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MEMORANDUM

Date:	October 14, 2010	Project #: 10633
To:	Jim Olson, P.E. City of Ashland	
cc:	Project Management Team	
From:	Susan Wright, P.E., KAI; Mike Tresidder, Alta; and Tom Litster, Otak	
Project:	City of Ashland Transportation System Plan Update	
Subject:	Draft Technical Memorandum #4 Existing System Conditions	

The purpose of this memorandum is to report the current conditions and performance of the City of Ashland's transportation system as part of this Transportation System Plan (TSP) update. Findings from the existing system conditions analysis will be used to identify system deficiencies and begin to indicate opportunities to improve the system to meet the City's goals and objectives identified in Technical Memorandum #2 Goals, Objectives, and Evaluation Criteria. As noted in Technical Memorandum #3, the City of Ashland recognizes six functional street classifications; they are: boulevard (i.e., arterial), avenue (i.e., major collector), neighborhood collector (i.e., minor collector), neighborhood street (i.e., local street), alley, and multiuse path. This memorandum uses this same terminology from Technical Memorandum #3. The existing conditions of the following elements of the transportation system are discussed further below:

- Active transportation facilities (facilities for active modes of transportation such as bicyclists and pedestrians);
- Traffic counts and traffic analysis;
- Collisions analysis;
- Access management;
- Bridge conditions;
- Inter-modal and intra-modal connections; and
- Funding analysis.

Future work within this TSP update will identify potential projects to improve the system.

Active Transportation Facilities

The term active transportation refers to modes of transportation that require physical activity on the part of the traveler. Traveling as a pedestrian or bicyclist are the two most common forms of active transportation. However, the term also incorporates skateboards, rollerblades, and other such modes. While some of these active modes are less common than pedestrian and bicycle travel, planning and designing for ways to accommodate multiple active transportation modes can help facilitate non-auto travel at the broadest level and help reduce conflicts or friction between non-auto modes. A simple example is making multi-use paths sufficiently wide to allow for safely accommodating bicycle and pedestrian travel. This section provides an analysis of the existing pedestrian and bicycle system in the City of Ashland. The analysis considers active transportation demand as well as reviews system, network, and location deficiencies in the pedestrian and bicycling networks using risk and gap analyses.

ACTIVE TRANSPORTATION DEMAND

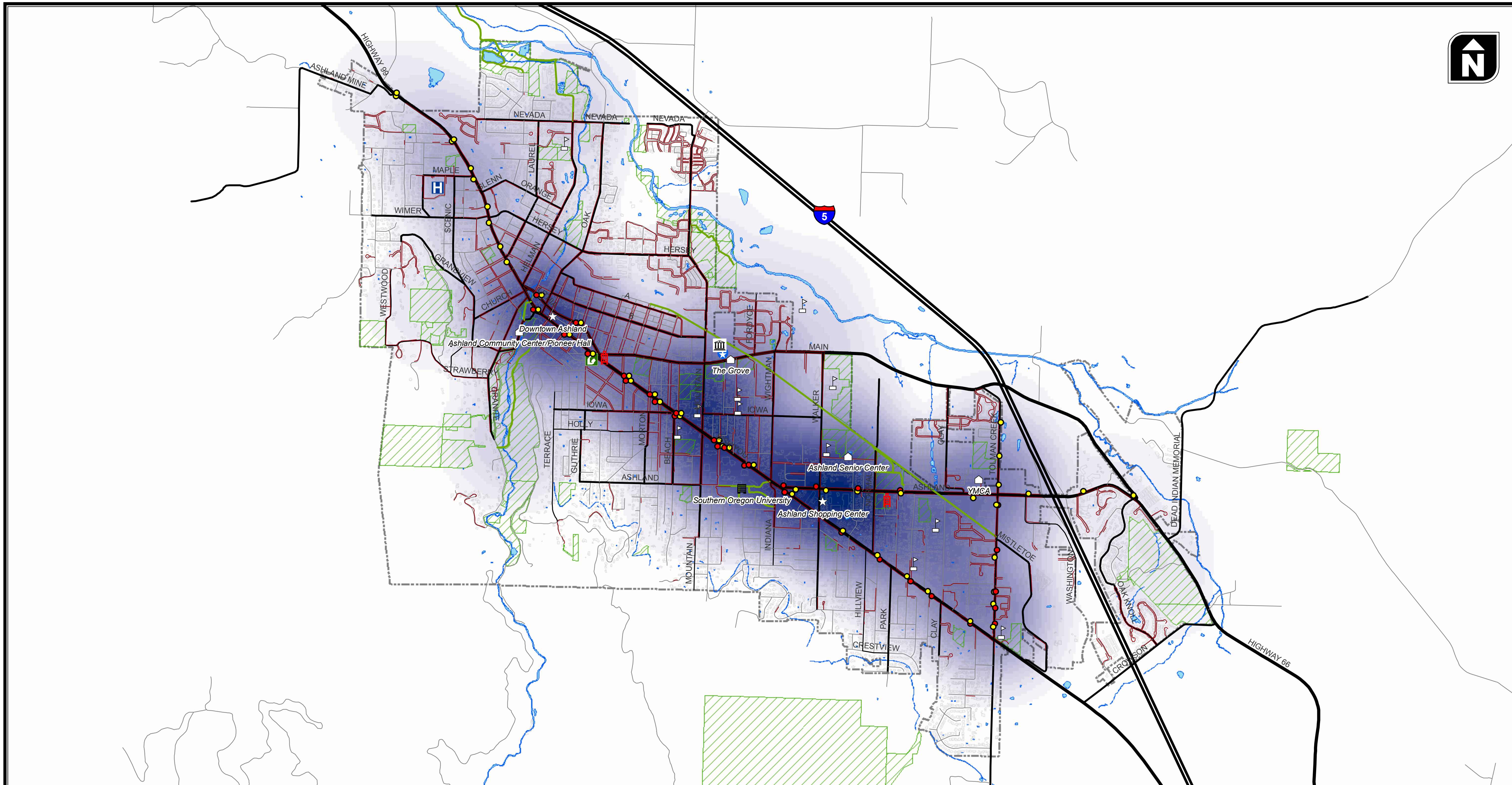
Active transportation demand potential in Ashland has been determined based on the "relative attractiveness" of key destinations in the area. Each attractor will generate demands from within a "comfortable" walking or cycling radius (referred to as the buffer area) – the amount of that demand depends on the relative strength of the attractor to walking and biking, its geographic proximity to potential users, and conglomerations of multiple attractions.

Relative strength is represented by a multiplier that rates the attraction of one destination compared to another and is based on our experience in other cities. For example, a transit center is likely to be more attractive than an individual bus stop. A list of attractors and their multipliers is included in Table 1.

Table 1 Attractiveness Multipliers

Attractor	Multiplier
Regional Center	5
Village Center	4
Transit Center	4
Bus Transfer Stop	2
Bus Stop	1
Regional Park	2
Local Park	1
Civic – Justice/Government	1
Civic – Library/Museum	2
Civic – Recreation Center	3
Post-Secondary Institution	4
School (K-12)	2

GIS spatial analysis was used to model potential active transportation demands in Ashland. Areas of high and low potential demand are shown on Figures 1 and 2 with the pedestrian and bicycle networks overlaid respectively.



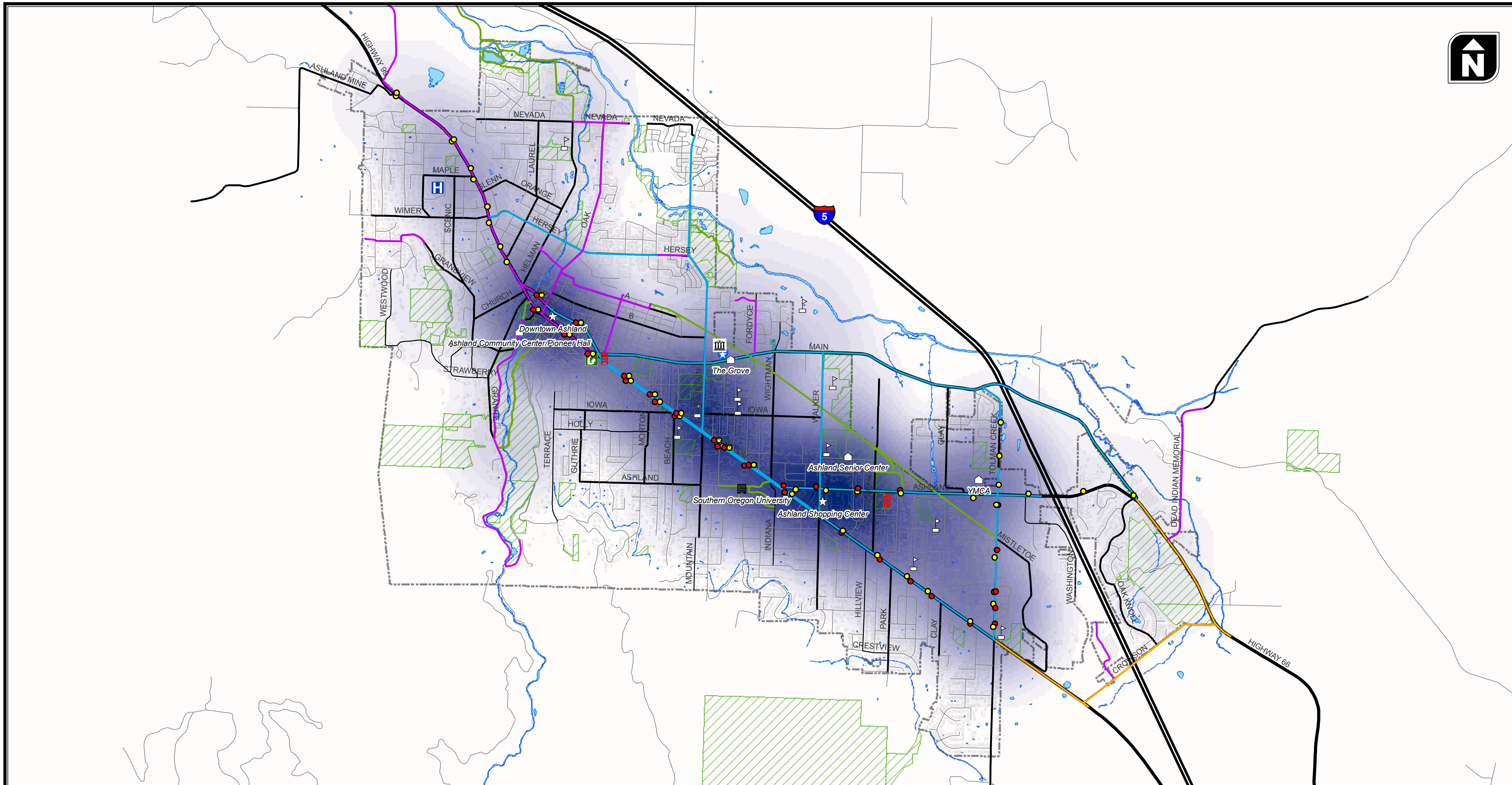
- Commercial Center
- Community Center
- University
- School
- Library
- City Hall
- Fire Station
- Hospital
- Law Enforcement
- Sidewalk
- Greenway
- Water
- Park
- City Limits

Active Transportation Demand

Low — High

Active Transportation Demand and Ashland Pedestrian Network

Figure 1



Commercial Center
Community Center
University
School
Library
City Hall
Fire Station
Hospital
Law Enforcement
Bike Lane
Bike Path/Greenway
Greenway
Shared Lane
Shoulder Bikeway
Water
Park
City Limits

Active Transportation Demand

Low High

Active Transportation Demand and Ashland Bicycle Network

Figure

2

Not surprisingly, the areas of highest demand are along the boulevard road network. This reflects the historical land use development pattern that has generally followed development of the motor vehicle and has resulted in high concentrations of attractors (e.g. strip retail, commercial centers, education facilities, etc.) along major traffic routes.

RISK ANALYSIS

Figures 3 and 4 show the location of crashes involving pedestrians or cyclists reported between 1999 and 2009. Crash data used for this risk analysis is from GIS data files provided by the City of Ashland. Pedestrian and bicycle volumes recorded during the weekday p.m. peak hour (3:15 – 4:15 PM) at the 31 intersections included in the 2009 count program are also displayed.

Pedestrian Risk Analysis

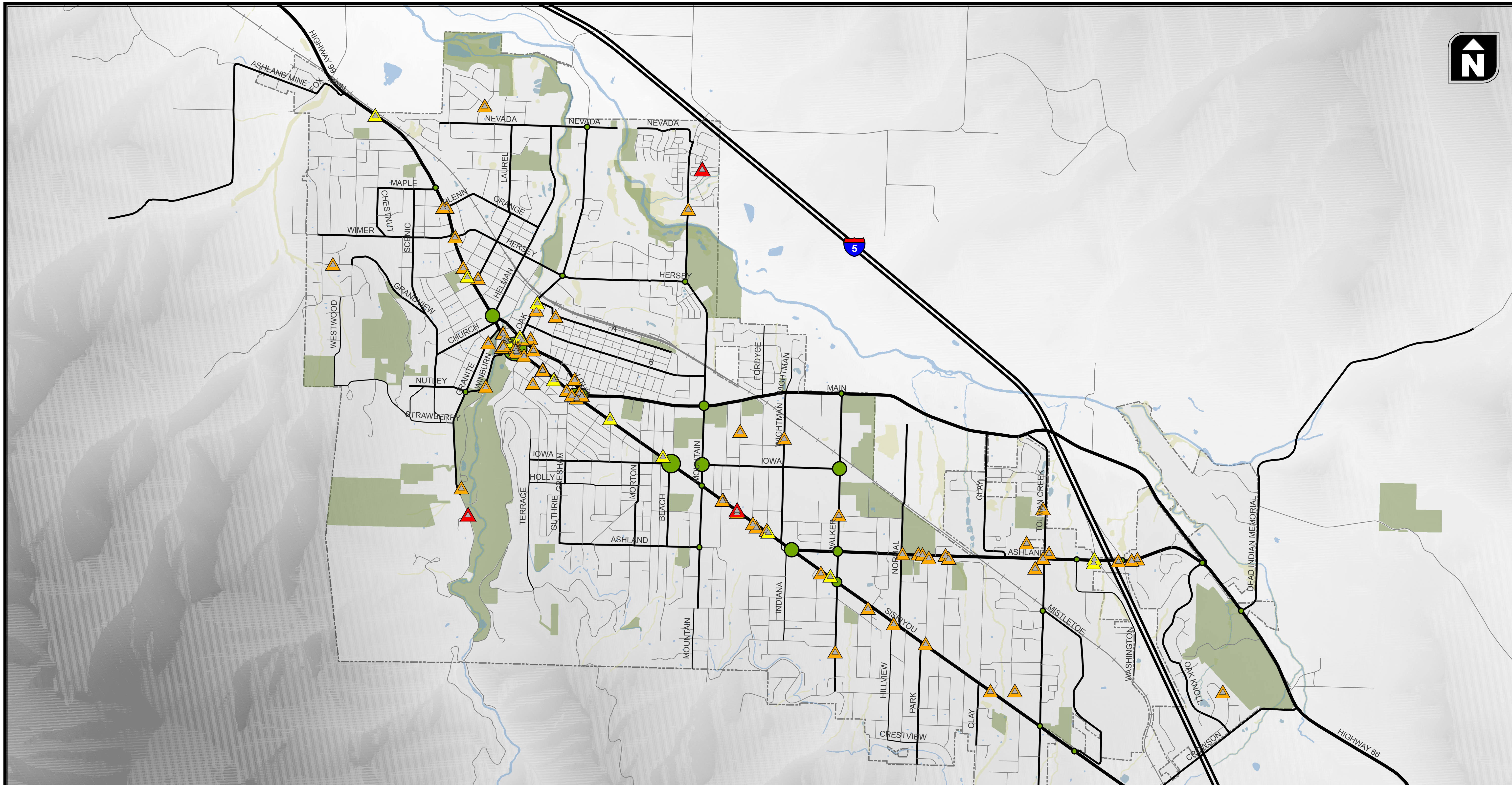
In the 10 years between 1999 and 2009 a total of 86 pedestrian crashes were reported including 68 injury crashes and 4 fatal crashes (i.e. approximately 84% of pedestrian-related crashes involved injury or death of the pedestrian). Figure 3 shows that pedestrian crashes are heavily concentrated along the boulevard road network – in particular along OR 99 and OR 66.

