

**I-5 Interchange 19 (North Ashland)
Jackson County**

Interchange Area Management Plan

**Technical Memorandum #3:
Summary of Existing Conditions Analyses**

Prepared for

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July 2, 2007

Introduction and Background

This memorandum provides a summary of existing traffic operations analysis findings related to I-5 Interchange 19 (North Ashland Interchange). Analysis of existing and future conditions was originally conducted for the *Traffic Analysis Report* (TAR) for the I-5 Interchanges 14 and 19 (Green Springs and North Ashland Interchanges, dated August 22, 2006). This IAMP effort focuses only on Interchange 19. A separate IAMP addressing Interchange 14 is being prepared concurrently with the Interchange 19 IAMP project.

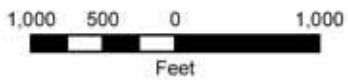
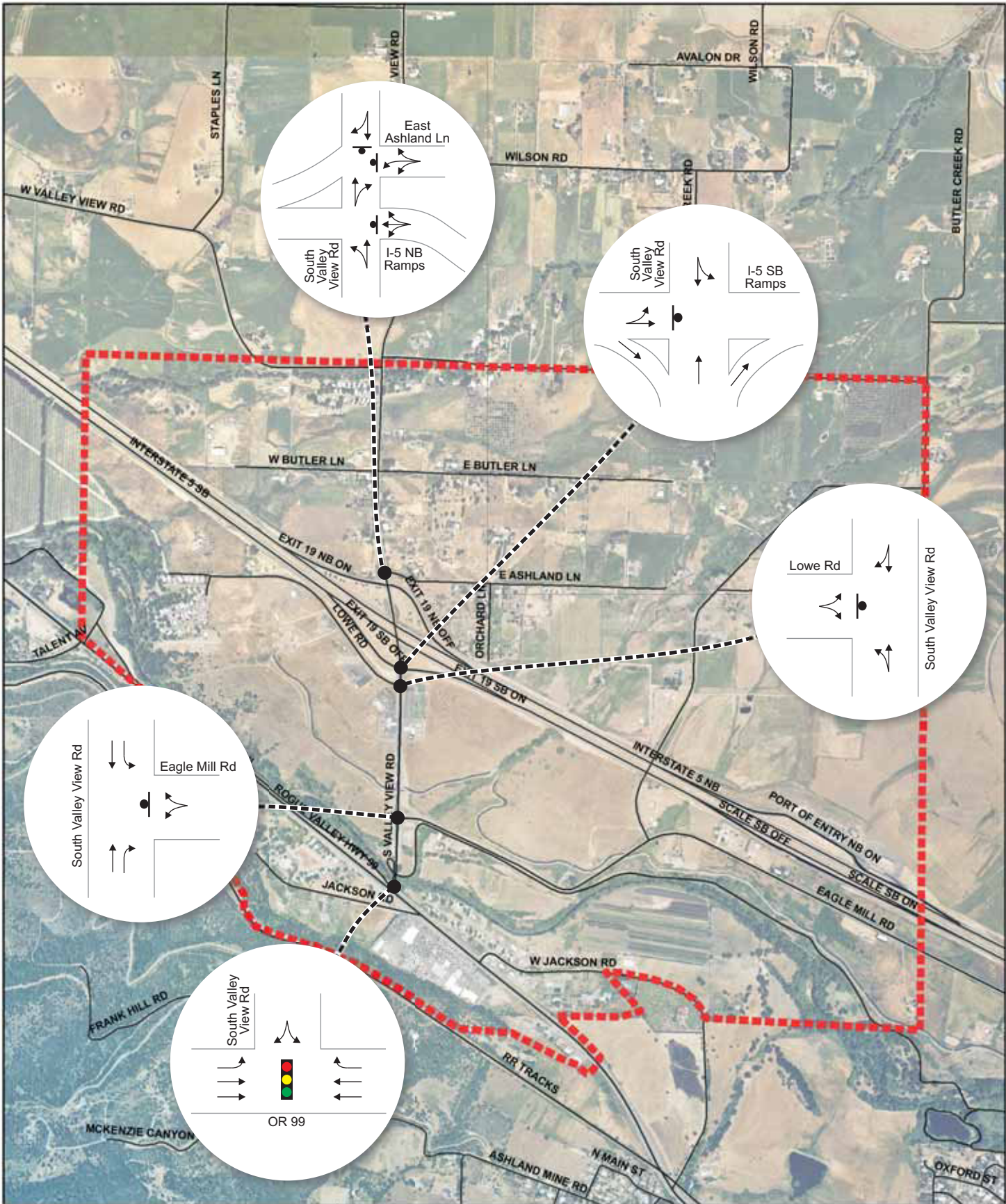
Although the TAR analyzed future traffic operations, this memorandum reviews only the sections of the TAR pertaining to existing conditions. The present IAMP project will develop revised future traffic volume projections that will be based on a new regional travel demand model. This memorandum also provides an inventory of existing roadways, plus the traffic signal warrant and safety analyses presented in the TAR.

