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MEMORANDUM

Date: February 16, 2011 Project #: 10633.05

To: Jim Olson, City of Ashland

Cc: Project Management Team

From: Marc Butorac, PE and Matt Bell

Project: City of Ashland Transportation System Plan Update

Subject: Final Technical Memorandum #5: Future Conditions Analysis

This memorandum summarizes the results of the future "No-Build" traffic conditions analysis for the Ashland Transportation System Plan (TSP) Update. The analysis includes an evaluation of how the study intersections will operate in the year 2034 assuming growth and development occur without any modifications to the transportation system. The analysis also includes an evaluation of existing and future multimodal levels-of-service (MMLOS) along six major roadways throughout the City.

The following sections present the model assumptions included in the intersection operations and MMLOS analyses, provide a description of the methodology used to develop forecast traffic volumes at the study intersections, and discuss the results of the operations and MMLOS analyses. Future funding forecasts and funding options for future transportation system improvements are also discussed below.

FUTURE POPULATION AND EMPLOYMENT ASSUMPTIONS

The following documents the modeling assumptions for the 2034 future no-build traffic conditions analysis and evaluates the differences between the population and employment growth assumptions included in the Rogue Valley Metropolitan Planning Organization's travel demand model (RVMPO2) and existing City plans. As discussed in the following sections, the population and employment assumptions included in the RVMPO2 model are inconsistent with population and employment projections included in the City's comprehensive plan and the City's Economic Opportunities Analysis.

Population and Employment Growth

Table 1 documents the 2009 certified population estimate for Ashland along with the year 2040 and interim year 2034 population forecasts based on the City's comprehensive plan. As shown, the comprehensive plan estimates an increase of 3,959 people between 2009 and 2034, or approximately 158 people per year. *Attachment "A" provides a table and graph of the City's historic and projected population growth by year and a copy of the certified 2009 population estimate from Portland State University (PSU).*

Table 1 City of Ashland Actual Population and Comprehensive Plan Growth

Year	Population	Difference	Annual Growth	
2009*	21,505			
2034	25,464	3,959 (Year 2034-2009)	158 people/yr	0.74%/yr

*Certified 2009 population by PSU

Table 2 provides the 2007 jobs and projected 2037 jobs from the City's Economic Opportunities Analysis (EOA – Reference 1) along with 2009 and 2034 jobs interpolated for the purpose of this analysis. As shown in Table 2, the City's EOA estimates an increase of 2,212 jobs between 2009 and 2034, or approximately 88 jobs per year.

Table 2 City Economic Opportunities Analysis Job Forecast

Year	Jobs	Difference	Annual Growth	
2007	13,107			
2037	15,761	2,654 (Year 2007-2037)	88 jobs/yr	0.68%/yr
2009*	13,284			
2034*	15,496	2,212 (Year 2009-2034)	88 jobs/yr	0.67%/yr

*Interpolated year using straight-line growth between data provided

Table 3 documents the 2009 and 2034 population and employment growth forecasts within the City's urban growth boundary included in the RVMPO2 travel demand model. It should be noted that the extents of the RVMPO2 model does not align directly with the city's urban growth boundary; therefore, it is the average annual growth rate that is most important and not the 2009 base data.

Table 3 RVMPO2 Model and Ashland Projected Population and Employment (within Ashland UGB)

	RVMPO 2 Model				City Plans	
	2009 Base	2034 Base	2009-2034 Difference	Annual Growth	Annual Growth	Source
Households (HH)	10,935	11,604	669	27 HH/yr		
Population (people)	23,941	25,528	1,587	63 people/yr	158 people/yr	City Comp Plan
Employment (jobs)	14,484	18,806	4,322	173 jobs/yr	88 jobs/yr	City EOA

As shown in Table 3, the RVMPO2 model population growth is significantly less than what is projected in the city's comprehensive plan and the employment growth is significantly higher than the City's EOA. Figures 1 and 2 illustrate the differences in the population and employment growth assumptions in the RVMPO2 model and the City's comprehensive plan and EOA. As shown in Figure 1, the City's comprehensive plan anticipates significantly more growth in population throughout the city than the RVMPO2, while Figure 2 shows that the RVMPO2 model anticipates significantly more growth in employment throughout the city than the City's EOA.

Further evaluation of the differences between the model and City plans is included in the following sections, including an evaluation of how the differences impact traffic operations at the study intersections.

FUTURE TRANSPORTATION CONDITIONS

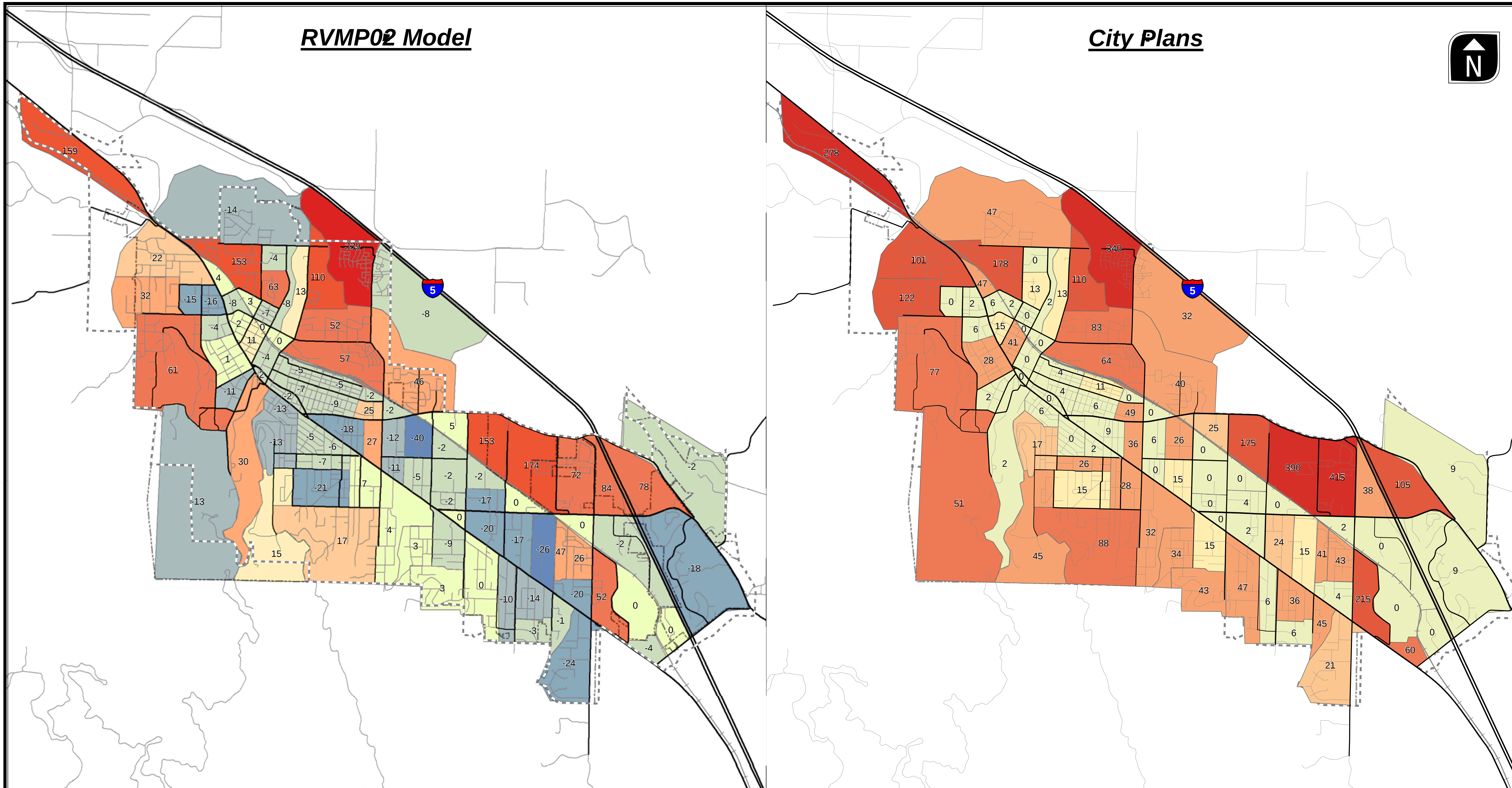
The following describes the weekday p.m. peak hour traffic volume development and the projected weekday p.m. peak hour traffic operations under year 2034 no-build traffic conditions.

Traffic Volume Forecast

The turning movement counts provided by the Oregon Department of Transportation (ODOT) for the existing conditions analysis were used in conjunction with the link volumes provided by the Rogue Valley Metropolitan Planning Organization (RVMPO) to derive future turning movements at the study intersections.