A segment analysis of these two highways (within the City of Ashland) is included in Table 2 and compares the pedestrian crash rate with environmental factors including vehicular traffic volumes, sidewalk coverage, and signalized crossing density and coverage.

Table 2 Pedestrian Analysis of Boulevard Segments

Segment			Pedestrian Crashes (crashes/mi/year)	Traffic Volume* (vph)	Sidewalk Coverage (%)	Signalized Crossing Density (cr/mi)	Signal Coverage (sig/int)
Road	To	From					
OR 99 (N Main St)	Valley View Rd	Maple St	0.2	-	56%	1.7	20%
OR 99 (N Main St)	Maple St	Helman St	1.0	1,500	83%	1.7	30%
OR 99 (N Main St)	Helman St	Siskiyou Blvd	2.4	1,500	85%	6.0	35%
OR 99 (Siskiyou Blvd)	Union St	Ashland St	1.1	900	95%	5.0	70%
OR 99 (Siskiyou Blvd)	Ashland St	Normal Ave	0.8	800	65%	0.0	30%
OR 99 (Siskiyou Blvd)	Normal Ave	Boundary	0.2	500	52%	1.1	7%
OR 66 (Ashland St)	Siskiyou Blvd	Clay St	0.6	1,100	80%	1.0	20%
OR 66 (Ashland St)	Clary	Boundary	1.0	1,250	65%	1.7	7%

*Weekday p.m. peak hour traffic volumes (3:15-4:15PM) collected in September/October 2009.
**Sidewalk coverage calculation determined by presence of sidewalks on <u>both</u> sides of the street.



Pedestrian Collision Severity
- Fatality
- Non-injury
- Injury
- Pedestrian Collisions

Pedestrian Traffic Volume (Weekdays PM)
- Less than 25
- 25 to 50
- 50 to 75
- 75 to 100
- More than 100

- Rivers
- Parks
- Wetlands
- City Limits

Pedestrian Traffic Volumes and Collisions

Figure 3

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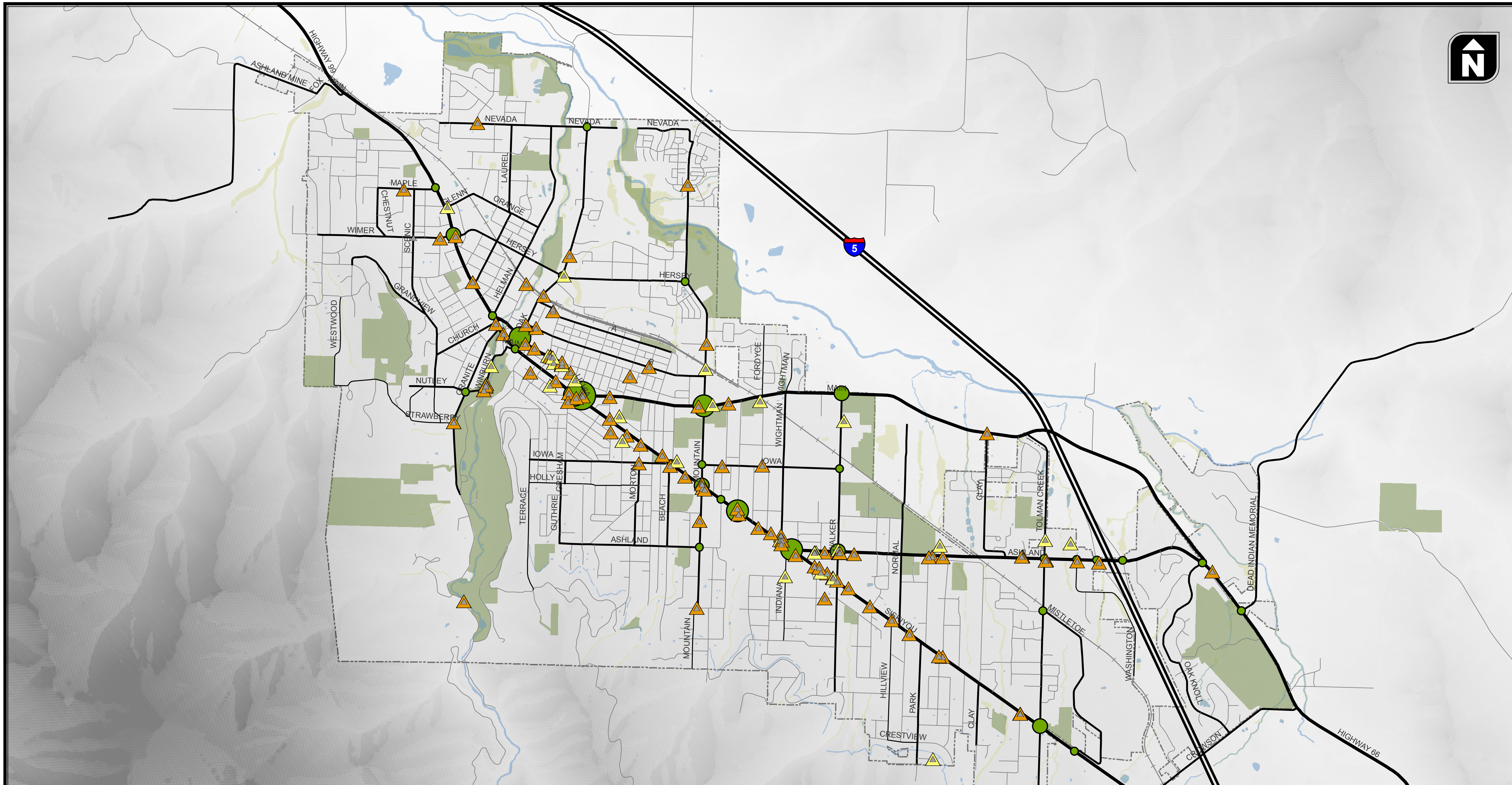

Bicycle Collision Severity
- Non-injury
- Injury
- Bicycle Collisions

Bicycle Traffic Volume (Weekdays PM)
- Less than 10
- 10 to 20
- 20 to 30
- More than 30

- Rivers
- Parks
- Wetlands
- City Limits

Bicyclist Traffic Volumes and Collisions

Figure 4

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In general the road segments with the highest pedestrian crash rates were those where high numbers of pedestrian crossings interact with high traffic volumes – such as in and near downtown – and where there is high traffic volumes and fewer intersections treated with signals.

Bicyclist Risk Analysis

In the 10 years between 1999 and 2009 a total of 122 cycling crashes were reported including 90 injury crashes (i.e., approximately 74% of crashes involving cyclists resulted in an injury to the cyclist). There were no fatal bicycle crashes during this time. Figure 4 shows that, similar to pedestrian crash distribution, bicycle crashes also tend to be concentrated along the boulevard road network – particularly along OR 99 and OR 66.

Bicycle crash rates for segments of OR 99 and OR 66 have been compared to bicycle traffic volume, vehicular traffic volume, bike lane coverage (note: this does not include shared roadways), and signalized crossing density and coverage in Table 3.

Table 3 Bicycling Analysis of Boulevard Segments

Segment			Bicycle Crashes (crashes/mi/year)	Bike Volume* (bph)	Traffic Volume* (vph)	Bike Lane Coverage (%)	Signalized Crossing Density (cr/mi)	Signal Coverage (sig/int)
Road	To	From						
OR 99 (N Main St)	Valley View Rd	Maple St	0.0	-	-	0%	1.7	20%
OR 99 (N Main St)	Maple St	Helman St	0.5	11	1,500	0%	1.7	30%
OR 99 (N Main St)	Helman St	Siskiyou Blvd	1.7	14	1,500	43%	6.0	35%
OR 99 (Siskiyou Blvd)	Union St	Ashland St	1.7	9	900	100%	5.0	70%
OR 99 (Siskiyou Blvd)	Ashland St	Normal Ave	2.2	13	800	100%	0.0	30%
OR 99 (Siskiyou Blvd)	Normal Ave	Boundary	0.4	15	500	80%	1.1	7%
OR 66 (Ashland St)	Siskiyou Blvd	Clay St	1.1	14	1,100	100%	1.0	20%
OR 66 (Ashland St)	Clary	Boundary	1.0	3	1,250	50%	1.7	7%

*Weekday p.m. peak hour bike and traffic volumes (3:15-4:15PM) collected in September/October 2009.

There are no obvious trends to explain why one segment performs better than another. In fact, a number of segments that are fully covered by on-street bike lanes and had lower traffic volumes than other segments recorded higher bicycle crash rates.

GAP ANALYSIS

System, network, and location deficiencies in the pedestrian and cycling networks have been assessed through a desktop inspection of the existing networks. The findings of this analysis are included below.

Pedestrian Network

There are a number of gaps in the City's major street (i.e., neighborhood collectors, avenues, and boulevards) sidewalk network. Based on the findings of Technical Memorandum #3, 34% of the 15.2 miles of boulevard network is covered by sidewalk on both sides of the street; 44% of the boulevard network has side on at least one side of the street. For avenues and neighborhood collectors, sidewalk coverage on at least one side of the street is approximately 48% and 43% respectively.

The overall objective of the City's sidewalk plan should be to cover the major street network (i.e., neighborhood collectors, avenues, and boulevards) with sidewalk on both sides. This can be phased by providing the highest priority to constructing sidewalk on both sides of all boulevards – specifically along Siskiyou Boulevard between Walker Avenue and Tolman Creek Road and the OR 66 (Ashland Street) bridge over I-5.

Beyond the boulevards, a sidewalk network on at least one side of all avenues and neighborhood collectors should be the next priority. Completing the network with sidewalk on both sides is the long term objective. The highest priority "collector" routes would include completing gaps along:

- Wimer Street;
- Hersey Street;
- Laurel Street;
- Church Street;
- Mountain Avenue;
- Indiana Street;
- Walker Avenue;
- Hillview Drive;
- Park Street;
- Clay Street; and
- Tolman Creek Road.

Signalized crossings are generally located along the boulevard road network, with the highest concentrations located downtown, in front of the Southern Oregon University, and near the intersection of OR 99 and OR 66. Detailed signal warrants have not been undertaken given the limited availability of data; however, in general, crossing locations where higher pedestrian / bicycle volumes interact with higher motorized traffic volumes and/or vehicle speeds should be prioritized for engineering studies to consider what (if any) enhanced pedestrian crossing treatments such as marked crosswalks, pedestrian-activated signals and traffic signals are warranted.

Bicycling Network

The land use and road network pattern in Ashland is a "fishbone" network that consists of one or two east-west "spines" (OR 99 and OR 66) supported by a north-south collector system. The spinal corridors provide a regional traffic mobility function as well as hosting the majority of the City's attraction-based land uses including its retail, commercial, service, and educational hubs. These locations are also attractive to bicycle riders (see Figure 1).

The existing bikeway network reflects the same structure as the major road network (i.e., neighborhood collectors, avenues, and boulevards); there are few continuous alternatives to the boulevard network, particularly routes that connect riders to the major land use attractions.

Overall, the City has approximately 30 miles of bikeway facilities. Approximately half of these are dedicated on-street facilities (i.e., bike lanes or bike shoulders) that cover approximately 32% of the major road network (i.e., neighborhood collectors, avenues and boulevards) in Ashland. An additional 23% of the bikeway network is off-street (i.e., either shared use path or greenway trails) with the remainder of the network consisting of shared roadway or signed shared roadway facilities.

Bicyclist Types

Increasingly, transportation planners in North America are recognizing that there are various types of cycling populations. For example, the City of Portland has found that its current ridership is represented by a small percentage of people (approximately 0.5% of the population) that are "strong and fearless" and will generally ride regardless of the roadway conditions. They have also identified an "enthused and confident" group (approximately 7% of the population) that is comfortable with the current policy of providing on-street bicycle lanes and similar facilities. This group represents the majority of recent growth in bicycle ridership.

However, there is a much larger segment of the population (approximately 60%) that is "interested but concerned" in cycling. These people would like to cycle but currently have some sort of concern about using the existing cycling system – often this is a concern about safety riding amongst traffic.

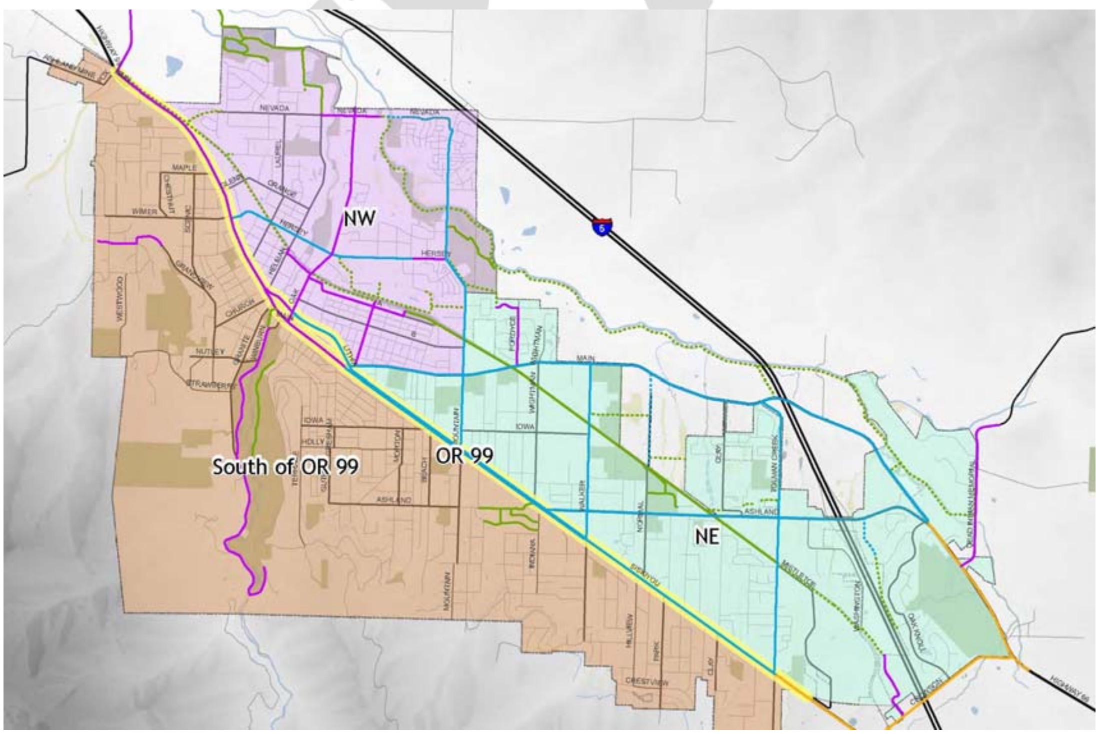
Based on the information above, there appears to be a need to provide a multi-level cycling system that caters to multiple types of cyclists, if there is to be a significant change in shifting more people to cycling. The existing cyclists, made up of the "strong and fearless" and "enthused and confident" groups, prefer direct, unimpeded, quick routes that tend to be along the major road network (i.e., neighborhood collectors, avenues and boulevards), whereas the "interested but concerned" group is less interested in speed and tend to seek greater comfort and an enhanced sense of safety. Generally, the "interested but concerned" group can be catered for in two ways:

- By providing more protection along busy traffic streets (e.g., using buffered, protected, or separated bike lanes); or
- By providing comfortable alternatives to the boulevard network, such as bicycle boulevards along low volume streets.

