario 2 offers the greatest predicted increase in bicycle and pedestrian safety by increasing the shoulder width in the rural segment from south of Creel Road to north of S. Valley View Road, in addition to the RD Scenario 1 benefits. This may decrease the risk of a vehicle-to-bicycle collision.

3.4. Multimodal Assessment

A multimodal analysis provides a comprehensive assessment of all modes, taking into account the impact of adjacent modes of travel. The multimodal analysis conducted as part of the road diet analysis uses information from the existing, baseline, and road diet scenarios previously discussed. Table 17 provides a summary of performance for each mode, using a ranking system with five categories, from very poor to excellent. These rankings take into account available facilities and their widths, vehicular travel speeds, volumes, operations, access, transit routes and frequencies, general conditions, and other factors that influence level of service for each mode. While bicycle, pedestrian, and transit conditions are largely influenced by adjacent modes, vehicular performance is primarily rated based on vehicular-oriented variables.

Future Baseline

The future baseline scenario with the five lane STIP project generally improves all modes of travel between Rapp Road and Creel Road. New bicycle and pedestrian facilities improve conditions for these users. With the five-lane cross-section, the volume in the outer travel lane is lower than it would be for the three-lane cross-section; therefore, the segments were rated better for the baseline condition than RD Scenario 1 or 2. However, the wider crossing width at intersections makes the rating for pedestrians and bicyclist worse for the five-lane versus three-lane cross-sections. Transit service runs along Talent Avenue for most of the corridor and is not impacted by the different scenarios. Auto operations would improve with the five-lane cross-section but safety issues raised in the HSM analysis may offset some of those benefits.

RD Scenario 1

The reduction from five lanes to three lanes results in several trade-offs for all modes. Because the traffic volumes adjacent to the bicycle lanes would be higher with the three-lane cross-section, the facilities were not rated quite as well as the five-lane cross-section. Conversely, the narrower cross-section would make crossings at intersections easier. Auto operations would meet operational standards but the reduced throughput would result in some additional delays. The safety benefits are assumed to offset these negative impacts.

RD Scenario 2

The ratings for RD Scenario 2 are the same as those for RD Scenario 1 north of Creel Road but would generally be improved south of Creel Road. The ability to provide wider shoulders with the two-lane cross-section would provide a benefit to bicyclists and pedestrians, particularly in the southbound direction. Narrower crossing distances would also be beneficial. Auto operations would meet operational standards but would have reduced throughput. Although

safety benefits would be realized at the intersections, the HSM rating for the segment predicted a slightly higher potential for crashes.

Table 17. Multimodal Assessment

Location	Travel Mode			
	Bicycle	Pedestrian	Transit	Auto
EXISTING				
Rapp Rd to Arnos Rd	Poor	Poor	NA	Good
OR 99 at Arnos Rd	Poor	Poor	NA	Good
Arnos Rd to Creel Rd	Poor	Poor	NA	Good
OR 99 at Creel Rd	Poor	Poor	NA	Good
Creel Rd to Talent Ave	Poor	Poor	NA	Good
OR 99 at Talent Ave	Poor	Poor	Fair	Good
Talent Ave to S. Valley View Rd	Fair	Fair	Fair	Good
FUTURE BASELINE				
Rapp Rd to Arnos Rd	Good	Good	NA	Good
OR 99 at Arnos Rd	Fair	Fair	NA	Good
Arnos Rd to Creel Rd	Good	Good	NA	Good
OR 99 at Creel Rd	Fair	Fair	NA	Good
Creel Rd to Talent Ave	Poor	Poor	NA	Good
OR 99 at Talent Ave	Poor	Poor	Fair	Good
Talent Ave to S. Valley View Rd	Fair	Fair	Fair	Good
FUTURE RD SCENARIO 1				
Rapp Rd to Arnos Rd	Fair	Good	NA	Good
OR 99 at Arnos Rd	Good	Good	NA	Good
Arnos Rd to Creel Rd	Fair	Good	NA	Good
OR 99 at Creel Rd	Good	Good	NA	Good
Creel Rd to Talent Ave	Poor	Poor	NA	Good
OR 99 at Talent Ave	Poor	Poor	Fair	Good
Talent Ave to S. Valley View Rd	Fair	Fair	Fair	Good
FUTURE RD SCENARIO 2				
Rapp Rd to Arnos Rd	Fair	Good	NA	Good
OR 99 at Arnos Rd	Good	Good	NA	Good
Arnos Rd to Creel Rd	Fair	Good	NA	Good
OR 99 at Creel Rd	Good	Good	NA	Good
Creel Rd to Talent Ave	Fair	Fair	NA	Fair
OR 99 at Talent Ave	Good	Good	Fair	Good
Talent Ave to S. Valley View Rd	Good	Good	Fair	Fair

Notes:
Multimodal analysis uses available data from existing conditions analysis for all modes.