Analysis Area

This interchange has a standard diamond configuration. South Valley View Road, a Jackson County facility, is the interchange crossroad and provides access between the Rogue Valley Highway (OR 99) and I-5. While located outside of Ashland's Urban Growth Boundary, this interchange is heavily used by commuters within the Rogue Valley MPO area. The segment of South Valley View Road between OR 99 and I-5 carries the highest traffic volumes of any Jackson County roadway.

The North Ashland Interchange analysis area consists of all the major intersections along South Valley View Road from East Ashland Lane located directly north of the I-5 northbound ramp terminal intersection, to OR 99, which lies about 2500 feet south of the interchange.

Figure 1 illustrates the analysis area, showing existing lane configurations and traffic control at the analysis area intersections. Table 1 provides roadway names, jurisdictional authorities, functional classifications, posted speeds (if available), number of lanes and operational standards for analysis area roadways. This information was collected through a site visit and review of the 1999 Oregon Highway Plan (OHP), 2003 Highway Design Manual (HDM) and the Jackson County Transportation System Plan (TSP).



GIS Data Source: Jackson County

Legend

- IAMP Management Area
- Traffic Signal
- Stop Sign

*Interchange 19
(North Ashland)*

Figure 1
*Existing Lane Configurations and
Traffic Control Devices*
Interchange 19 Area Management Plan

Table 1. Analysis Area Roadway Inventory

Roadway/Highway Name	Jurisdiction	ODOT Functional Classification	County Functional Classification	Posted Speed	Lanes	Operational Standard (v/c ratio)		
						OHP ¹	HDM ²	County ⁵
I-5 (Pacific Highway No. 1)	ODOT	Interstate Hwy, NHS ⁶ , FR ⁷	-	65	4	0.80	0.75	-
I-5 Ramp terminal Intersections	ODOT	Interstate Hwy, NHS ⁶ , FR ⁷	-	-	1	0.85	0.75	-
OR 99 (Rogue Valley Hwy)	ODOT	District Hwy	Arterial	45, 55 ³	5	0.90	0.85	0.95
South Valley View Road	Jackson County	-	Arterial	45, 55 ⁴	2, 3	-	-	0.95
Eagle Mill Road	Jackson County	-	Minor Collector	45	2	-	-	0.95
Lowe Road	Jackson County	-	Local Street	-	2	-	-	0.95
East Ashland Lane	Jackson County	-	Local Street	-	2	-	-	0.95

Notes:

1. Source: 1999 Oregon Highway Plan (OHP), Table 6. Standards apply to planning and design projects of existing and no-build conditions through the planning horizon (2030).
2. Source: 2003 Highway Design Manual (HDM), Table 10-1. Standards apply to planning and project design projects of build conditions through the planning horizon (2030).
3. 45 mph east of S. Valley View Rd, 55 mph west of S. Valley View Rd.
4. 45 mph south of I-5, 55 mph north of I-5.
5. Source: Jackson County Transportation System Plan.
6. NHS: National Highway System
7. FR: Freight Route

Traffic Counts

Traffic counts, conducted on May 16, 2006, consisted of 16-hour and 3-hour AM and PM peak period counts at analysis area intersections, and a 24-hour count on the I-5 mainline. The counts included full FHWA 13-class vehicle classifications. Table 2 below provides a list of all intersection count locations including the count type.