Network Analysis

An analysis of the bicycle network has been conducted that describes the existing system and provides some general comments on gaps in the existing system with a particular focus on facilities that cater towards the "interested but concerned" cycling group. For the purposes of the analysis, the City has been organized into four analysis areas: the north-east quadrant (generally north of Siskiyou Boulevard and east of downtown), the north-west quadrant (north of E Main Street including and west of downtown), south of OR 99, and along OR 99. Exhibit 1 illustrates these analysis areas.

Exhibit 1 Network Analysis Areas



North-East Quadrant

Currently, there is approximately 7 miles of off-street pathway or trail network in the City of Ashland that caters to the "interested but concerned" cyclist. Some of this is contained within parklands and tends to attract recreational cyclists.

The shared-use path adjacent to the rail corridor between Tolman Creek Road and 6th Street provides the basis of a comprehensive bike network in the north-east quadrant of the City. On-street bike lanes on E Main Street, OR 66 (Ashland Street), Tolman Creek Road, Walker Avenue, and Mountain Avenue provide connections to the attractions along OR 99 and OR 66 at regular spacing – approximately every 0.5 to 1.0 mile.

Future development of the network in the north-east quadrant could include "in-filling" existing connections between the shared-use pathway and OR 99 and OR 66 with a greater emphasis on facilities more appropriate for "interested but concerned" cyclists. This could include on-street (preferably buffered or separated) bike lanes or bicycle boulevards along lower volume streets.

North-West Quadrant

Bicycle facilities in the north-west quadrant consist of three primary north-south bikeways including on-street bike lanes on Mountain Avenue and shared lanes on Oak Street and 4th Street (the latter in downtown only). Only Mountain Avenue provides protected facilities and there are no north-south bikeways west of Oak Street.

East-west bikeways include shared lanes along Nevada Street and A Street (downtown) and on-street bike lanes along Hersey Street. A Street may be an appropriate street, in-terms of directness and traffic environment, to provide an interim on-street alternative to the continuation of the shared-use pathway along the rail corridor. There are a number of gaps along the Nevada Street bikeway including an incomplete connection across the creek between Kestrel Parkway and Oak Street and the section west of Helman Street. Apart from those already provided, there are few opportunities for additional east-west bikeway connections due to geographical and physical barriers.

Continuing the shared-use pathway along the rail corridor would provide a comfortable "distributor" function for bicyclists in the north-west quadrant. A number of pathway "stubs" would provide connection to existing bikeways such as Nevada and Hersey Streets as well as development areas such as the lands south of Hersey Street between Mountain Avenue and Oak Street.

Similar to the north-east quadrant, connections to OR 99 can be provided along low volume streets in the form of bicycle boulevards or using buffered or separated on-street bike lanes where appropriate. These will supplement or upgrade the existing connections to OR 99 that include an on-street bike lane along Hersey Street and shared roadways along Oak Street, and 4th Street. Additional connections may include a central connection to downtown (perhaps a bicycle boulevard along 1st or 2nd Street) and a north-south connection between Helman and Hersey Streets. A north-south connection reaching into the residential areas west of Oak Street and north of Hersey Street would also be appropriate. This could connect to the existing greenway trail north of Nevada Street.

South of OR 99

The existing cycling network is sparse south of OR 99 with a few off-street pathways provided in the Southern Oregon University campus and in Lithia Park and a shared roadway route along Winburn Way.

There appears to be fewer opportunities to create a continuous bicycle route parallel to OR 99 as is provided by the rail corridor trail on the north side of OR 99. However, there is an opportunity to provide a more circuitous bicycle boulevard network that winds through the local street network. This will require additional signing and striping to highlight changes in direction, but would provide an alternative to OR 99 for "interested but concerned" cyclists that are generally less concerned with speed and direct routes.

There are few north-south connections currently. It is recommended that north-south connections to OR 99 occur at a spacing of at least every mile initially to be filled in later to every 0.5 miles or less. At a minimum these should consist of on-street bike lanes, but preferably would consider separated or protected bike lanes along heavier traffic streets or utilize lower volume streets to create bicycle boulevards.

OR 99

OR 99 provides the quickest and most direct route through the City as well as between land use attractions which are generally concentrated along the highway. The existing policy of developing on-street bike lanes will continue to attract the "strong and fearless" and "enthused and confident" cycling groups. Therefore, continuing on-street bike lanes north of the E Main Street / Siskiyou Boulevard intersection is still appropriate.

However, to attract the "interested but concerned" cycling group, a system of protected or buffered bike lanes along OR 99 or a parallel alternative route along lower volume streets or an off-street shared pathway is recommended. North of the highway, there are no continuous parallel streets and the shared-use path adjacent the rail corridor is approximately 0.5 miles north of OR 99. There is more potential for a parallel route south of OR 99, although this would be a circuitous combination of local streets. The potential for protected bike lanes along OR 99 should be investigated further.

Some locations along OR 99 may warrant enhanced crossing treatments for less experienced cyclists. This could include median refuge crossings and pedestrian-activated signals with bicycle push buttons. Enhanced crossings should be considered where crossing opportunities are limited by traffic volumes or vehicle speeds or where these is a safety risk for crossing bicyclists.

Traffic Analysis

Technical Memorandum #3 contains a detailed inventory of the City of Ashland's roadway facilities for those classified as neighborhood collectors and higher (i.e., neighborhood collectors, avenues, and boulevards). The inventory in Technical Memorandum #3 includes information on functional classification, jurisdictional responsibilities, posted speed limits, surface type, number of lanes and other similar roadway characteristics. The focus of this section is to report the existing conditions traffic operations for the study intersections identified for the TSP update. The sub-sections below present information on the traffic count data used in the evaluation, the analysis methodology applied, the operational standards used to assess the results, and the traffic operations results for the study intersections.

STUDY INTERSECTION OPERATIONS ASSESSMENT

Existing conditions traffic operations analysis was conducted for 31 key intersections within the City of Ashland during the weekday p.m. peak hour.

Traffic counts were conducted at the study intersections in September and October of 2009 and consist of both 16-hour and 4-hour counts. All 16-hour counts used 15-minute intervals in the 6-9 a.m. and 2-6 p.m. periods. All 4-hour counts used 15-minute intervals in the 2-6 p.m. period. All intersection traffic counts include vehicular turning movements, pedestrian movements (with or without marked crosswalks), bikes, and wheeled pedestrians (wheelchairs, skateboards, etc). Additional pedestrian counts were conducted on OR 99 between Palm and Garfield Streets and on OR 99 between Morse and Mountain Avenues. Additional traffic volumes for the I-5 mainline were obtained from the 2009 ODOT Transportation Volume Tables (Reference 1), which provide the average annual daily traffic at select locations on the I-5 corridor. *Appendix A* contains the traffic count data used for the traffic operations analysis.

Analysis Methodology and Performance Standards

All operations analysis described in this report were performed in accordance with the procedures in the *2000 Highway Capacity Manual* (Reference 2).

Per the August 2010 Methodology Memorandum (see *Appendix B*) and the ODOT *Analysis Procedures Manual* (APM – Reference 3), intersection operational evaluations were conducted based on the peak 15-minute flow rate observed during the weekday p.m. peak hour. Using the peak 15-minute flow rate ensures this analysis is based on a reasonable worst-case scenario. For this reason, the analysis reflects conditions that are likely to occur for 15 minutes out of each average weekday p.m. peak hour. The transportation system will likely operate under conditions better than those described in this report during other typical time periods.

The operational analysis results were compared with mobility standards used by the local agencies to assess performance and potential areas for improvement.

City of Ashland Intersection Traffic Operations Performance Standards

The City of Ashland has not adopted level-of-service (LOS) or volume-to-capacity (V/C) ratio standards for signalized or unsignalized intersections but will likely establish standards as part of the TSP Update. Prior to developing intersection operation standards, City of Ashland intersections that do not meet the following operational thresholds will be identified:

- LOS "D" at signalized and all-way stop controlled (AWSC) intersections if the V/C ratio is not higher than 1.0 for the sum of critical movements.
- LOS "E" for the poorest operating approach at two-way stop controlled (TWSC) intersections. Approaches operating at a LOS "F" where a traffic signal is not warranted will also be identified.

A summary of the operational thresholds that will be used to identify study intersections under city jurisdiction with operational issues is included in Table 4.

Table 4 Operational Thresholds for City Intersections

Intersection	Traffic Control[1]	Threshold for Identification	Intersection	Traffic Control[1]	Threshold for Identification
Tollman Creek Road/ Mistletoe Road	TWSC	LOS "E"	E Main Street/ Walker Avenue	TWSC	LOS "E"
Nutley Street/ Granite Street	TWSC	LOS "E"	Walker Street/ Iowa Street	AWSC	LOS "D"
Hersey Street/ Oak Street	AWSC	LOS "D"	Mountain Avenue/ Ashland Street	TWSC	LOS "E"
Nevada Street/ Oak Street	TWSC	LOS "E"	Mountain Avenue/ Iowa Street	TWSC	LOS "E"
Mountain Avenue/ E Main Street	Signal	LOS "D"	Mountain Avenue/ Hersey Street	AWSC	LOS "D"
OR99 NB/ E Main Street	Signal	LOS "D"	OR99/ OR66	Signal	LOS "D"
OR99 SB/ E Main Street	N/A	LOS "E"	OR99/ Walker Street	Signal	LOS "D"
OR99/ Mountain Avenue	Signal	LOS "D"	OR66/ Walker Street	Signal	LOS "D"
OR99/ Garfield Street	TWSC	LOS "E"			

[1]TWSC: Two-way stop-controlled (unsignalized); AWSC: All-way stop-controlled (unsignalized)

ODOT Intersection Traffic Operations Performance Standards

ODOT uses volume-to-capacity (V/C) ratio standards to assess intersections operations. Table 6 of the *Oregon Highway Plan* (OHP - Reference 4) and Table 10-1 of the *Oregon Highway Design Manual* (HDM – Reference 5) provide maximum volume-to-capacity ratios for all signalized and unsignalized intersections outside the Metro area. The OHP ratios are used to evaluate existing and future no-build conditions, while the HDM ratios are used in the creation of future TSP alternatives which involve projects along state highways. The ODOT controlled intersections within the study area are located along OR 99 and OR 66, which are both designated as District

Highways within a Metropolitan Planning Organization (MPO). However, OR 99 is also designated as a Special Transportation Area (STA) between Maple Street and Oak Street and as an Urban Business Area (UBA) between Oak Street and E Main Street.

Table 5 summarized the intersection performance standards for OR 99 and OR 66 per the OHP.

Table 5 Summary of ODOT Intersection Performance Standards

Intersection	Traffic Control	OHP Standard	HDM Standard	Intersection	Traffic Control	OHP Standard	HDM Standard
OR99/ South Valley View Road	Signal	V/C=0.90	V/C=0.85	OR99/ Mistletoe Road	TWSC	V/C=0.90	V/C=0.85
OR99/ Maple Street	Signal	V/C=0.95	V/C=0.95	OR66/ Tollman Creek Road	Signal	V/C=0.90	V/C=0.85
OR99/ Hersey Street	TWSC	V/C=0.95	V/C=0.95	OR66/ Washington Street	TWSC	V/C=0.90	V/C=0.85
OR99/ Helman Street	Signal	V/C=0.95	V/C=0.95	OR66/ I-5 SB Ramps	TWSC	V/C=0.90	V/C=0.85
OR99 NB/ Oak Street	TWSC	V/C=0.95	V/C=0.95	OR66/ I-5 NB Ramps	TWSC	V/C=0.90	V/C=0.85
OR99 SB / Oak Street	TWSC	V/C=0.95	V/C=0.95	OR66/Oak Knoll/ E Main Street	TWSC	V/C=0.90	V/C=0.85
OR99/ Tollman Creek Road	TWSC	V/C=0.90	V/C=0.85	OR66/ Dead Indian Memorial	TWSC	V/C=0.90	V/C=0.85

[1]TWSC: Two-way stop-controlled (unsignalized)

Traffic Volumes

The following sub-sections discuss the weekday evening (PM) peak hour traffic volume development and the seasonal adjustment factor used to adjust the September and October 2009 traffic counts.

Evening (PM) Peak Hour Development

Traffic volumes were reviewed along OR 66, OR 99 and for the entire combined study area to determine a one-hour system peak period for the TSP intersection analysis. A system weekday p.m. peak hour was found to occur along OR 66 between 3:45 and 4:45 p.m. and along OR 99 between 3:15 and 4:15 p.m. The entire study area combined was also found to have a system peak hour occurs between 3:15 and 4:15 p.m. However, because the travel demand model that will be used to generate the future conditions analysis will produce traffic volumes representative of a 1-hour weekday p.m. peak that is assumed to occur between 4:00 and 6:00 p.m., a secondary system peak hour was identified for the City of Ashland that occurs within this time frame. As shown in Table 6, a secondary system peak hour occurs from 4:15 to 5:15 p.m. that is within 1.5% of the afternoon peak hour traffic volumes system wide. Traffic volumes from the 4:15 to 5:15 p.m. hour were used in the existing conditions intersection analysis and will be used to post-process the future traffic volume projections from the travel demand model.

Table 6 Peak Hour Summary

OR 66			OR 99			All Study Intersections		
1-Hour TEV	Time	% Dif from Peak	1-Hour TEV	Time	% Dif from Peak	1-Hour TEV	Time	% Dif from Peak
9333	3:00-4:00	-4.9%	14,820	3:00-4:00	-1.7%	32,336	3:00-4:00	-1.1%
9462	3:15-4:15	-3.6%	**15,070**	**3:15-4:15**	**0.0%**	**32,701**	**3:15-4:15**	**0.0%**
9604	3:30-4:30	-2.2%	14,909	3:30-4:30	-1.1%	32,666	3:30-4:30	-0.1%
9819	**3:45-4:45**	**0.0%**	14,691	3:45-4:45	-2.5%	32,577	3:45-4:45	-0.4%
9784	4:00-5:00	-0.4%	14,311	4:00-5:00	-5.0%	31,961	4:00-5:00	-2.3%
9812	**4:15-5:15**	**-0.1%**	**14,408**	**4:15-5:15**	**-4.4%**	**32,203**	**4:15-5:15**	**-1.5%**
9767	4:30-5:30	-0.5%	14,239	4:30-5:30	-5.5%	32,008	4:30-5:30	-2.1%
9448	4:45-5:45	-3.8%	13,953	4:45-5:45	-7.4%	31,317	4:45-5:45	-4.2%
9164	5:00-6:00	-6.7%	13,449	5:00-6:00	-10.8%	30,314	5:00-6:00	-7.3%

Seasonal Adjustment Factor

30th Highest Hour Volumes (30 HV) for Ashland were calculated based on the traffic counts collected in September and October of 2009 and the application a seasonal adjustment factor. 30 HV are considered the traffic volumes present in the 30th highest hour out of the year; these volumes are intended to represent a weekday evening peak hour during the peak month of the year. The APM identifies three methods for identifying seasonal adjustment factors for highway traffic volumes. All three methods utilize information provided by Automatic Traffic Recorders (ATR) located in select locations throughout the State Highway System that collect traffic data 24-hours a day/365 days a year. Each method was evaluated to determine the most appropriate method for the study area. Based on the evaluations and direction provided by TPAU, the ATR Characteristics Table Method was used to develop 30 HV volumes for OR 99 and resulted in a factor of 1.08 for the September counts and 1.13 for the October counts. The Seasonal Trend Table method, utilizing and average of summer and commuter trends, was used to develop 30 HV for all other study intersections and resulted in a factor of 1.05 and 1.09 for October counts. *Appendix B* contains the August 2010 Methodology Memorandum which documents the details how the adjustment factors were calculated.

Traffic Operations Analysis Results

Level-of-service (LOS), volume-to-capacity (v/c) ratios and 95th percentile queue lengths were calculated for each of the study intersections identified for the Ashland TSP update. The following two sub-sections present the results of these analyses and discuss which intersections do not meet the applicable standards.