Existing link volumes were derived at each approach to the study intersections by summing the total of the left, through, and right-turning movements from the ODOT traffic counts. The existing link volumes were then evaluated along with the link volumes shown in the base year 2006 and future year 2034 RVMPO2 traffic model following the methodology described in the National Cooperative Highway Research Program Report 255 (NCHRP - Reference 2). NCHRP 255 describes two types of adjustment methods use to determine the final link volumes used in the analysis. The two adjustment methods are applied as follows:

- **Ratio Method:** In the Ratio method the existing link volume is divided by the base model volume then multiplied by the future model volume to derive an *adjusted* link volume that takes into account the difference between the models and the observed count. The results of this method were used when the Difference method resulted in a negative number or when the absolute value of the Difference method was greater than the absolute value of the Ratio method.
- **Difference Method:** In the Difference method the base model volume is subtracted from the existing link volume then added to the future model volume to derive a future *adjusted* link volume that takes into account the net difference between the models and the observed count. The results of this method were used when the existing link volumes were significantly higher than the base model volumes resulting in an excessively high value for the Ratio method.



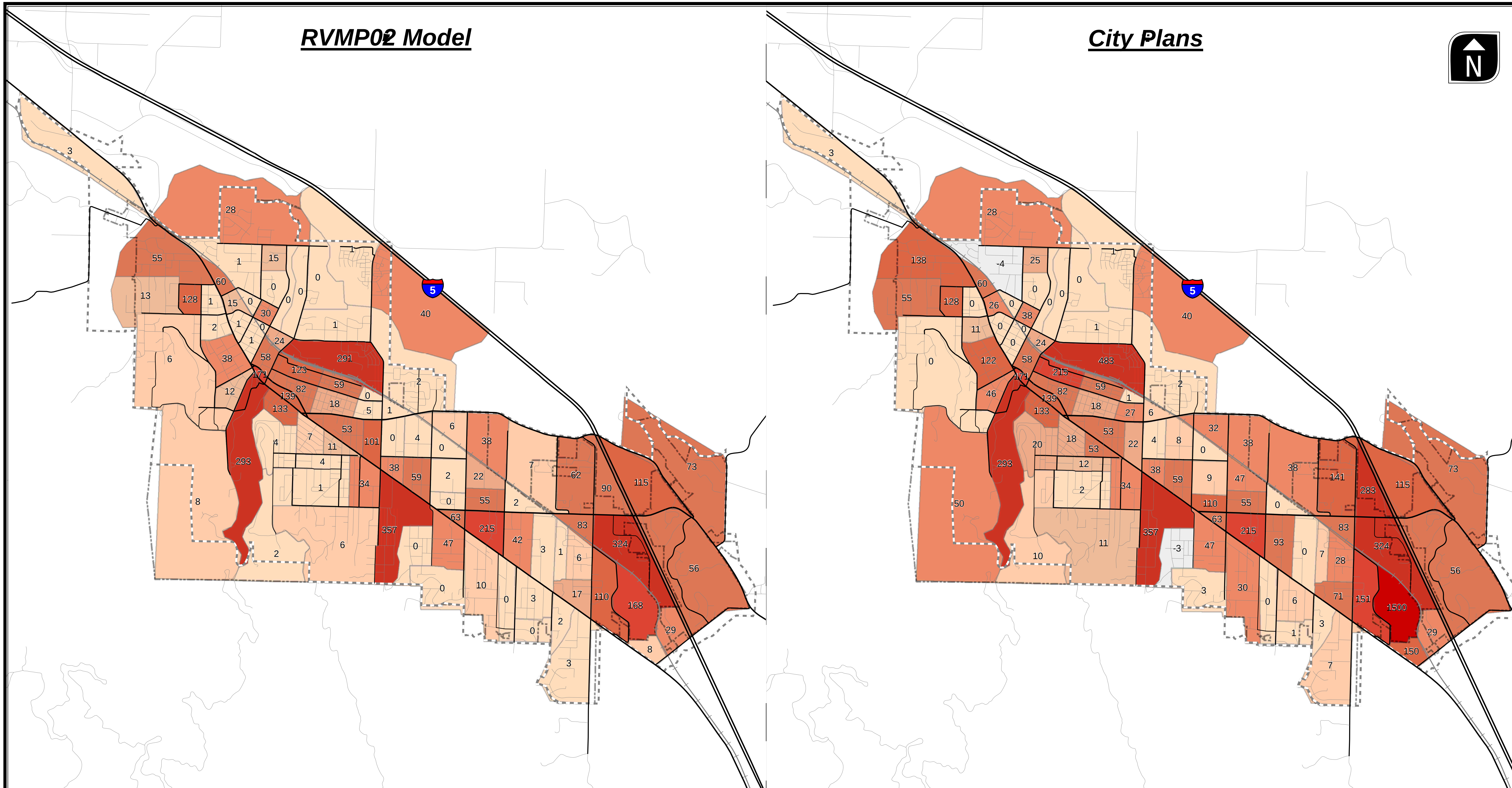
- -50	-10 - 0	25 - 50	City Limits
-49 - -25	0 - 10	50 - 100	City UGB
-25 - -15	10 - 15	100 - 250	
-15 - -10	15 - 25	250+	

Population Growth Assumptions by TAZ

CITY OF ASHLAND

Figure

1



Employment Growth Assumptions by TAZ

CITY OF ASHLAND

Figure

2

Based on NCHRP 255, the final model volumes is often the results of a average of the two methods except in those situations described above: when the Difference is less than zero, when the absolute value of the Difference is greater than the absolute value of the Ratio, or when the existing link volume is significantly higher then the base model volume. The link volumes selected through this process were later distributed at the study intersections based on the existing distribution. The resulting turning movements were used in the traffic operations analysis as described below. *Attachment "B" contains the base and future year model outputs from the RVMPO2 transportation demand model.*

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 present the results of these analyses and discusses which intersections do not meet the applicable standards under future no-build traffic conditions. While the results of the analyses are based on the assumptions in the RVMPO2 model, an evaluation of how a model based on the City's Comprehensive Plan and EOA is also provided for informational purposes.

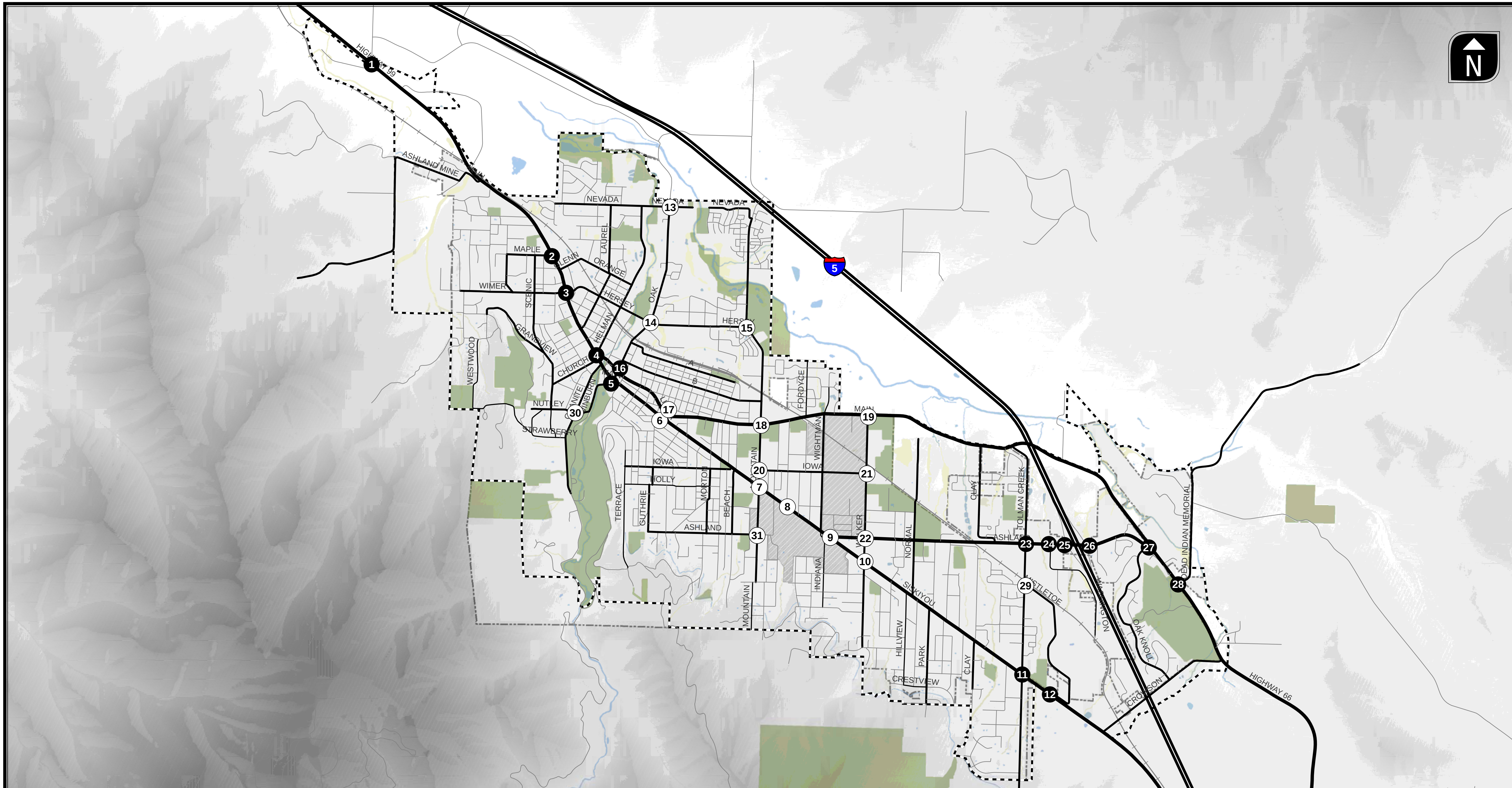
Intersection Delay and Capacity Analysis

A traffic analysis was conducted at 30 study intersections within the City of Ashland. Figures 3, 4, and 5 illustrate the study intersection locations, lane configurations and traffic control devices, and the traffic operations results, respectively.