3.5. Land Use Compatibility

The three road scenarios are evaluated for compatibility with the planned land uses in the corridor that includes both urban sections (the City of Talent) and rural sections (Jackson County).

Compatibility Assessment (STIP Project)

The 2014-2015 STIP includes a roadway widening project along OR 99 between Rapp Road and Creel Road. The Project would continue the five-lane section of roadway currently in use between Suncrest/Culver Road and Rapp Road south to Creel Road. Comprehensive Plan designations and zoning along this section of roadway are primarily commercial which would be served well by the turn lane as part of the STIP project.

Commercial uses need access to the roadway to support business. Each access is an additional conflict point for all users (vehicle, bicycle, and pedestrian). The STIP project would provide a center left-turn lane refuge which may reduce the rear-end collision potential for entering vehicles, but may also reduce the number of adequate gaps for existing vehicles to safely maneuver due to the roadway widening. The STIP project would extend the bicycle lanes and pedestrian facilities through this section of roadway which currently has limited or no facilities providing access to businesses along this section of roadway.

Compatibility Assessment (Road Diet Scenario 1)

Unlike the STIP Project scenario, RD Scenario 1 would reduce capacity along OR 99 from south of Rapp Road to south of Creel Road with a three-lane cross-section. Like the STIP project scenario the center left-turn refuge could reduce the rear-end crash potential for vehicle turning left into a business or residence. It would also provide the same bicycle and pedestrian improvements as the STIP project scenario. However, the three-lane cross-section would result in exiting vehicles crossing fewer lanes of traffic when exiting businesses, a safety benefit over the STIP scenario.

Compatibility Assessment (Road Diet Scenario 2)

RD Scenario 2 includes modifications to two sections of roadway: those described in RD Scenario 1 as well as lane reductions between Creel Road and S. Valley View Road. For the section of roadway between Rapp Road and Creel Road, RD Scenario 2 would have land use compatibility similar to that described in RD Scenario 1. The section of roadway between Creel Road and S. Valley View Road primarily serves rural residential properties and through traffic along OR 99. The proposed two-lane cross section would be adequate to serve these land uses with periodic left-turn lanes as needed.

3.6. Access Management

Along both the east and west sides of the OR 99 corridor, between Rapp Road and S. Valley View Road, the majority of the segments do not meet current access spacing standards. The

one location that does meet the ODOT spacing standard (500 feet) is located between Talent Avenue and S. Valley View Road on the west side of OR 99.

Access Management will be an important element to any corridor scenario (Baseline with STIP project scenario, RD Scenario 1, and RD Scenario 2). Of particular concern will be the sections of OR 99 that include commercial zoning. Access consolidation and local street networks that provide alternative access to OR 99 would move in the direction of access management spacing standards and limit the number of conflict points for all users (vehicle, bicycle, and pedestrian).

At the time of construction or an increase in crash frequency, turn restrictions and roadway turn lanes (right-turn deceleration lane or left-turn refuge lane) should be assessed to determine if criterion is met.

3.7. Basic Roadway and Right-of-Way Considerations

The existing cross-sections along with potential cross-sections for the baseline and road diet scenarios are illustrated in Figure 5.

Future Baseline

Two potential five-lane cross-sections are illustrated in Figure 5. One of the cross-sections includes a center lane which can accommodate left turns while the other includes a raised median. Both include 6-foot bike lines and sidewalks. With the five-lane cross-section, the paved width is shown as 74 to 76 feet. This is more than 20 feet wider than the existing paved surface.

A landscape buffer is also an option shown in one of the images. The presence of a landscape buffer with the sidewalks will affect the overall right of way (ROW) needed. The ROW in the illustrations is shown as 90 to 92 feet. This will require additional ROW over the existing roadway.