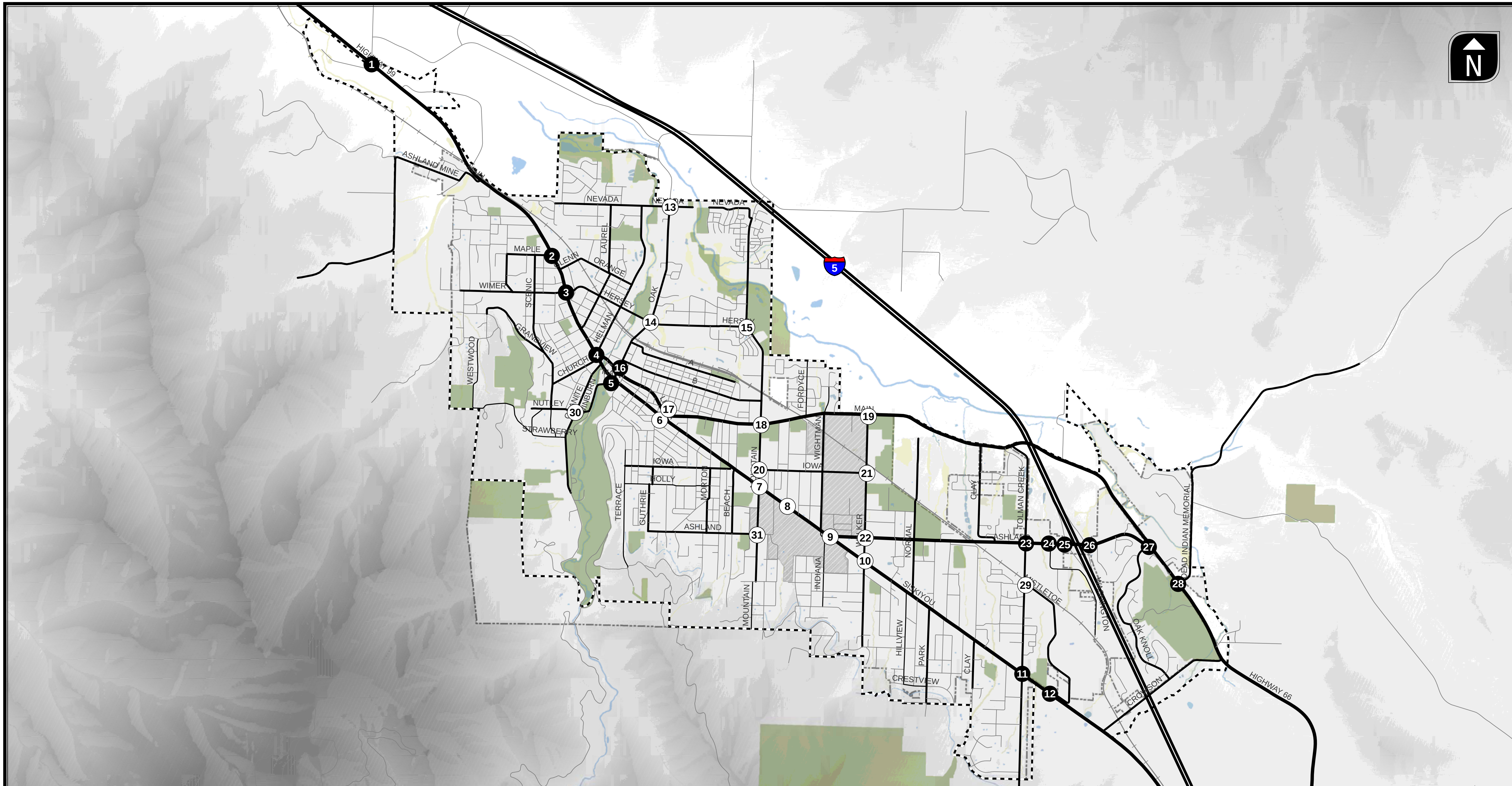
Intersection Delay and Capacity Analysis

Traffic analysis was conducted for 31 study intersections within the City of Ashland. Figures 5, 6, and 7 illustrate the study intersection locations, lane configurations and traffic control devices, and the traffic operations results, respectively. Table 7 summarizes the volume-to-capacity (v/c) ratio and level-of-service (LOS).

Table 7 Study Intersections Traffic Operations Analysis Results

Intersection ID #	Study Intersections	Jurisdiction	V/C Ratio	LOS
			PM Peak	PM Peak
1	OR 99/Valley View Road	ODOT	0.78	C
2	OR 99/Maple Street	ODOT	0.50	A
3	OR 99/Hersey Street/Wimer Street	ODOT	0.63	F
4	OR 99/Helman Street	ODOT	0.35	A
5	OR 99 Southbound/Oak Street	ODOT	0.82	F
6	OR 99 Southbound/E Main Street	Ashland	0.13	A
7	OR 99/Mountain Avenue	Ashland	0.60	C
8	OR 99/Garfield	Ashland	0.11	C
9	OR 66/OR 99	Ashland	0.37	B
10	OR 99/Walker Street	Ashland	0.41	A
11	OR 99/Tolman Creek Road	ODOT	0.13	B
12	OR 99/Mistletoe Road	ODOT	0.05	A
13	Nevada Street/Oak Street	Ashland	0.09	B
14	Hersey Street/Oak Street	Ashland	0.34	A
15	Mountain Avenue/Hersey Street	Ashland	0.45	B
16	OR 99 Northbound/Oak Street	ODOT	0.55	E
17	OR 99 Northbound/ E Main Street	Ashland	0.51	B
18	Mountain Avenue/E Main Street	Ashland	0.59	E
19	E Main Street/Walker Avenue	Ashland	0.24	C
20	Mountain Avenue/Iowa Street	Ashland	0.06	B
21	Walker Street/Iowa Street	Ashland	0.24	A
22	OR 66/Walker Street	Ashland	0.45	B
23	OR 66/Tolman Creek Road	ODOT	0.63	C
24	OR 66/Washington Street	ODOT	0.11	B
25	OR 66/I-5 Exit 14 Southbound Ramps	ODOT	0.45	C
26	OR 66/I-5 Exit 14 Northbound Ramps	ODOT	>1.0	F
27	OR 66/E Main Street/Oak Knoll Drive	ODOT	0.05	C
28	OR 66/Dead Indian Memorial Road	ODOT	0.14	B
29	Tolman Creek Road/Mistletoe Road	Ashland	0.05	B
30	Granite Street/Winburn Way/Nutley Street	Ashland	0.01	A
31	Mountain Avenue/Ashland Street	Ashland	0.08	B

Note: Rows that are shaded denotes intersections exceeding standards.



ODOT Study Intersection
City Study Intersection

Existing Traffic Conditions

CITY OF ASHLAND

Figure 5

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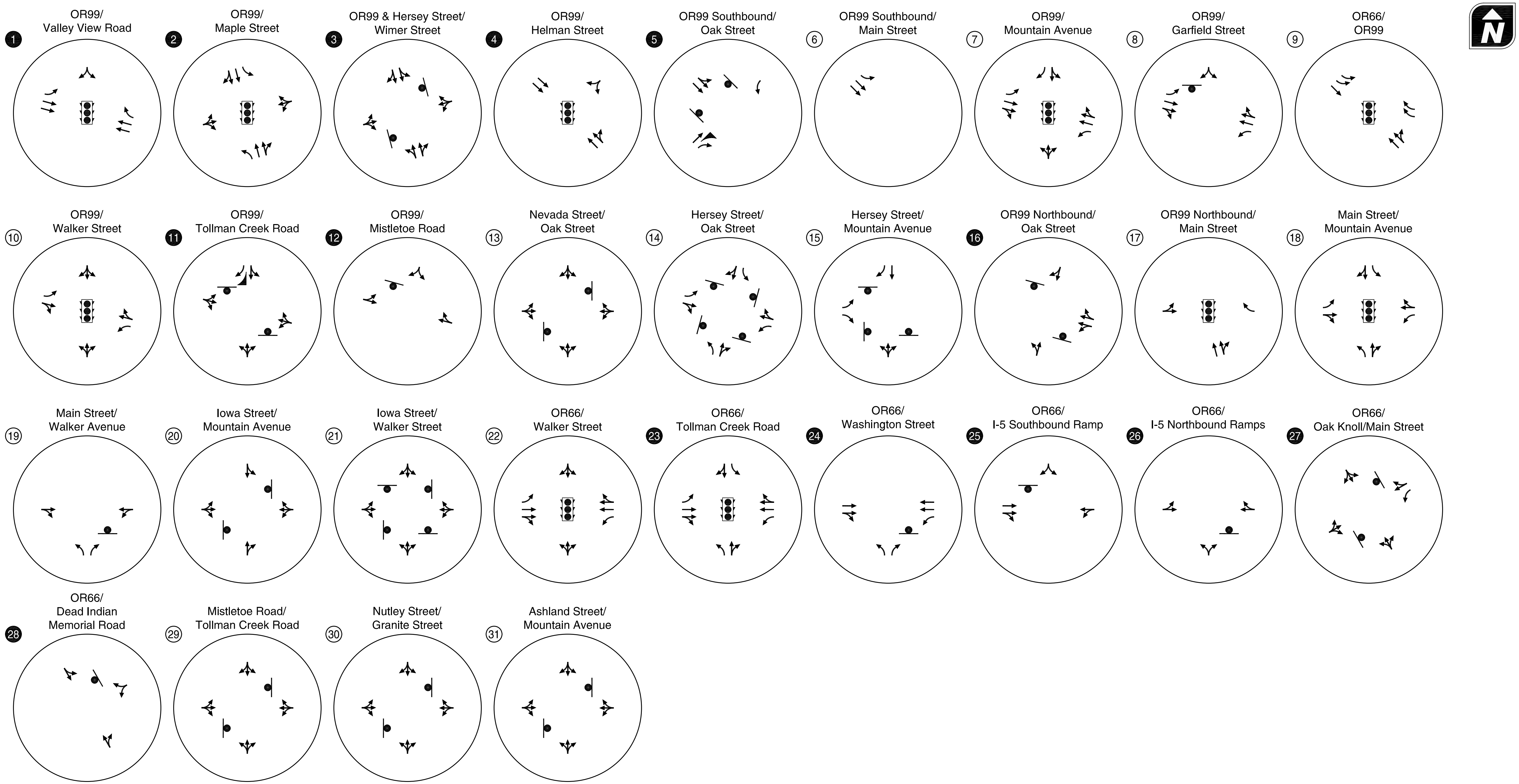
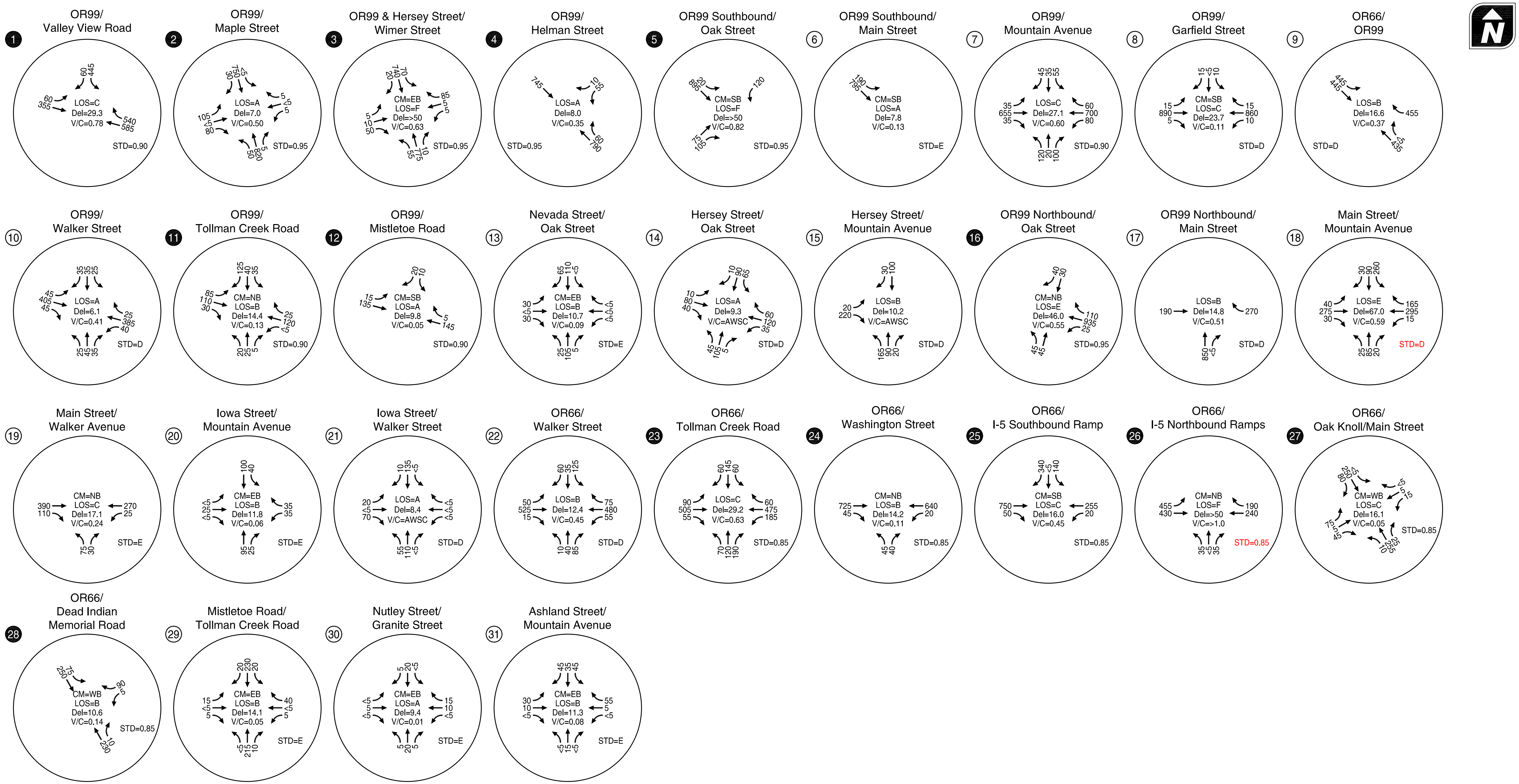


- ODOT STUDY INTERSECTION
- SITY STUDY INTERSECTION
- STOP SIGN
- TRAFFIC SIGNAL

Existing Lane Configurations and Traffic Control Devices

CITY OF ASHLAND

Figure 6



CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
STD = OPERATIONAL STANDARD

Existing Traffic Conditions Weekday PM Peak Hour

CITY OF ASHLAND

Figure 7

As can be seen in Table 7, there is one study intersection under ODOT's jurisdiction that does not meet the applicable OHP mobility standard. There is also one study intersection under the City of Ashland's jurisdiction that exceeds the LOS D threshold identified for traffic signal controlled intersections in the City of Ashland. The LOS D threshold is not a formal City of Ashland standard (the City does not currently have adopted mobility standards). The LOS D threshold was set for the purpose of this analysis to identify intersections under the City's jurisdiction that may experience existing operational issues.

The intersection under ODOT's jurisdiction that does not meet the applicable mobility standard is OR 66/I-5 Exit 14 NB Ramps intersection. The OR 66/I-5 Exit 14 NB Ramps are located in the southeastern portion of the City. An Interchange Area Management Plan (IAMP) has recently been prepared for the OR 66/I-5 interchange. The intersection improvements identified within the IAMP for the OR 66/I-5 Exit 14 NB Ramps intersection includes converting the existing two-way stop controlled intersection to a signalized intersection, which will help address existing operational issues. The findings and recommendations in the IAMP will be considered when future analysis scenarios are conducted within this TSP update project.

The study intersection under the City of Ashland's jurisdiction identified as potentially experiencing operational issues is East Main Street/Mountain Avenue intersection. The intersection is currently signalized and has exclusive left-turn lanes on all four approaches. The intersection is currently operating with at LOS E with a V/C ratio of 0.59. The southbound left-turn movement in the weekday evening peak hour is the dominant north-south movement and is the likely the contributing factor to the intersections higher average control delay (i.e., LOS E) and relatively low V/C ratio. There are likely signal timing adjustments that could be made to reduce the average control delay at this location.