As shown in Figure 5, there are three study intersections under ODOT's jurisdiction that are forecast to exceed the applicable OHP mobility standard under future no-build traffic conditions. Improvements at these intersections as well as those potentially impacted by other future "build" improvements will need to satisfy the mobility standards identified previously. Alternatively, the City and ODOT may seek alternative mobility standards for these intersections. Further evaluation of operations at the study intersections based on link volumes derived from the City's Comprehensive Plan and EOA is provided below. *Attachment "C" contains the year 2034 future traffic operations worksheets.*

OR 66 (Ashland Street)/I-5 Northbound/Southbound Ramp Terminals

Operations at the Ashland Street (OR66)/I-5 Northbound/Southbound Ramp terminals reflect intersection improvements currently underway, including the conversion of the existing two-way stop controlled intersections to signalized intersections. As indicated in the existing conditions analysis, an Interchange Area Management Plan (IAMP) has recently been prepared for the OR 66/I-5 interchange, which includes additional access management measures near the interchange. The findings and recommendations of the IAMP will be considered when future "build" analysis scenarios are conducted within this TSP update project.



- ODOT Study Intersection
- City Study Intersection

Year 2034 Future No-Build Study Intersections

CITY OF ASHLAND

Figure 3

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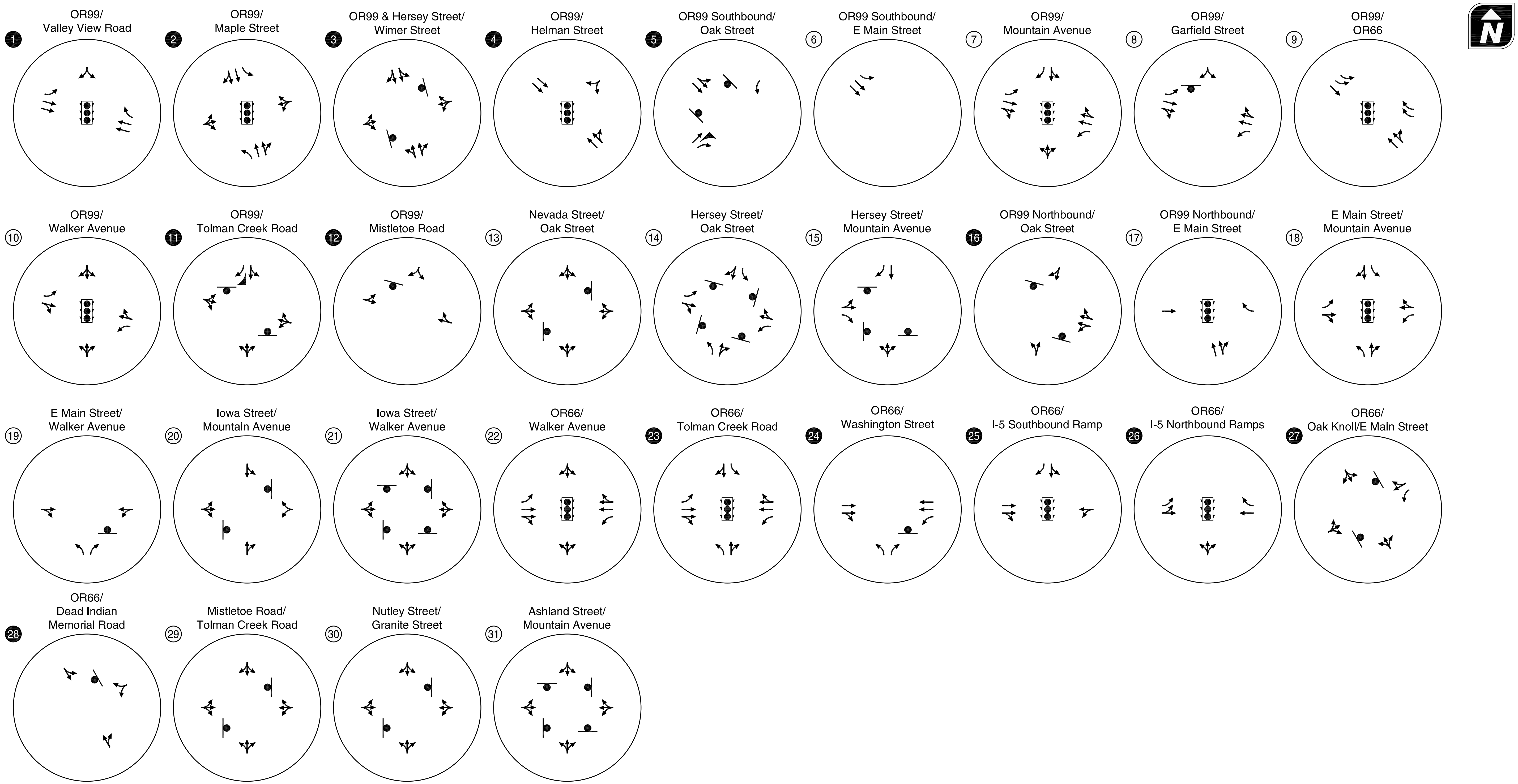
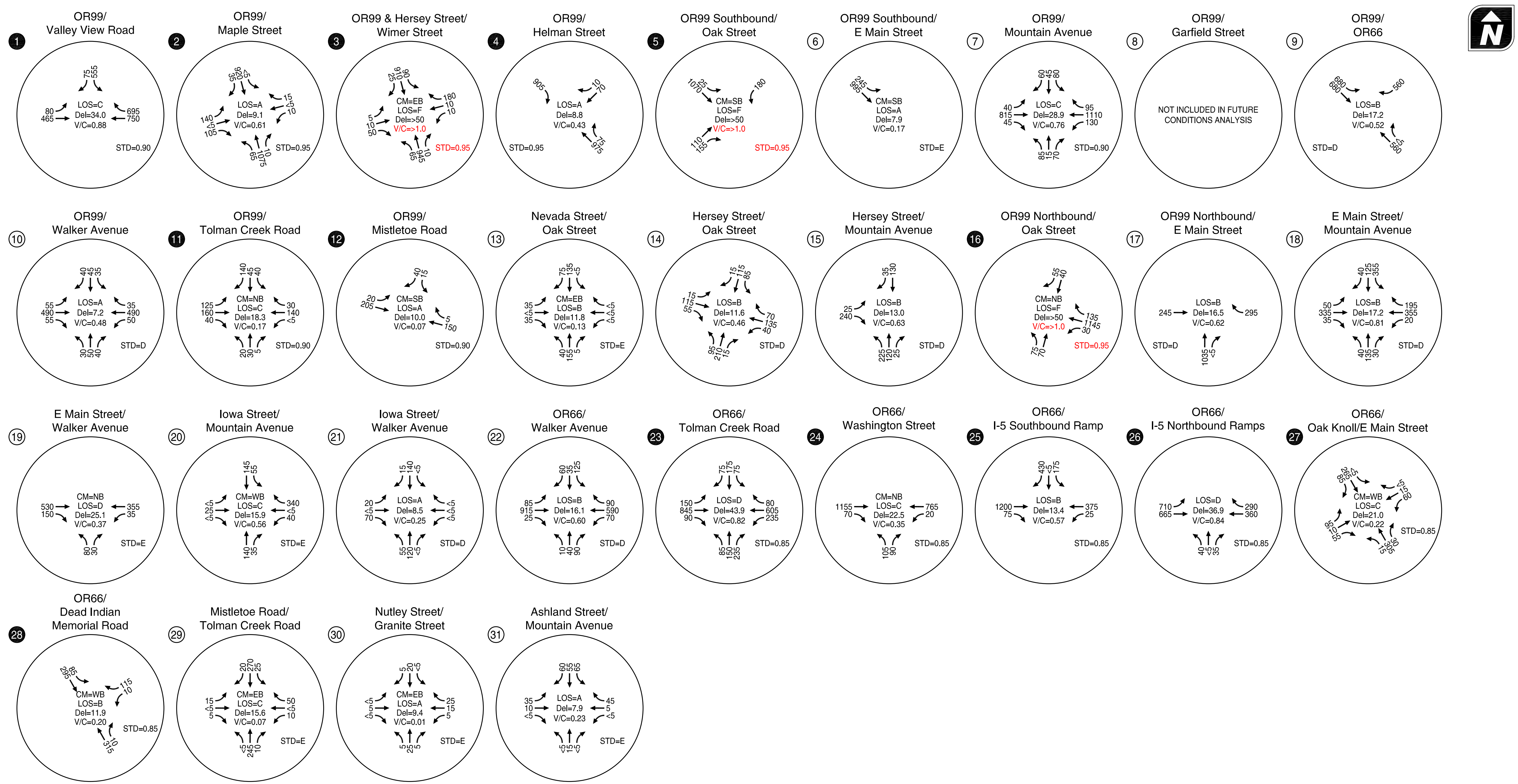