Table 2. Intersection Turning Movement Count Locations and Types

Location	Type of Count
I-5 mainline, both directions, South of North Ashland Interchange	24 hour
South Valley View Road at East Ashland Lane	16-hour (6 AM – 10 PM)
North Ashland Interchange 19 : Northbound Ramps at South Valley View Road	16-hour (6 AM – 10 PM)
North Ashland Interchange 19: Southbound Ramps at South Valley View Road	16-hour (6 AM – 10 PM)
South Valley View Road at Lowe Road	3-hour AM and PM
South Valley View Road at Eagle Mill Road	3-hour AM and PM
South Valley View Drive at Rogue Valley Highway (OR 99)	16-hour (6 AM – 10 PM)

Note: All 16-hour and 3-hour counts conducted May 16, 2006. 24-hour I-5 mainline count conducted from 22:00 May 15 to 22:00 May 16, 2006.

Traffic volumes are typically subject to seasonal variation. Therefore, the traffic counts conducted in May needed to be seasonally adjusted to roughly correspond to traffic volumes that are seen in the peak month, which is typically July or August. The ODOT Transportation Planning Analysis Unit (TPAU) has developed

procedures to convert traffic volumes taken at any time of the year to peak month volumes. TPAU methodology was employed to adjust the May 2006 volumes. Year 2006 seasonally adjusted PM peak hour volumes are shown in Figure 2.