Intersection Queuing Analysis

Queuing analysis was performed at the study intersections in accordance with the recommendations provided in Section 8.3 of the ODOT *Analysis Procedures Manual* (APM – Reference 3). The APM recommends the use of SimTraffic for estimating queues at intersections belonging to a coordinated signal systems. SimTraffic performs microsimulation and animation of vehicle traffic, modeling travel through signalized and unsignalized intersections and arterial networks, with cars, trucks, pedestrians and buses. SimTraffic includes the vehicle and driver performance characteristics developed by the Federal Highway Administration for use in traffic modeling. SimTraffic is primarily used by ODOT for the analysis of signal systems and vehicle queue estimation, especially in congested areas and locations where queue spillback may be a problem.

The results of the queuing analysis represent an average of 10 consecutive, random runs of the SimTraffic model as recommended by the APM. As there were 31 intersections included in the analysis, Table 8 summarizes the queuing results for the study intersections where storage deficiencies were identified. The queue lengths reported in Table 8 were rounded up to the nearest 25 feet. The available storage length is based on the striped storage lane at the intersection. If a striped storage lane is not provided for a movement, the distance between roadways is reported as the available storage. *Appendix D* contains the results of the queuing analysis for all of the study intersections.

Table 8 95th Percentile Queues at Study Intersections with Storage Deficiencies

Location	Approach/ Movement	95th Percentile Queue (ft)	Striped Storage Available (ft)	Adequate Storage?
OR99/ Valley View Road	WBR	175	100	**No**
OR99/ Mountain Avenue	WBL	150	125	**No**
	SBTL	125	100	**No**
OR99/ OR66	SBL	150	100	**No**
	SBL	450	225	**No**[1]
Hersey St/ Mountain Avenue	EBR	150	100	**No**
OR66/ Tolman Creek Road	EBL	150	100	**No**
	WBL	150	100	**No**
	NBL	125	100	**No**
	SBL	125	100	**No**
OR66/ I-5 NB On-ramp	EBL	550	500	**No**[2]
E Main Street/ Mountain Avenue	SBTR	325	200	**No**
	SBL	2,575	650	**No**[3]

*The following abbreviations are used in this table: NB: Northbound; SB: Southbound; EB: Eastbound; WB: Westbound; L: Left; LTR: Shared left/through/right lane; LT: Shared left/through lane

[1]The 95th percentile queue exceeds the link distance between the stop bar and Indiana Street located approximately 225 feet northwest of the intersection.
[2]The 95th percentile queue exceeds link distance between the I-5 Northbound On-ramp and the I-5 Southbound On-ramp.
[3]The 95th percentile queue exceeds link distance between the stop bar and B Street located approximately 650 feet north of the intersection.

As shown in Table 8, seven study intersections were found to have 95th percentile queues on one or more approach that exceed the available storage capacity. The remaining study intersections were found to have adequate storage at each approach.

Collision Analysis

Collision analysis was conducted for the Ashland TSP study intersections and key roadway segments within the City. The intersection analysis was performed using ten years of crash data obtained from ODOT; the data covers crashes reported from 2000 through 2009. The segment crash analysis was performed using a GIS data set from the City of Ashland. As part of the analysis, the Statewide Priority Index System (SPIS) was reviewed to determine if ODOT had identified any hazardous locations along OR 99 or OR 66 within the City of Ashland.

Findings from the collision analysis indicate the following.

- ODOT's 2009 SPIS analysis rates OR 99 and OR 66 through Ashland as Category 3 (of 5 categories) or lower indicating 3 to 5 fatal and/or serious injury crashes or fewer per five miles have occurred on OR 66 and OR 99 sometime from 2006 through 2008.
- There are five study intersections with crash rates higher than expected based on crash rates at similar types of intersections within Ashland; these intersections are:
  - OR 99/Hersey Street/Wimer Street;
  - OR 99 SB/Oak Street;
  - OR 99/Tolman Creek Road;
  - OR 99 NB/E Main Street;
  - OR 66/Tolman Creek Road; and
  - OR 66/E Main Street/Oak Knoll Drive.
- The majority of reported crashes on the selected roadway segments were property damage only crashes.

The following subsections discuss the SPIS list, the intersection crash analysis and the segment crash analysis in additional detail.

STATEWIDE PRIORITY INDEX SYSTEM (SPIS)

The Statewide Priority Index System (SPIS) is a method developed by ODOT for identifying hazardous locations on state highways through consideration of crash frequency, crash rate, and crash severity. As described in ODOT's SPIS description, a roadway segment is designated as a SPIS site if a location experiences three or more crashes or one or more fatal crashes over a three-year period. Under this method, all state highways are analyzed in 0.10 mile segments to identify SPIS sites. Statewide, there are approximately 6,000 SPIS sites. SPIS sites are typically intersections, but can also be roadway segments.

Based on ODOT's 2009 SPIS analysis, OR 99 and OR 66 through the City of Ashland are rated as Category 3 SPIS sites or lower. Category 3 indicates 3 to 5 fatal and/or serious injury crashes per five miles have occurred on OR 66 (sometime from 2006 through 2008). The segment of OR 66 within the City of Ashland is rated as Category 3 (of 5 categories with the 5th category as the highest priority). OR 99 through the City of Ashland is primarily rated as Category 3 with the except for the northbound segment of the couplet through downtown Ashland which is rated as Category 1 (no fatal and/or serious injury crashes from 2006 through 2008).

CRASH DATA ANALYSIS

The data from the City of Ashland contained in the GIS files were used to perform the segment crash data analysis. The intersection data from ODOT was used to perform the intersection crash data analysis; the ODOT crash data files contain more detailed information regarding events, actions, and errors contributing to the crashes than the GIS files from the City of Ashland. As a result, a more detailed crash analysis was conducted for the study intersections than what was feasible for the roadway segments.

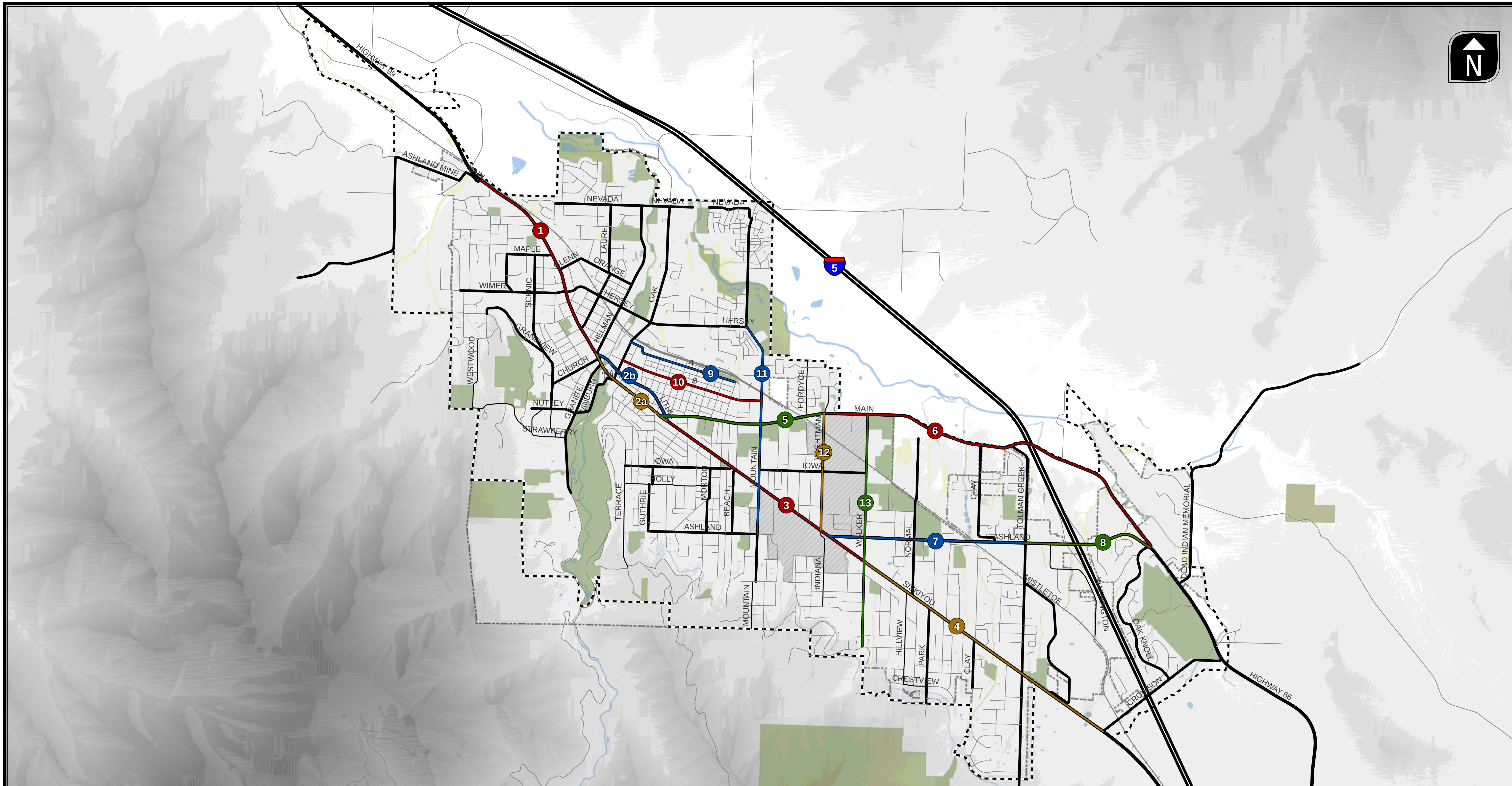
Segment Crash Data Analysis

The segment crash data analysis focused on the boulevards and key avenues in the City of Ashland. As noted above, the GIS files obtained from the City of Ashland were used to conduct the segment crash analysis. Segment crashes were identified as crashes that occurred further than 75 feet from signalized intersections and 50 feet from unsignalized intersections. The roadways analyzed were:

- OR 99 (Siskiyou Boulevard);
- OR 66 (Ashland Street);
- E Main Street;
- A Street;
- B Street;
- Walker Avenue;
- Wightman Street; and
- Mountain Avenue from Ashland Street to Hersey Street.

These roadways were selected for analysis because they provide key east-west or north-south connectivity throughout Ashland and/or the frequency of crashes on these segments (based on Figure 15 in Technical Memorandum #3) indicated a relatively high number of crashes had occurred on the roadway. Traffic volumes for the majority of the roadway segments were estimated from the intersection traffic volume counts obtained for the study intersections. However, traffic volume information was not available for A Street, B Street, and Wightman Street because study intersections are not located on these streets. The crash analysis for those three roadway segments focused on summarizing crash statistics.

The boulevard and avenues selected for evaluation were organized into basic segments. The boulevards (OR 99, OR 66, and E Main Street) were divided into segments based on where their basic roadway cross-section and/or character changed. Each avenue was considered as a single segment because their cross-section and character changed minimally over their length. Figure 8 illustrates the roadway segments analyzed and the number of crashes on each segment. Table 9 summarizes the crash severity statistics for the selected roadway segments. Table 10 summarizes the crash types for the selected roadway segments. Table 11 presents the crash rates for the roadway segments on which traffic volumes could be estimated. Roadway segment crash rates were calculated as crashes per million vehicle miles (MVM) traveled. *Appendix F* contains the crash rate calculations.



Roadway Segment ID Number

Segment Crashes

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Figure 8

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Table 9 Crash Severity Statistics for the Segment Crash Data Analysis

ID	Roadway	Extents	Length (miles)	Fatal	Injury	PDO	Unknown	Total
Boulevards								
1	OR 99	From Valley View Road to Helman Street	1.14	1	11	38	0	50
2a	OR 99 SB	Helman Street to E Main Street	0.53	0	7	48	0	55
2b	OR 99 NB	E Main Street to Helman Street	0.73	0	2	42	1	45
3	OR 99	E Main Street to Walker Avenue	1.28	0	17	60	0	77
4	OR 99	Walker Avenue to UGB Southern Boundary	1.78	0	10	23	0	33
5	E Main Street	OR 99 to Walker Avenue	1.11	0	0	11	0	11
6	E Main Street	Walker Avenue to OR 66	1.78	0	2	6	0	8
7	OR 66	OR 99 to Tolman Creek Road	1.04	0	11	36	0	47
8	OR 66	Tolman Creek Road to E Main Street	0.67	0	8	32	0	41
Boulevards Total			**10.06**	**1**	**68**	**296**	**1**	**367**
Selected Avenues								
9	A Street	Entire	0.61	0	1	23	1	25
10	B Street	Entire	0.77	0	0	22	2	24
11	Mountain Avenue	Hersey Street to Ashland Street	1.23	0	1	25	0	16
12	Wightman Street	Entire	0.62	0	1	23	0	24
13	Walker Avenue	Entire	1.13	0	5	28	1	34
Selected Avenues Total			**4.36**	**0**	**8**	**111**	**4**	**123**

Note: Crash severity statistics above include crashes involving pedestrians and bicycles.

Table 10 Summary of Crash Types on Selected Roadway Segments

ID	Roadway	Extents	Length (miles)	Angle	Fixed-Object	Rear-End	Parked Vehicle	Other
Boulevards								
1	OR 99	From Valley View Road to Helman Street	1.14	7	18	16	1	8
2a	OR 99 SB	Helman Street to E Main Street	0.53	4	1	19	17	14
2b	OR 99 NB	E Main Street to Helman Street	0.73	1	8	12	6	18
3	OR 99	E Main Street to Walker Avenue	1.28	7	3	41	0	26
4	OR 99	Walker Avenue to UGB Southern Boundary	1.78	6	3	20	1	3
5	E Main Street	OR 99 to Walker Avenue	1.11	0	4	5	0	2
6	E Main Street	Walker Avenue to OR 66	1.78	1	4	2	0	1
7	OR 66	OR 99 to Tolman Creek Road	1.04	12	9	11	0	15
8	OR 66	Tolman Creek Road to E Main Street	0.67	14	6	8	1	12
Boulevards Total			**10.06**	**52**	**10.06**	**134**	**26**	**99**
Selected Avenues								
9	A Street	Entire	0.61	1	2	0	15	7
10	B Street	Entire	0.77	1	2	1	15	5
11	Mountain Avenue	Hersey Street to Ashland Street	1.23	0	5	4	6	1
12	Wightman Street	Entire	0.62	5	3	0	14	2
13	Walker Avenue	Entire	1.13	8	3	4	12	7
Selected Avenues Total			**4.36**	**15**	**15**	**9**	**62**	**22**

Note: Crash severity statistics above include crashes involving pedestrians and bicycles.