- ODOT STUDY INTERSECTION
- SITY STUDY INTERSECTION
- STOP SIGN
- TRAFFIC SIGNAL

Year 2034 Future No-Build Lane Configurations and Traffic Control Devices

CITY OF ASHLAND

Figure 4



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

Year 2034 Future No-Build Traffic Conditions Weekday PM Peak Hour

CITY OF ASHLAND

Figure 5

N Main Street (OR99)/Wimer Street

The N Main Street (OR99)/Wimer Street intersection is a four-leg, stop-controlled intersection with two north-southbound travel lanes and one east-westbound shared left-through-right lane. Both the east and westbound approaches to the intersection are forecast to operate at LOS F and above capacity during the weekday p.m. peak hour under future no-build traffic conditions with relatively few minor street left-turns or through movements. Signal Warrants at the N Main Street (OR99)/Wimer Street intersection are presented in the next section.

E Main Street (OR99 SB)/Oak Street

The E Main Street (OR99 SB)/Oak Street intersection is a four-leg intersection with two eastbound travel lanes, one stop-controlled southbound left-turn lane, one stop-controlled northbound through lane, and a free-flow northbound right-turn lane. The northbound approach to the intersection is forecast to operate at LOS F and below capacity during the weekday p.m. peak hour with 108 northbound through movements and 153 northbound rights while the southbound approach is forecast to operate at LOS F and above capacity with 182 southbound rights. Signal warrants at the E Main Street (OR99 SB)/Oak Street intersection are presented in the next section.

Lithia Way (OR99 NB)/Oak Street

The Lithia Way (OR99 NB)/Oak Street intersection is a four-leg intersection with two westbound travel lanes, one northbound shared left-through travel lane, and one southbound shared through-right travel lave. The north and southbound approaches are currently stop controlled. The northbound approach to the intersection is forecast to operate a LOS F and above capacity during the weekday p.m. peak hour with 77 northbound lefts and 70 northbound throughs, while the southbound approach is forecast to operate at LOS E and below capacity with 42 southbound throughs and 54 southbound rights. Signal Warrants at the Lithia Way (OR99 NB) /Oak Street intersection are presented in the next section.

Traffic Signal Warrants

Traffic signal warrants were evaluated at the unsignalized intersections identified above in accordance with the methodology described in Section 7.4.1 of the ODOT *Analysis Procedures Manual* (APM – Reference 4). For a long-term future conditions analysis signal warrants 1, Case A and Case B, which deal primarily with high volumes on the intersecting minor street and high volumes on the major-street must be met. Meeting preliminary signal warrants does not guarantee that a signal shall be installed. Before a signal can be installed a field warrant analysis is conducted by the Region. If warrants are met, the State Traffic Engineer will make the final decision on the installation of a signal. Table 4 summarizes the signal warrant analysis for the study intersections under future no-build traffic conditions.

Table 4 Signal Warrant Analysis - 2034 future traffic Conditions

Intersection	Peak Hour Traffic Volumes				Preliminary Signal Warrants	
	EB	WB	NB	SB	Case A - Minimum Vehicular Volumes	Case B – Interruption of Continuous Traffic
N Main Street (OR99)/ Wimer Street	18[1]	19[1]	1,021	1,019	No	No
E Main Street (OR99 SB)/ Oak Street	1,094	0	108	182	No	No
Lithia Way (OR99 NB)/ Oak Street	0	1,312	147	96	No	No

[1] All of the eastbound rights and a majority of the westbound rights were excluded from the signal warrant analysis at the N Main Street/Wimer Street intersection based on the methodology described in Section 7.4.1 of the APM.

As shown in Table 4, preliminary signal warrants were not met at any of the intersections identified as deficient under future no-build traffic conditions. Additional signal warrants, including the Four Hour and Peak Hour warrants were also evaluated at the intersections under future no-build traffic conditions. However, these warrants were also not met. *Attachment "D" contains the signal warrant analysis worksheets for the study intersections.*

Intersection Queuing Analysis

A queuing analysis was performed at the study intersections under future traffic conditions in accordance with the recommendations provided in Section 8.3 of the APM. 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 5 consecutive, random runs of the SimTraffic model as recommended by the APM. As there were 30 intersections included in the analysis, Table 5 summarizes only the queuing results for the study intersections where storage deficiencies are anticipated. The queue lengths reported in Table 5 were rounded up to the nearest 25 feet. The available storage length is based on the striped left and right-turn storage lanes at the intersection.

Table 5 95th Percentile Queues at Study Intersections with Storage Deficiencies

Location	Approach/ Movement	95th Percentile Queue (ft)	Striped Storage Available (ft)	Adequate Storage?	Additional Storage Required (ft)
OR99/ Valley View Road	EBL	200	150	**No**	**50**
	WBR	150	100	**No**	**50**
Mountain Avenue/ Siskiyou Blvd (OR99)	WBL	175	125	**No**	**50**
	SBL	150	100	**No**	**50**
Mountain Avenue/ E Main Street	EBL	125	100	**No**	**25**
	SBTR[1]	250	200	**No**	**50**
Ashland Street (OR66)/ Walker Avenue	EBL	150	100	**No**	**50**
	WBL	125	100	**No**	**25**
Ashland Street (OR66)/ Tolman Creek Road	EBL	150	100	**No**	**50**
	WBL	150	100	**No**	**50**
	NBL	175	100	**No**	**75**
	SBL	150	100	**No**	**50**
Ashland Street (OR66)/ Washington Street	NBL	225	150	**No**	**75**

1. The 95th percentile queue for the southbound through-right (SBTR) turn movement extends beyond the 200-feet of available storage into the southbound left turn lane, which is the dominant movement at the intersection.

*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.

As shown in Table 5, there are six study intersections that were found to have 95th percentile queues on one or more approach that exceed the available storage capacity under future no-build traffic conditions. The remaining study intersections were found to have adequate storage at each approach. *Attachment "E" contains the results of the queuing analysis for all of the study intersections.*

Intersection Queuing Analysis - Synchro

The 95th percentile queues shown in the Synchro analysis results were further reviewed to identify the study intersections where 95th percentile traffic volumes are expected to either exceed the capacity of the intersection or be metered by an upstream intersection. The reported queues at these locations are expected to be longer than what is shown in Synchro. Table 6 summarizes the study intersections and the individual turning movements where 95th percentile traffic volumes either exceed capacity or are being metered. Per direction from ODOT's Transportation Planning Analysis Unit, the information shown in Table 6 is for informational purposes and is not be used as a basis for TSP project decisions.

Table 6 95th Percentile Volumes that Exceed Capacity or are Metered

Intersection	Movement	95th Percentile Volumes	
		Exceeds Capacity?	Metered?
OR99/S Valley View Road	EBL	Yes	No
	WBR	Yes	No
	SBL	Yes	No
Mountain Avenue/Siskiyou Blvd (OR99)	EBT	Yes	No
	WBT	Yes	No
	SBR	No	Yes
Mountain Avenue/E Main Street	WBT	Yes	No
	NBL	No	Yes
	NBT	No	Yes
	SBL	Yes	No
Tolman Creek Road/Ashland Street (OR66)	EBT	Yes	No
	WBL	Yes	No
	NBT	Yes	No
Ashland Street (OR66)/I-5 SB Ramp	WBT	No	Yes
Ashland Street (OR66)/I-5 NB Ramp	EBL	Yes	No
	EBT	Yes	No
	WBT	Yes	No

*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.

RVMPO2 VS COMPREHENSIVE PLAN AND EOA

As indicated previously, operations at the study intersections were further evaluated based on link volumes derived from the City's Comprehensive Plan and EOA. A preliminary review of the City's link volumes indicates that there are relatively minor differences along many of the major roadways throughout the City. The differences that are shown include link volumes that are both higher in some areas and lower in others. In areas where the City's link volumes were found to be higher, the impacts on operations at the intersections were evaluated following the same methodology described above. Table 6 summarizes the study intersections with link volumes on one or more approaches that were significantly higher than the link volumes from the RVMPO2 model. Table 7 also summarized the operations at the study intersections given both sets of volumes.