Existing Traffic Operations

Intersection Analyses

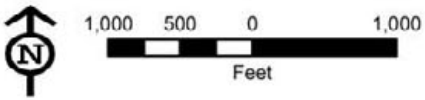
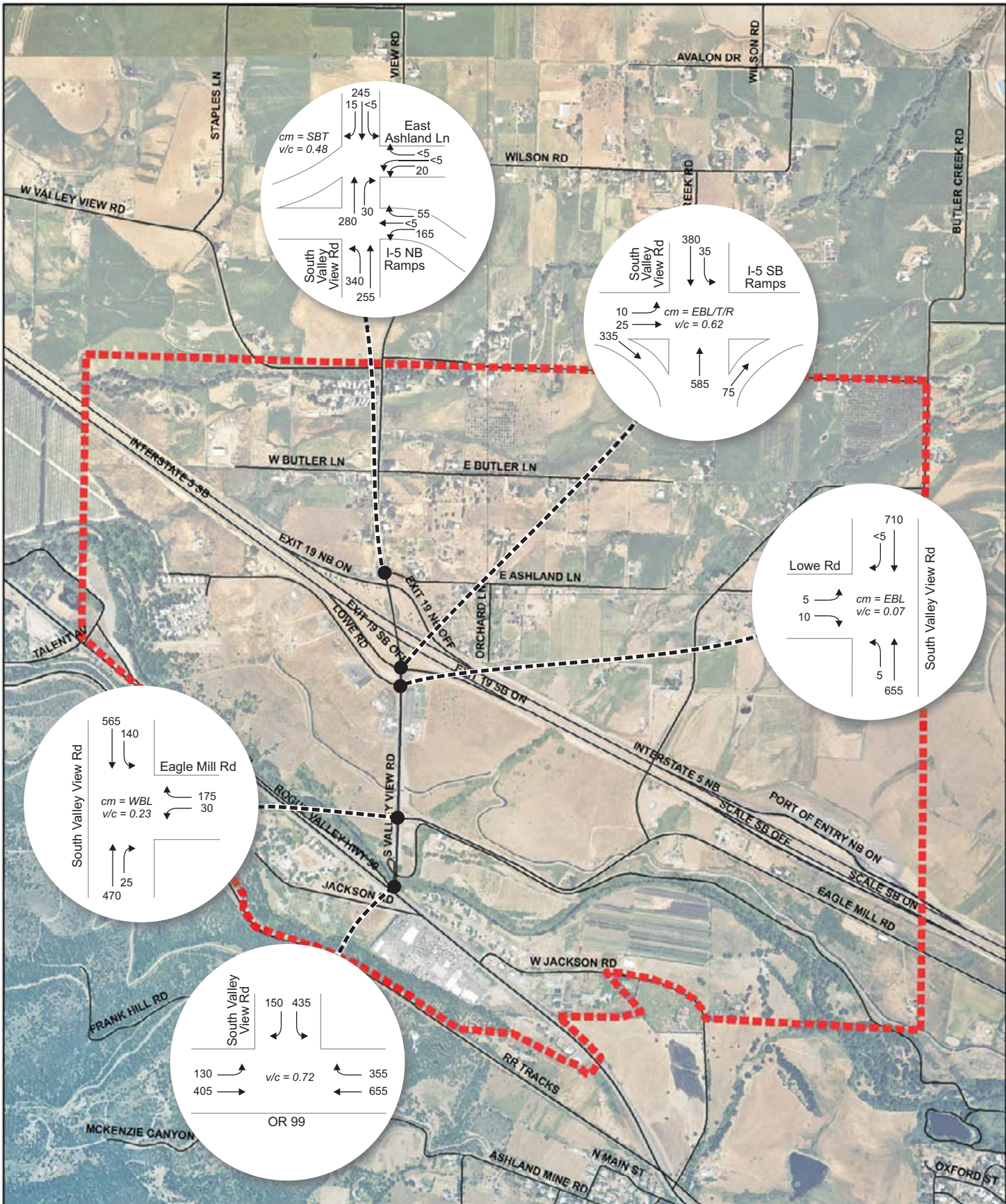
Table 3 summarizes the results for all analysis area intersections and also presents agency operational standards to enable comparison with intersection results. Table 4 summarizes queuing on critical approach legs at the same intersections. Critical movements at unsignalized intersections are typically the minor street left turns or, in the case of single-lane approaches, the minor street approaches. These movements are required to yield to all other movements at the intersection and thus are subject to the longest delays and have least capacity. Left turns from the major street are also subject to delays since motorists making these maneuvers must also yield to on-coming major street traffic.

Table 3. Existing (Year 2006) PM Peak Hour Traffic Operations Analysis Results

Intersection	Critical Movement	v/c Ratio	LOS	Operational Standard (v/c ratio)		
				OHP ¹	HDM ²	County ⁵
S. Valley View Rd & OR 99	n/a ⁴	0.72	C	0.90	0.85	0.95
S. Valley View Rd & Eagle Mill Rd	WBL	0.23	D	-	-	0.95
S. Valley View Rd & Lowe Rd	EBL	0.07	D	-	-	0.95
S. Valley View Rd & I-5 SB Ramps	EBL/T/R	0.62	A	0.85	0.75	0.95
S. Valley View Rd & I-5 NB Ramps	WBL/T/R	0.48	C	0.85	0.75	0.95
S. Valley View Rd & E. Ashland Lne	WBL/R	0.05	C	-	-	0.95

Notes:

1. 1999 Oregon Highway Plan Mobility Standards (Table 6)
2. 2003 ODOT Highway Design Manual Mobility Standards (Table 10-1)
3. Operational standards for Jackson County roadway facilities (Source: Jackson County Transportation System Plan)
4. Signalized intersection. LOS and v/c are for overall intersection.
5. Refers to left turn from Main Street to Ashland Street.