Table 11 Roadway Segment Crash Rates

ID	Roadway	Extents	Length (miles)	Daily Volume	Crash Rate (Crashes/MVM)
Boulevards					
1	OR 99	From Valley View Road to Helman Street	1.14	17,500	0.57
2a	OR 99 SB	Helman Street to E Main Street	0.53	9,500	2.49
2b	OR 99 NB	E Main Street to Helman Street	0.73	11,000	1.28
3	OR 99	E Main Street to Walker Avenue	1.28	16,500	0.83
4	OR 99	Walker Avenue to UGB Southern Boundary	1.78	6,000	0.71
5	E Main Street	OR 99 to Walker Avenue	1.11	8,000	0.28
6	E Main Street	Walker Avenue to OR 66	1.78	3,500	0.29
7	OR 66	OR 99 to Tolman Creek Road	1.04	12,000	0.86
8	OR 66	Tolman Creek Road to E Main Street	0.67	14,000	1.00
Selected Avenues					
9	A Street	Entire	0.61	-	-
10	B Street	Entire	0.77	-	-
11	Mountain Avenue	Hersey Street to Ashland Street	1.23	6,000	0.49
12	Wightman Street	Entire	0.62	-	-
13	Walker Avenue	Entire	1.13	3,100	2.22

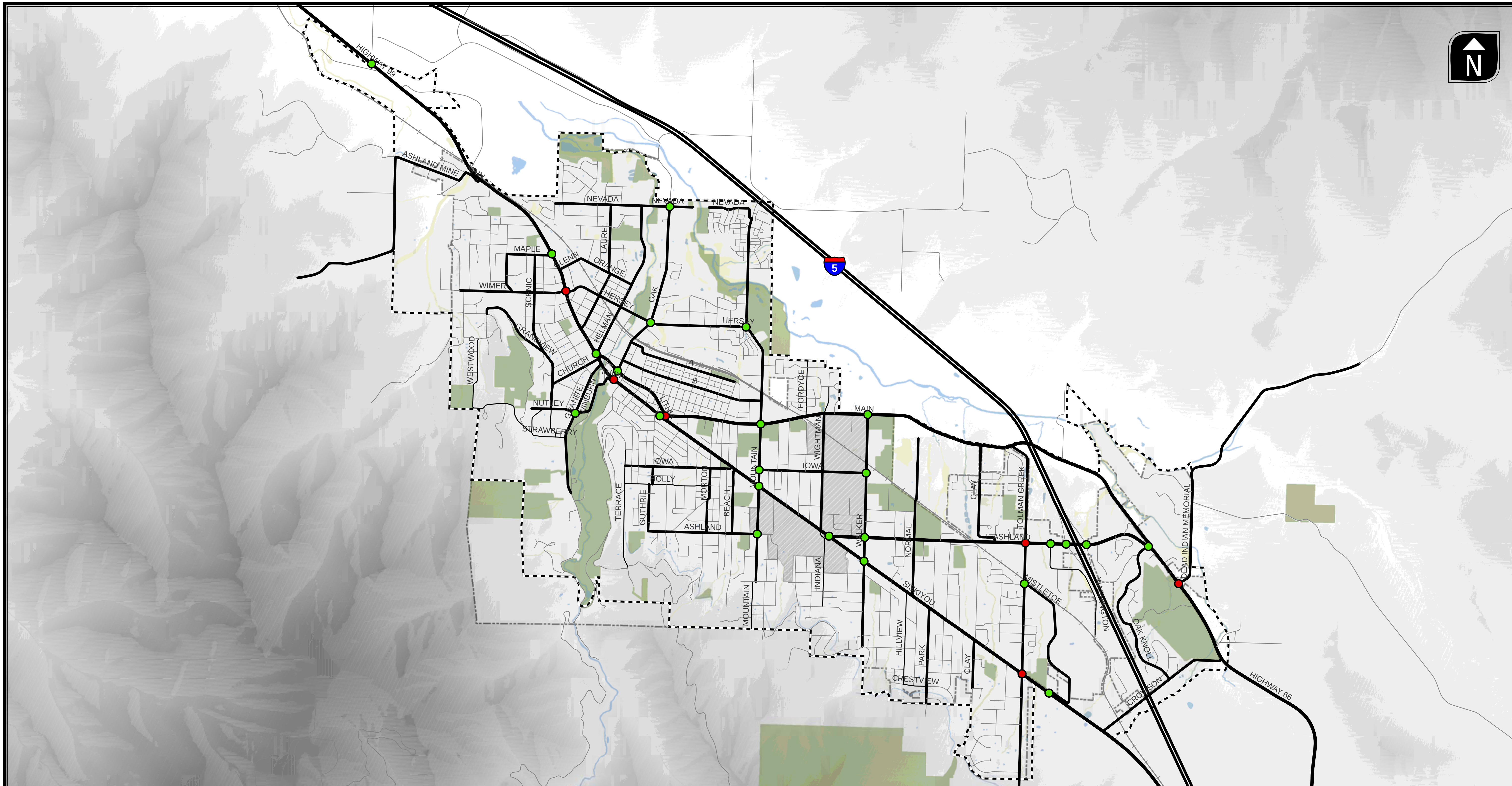
Note: Crash severity statistics above include crashes involving pedestrians and bicycles.

As expected, the segments with the highest frequency of crashes are those generally known to carry the most vehicular traffic and/or are segments of longer lengths. For example, the frequency of crashes on the segments that make up OR 99 is noticeably higher than the frequency of crashes on East Main Street and in some instances higher than the frequency on OR 66. On boulevards, the most common crash type reported is rear-end crashes. On avenues, the most common crash type reported is collisions with parked cars. The majority of segment crashes on the selected boulevards and avenues are property-damage only crashes (80.6% on boulevards and 90.2% on the selected higher crash avenues). The OR 99 SB, OR 99 NB, and Walker Avenue segments have crash rates higher than 1.00 crashes/MVM traveled. These three segments appear to have the most potential to reduce crashes. The OR 99 SB and OR 99 NB segments are through downtown Ashland where the slower speed environment leads to the majority of these crashes, 87% and 93%, respectively, being property damage only crashes. Similarly, the 82% of the crashes reported along Walker Avenue are property damage only crashes with the most common crash type being a collision with a parked vehicle.

Intersection Crash Data Analysis

Crash analysis was performed for each study intersection. The critical rate method was used in the analysis (refer to *Appendix F* for details of the crash rate calculations and *Appendix G* for ODOT crash data). Under this methodology, a critical crash rate is developed for each intersection based on comparing similar intersections. The study intersections were divided into three groups: signalized intersections, all-way stop-controlled intersections, and two-way stop-controlled intersections. If the crash rate at a specific intersection was found to be higher than the critical crash rate for the intersection, further safety analysis was conducted (Reference 6).

Crash rates for intersections were calculated in crashes per million entering vehicles (MEV). Figure 9 illustrates the crash analysis results for the study intersections. The observed crash rate and critical crash rate for each study intersection are summarized in Table 12.



- Below Critical Crash Rate
- Exceeds Critical Crash Rate

Intersection Crash Analysis

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Figure

9

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Table 12 Study Intersection Crash Rates and Critical Crash Rates

Study Intersections	Crash Rate	Critical Crash Rate	Exceeds Critical Rate?
OR 99/Valley View Road	0.19	0.27	-
OR 99/Maple Street	0.06	0.28	-
OR 99/Hersey Street/Wimer Street	0.67	0.38	Yes
OR 99/Helman Street	0.09	0.28	-
OR 99 Southbound/Oak Street	0.63	0.41	Yes
OR 99 Southbound/E Main Street	0.22	0.31	-
OR 99/Mountain Avenue	0.23	0.27	-
OR 66/OR 99	0.23	0.28	-
OR 99/Walker Street	0.23	0.30	-
OR 99/Tolman Creek Road	0.36	0.33	Yes
OR 99/Mistletoe Road	0.24	0.52	-
Nevada Street/Oak Street	0.21	0.29	-
Hersey Street/Oak Street	0.16	0.25	-
Mountain Avenue/Hersey Street	0.04	0.25	-
OR 99 Northbound/Oak Street	0.32	0.40	-
OR 99 Northbound/Lithia Way/E Main Street	0.36	0.29	Yes
Mountain Avenue/E Main Street	0.22	0.29	-
E Main Street/Walker Avenue	0.00	0.23	-
Mountain Avenue/Iowa Street	0.07	0.29	-
Walker Street/Iowa Street	0.11	0.27	-
OR 66/Walker Street	0.15	0.28	-
OR 66/Tolman Creek Road	0.29	0.27	Yes
OR 66/Washington Street	0.09	0.39	-
OR 66/I-5 Exit 14 Southbound Ramps	0.27	0.39	-
OR 66/I-5 Exit 14 Northbound Ramps	0.17	0.40	-
OR 66/E Main Street/Oak Knoll Drive	0.49	0.44	Yes
OR 66/Dead Indian Memorial Road	0.04	0.45	-
Tolman Creek Road/Mistletoe Road	0.00	0.47	-
Granite Street/Winburn Way/Nutley Street	0.22	0.41	-
Mountain Avenue/Ashland Street	0.10	0.32	-

As shown in Table 12 and Figure 9, the following intersections exceeded their respective critical crash rate:

- OR 99/Hersey Street/Wimer Street;
- OR 99 SB/Oak Street
- OR 99/Tolman Creek Road;
- OR 99 NB/Lithia Way/E Main Street;
- OR 66/Tolman Creek Road; and
- OR 66/E Main Street/Oak Knoll Drive.

A more detailed review of the reported crashes at each of these six intersections was conducted to determine potential contributing factors as well as potential countermeasures for reducing crashes. The results of the more detailed review are summarized in Table 13 and discussed in the subsections below.

Table 13 Potential Countermeasures at Study Intersections Exceeding Critical Crash Rate

Intersection	Potential Countermeasures
OR 99/Hersey Street/Wimer Street	Add left-turn pockets and/or right-turn lanes on OR 99. Consider installing a traffic signal or roundabout. Convert access to Hersey Street and Wimer Street to right-in/right-out access only.
OR 99 SB/Oak Street	Consider realigning southern approach from off-street parking to occur at closer to a 90-degree angle.
OR 99/Tolman Creek Road	Prohibit parking on OR 99 in the vicinity of the intersection. Conduct a speed study and investigate potential speed reduction treatments.
OR 99 NB/Lithia Way/E Main Street	Consider automated enforcement such as installing red-light running cameras.
OR 66/Tolman Creek Road	Consider automated enforcement such as installing red-light running cameras.
OR 66/E Main Street/Oak Knoll Drive	Conduct a sight-distance evaluation at the intersection. Add left-turn and right-turn pockets on OR 66. Investigate prevailing vehicle speeds on OR 66 and consider treatments to reduce vehicle speeds. Increase intersection sight distance by realigning intersection approaches.

OR 99/Hersey Street/Wimer Street

The OR 99/Hersey Street/Wimer Street intersection is a two-way stop-controlled intersection located in the northwestern portion of the City of Ashland. The physical characteristics of the intersection, trends from ODOT crash data, and potential countermeasures are discussed below.

The basic physical characteristics of the intersection are noted below.

- At the intersection, OR 99 has a four-lane cross-section with two through lanes in each direction.
- Hersey Street and Wimer Street are offset such that Hersey Street is slightly further south than Wimer Street.

Exhibit 2 is an aerial view of the intersection from Google Earth illustrating the physical characteristics noted above.

Exhibit 2 OR 99 / Hersey Street / Wimer Street

In reviewing the ODOT crash data in more detail, the following trends were identified:

- The majority of the reported crashes were rear-end crashes or turning crashes;
- The majority of the turning crashes (i.e., 18 out of 21 reported turning crashes) occurred when motorists waiting to turn left off of OR 99 onto the minor street turned in front of on-coming traffic;
- Slightly more than half of the reported rear-end crashes (i.e., 7 out of 13 reported rear end crashes) occurred when motorists waiting to turn left off of OR 99 were hit from behind by a motorist traveling straight on OR 99;
- Four crashes at the intersection were related to bicyclists or pedestrians attempting to cross OR 99; and
- Three crashes at the intersection were related to motorists misjudging gaps in traffic or failing to see approaching traffic while attempting to cross OR 99 from Hersey Street to Wimer Street or the reverse.

Based on the physical conditions at the intersection and the reported crashes, the following countermeasures could be considered to help reduce crashes at the location:

- **Add left-turn pockets and/or right-turn lanes on OR 99 –** The left-turn pockets would provide refuge for motorists waiting to turn left off of OR 99 and may help reduce the rear-end crashes on OR 99. Similarly, the right-turn lanes on OR 99 at the intersection would provide refuge for vehicles slowing to turn right.
- **Consider a traffic signal or roundabout at the intersection –** A traffic signal and/or roundabout would help facilitate the left-turn movements onto and off of OR 99 at this intersection. An engineering study is needed to determine whether a traffic signal or roundabout would be appropriate or effective for this location and if so, which type of traffic control would be most appropriate.
- **Convert access to Hersey Street and Wimer Street to right-in/right-out access only** – Restricting access to these minor streets to right-in/right-out only would eliminate collisions related to motorists turning left onto or off of OR 99 as well as crashes related to motorists crossing OR 99 from Hersey Street to Wimer Street or the reverse. Left-turn access to and from OR 99 could be served to the north through the signalized Maple Street/OR 99 intersection or to the south through the signalized OR 99/Helman Street intersection. This countermeasure is noted because 28 of the 42 reported crashes at the intersection were related to left-turning or crossing maneuvers.

OR 99 SB / Oak Street

The OR 99 SB/Oak Street intersection is a two-way stop-controlled intersection located at the northern end of the downtown couplet terminus. The physical characteristics of the intersection, trends from ODOT crash data, and potential countermeasures are discussed below.

The basic physical characteristics of the intersection are noted below.

- OR 99 is one-way southbound with a two-lane cross-section.
- There are marked crosswalks on three approaches to the intersection.
- Opposite Oak Street is a driveway from a downtown off street parking lot, which intersects OR 99 at a skewed angle.
- On-street parking is permitted along both sides of OR 99.

In general, the intersection is surrounded by urban activity including on-street parking, pedestrians, bicyclists, transit and autos.

Exhibit 3 is an aerial view of the intersection from Google Earth illustrating the physical characteristics noted above particularly the driveway opposite of Oak Street which intersects OR 99 SB at a skewed angle.

Exhibit 3 OR 99 SB / Oak Street

In reviewing the ODOT crash data in more detail, the following trends were identified:

- Over half of the crashes reported at the intersection were turning related crashes and of those the majority involved improper turns in which motorists were distracted and/or failed to yield the right-of-way appropriately; and
- The majority of crashes at the intersection were property damage only crashes, which generally indicates the crashes that do occur are occurring at slower speeds as motorists navigate a busy urban area.

The types and severity of crashes occurring at the OR 99 SB/Oak Street intersection are relatively consistent with what is expected for an urban area with multiple types of users (e.g., pedestrians, bicyclists, transit, autos). To reduce collisions at this location, an engineering study could be conducted to investigate the feasibility of realigning the southern approach from the off-street parking lot to occur closer to a 90-degree. Such an adjustment may help provide motorists with better angle at which to identify approaching cars on OR 99 SB and appropriate gaps in traffic.

OR 99 / Tolman Creek Road

The OR 99/Tolman Creek Road intersection is a two-way stop-controlled intersection located in the southwestern portion of the City of Ashland. The physical characteristics of the intersection, trends from ODOT crash data, and potential countermeasures are discussed below.

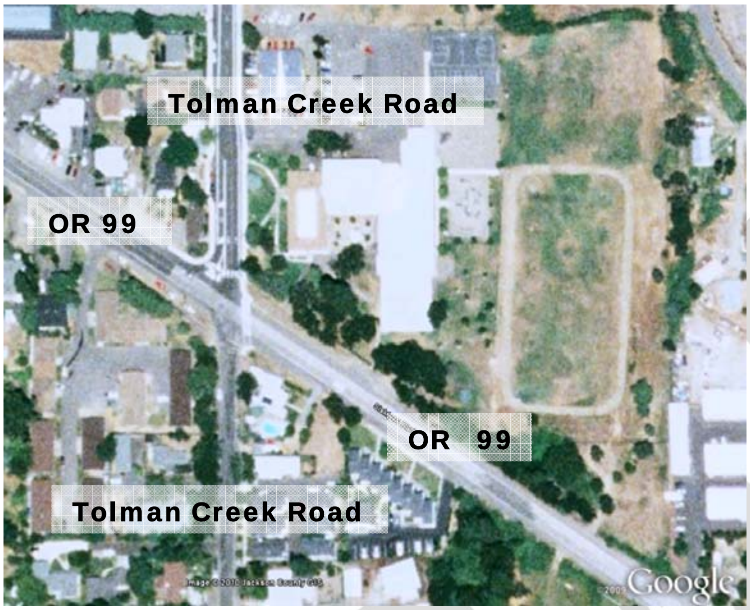
The basic physical characteristics of the intersection are noted below.