Table 7 RVMO2 Model vs. City Plans

Intersection	Mobility Standard	RTP Model			City Plans		
		V/C	Delay	LOS	V/C	Delay	LOS
Mountain Avenue/Siskiyou Blvd (OR99)	0.90	.76	28.9	C	.77	26.5	C
Tolman Creek Road/Siskiyou Blvd (OR99)	0.90	.17	18.3	C	.27	25.7	D
Mistletoe Road/Siskiyou Blvd (OR99)	0.90	.07	10.0	A	.31	12.4	B
Oak Street/Nevada Street	LOS E	.13	11.8	B	.14	12.1	B
Oak Street/Hersey Street	LOS D	.46	11.6	B	.47	11.9	B
Mountain Avenue/Hersey Street	LOS D	.63	13.0	B	.60	12.5	B
Tolman Creek Road/Ashland Street (OR66)	0.85	.82	43.9	D	.78	39.4	D
Oak Knoll Drive/Ashland Street (OR66)	0.85	.22	21.0	C	.40	19.3	C
Tolman Creek Road/Mistletoe Road	LOS E	.07	15.6	C	.10	20.9	C

As shown in Table 7, the overall impact of the City's higher link volumes on one or more approach to the study intersections was not sufficient to cause any of the intersections to fail to meet their applicable mobility standards. In addition, lower link volumes on one or more approaches to the intersections often off-set the higher link volumes, and in some cases, improved operations at the intersections (operations at the intersections shown in grey improved with the application of the City's link volumes, despite higher link volumes at one or more approach).

In areas where the City's link volumes were found to be lower on one or more approach, the impact on operations at the intersections found to be failing under the RVMPO2 model were evaluated following the same methodology described above. Table 8 summarizes the intersections that were anticipated to fail under the RVMPO2 model and the resulting operations given the application of the City's link volumes.

Table 8 RVMO2 vs. City Plans

Intersection	Mobility Standard	RTP Model			City Plans		
		V/C	Delay	LOS	V/C	Delay	LOS
N Main Street (OR99)/Wimer Street	0.95	1.06	226.1	F	1.08	158.1	F
E Main Street (OR99 SB)/Oak Street	0.95	3.55	Err[1]	F	2.40	718.1	F
Lithia Way (OR99 NB)/Oak Street	0.95	1.10	169.5	F	0.48	46.5	E

1. When the volume/capacity of an intersection exceeds 3.0, Synchro presents an error in place of the Delay.

As shown in Table 8, the Lithia Way (OR99 NB)/Oak Street intersection would meet its applicable mobility standard with a v/c of 0.48, while the remaining intersection would improve slightly either in terms of v/c, delay, or LOS, but continue to fail to meet their individual applicable mobility standards.

It should be noted that the results shown in Tables 7 and 8 are for informational purposes and can not be used as a basis TSP project decisions unless new population forecasts are adopted by the

County, the model is revised and rerun, and this analysis is updated to reflect any changes between the assumptions in the "City Plans" and the final assumptions.

MULTI-MODAL LEVEL-OF-SERVICE

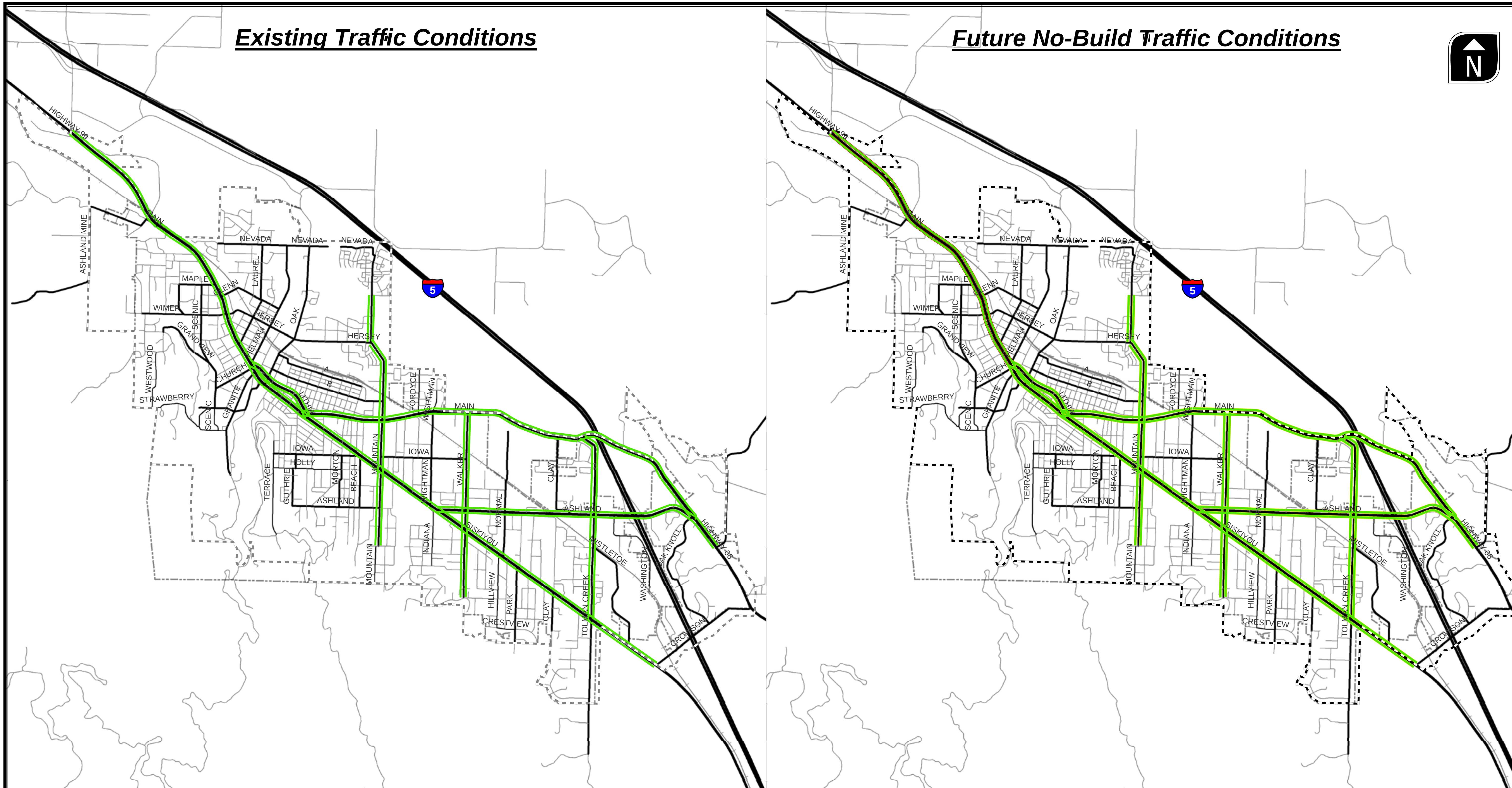
A multi-modal level-of-service (MMLOS) analysis was conducted along six major corridors throughout the City of Ashland; the corridors evaluated were: N Main Street/E Main Street/Siskiyou Boulevard (OR99), Ashland Street (OR66), E Main Street, Mountain Avenue, Walker Avenue, and Tolman Creek Road. Each corridor was divided into several segments based on the location of major study intersections and changes in the roadway characteristics. The analysis was conducted in accordance with the methodology described in the National Cooperative Highway Research Program Report 3-70 (NCHRP - Reference 5), which has been included in the 2010 Highway Capacity Manual. It should be noted that the MMLOS methodology was originally developed for smaller scale analyses within a detailed corridor study or evaluation. It was applied here at a larger scale and indicates the general trends in performance for each mode; however, it is not intended to precisely represent users' experiences as a bicyclist, pedestrian, and/or transit user.

NCHRP 3-70 provides a set of recommended procedures for predicting traveler perceptions of quality of service and performance measures along urban streets. A level-of-service for each mode is derived based on several inputs related to conditions along the roadway. The types of inputs considered by this analysis for bicyclists and pedestrians include peak hour traffic volumes, presence and width of sidewalks and bicycle lanes, crossing delay, and driveway and unsignalized intersection density; for transit users, access to transit facilities, headways, and travel experiences play an important role.