GIS Data Source: Jackson County

Legend

IAMP Management Area

cm = Critical Movement (stop controlled intersections)
 v/c = Intersection Volume to Capacity (signalized intersections)
 Critical Movement Volume to Capacity (stop controlled intersections)

**Interchange 19
(North Ashland)**

Figure 2
 Existing (2006) PM Peak Hour Traffic
 Volumes and Intersection Operations
 Interchange 19 Area Management Plan

Table 4. Existing (Year 2006) 30th Highest Hour 95th Percentile Queues

Intersection	Movement	95% Queue
S. Valley View Rd & OR 99	SBL/R	775 ²
	EBL	175 ¹
	WBR	125 ¹
S. Valley View Rd & Eagle Mill Rd	WBL/R	175
	SBL	75
S. Valley View Rd & Lowe Rd	EBL/R	25
	NBL/T	25
S. Valley View Rd & I-5 SB Ramps	EBL/T/R	125
	SBL/T	75
S. Valley View Rd & I-5 NB Ramps	WBL/T/R	175
	SBT	175 ²
S. Valley View Rd & E. Ashland Ln	WBL/R	50

Notes:

1. Storage bay at or above capacity.
2. Queue extends into adjacent intersection(s).

Northbound and Southbound Ramp Terminals

Traffic operations analyses at the interchange revealed that both ramp terminals currently meet ODOT OHP mobility standards. However, under seasonally adjusted volume conditions, queuing on the southbound exit ramp is calculated to extend into the deceleration portion of the ramp. Queue lengths are expected to lengthen as traffic volumes increase in the future.

The northbound ramp terminal intersection has an unconventional configuration in which left turning vehicles from South Valley View Road to the I-5 northbound entrance ramp have a free movement. All other approaches, consisting of the I-5 northbound exit ramp and southbound South Valley View Road, must yield to the northbound through and left turning movements. This type of intersection control violates driver expectation and is generally not recommended for new construction. However, since the heaviest movement at this intersection is the left turn from northbound South Valley View Road to I-5 northbound, this configuration provides optimal capacity of any unsignalized configuration. The TAR provided a safety analysis that found no evidence of an elevated crash rate at this intersection related to the unconventional intersection control.

South Valley View Road at Rogue Valley Highway (OR 99)

This intersection currently has a v/c ratio of 0.72 during seasonally-adjusted, PM peak-hour traffic volume conditions. This meets the OHP mobility standard of 0.90 for District-level highways. However, queuing on the single-lane southbound approach is significant, at nearly 800 feet. Future traffic operations are expected to worsen with major queuing on the southbound approach leg. The Jackson County TSP recognizes the need for improvements to South Valley View Road between the North Ashland Interchange and OR 99, as this segment of arterial carries the highest traffic volume of any County roadway. Proposed improvements to this segment of South Valley View Road consist of an upgrade to a five-lane arterial. The TSP classifies the project as a Tier 1 – financially constrained long-range (2014-2023) roadway improvement project.

Freeway Ramp Merge/Diverge Analysis

Analyses were conducted for each of the merge and diverge segments for the entrance and exit ramps at the interchange under existing 30th highest hour traffic volume conditions. The analyses showed that traffic operations at each of the ramp merge and diverge sections meet the OHP mobility standard for interstate freeways.

Safety Analysis

The TAR conducted a thorough safety analysis to determine if there were any significant documented safety issues within the analysis area and to recommend measures at specific locations or general strategies for improving overall safety.

The safety analysis included a review of crash history data supplied by the ODOT Crash Analysis and Reporting Unit for the period between January 1, 2002 and December 31, 2004, which are the three most recent full years for which crash data is available. The analysis also examined ODOT Safety Priority Index System (SPIS) data and compared calculated crash rates from analysis area roadways with statewide averages.