- The intersection is skewed with Tolman Creek Road oriented north-south and OR 99 oriented northwest-southeast.
- There is a flashing amber light at the intersection and marked crosswalks along the northern, southern, and southeastern legs of the intersection.
- OR 99 has a two-lane cross-section with relatively wide shoulders.

- The posted speed limit on OR 99 changes from 45 mph to 35 mph when approaching the intersection from the southeast.

Exhibit 4 is an aerial view of the intersection from Google Earth illustrating the physical characteristics noted above.

Exhibit 4 OR 99 / Tolman Creek Road



In reviewing the ODOT crash data in more detail, the following trends were identified:

- The majority of the reported crashes were angle crashes; and
- The majority of the angle crashes occurred when vehicles were attempting to cross OR 99 or turn onto OR 99; motorists appear to misjudge approaching vehicle speeds or fail to see approaching vehicles.

Based on the physical conditions at the intersection and the reported crashes, drivers appear to have difficulty judging approaching speeds or seeing approaching vehicles. Potential countermeasures include:

- **Prohibit parking on OR 99 in the vicinity of the intersection –** Based on photos on Google Earth, parking on the shoulder of OR 99 appears to be permitted, which may inhibit motorists' sight distance at the intersection.
- **Conduct a speed study and investigate potential speed reduction treatments** - A pertinent next step could be to conduct a speed study to determine prevailing vehicle speeds on OR 99 and if they are higher than appropriate for the desired conditions. This could be the case given the change in the posted speed limit from 45 mph to 35 mph on approach to the intersection. This is also the area in which OR 99 begins to change in function from a non-urban highway-type function to a facility passing through an increasingly urban area that provides access as well as mobility to travelers. If prevailing

speeds are higher than desired on approach to the intersection, speed reduction treatments may be appropriate to investigate and may serve as an opportunity to change the physical cross-section of OR 99 to visually inform drivers the change in roadway function.

OR 99 NB/Lithia Way/E Main Street

The OR 99 NB/E Main Street intersection is a signalized intersection located at the southern end of the downtown couplet terminus. The physical characteristics of the intersection, trends from ODOT crash data, and potential countermeasures are discussed below.

The basic physical characteristics of the intersection are noted below.

- OR 99 is a one-way street in the northbound direction.
- OR 99 has a two-lane cross-section without exclusive turn lanes.
- There are marked crosswalks across all four legs of the intersection.
- E Main Street has a two-lane cross section without exclusive turn lanes.

Exhibit 5 is an aerial view of the intersection from Google Earth illustrating the physical characteristics noted above.

Exhibit 5 OR 99 NB/E Main Street

In reviewing the ODOT crash data in more detail, the following trends were identified:

- The majority of reported crashes are rear end crashes that occurred when motorists were following too close or were distracted;
- The angle/turning crashes at the intersection occurred when motorists disregarded the traffic signal and/or failed to yield to pedestrians in the crosswalk.

In general, the types of crashes noted above are consistent with what is expected to occur at signalized intersections. A potential countermeasure that may help reduce crashes particularly those related to disregarding the traffic signal could be automated enforcement such as red-light running cameras. It is important to note while red-light running cameras tend to help reduce crashes related to disregarding the traffic signal, in some instances they have been found to increase the occurrence of rear-end crashes.

OR 66 / Tolman Creek Road

The OR 66 SB/Tolman Creek Road intersection is a signalized intersection. The physical characteristics of the intersection, trends from ODOT crash data, and potential countermeasures are discussed below.

The basic physical characteristics of the intersection are noted below.

- OR 66 has a five-lane basic cross-section on approach to the intersection.
- There are exclusive left-turns on all four approaches at the intersection.
- Right-turns are served by shared through/right turn lanes on all four approaches.
- Marked crosswalks are present on all four approaches.

Exhibit 6 is an aerial view of the intersection from Google Earth illustrating the physical characteristics noted above.

Exhibit 6 OR 66 / Tolman Creek Road

In reviewing the ODOT crash data in more detail, the following trends were identified:

- Crashes tend to be rear end, angle or turning crashes;

- The majority of the rear end crashes occurred when motorists failed to stop or were following too close to vehicles in front of them;
- The majority of turning crashes occurred when motorists turned from the wrong the lane; and
- The majority of angles crashes occurred when motorists disregarded the traffic signal control and/or were distracted or inattentive.

The current intersection form does not exhibit obvious features for improvement. The types of crashes reported for the intersection tend to be consistent with the types expected to occur at signalized intersections. One potential countermeasure would be to install red-light running enforcement cameras, which tend to reduce crashes related to disregarding traffic signals. However, red-light enforcement cameras have also been found to increase rear-end crashes. Therefore, additional information regarding why motorists are currently failing (and historically have failed) to stop to avoid other stopped vehicles would be helpful in determining whether or not red-light enforcement cameras would be appropriate for this intersection as well as what other countermeasures could be considered.

OR 66/E Main Street/Oak Knoll Drive Intersection

The OR 66/E Main Street/Oak Knoll Drive intersection is a two-way stop controlled intersection located in the southeastern portion of the City of Ashland. The physical characteristics of the intersection, trends from ODOT crash data, and potential countermeasures are discussed below.

The basic physical characteristics of the intersection are noted below.

- The intersection is skewed and occurs along a horizontal curve.
- The minor streets (E Main Street and Oak Knoll Drive) are slightly off set from one another.
- There is a downhill grade when traveling on OR 66 approaching the intersection from the northwest.
- OR 66 is a two-lane cross-section (one travel lane in each direction) at the intersection.

Exhibit 7 is an aerial view of the intersection from Google Earth; the horizontal curve, intersection skew, and offset minor street approaches noted above can be seen.

Exhibit 7 OR 66/E Main Street/Oak Knoll Drive Intersection

In reviewing the ODOT crash data in more detail, the following trends were identified:

- The majority of the crashes are rear end crashes or angle/turning crashes;
- The rear end crashes tend to occur when a vehicle is stopped on OR 66 waiting to turn left onto E Main Street or Oak Knoll Drive; and
- The angle/turning crashes tend to occur when a vehicle is attempting to cross OR 66 (traveling from E Main Street to Oak Knoll Drive or the reverse). They also tend to occur when a vehicle turning off of or onto OR 66 fails to yield or give the right-of-way to through traffic on OR 66.

Based on the physical conditions in the field as well as the crash types and events documented in ODOT's crash data, it appears motorists may have minimum or inadequate sight distance at the intersection. A lack of sight distance could be contributing to the rear end crashes on OR 66 because motorists traveling along OR 66 do not have adequate time and distance to identify and react to vehicles stopped in the roadway waiting to turn. Similarly, motorists attempting to turn to, from, or crossing OR 66 may not have adequate sight distance to identify and react to acceptable gaps in traffic for turning and crossing maneuvers and/or may misjudge gaps.

Considerations and potential countermeasures to reduce crashes at this intersection include:

- **Conduct a sight-distance evaluation at the intersection** – It would be pertinent to conduct an engineering study to determine the amount of sight distance available at the intersection for the turning movements onto and off of OR 66 as well as the sight distance available for motorists approaching the intersection on OR 66. Findings from such a study would help guide decisions related to what types of countermeasures are considered for the location.

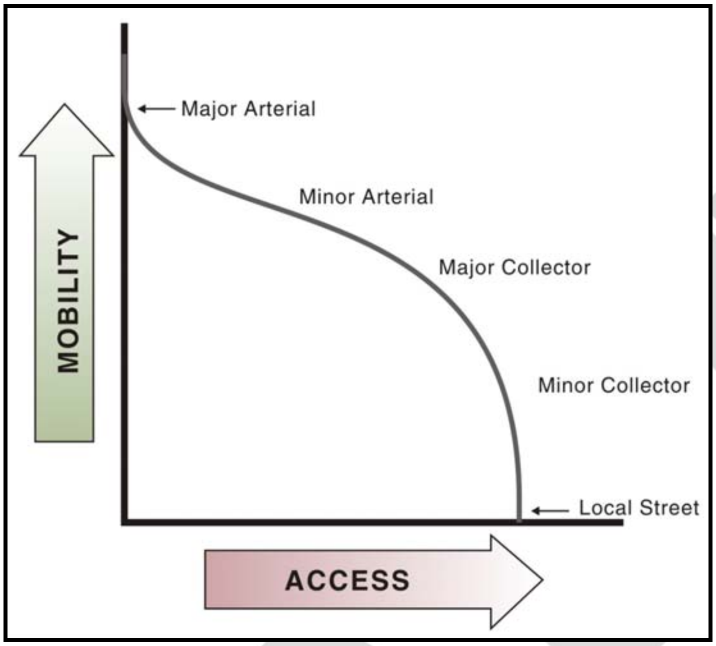
- **Add left-turn and right-turn pockets on OR 66** – These would provide a refuge for vehicles stopped waiting to turn left off of OR 66 and for vehicles slowing to turn right off of OR 66.
- **Investigate prevailing vehicle speeds on OR 66 and consider treatments to reduce vehicle speeds** – The prevailing vehicle speeds on OR 66 may be higher than is appropriate for the roadway geometry. A speed study could be used to determine if the 85th percentile speed is higher than the posted speed and/or the appropriate speed based on the sight distance at the intersection. If prevailing vehicle speeds on OR 66 are higher than those warranted for the sight distance at the intersection, treatments to slow vehicle speeds on approach to the intersection could be explored. *NCHRP Report 613 Guidelines for Selection of Speed Reduction Treatments at High-Speed Intersections* contains information on potential treatments.
- **Increase intersection sight distance** – This could be accomplished by adjusting the horizontal and/or vertical alignments of the intersecting roadways. Whether or not realigning or adjusting the horizontal and/or vertical alignments for the intersection is feasible and the potential value it would provide should to be explored in an engineering study.

Access Management

Spacing requirements for public roadways and private driveways can have a profound impact on transportation system operations, safety and land development. Access management strategies and implementation require careful consideration to balance the needs for access to developed land with the need to ensure movement of traffic in a safe and efficient manner.

Access management generally becomes more stringent as the functional classification level of roadways increases and the corresponding importance of mobility increases. Exhibit 8 illustrates the general relationship between access and mobility.

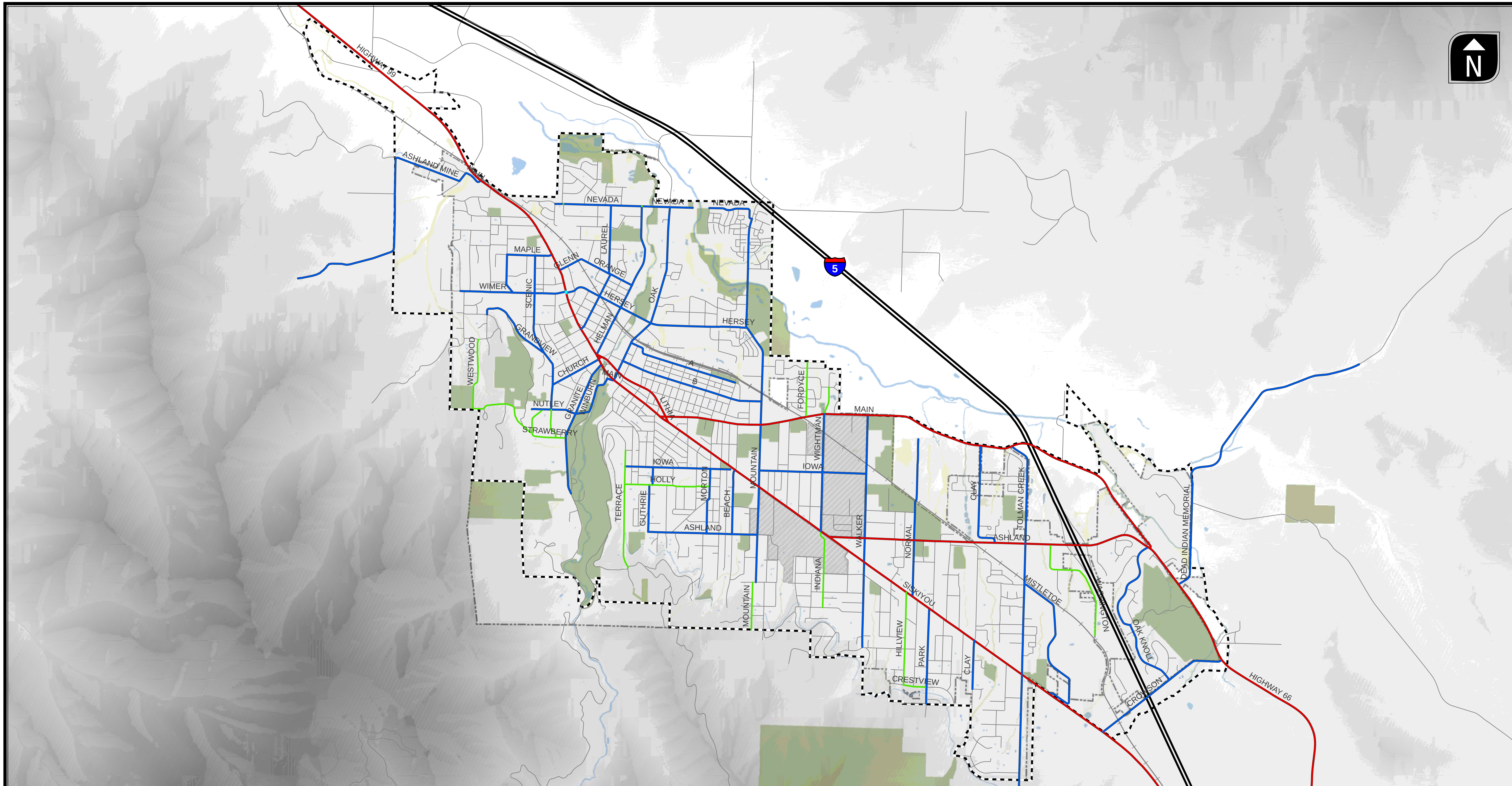
Exhibit 8 Relationship between Access, Mobility, and Functional Classification



As documented in Technical Memorandum #3, the City of Ashland has a minimum driveway access spacing of 300 feet for boulevards, 100 feet for avenues, and 75 feet for neighborhood collectors. OR 99 and OR 66 are also subject to ODOT spacing standards; however, ODOT and the City of Ashland have an agreement that OR 66 and OR 99 within the City limits are subject to minimum spacing standards different than those typically applied to District Highways. OR 66 and OR 99 within the City of Ashland are subject to a minimum access spacing standard of 300 feet. These access spacing standards are illustrated in Figure 10.

Figure 11 illustrates which study roadways (i.e., roadways classified as neighborhood collectors or higher) meet or exceed the applicable driveway access spacing standards based on average driveway access spacing for each roadway segment documented in Technical Memorandum #3.