Figure 6, 7, 8 and 9 summarize the results of the MMLOS analyses conducted under existing and future no-build traffic conditions for auto, transit, bicycle, and pedestrian facilities, respectively. As shown there is little difference in the level-of-service between the two travel directions shown along each corridor. Where there are differences, it is typically due to the presence of a sidewalk, bike lane, or unsignalized intersections and/or driveways with high traffic volumes on one side, but not the other. There is also little difference between existing and future no-build traffic conditions. The differences that are present reflect the influence of traffic volumes on the level-of-service for each mode. *Attachment "F" contains the MMLOS worksheets used in the analysis.*

Auto

Auto level of service is primarily measured by the average speed over the length of the corridor and the average of number of stops per mile. Traffic volumes, heavy vehicle percentages, turning percentages, and peak hour factors are all inputs to the auto level of service along with signal timing at signalized intersections and saturation flow rates. Additional information related to Auto level-of-service at the study intersections is provided in Figure 5 above.



LOS A-B
LOS C-D
LOS E-F
City UGB
City Limits

Multimodal Level-of-Serivce - Auto
Weekday PM Peak Hour

CITY OF ASHLAND

Figure 6

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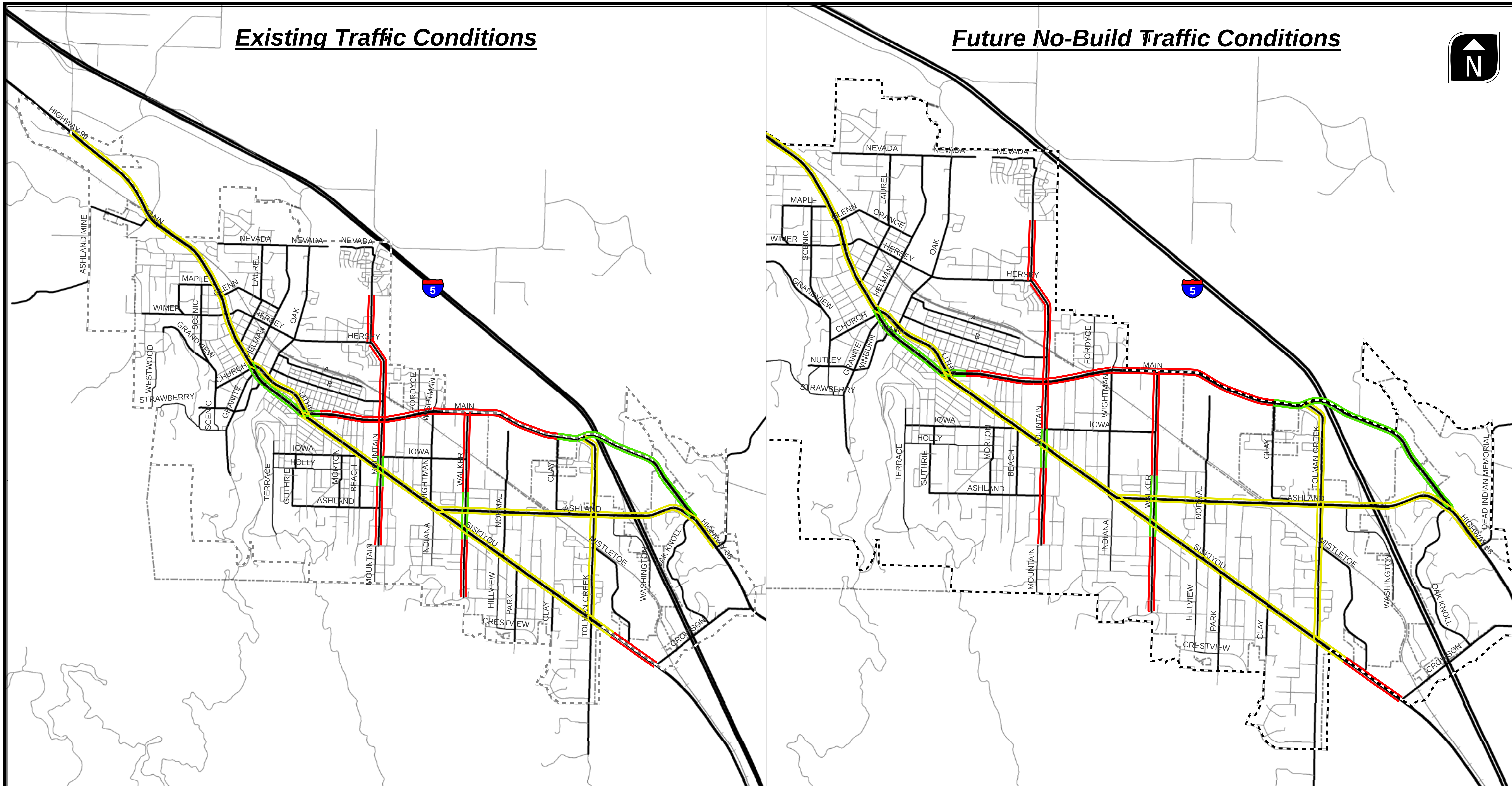

LOS A-B
LOS C-D
LOS EF
City UGB
City Limits

Multimodal Level-of-Serivce - Transit
Weekday PM Peak Hour

CITY OF ASHLAND

Figure

7

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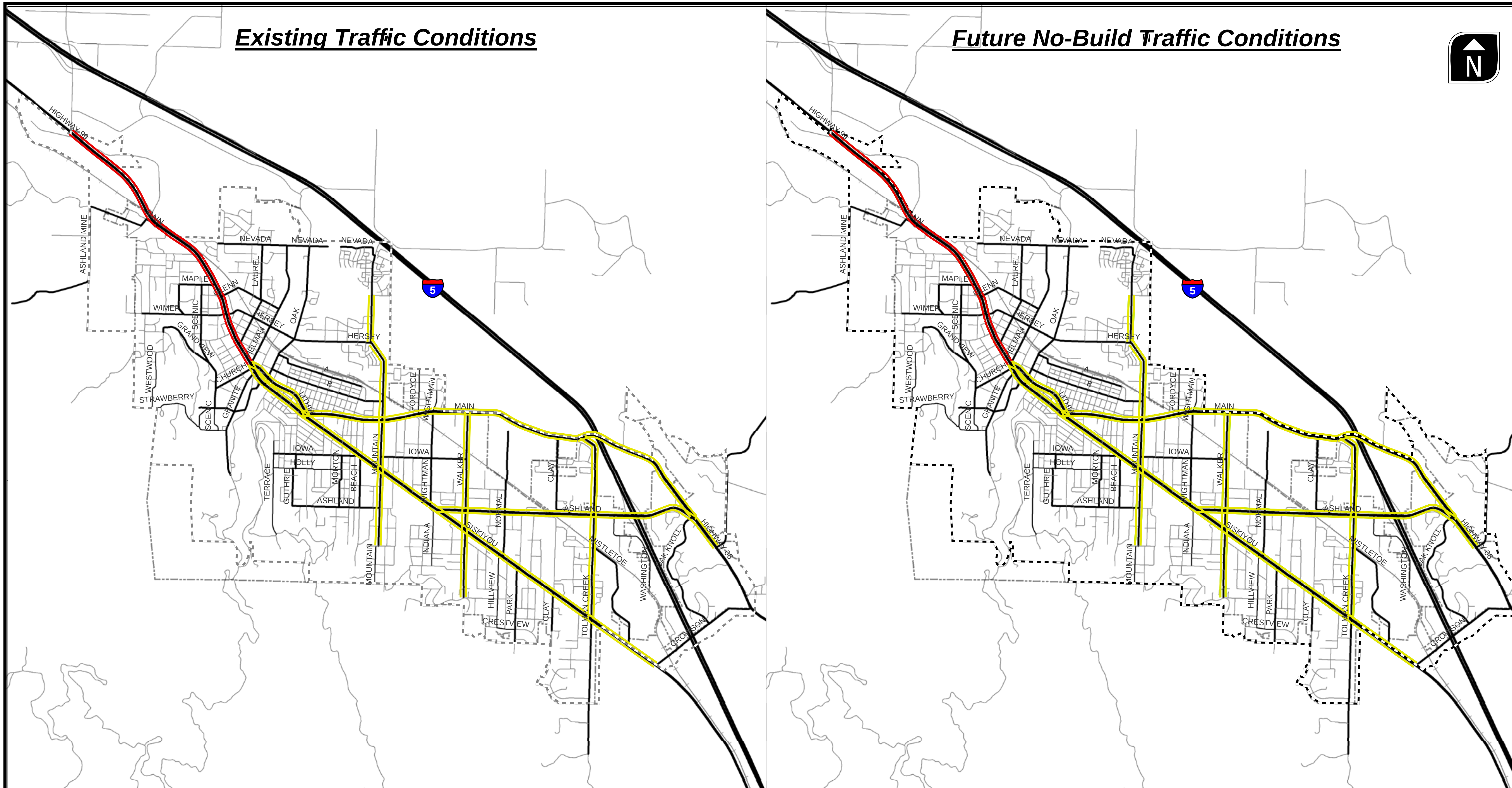