Overall, analysis found no apparent crash patterns at any of the study area intersections or freeway segments, and no single intersection demonstrated a significant safety problem. There were no reported crashes during the three year study period at either of the North Ashland Interchange ramp terminals. However, there were four crashes resulting in three injuries at the intersection of South Valley View Road at Lowe Road, which is very close to the interchange, directly to the south of the southbound ramp terminal intersection. The primary type of crashes at this location are turning and rear end. While the intersection spacing is much closer than what is advised under current interchange design standards, there is no evidence that the crashes were caused by the close spacing. Regardless, the TAR recommended that future improvements to the interchange should include a relocation of the intersection to a point further south. A possible relocation of Lowe Road, and other potential access management actions, will be explored in Technical Memorandum #6 (Access Management Plan).

Future Conditions

The TAR provided traffic operations analysis of interchange area roadways for no-build and various build alternatives under future traffic conditions: 2010 year of build and 2030 plan horizon year. The analysis was prepared prior to completion of the new Rogue Valley MPO Transportation Demand Model (RVMPO model), which did not include data for the Ashland area. Consequently, future traffic volumes were developed using a TPAU-approved methodology that involved determination of growth factors based on historical growth. In the intervening months, the RVMPO model has come online. Therefore, the analysis performed for this IAMP will revise future traffic volume projections, and they will be based on the projected population, household and employment data used in the RVMPO model.

Signal Warrant Analysis

The need for traffic signals at intersections is established by evaluating existing and projected traffic conditions against traffic signal warrants contained in the *2003 Manual on Uniform Traffic Control Devices* (MUTCD). The MUTCD provides eight signal warrants that consider different conditions under which a new signal may be warranted. The most commonly applied signal warrants are based on traffic volumes, although the MUTCD contains signal warrants based on crash experience, coordinated signal systems, and

warrants for signals at pedestrian and school crossings. Several volume-based MUTCD warrants were analyzed at the ramp terminal intersections for existing conditions (year 2006).

For years 2010 and 2030 conditions TPAU preliminary traffic signal warrants were evaluated. The TPAU preliminary warrants are based on MUTCD warrants, but require less data. TPAU developed these warrants for the purpose of projecting future traffic signal needs.

The TAR found that neither MUTCD Warrants nor TPAU preliminary signal warrants are met under existing or future conditions at either the northbound or southbound ramp terminals. Despite these results, the TAR noted that failure to meet preliminary signal warrants should not be viewed as a definitive disqualification for signalization as a possible future solution. Future year traffic operations analysis contained in the TAR showed both ramp terminals failing to meet operations standards within the planning horizon under their current, unsignalized conditions. Signalization may in fact be an appropriate solution as traffic volumes increase and interchange operations deteriorate.

The TAR also noted that a build option that included a loop ramp would remove the heaviest movement from the northbound ramp terminal intersection and would eliminate the need for a signal at the intersection through the planning horizon.

Access Management

The TAR provided an assessment of existing public and private accesses along South Valley View Road within the interchange influence area, as well as a review of access management standards as listed in the 1999 Oregon Highway Plan (OHP).

OHP Table 16: Minimum spacing standards applicable to freeway interchanges with two-lane crossroads specifies the following minimums for rural area type:

- 1320 feet distance to the first approach on the right; right in/right out
- 1320 feet distance to the first intersection where left turns are allowed
- 1320 feet distance between the last right in/right out approach and the start of taper for the entrance ramp

There are several access points that do not meet the above spacing standards, including some that are located within close proximity to the ramp terminals. Directly north of the northbound ramp terminal, East Ashland Lane, as well as several private residential driveways, intersect with South Valley View Road. East Ashland Lane provides access to a few homes and experiences very low volumes. Directly south of the southbound ramp terminal, Lowe Road, as well as several driveways (gas stations, a hotel and fast food restaurant) intersect South Valley View Road. Traffic volumes to the south of the interchange are significantly higher than those to the north of the interchange. As traffic volumes increase, the potential conflicts and delays associated with these accesses will have an increasingly significant impact on traffic operations at the interchange.

The TAR listed the following non-conforming accesses in the vicinity of the North Ashland Interchange 19:

- The intersection of East and West Butler Lane is less than 1320 feet from the northbound ramp terminal. The distance is estimated to be approximately 1100 feet.
- The intersection of East Ashland Lane is less than 1320 feet from the northbound ramp terminal. The distance is estimated to be approximately 200 feet.