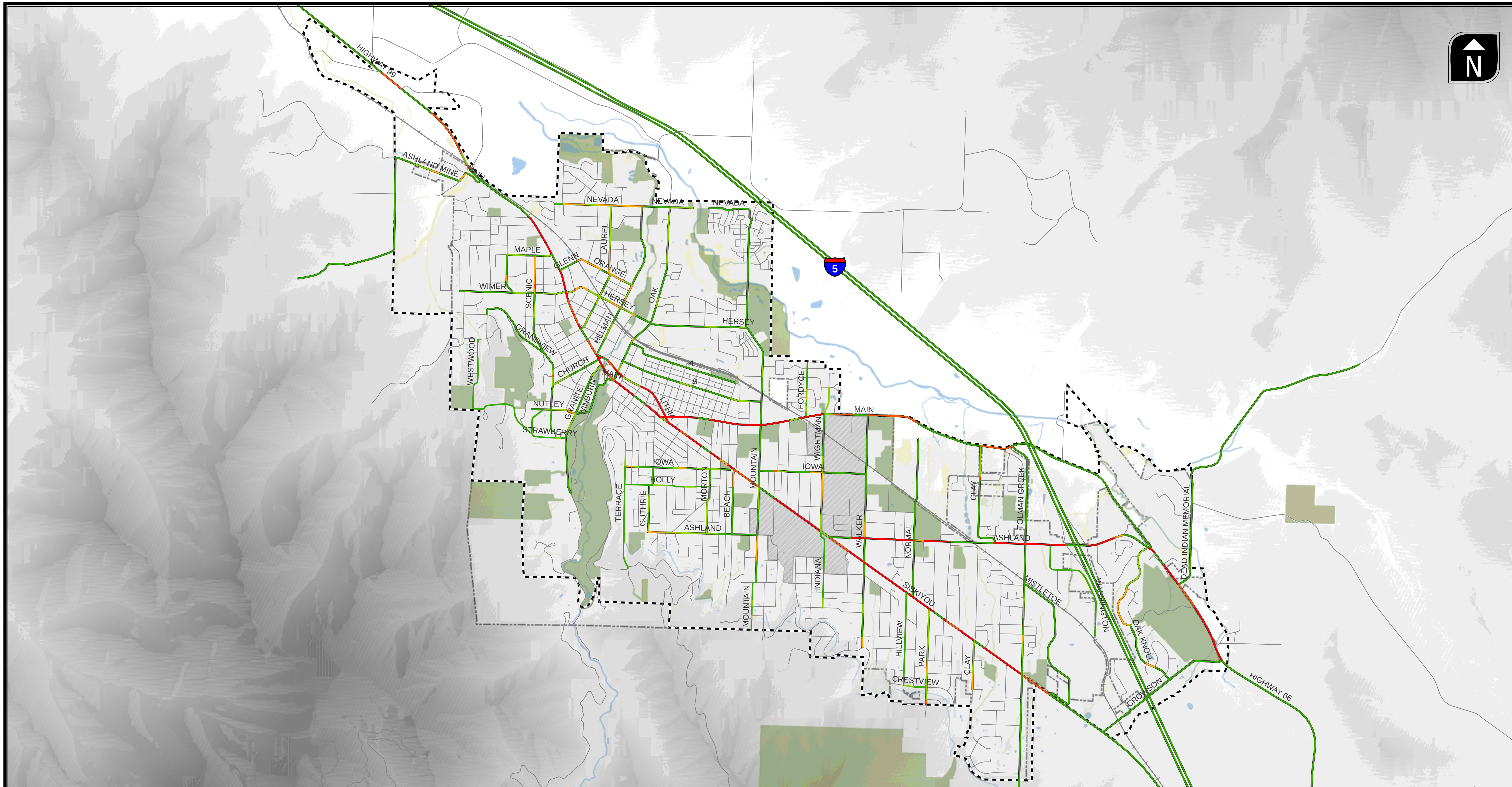
In general, the average access driveway spacing on neighborhood collectors and avenues tends to meet the applicable standard or exceed the applicable standard by no more than 25 feet. The average access spacing on the boulevard network specifically stretches of OR 99, OR 66, and E Main Street exceeds the applicable standard by 100 to 250 feet.



75 feet
100 feet
300 feet

Access Spacing Standards

Figure 10



- Meets Standards
- Exceeds Standard 0 - 25 feet
- Exceeds Standard 25 - 50 feet
- Exceeds Standard 50 - 100 feet
- Exceeds Standard 100 - 250 feet

Deviation from Access Spacing Standards

CITY OF ASHLAND

Figure 11

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Bridge Conditions

Using the ODOT Bridge Management System, conditions for ten bridges were investigated based the inspection report database *PONTIS*. No inspection records were found for Hamilton Creek, Highway 21 Bridge (No. 03676A). There are many factors that go into the decision-making process for determining whether a bridge needs to be replaced or rehabilitated. The sufficiency rating (SR) can be a useful assessment tool and used as an indicator to the condition of the bridge. The following are not absolutes, but guidelines that some agencies have used:

- An SR less than 50 is a sign that the bridge may need to be replaced.
- SRs between 50 and 70 indicate that the bridge may need to be rehabilitated.
- SRs above 70 may require some maintenance and repair.

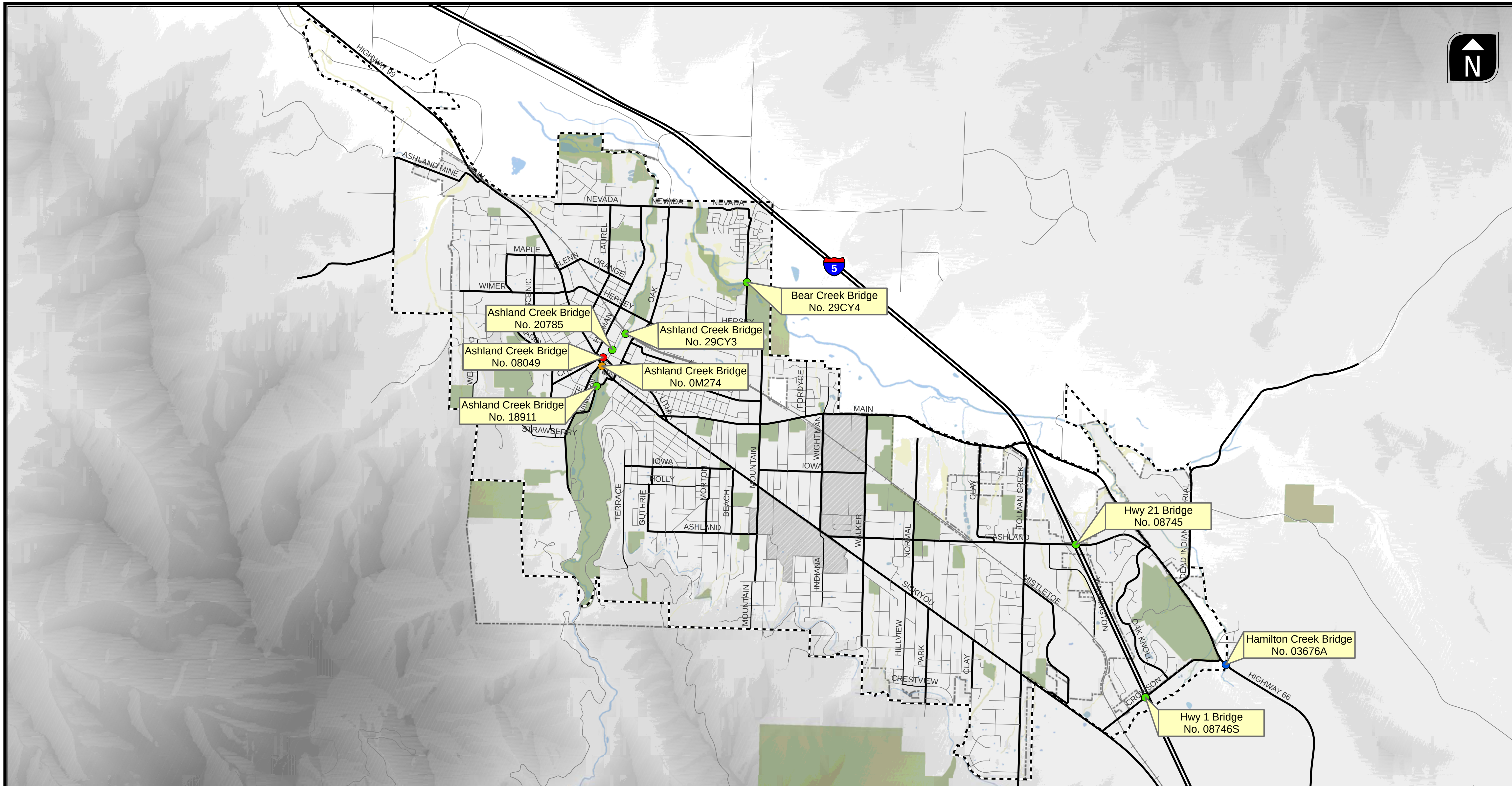
Table 14 summarizes the bridge conditions for the ten bridges investigated.

Table 14 Bridge Condition Summary

Bridge No.	Bridge Name	Location	Sufficiency Rating	Year Built
08049	Ashland Creek, Hwy 63 NB	027 MI N ASHLAND	6.0 (Structurally Deficient)	1956
0M274	Ashland Creek, Hwy 63 SB	018 MI N ASHLAND SCL	66.5 (Functionally Obsolete)	1911
29CY3	Ashland Creek, Van Ness Ave	0.1 EAST OF HELMAN ST	67.1 (Not Deficient)	1974
08745	Hwy 21 over Hwy 1	00.0 INTERSECT HWY 001	73.5 (Not Deficient)	1963
18911	Ashland Creek, Winburn Way	WINBURN WY AT LITHIA PARK	79.4 (Not Deficient)	2000
08746S	Hwy 1 SB over Crowson Rd	13.3 MI N CA STATE LINE	81.0 (Not Deficient)	1963
20785	Ashland Creek, Water St	0.3 NORTH OF B STREET	82.4 (Not Deficient)	2006
29CY4	Bear Creek, Mountain Ave	MOUNTAIN AVE AT BEAR CR	83.3 (Not Deficient)	1967
03676A	Hamilton Creek, Hwy 21	002 MI W HWY I	*	*

Note: *Inspection report not available.

Figure 12 illustrates the location of each bridge noted in Table 14 and its corresponding sufficiency rating. *Appendix H* contains additional information for each bridge including bridge length, structural materials, and observations from inspection reports.



●	Not Deficient
●	Structurally Deficient
●	Functionally Obsolete
●	Report Not Available

Bridge Conditions

Figure

12

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Air, Rail, Pipeline, and Water

In the course of inventorying the existing air, rail, pipeline, and water transportation facilities within the City of Ashland and those serving the City of Ashland deficiencies in these systems were not identified. Forthcoming future conditions analysis will consider the potential demand for expanding such services as passenger rail which is currently not provided to/from the City of Ashland.

Intra-Modal and Inter-Modal Connections

The City of Ashland does not currently contain hubs for intra-modal and inter-modal connections. The nearest transit center is located in Medford, Oregon, which is approximately 15 miles northwest of Ashland. While rail freight passes through Ashland on the Central Oregon and Pacific Railroad there are no major transfer hubs for rail to truck freight movements nor are there such transfer or intra-modal connections between air and truck freight.

Funding Analysis

This section summarizes the existing and historical transportation funding sources for the City of Ashland. The information summarized below will be used in future tasks as the base from which to identify additional and innovative funding sources to help fund the transportation projects identified in the TSP update.

Historically, a transportation program has been funded through the Street Fund. The Street Fund is a combination of federal, state, and city funds including Local Improvement Districts (LID). The City portion of LID total project costs may vary. The transportation program includes streets, sidewalks, bike paths, railroad crossings, and transit. Federal stimulus funds (ARRA) dedicated to transportation projects represent a new federal funding source for 2010. The Street Fund also covers maintenance costs associated with landscaping for medians, entry ways, and downtown landscaping. This landscape maintenance is accomplished through an agreement with the Parks Department. The Transportation Commission, specific transportation studies and the current update of the TSP are also funded as elements of the transportation program.

Street Fund Revenue sources include:

- Oregon State gasoline taxes that may be used on roadway pavement and maintenance projects.
- City franchise fees paid by other city enterprise funds such as electric, water, wastewater, and others for use of the transportation system.
- City transportation systems development charges (SDCs which were updated in FY08) to pay for future growth needs of the system.
- City transportation user/utility fees assessed to all property owners.

- City Local Improvement District charges for specific projects assessed through a benefiting district, and state and federal grants including:
  - TE – Federal Transportation Enhancement projects for sidewalks, bike path, etc.
  - STP – State Transportation Program funds for major improvements and system upgrades to the City's system.
  - STIP – State Transportation Improvement Plan funds for urban upgrades on state facilities.
  - CMAQ – Federal Congestion Mitigation and Air Quality grant funds for projects that help reduce emissions (Diesel Retrofit and Sweeper purchases) and dust (paving projects).
  - OECDD SPWF – Oregon Economic Commission Development Division Special Public Works Funds for projects that relate to the creation of new jobs.
  - Other safety and specific transportation funding program opportunities.
  - Federal Stimulus funds (ARRA).

Economic uncertainty has created funding shortfalls and a newly created "Unfunded" category for Capital Improvements Program (CIP) projects. In Fiscal Year (FY) 2009-10, the proposed CIP was over $12 Million. For FY 2010-11 the total has declined to less than $6 Million, with $2.5 Million identified for Transportation/LID projects. Standard transportation projects are roughly split as 12 percent street utility fees, 16 percent transportation System Development Charges (SDCs), 53 percent federal and state grants, and 19 percent other loans. Table 15 summarizes the Transportation/LID portion of the CIP through FY 2012-17. A more detailed summary is provided in *Appendix I*.

Table 15 CIP Funding for Construction Years 2008-2017

Transportation Program	Project Totals	Street SDC	Grants	LIDs	Fees & Rates
Transportation	$5,260,216	$605,070	$2,140,100	-	$2,515,406
Street Improvements and Overlays	$2,635,000	-	$651,000	-	$1,984,000
Local Improvement Districts	$827,400	$148,932	-	$320,100	$358,368
Transportation and LID Totals	**$8,722,616**	**$754,002**	**$2,791,100**	**$320,100**	**$4,857,414**
Percent of Total		**8.64%**	**32.00%**	**3.67%**	**55.69%**

Summary

The overall findings from the existing conditions analysis include:

- The highest demand for pedestrian and bicycle travel is currently along the boulevard road network due to the current land use patterns in Ashland.
- There are opportunities to increase the sidewalk coverage to better serve pedestrians specifically on the boulevard network where currently 62% of the network does not have sidewalks on both sides of the street.
- There are opportunities to expand the bicycle network to better serve the community of "interested but concerned" segment of the population.
- With the exception of OR 66/I-5 Exit 14 Northbound Ramps, the study intersections meet current traffic operations standards. One City of Ashland intersection, Mountain Avenue/E Main Street does currently operate at LOS E indicating the potential for operational issues.
- The majority of study intersections have adequate storage to accommodate 95^{th} percentile queues; seven study intersections had one or more approaches where the 95^{th} percentile queue length exceeded the available storage.
- ODOT's 2009 SPIS analysis rates OR 99 and OR 66 through Ashland as Category 3 (of 5 categories) or lower.
- There are five study intersections with crash rates higher than expected based on crash rates at similar types of intersections within Ashland.
- The majority of reported crashes on the selected roadway segments were property damage only crashes.
- Average access driveway spacing on neighborhood collectors and avenues tends to meet the applicable standard; however, relatively long stretches of OR 99, OR 66, and E Main Street have average access spacing that exceeds the applicable standard.
- The majority of bridges within the City of Ashland UGB are structurally and functionally sufficient.
- Historically, transportation funds for the City of Ashland have come from the Street Fund, which is a combination of federal, state, and local revenue sources.

Collectively, these findings provide baseline documentation of how the City of Ashland transportation system is operating in 2010. The TSP update will consider how to build upon and improve upon its performance based on the City's goals and objectives (outlined in Technical Memorandum #2) and the anticipated future growth for the area.

References

1. The Oregon Department of Transportation. *2009 ODOT Transportation Volume Tables*. 2009.
2. Transportation Research Board. *Highway Capacity Manual*. 2000.
3. The Oregon Department of Transportation. *Analysis Procedures Manual*. 2006.
4. The Oregon Department of Transportation. *Oregon Highway Plan*. 1999.
5. The Oregon Department of Transportation. *Oregon Design Manual*. 2003.
6. American Association of State Highway Transportation Officials. *Highway Safety Manual*. 2010.

Appendices

A. Traffic Count Data

B. Methodology Memorandum

C. Existing Conditions Traffic Operations Worksheets

D. Queuing Analysis Worksheets

E. ODOT SPIS City Map for Ashland and Surrounding Cities, 2009

F. Crash Rate Calculations

G. Crash Data

H. Existing Bridge Conditions

I. Transportation/LID Portion of the CIP through FY 2012-17