The Baseline scenario includes four travel lanes, two in each direction, throughout the analysis corridor. This configuration will not require any traffic merges in either direction of travel.

This scenario would not result in any throughput capacity reductions on OR 99. In the event that a section of I-5 is fully or partially closed and traffic must be routed onto OR 99, conditions would be better than the existing four-lane roadway.

RD Scenario 1

Two potential three-lane cross-sections are illustrated in Figure 5. One of the cross-sections includes a center lane which can accommodate left turns while the other includes a raised median. Both include 6-foot bike lines and sidewalks. With the reduction from four travel lanes to three lanes, the paved width is shown 50 to 52 feet, the same as the existing roadway.

A landscape buffer is also an option shown in one of the images. The presence of a landscape buffer with the sidewalks will affect the overall right of way (ROW) needed. The ROW in the

illustrations is shown as 66 to 68 feet. The narrower width may not require any additional ROW over the existing roadway.

RD Scenario 1 includes transition points between four travel lanes (two in each direction) and two travel lanes (one in each direction). One of the transitions would be located in the northbound direction south of Creel Road. Traffic simulations and v/c ratios indicate that the merge is feasible without significant backups. The other transition would be located in the southbound direction south of Rapp Road. Drivers traveling southbound through the Rapp Road traffic signal may be more inclined to use the leftmost through travel lane at the signal because of the lane taper from two lanes to one lane south of the intersection. This behavior would reduce the effective capacity of the approach. However, this behavior can be mitigated by installing the taper at least 500 feet south of the intersection.

Although RD Scenario 1 would reduce throughput capacity on OR 99, the three-lane cross-sections would have residual capacity that could accommodate additional traffic when OR 99 must serve as a detour route to I-5 because a section of the freeway is fully or partially closed. The bottlenecks associated with I-5 traffic detours are most likely to occur on the freeway ramps and at the signalized intersections that access OR 99. Thus, the throughput of a four-lane roadway may not be necessary on this low-volume section of OR 99.

RD Scenario 2

In addition to the potential three-lane cross-sections that would be the same as RD Scenario 1, Figure 5 also provides illustrations of a two-lane rural cross-section and a rural cross-section with turn lanes for RD Scenario 2. The two-lane section includes 10-foot shoulders and an 8-foot painted median in a 52-foot paved surface, the same as the existing roadway. The section with turn lanes includes 7-foot shoulders and a 14-foot turn lane with a 52-foot paved surface. No additional ROW would be needed with either of these sections.

A three-lane section with two through lanes in one direction and one through lane in the other could also be considered for the section south of Creel Road. This section would maintain two-lane throughput in one direction but would require widening the roadway to add left-turn lanes at Talent Avenue or any other access points. The two-lane direction would allow vehicles to pass other slower vehicles but the roadway would still neck down to one lane in each direction from Creel Road to Rapp Road so the capacity benefit would be limited.

RD Scenario 2 includes transition points between four travel lanes (two in each direction) and two travel lanes (one in each direction). One of the transitions would be located in the southbound direction south of Rapp Road, as discussed with RD Scenario 1. Drivers traveling southbound through the Rapp Road traffic signal may be more inclined to use the leftmost through travel lane which could reduce the effective capacity of the approach. A similar issue would occur in the northbound direction north of S. Valley View Road. Because the S. Valley View Road intersection is expected to be very congested until the S. Valley View Road approach is widened, maximizing the northbound lane utilization will be important. The tendency to shift

into the leftmost lane can be mitigated by installing the taper at least 500 feet on the far side (northwest side) of the intersection.

Similar to RD Scenario 1, the reduction in throughput capacity may not be a significant concern on this low-volume section of OR 99. RD Scenario 2 would reduce throughput capacity on OR 99 but the two- and three-lane cross-sections would have residual capacity that could accommodate additional traffic when OR 99 must serve as a detour route to I-5. The bottlenecks associated with I-5 traffic detours are more likely to occur on the freeway ramps and at the signalized intersections that access OR 99.

4. CONCLUSIONS

The evaluation of the currently planned 5-lane STIP project and two road diet scenarios considered a variety of factors which are summarized in Table 18 on the following page.