LOS A-B	City UGB
LOS C-D	City Limits
LOS E-F	

Multimodal Level-of-Serivce - Bicycle
Weekday PM Peak Hour

CITY OF ASHLAND

Figure
8

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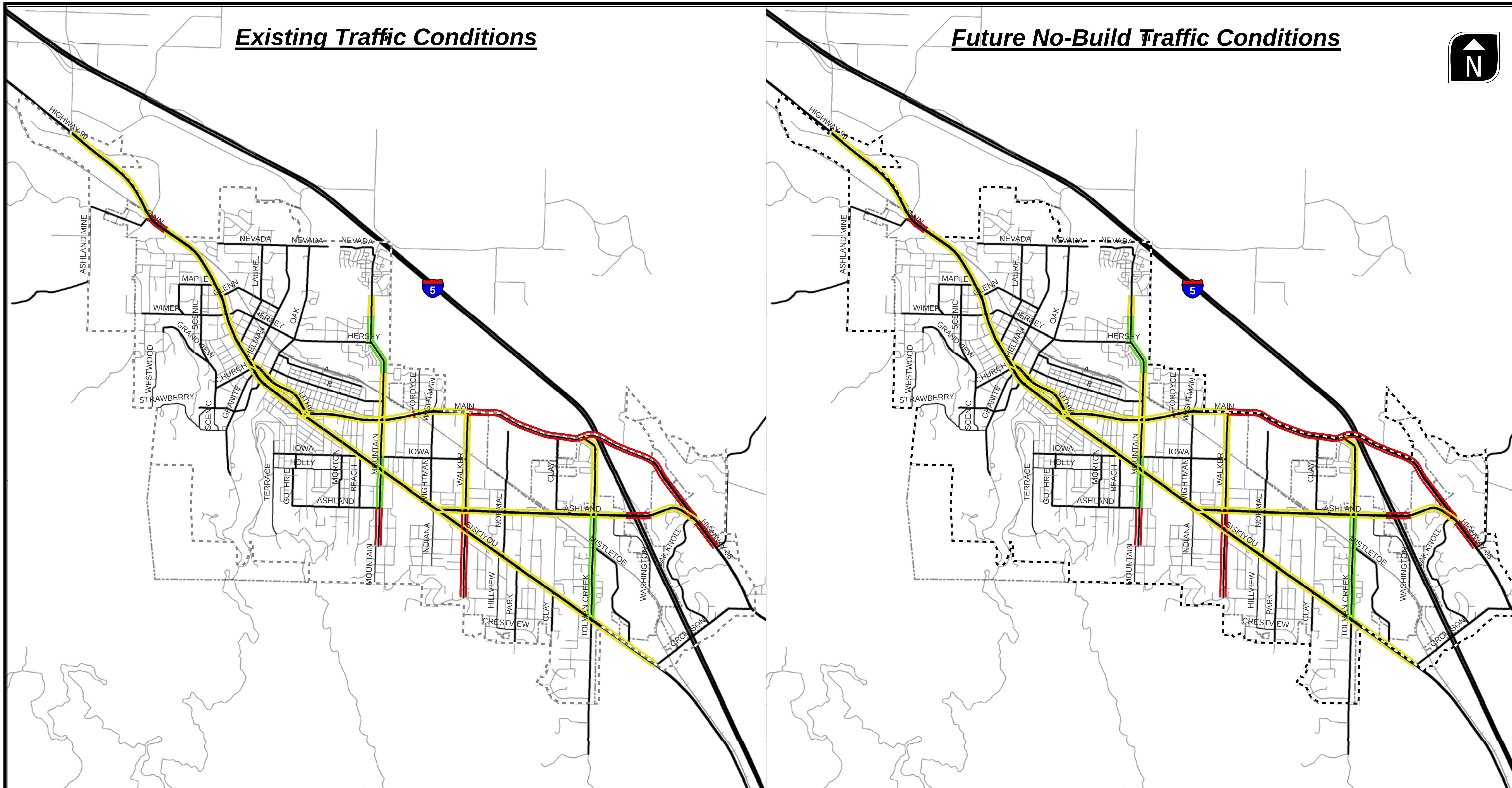

LOS A-B	City UGB
LOS C-D	City Limits
LOS E-F	

Multimodal Level-of-Serivce - Pedestrian
Weekday PM Peak Hour

CITY OF ASHLAND

Figure
9

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Transit

The three primary performance measures that influence the transit LOS results include access, wait time, and ride experience. Access is represented by the pedestrian level of service score and pedestrian access to bus stops along the corridor. Wait time and ride experience are affected by headways and passenger per seat ratings. For the corridors in Ashland, the MMLOS results for transit facilities are generally well-rated; transit service is provided along each of the roadways included in the analysis except for Mountain Avenue and Walker Avenue. However, both of those roadways cross Siskiyou Boulevard (OR99) and/or Ashland Street (OR66), each of which have transit service, therefore, transit service is provided within a quarter mile of at least a portion of both Mountain Avenue and Walker Avenue. It should be noted that the transit LOS result is biased towards the weekday p.m. peak hour when service is available. It does not take into account that service is not proved after 6:30 p.m. and that no service is provided on Saturdays or Sundays. Opportunities to improve transit service include the provision of bus shelters or seating at key stop locations, shorter headways, longer service hours, and more extensive coverage.

Bicyclists

Similar to the pedestrian LOS, there are two basic performance measures that influence the bicycle LOS results within the MMLOS analysis. One is the feeling of security and quality of experience a bicyclist has riding on a roadway facility (e.g., presence and width of bicycle lanes). The second is the frequency of conflicts with vehicle cross traffic (e.g., frequency of driveways or unsignalized intersections). For the corridors studied in Ashland, the MMLOS results for bicycle facilities indicate bicycling along these roadways may be uncomfortable for many individuals. This is primarily due to the lack of bicycle facilities on some roadways or roadway segments, relatively high traffic volumes, and the frequency of unsignalized intersections and driveways. Opportunities to improve LOS for bicyclists along the major roadways include adding additional bicycle lanes, implementing buffered bicycle lanes, and consolidating driveways.

Pedestrians

There are two basic performance measures that influence the pedestrian LOS results within the MMLOS methodology. One is the feeling of security and quality of experience a pedestrian has walking alongside a roadway facility (e.g., presence and width of sidewalks). The second is the ability pedestrians have to safely and efficiently cross the major roadway. For the corridors studied in Ashland, the MMLOS results for pedestrian facilities indicate pedestrians generally feel safe walking along the major roadways. However, curb-tight sidewalks, high traffic volumes, and the absence of crosswalks at several major intersections degrade the pedestrian experience resulting in a pedestrian LOS that may not be expected on facilities that provide continuous sidewalks. Opportunities to improve the pedestrian LOS include providing landscape strips between the roadway and the sidewalk, increasing the width of sidewalks, and providing additional opportunities for pedestrians to safely and efficiently cross major roadways.

FUTURE TRANSPORTATION FUNDING

The historical funding mechanism for transportation improvements in Ashland is the Street Fund. The Street Fund includes revenue generated through gas taxes, franchise fees, system development charges (SDCs), transportation user/utility fees, specific project funds generated through local improvement districts, and a variety of state and federal grants. Once obtained, these fees are generally dedicated to improvements, and do not require voter approval.

Historically, communities around the state have included funding sources that have leveraged improvements through advance financing by developers, assessed special property tax levies, or used revenue bonds for specific capital improvements which are backed by specific dedicated future revenue sources. With the exception of advance financing by developers, the majority of these funds are dependent on voter approval, which may temper their reliability as a funding source. These funding sources are almost always dependent upon current market and economic conditions, being less robust revenue streams in a 'down economy'.

Future Funding Forecast

The Street Funds three primary sources of revenue for the 2011 fiscal year are intergovernmental revenues (gas tax, state and federal grants), fees, and bond proceeds. The intergovernmental revenues are expected to account for approximately 50 percent of the Street Fund in the 2011 fiscal year. This indicates the importance of the gas tax, and state and federal grants, to the overall streets program for the City of Ashland.

Intergovernmental revenues, fees, and bond proceeds will likely continue to be the primary sources of revenue for the Street Fund in future budget cycles. Bond proceeds and fee increases will continue to be dependent on the state of the economy and voter willingness for passage, and the state gas tax will increase from 24 cents to 30 cents on January 1, 2011. This represents a 25 percent increase over the existing tax, and will constitute the first rise in the Oregon gas tax since 1993. However, the tax increase should not be considered a long-term funding source given the improved fuel efficiency of newer vehicles, the rise in ownership of hybrid and electric vehicles, and the increased use of alternative fuels. Additionally, Ashland will not be able to increase its proportional share of that tax increase without legislative action at the state level. It is reasonable to assume the overall total revenue will temporarily increase with the legislative action. However, if the average fuel efficiency of vehicles increases or there is precipitous drop in vehicle miles, a decline in gasoline consumption may lead to a decline in revenue.