- The intersection of Lowe Road is less than 1320 feet from the southbound ramp terminal. The distance is estimated to be approximately 200 feet.
- The driveways serving high-volume commercial establishments on both sides of South Valley View Road are less than 1320 feet from the southbound ramp terminal. The distance is estimated to be approximately 700 feet.

Numerous driveways serving fields and individual residences are also present both north and south of the interchange.

No determination was made as to which public and private approaches have valid access permits.

The TAR provided a list of changes to the local street network that would be necessary to fully comply with the OHP Access Management Standards. Most of the changes consisted of consolidating driveways and relocating streets away from the interchange crossroads. Specific access management actions will be identified as part of the IAMP process.

Bicycle and Pedestrian Facilities

The TAR provided a discussion of the provision of pedestrian and bicycle facilities as a component of the interchange improvement project. This section provides a summary of this discussion.

In the preparation of the TAR, the traffic engineer assumed that provisions would be made for pedestrians and bicyclists.

Oregon Revised Statutes (ORS) govern the provision of bicycle and pedestrian facilities. ORS 366.514 (Use of highway fund for footpaths and bicycle trails) specifies, in part, that "...reasonable amounts shall be expended as necessary to provide footpaths and bicycle trails, including curb cuts or ramps as part of the project. Footpaths and bicycle trails, including curb cuts or ramps as part of the project, shall be provided wherever a highway, road or street is being constructed, reconstructed or relocated."

ORS 366.514 does provide for exceptions. ORS 366.514 (2) states:

"Footpaths and trails are not required to be established under subsection (1) of this section:

(a) Where the establishment of such paths and trails would be contrary to public safety;

(b) If the cost of establishing such paths and trails would be excessively disproportionate to the need or probable use; or

(c) Where sparsity of population, other available ways or other factors indicate an absence of any need for such paths and trails."

There are numerous examples of interchanges being designed with specific facilities for pedestrians and bicyclists. No evidence has been presented to suggest that improvements designed to accommodate pedestrians and bicyclists at the North Ashland Interchange would be contrary to public safety.

The cost of providing bicycle and pedestrian facilities was not estimated. The cost of building the project without bicycle and pedestrian facilities also was not estimated. Such cost estimates were beyond the scope of the TAR, so no judgment was made as to whether the cost of providing such facilities would be "excessively disproportionate."

Technical Memorandum #3: Summary of Existing Conditions Analysis

The Ashland area is well known for outdoor activities, including bicycling and walking. Local governments in the area have invested in trails such as those in the Bear Creek Greenway. The presence of the Bear Creek Greenway enhances the opportunities for north-south travel in the valley. Though some may argue to the contrary, the Bear Creek Greenway probably helps justify providing bicycle and pedestrian facilities. The TAR judged it unlikely that the "absence of any need" criterion could be met to justify elimination of facilities for bicyclists and pedestrians at the interchange.

ODOT's usual signal plans provide for preformed detector loops in bicycle lanes and pushbuttons for actuation by pedestrians. Low volumes of bicycle and pedestrian activity during the peak hour are unlikely to have any measurable impact on traffic signal operations when actuated signals are used. Actuation by pedestrians may cause more time to be given to a particular movement than would be required for the vehicles for that cycle. Pedestrians and bicyclists may also cause motorists to be delayed when making certain turning movements, such as right turns. Potential conflicts between motorists and pedestrians and bicyclists were judged to be so low at both intersections that no adjustments were considered in the TAR when evaluating peak hour traffic operations.

The decision by the traffic engineer to evaluate peak hour traffic operations without specifically testing for the presence of pedestrians should not be used as justification by the roadway or signal designers to eliminate crosswalks, curb ramps, pedestrian signals, or detection. The roadway and signal designers should comply with appropriate provisions from ODOT's *Highway Design Manual* and the *Manual on Uniform Traffic Control Devices*.