In summary, the analysis indicates that the lane reductions associated with the road diet scenarios have many benefits including improved intersection safety, shorter crossing distances, and fewer roadway and right-of-way impacts. There would be a reduction in capacity, but not to a level that approaches forecast demand, or operational standards. The merge points from four through lanes (two in each direction) to two through lanes (one in each direction), associated with the Road Diet Scenarios, should be situated to equalize lane usage through the signal but would otherwise meet operational standards. These benefits would be realized with either of the road diet scenarios.

Although the road diet scenarios have many benefits, maintaining throughput capacity on OR 99 has been an ODOT goal when OR 99 must serve as a detour route to I-5 due to full or partial freeway closure. The three-lane cross-sections would have residual capacity that could accommodate additional traffic. The bottlenecks associated with I-5 traffic detours are most likely to occur on the freeway ramps and at the signalized intersections that access OR 99. Thus, the throughput of a four-lane roadway may not be necessary on this low-volume section of OR 99.

Table 18. Summary of Concept Performance and Impacts

Scenario	Existing Roadway	Baseline	RD Scenario 1	RD Scenario 2
General Description	▪ Existing lane configurations. ▪ Four through travel lanes through corridor	*Section 1 - South of Rapp Rd to South of Creel Rd*: ▪ Widen OR 99 from 4 lanes to 5 lanes ▪ Add sidewalks and bike lanes *Section 2 - South of Creel Road to north of S. Valley View Rd*: ▪ Same as existing	*Section 1 - South of Rapp Rd to South of Creel Rd*: ▪ Narrow OR 99 from 4 lanes to 3 lanes ▪ Add sidewalks and bike lanes *Section 2 - South of Creel Road to north of S. Valley View Rd*: ▪ Same as existing	*Section 1 - South of Rapp Rd to South of Creel Rd*: ▪ Same as RD Scenario 1 *Section 2 - South of Creel Road to north of S. Valley View Rd*: ▪ Narrow OR 99 from 4 lanes to 2 lanes ▪ Widen shoulders and add turn lanes
Traffic Volumes and Operations[1]	▪ Traffic volumes below available capacity ▪ Traffic operations meet applicable mobility thresholds except one intersection	▪ Traffic volumes far below available capacity ▪ Traffic operations meet applicable mobility thresholds except one intersection	▪ No change in forecast volumes from Baseline ▪ No impacts to parallel routes ▪ Negligible impacts to traffic operations ▪ Benefits from added turn lanes ▪ Adequate capacity in single through lane ▪ Merge near Rapp should be situated to equalize lane usage through signal	▪ No change in volumes from Baseline ▪ No impacts to parallel routes ▪ Negligible impacts to traffic operations ▪ Benefits from added turn lanes ▪ Adequate capacity in single through lane ▪ Merges near Rapp & S. Valley View should be situated to equalize lane usage through signal
Safety[2]	▪ Baseline condition	▪ Decrease in predicted crash rate at intersections ▪ Minor increase in predicted crash rate on 5-lane segment	▪ Decrease in predicted crash rate at intersections ▪ Decrease in predicted crash rate on 3-lane segment	▪ Decrease in predicted crash rate at intersections ▪ Decrease in predicted crash rate on 3-lane segment Minor increase in predicted crash rate on 2-lane segment
Bicycle and Pedestrian	▪ No bicycle or pedestrian facilities	▪ Added bike lanes & sidewalks improve safety ▪ Wider roadway creates longer crossing distances	▪ Added bike lanes & sidewalks improve safety ▪ Narrower roadway creates shorter crossing distances ▪ Higher traffic volume adjacent to bike lanes	▪ Added bike lanes & sidewalks improve safety ▪ Narrower roadway creates shorter crossing distances ▪ Wider rural shoulders ▪ Higher traffic volume adjacent to bike lanes
Basic Roadway Geometry and Right-of-Way	▪ No changes	▪ At least 20 feet additional paved surface ▪ Additional ROW needed (More than RD Scenarios)	▪ 3-lane section needs same paved surface as existing ▪ Some potential ROW needed for sidewalks and buffer	▪ 3-lane section needs same paved surface as existing ▪ Some potential ROW needed for sidewalks and buffer ▪ 2-lane rural section needs same paved surface as existing but no additional ROW

Notes:
1. Traffic analyses not conducted for this scenario. Findings are based on qualitative evaluation.
2. Based on Highway Safety Manual Part C and qualitative analysis