Alternative Funding Sources

There is a community desire to enjoy a transportation system that includes enhanced pedestrian and bicycle facilities, reduces vehicle travel, and increases transit service and amenities. Those improved transit choices lend themselves to integration with compact, transit-supportive development. Those objectives can be better achieved through considering alternative ways to fund and promote these initiatives. Alternative funding sources to consider include any combination of those summarized in Table 9.

Table 9 Alternative Funding Sources

Funding Source	Description	Benefits
User Fee	Fees tacked onto a monthly utility bill or tied to the annual registration of a vehicle to pay for improvements, expansion, and maintenance to the street system. This may be a more equitable assessment given the varying fuel efficiency of vehicles. Regardless of fuel efficiency, passenger vehicles do equal damage to the street system. The cost of implementing such a system could be prohibitive given the need to track the number of vehicle miles traveled in every vehicle. Additionally, a user fee specific to a single jurisdiction does not account for the street use from vehicles registered in other jurisdictions.	Primarily Street Improvements
Street Utility Fees/Road Maintenance Fee	The fee is based on the number of trips a particular land use generates and is usually collected through a regular utility bill. For the communities in Oregon that have adopted this approach, it provides a stable source of revenue to pay for street maintenance allowing for safe and efficient movement of people, goods, and services.	System-wide transportation facilities including: • Streets • Sidewalks • Bike lanes • Trails
Local Fuel Tax	A local tax assessed on fuel purchased within the jurisdiction that has assessed the tax. Some would argue that this tax is unfair given the increased fuel efficiency of today's vehicles. On the other hand, the tax could potentially generate revenue while encouraging fuel efficiency and lessening impacts to the environment.	Primarily Street Improvements
Systems Development Charges (SDCs)	Sometimes referred to as a transportation impact fee, SDCs are fees assessed on development for impacts created to public infrastructure. For example, Washington County implemented a transportation development tax in 2008 to replace their transportation impact fee. A transportation development tax is based on the estimated traffic generated. All revenue is dedicated to transportation capital improvements designed to accommodate growth. SDCs do generate revenue when the economy is doing well, and development is occurring. SDCs should not be considered a reliable source of income given the volatility of today's markets. Even when stable, some would argue that SDCs are not equitable because they are sometimes assessed in locations where services are already available. Nevertheless, they are an accepted source of revenue for many cities in Oregon, and help to offset the cost of new construction on public infrastructure. SDCs should be evaluated on a regular basis to ensure that they are proportional to the impacts created by new development. SDC credits can encourage private development to provide small-scale public improvements that can be constructed by the private sector at a smaller cost. For example, an SDC credit might be given for providing end-of-trip bike facilities within the new development. Eligible projects are on major roads, including sidewalks and bike lanes, as well as transit capital projects.	System-wide transportation facilities including: • Streets • Sidewalks • Bike lanes • Trails

Funding Source	Description	Benefits
Stormwater SDCs, Grants, and Loans	Systems Development Charges, Grants, and Loans obtained for the purposes of making improvements to stormwater management facilities. Some jurisdictions in Oregon have used these tools to finance the construction and maintenance of Green Streets, and should be considered as an alternate funding source for Green Streets in Ashland.	Primarily street improvements
Local Sales Tax	A tax assessed on the purchase of goods and services within a specific location. A sales tax could be assessed only on auto-related goods and services to generate revenue for transportation-related improvements.	System-wide transportation facilities including: • Streets • Sidewalks • Bike lanes • Trails • Transit
Optional Tax	A tax that is paid at the option of the taxpayer to fund improvements. Usually not a legislative requirement to pay the tax and paid at the time other taxes are collected, optional taxes are usually less controversial and easily collected since they require the taxpayer to decide whether or not to pay the additional tax.	System-wide transportation facilities including: • Streets • Sidewalks • Bike lanes • Trails • Transit
Parking In-lieu Fees	Fees that are assessed to developers that cannot or do not want to provide the parking for development.	System-wide transportation facilities including: • Streets • Sidewalks • Bike lanes • Trails • Transit
Sponsorship	Financial backing of a public-interest program or project by a firm, as a means of enhancing its corporate image. This has been used by local transit providers to help offset the cost of providing transit services and maintaining transit related improvements.	Transit Facilities
Incentives	An enticement such as bonus densities and flexibility in design in exchange for a public benefit. Examples might include a Commute Trip Reduction (CTR) program, or transit facilities in exchange for bonus densities.	System-wide transportation facilities including: • Streets • Sidewalks • Bike lanes • Trails • Transit
Congestion Pricing	Competitive pricing of public facilities to discourage non-essential trips during peak travel times and encouraging alternative forms of transportation. Congestion pricing is also a tool that can be used for parking management. Congestion pricing is basically a toll applied to drivers who drive or park within a designated area or on a designated facility during periods of heavy congestion. In some cases, such as parking, higher fees are imposed in certain areas to discourage long term use. Similar variable charges have been successfully utilized in other industries—for example, airline tickets, cell phone rates, and electricity rates.	Primarily street improvements

Funding Source	Description	Benefits
Public/Private Partnerships	Rarely used for transportation facilities, public/private partnerships are agreements between public and private partners that can benefit from the same improvements. They have been used in several places around the country to provide public transportation amenities within the public right-of-way in exchange for operational revenue from the facilities. These partnerships could be used to provide services such as charging stations, public parking lots, bicycle lockers, or carshare facilities.	System-wide transportation facilities including: • Streets • Sidewalks • Bike lanes • Trails • Transit
Tax Increment Financing (TIF)	A tool cities use to create special districts (tax increment areas) and to make public improvements within those districts that will generate private-sector development. During a defined period, the tax base is frozen at the predevelopment level. Property taxes for that period can be waived or continue to be paid, but taxes derived from increases in assessed values (the tax increment) resulting from new development either go into a special fund created to retire bonds issued to originate the development or leverage future improvements. A number of small-to-medium sized communities in Oregon have implemented, or are considering implementing, urban renewal districts that will result in a TIF revenue stream.	System-wide transportation facilities including: • Streets • Sidewalks • Bike lanes • Trails • Transit

Table 6 is not an all inclusive list of alternative funding. Each of these financing tools requires focused research to ensure that it is the right fit for the community, and can be closely matched with achieving the objectives of the TSP update.

Recommendations for SDC Updates

If the City chooses to continue collecting SDCs for development, then it should also evaluate the existing rates. Typically, in other jurisdictions in Oregon, Systems Development Charges account for approximately 10 to 12 percent of revenues that are applied towards the improvement and maintenance of streets. This has not been the case in Ashland since 2007. Prior to 2007, the Systems Development Charges that have been collected by the City accounted for a higher percentage of revenue within the street fund. In the next fiscal year, they will account for less than 1 percent of the revenue in the Street Fund.

Street Fund revenues for the 2011 fiscal year are 63 percent higher than in 2005 when SDCs accounted for approximately 12 percent of the revenues. Since 2008, it would make sense that the revenue generated from SDCs would be lower given the decline in the economy, and the overall lull in construction activity, but revenues generated from SDCs began decreasing well before the 2008 market declines. This trend would suggest that it may be time for the City to evaluate its SDC program to ensure that new construction helps to pay for the impacts that it creates. Several cities in Oregon increase their SDCs annually to keep current with the cost of inflation. Ashland should consider doing the same to ensure that the SDC program continues to pay for the true costs of maintaining and improving its transportation system. SDC's should be considered not only for the street system and location specific capacity improvements. This can be revenue stream to meet community-wide multimodal transportation system goals. From that perspective, funding could emphasize providing city wide pedestrian connectivity through continuous and standard sidewalks (e.g. fill in the gaps where needed), public trails development, enhanced bicycle facilities, enhanced pedestrian facilities on collector and arterial streets, and transit stop amenities beyond those provide by RVTD. The possibility of using SDC credits to encourage private development to meet some of these objectives was previously noted.

A last recommendation is for the City to consider the full-time or half-time dedication of a single employee's time to identifying and pursuing innovative funding through local, state, federal, and private grants that may be available to small- to medium-sized cities. The programs and objectives that the City is seeking to achieve with this update will undoubtedly make them more competitive and potentially provide them with an edge over other similar sized jurisdictions that are not making the progressive strides that are sought by this TSP update.

SUMMARY

Future Population and Employment Growth Assumptions

- The RVMPO2 model projects an increase of 1,587 people and 4,322 jobs between 2009 and 2034. These assumptions are inconsistent with the population and employment projections included in the City's comprehensive plan and the City's Economic Opportunities Analysis.
- An evaluation of the RVMPO2 model vs. City Plans indicates the following:
    - The forecast in the City's comprehensive plan anticipates more growth in population throughout the city than the RVMPO2.
    - The RVMPO2 model assumptions anticipate more growth in employment throughout the city than the City's EOA.
    - Despite differences in population and employment growth projections, operations at the study intersections remain relatively consistent.

Future Transportation Conditions

- Three study intersections under ODOT's jurisdiction are forecast to exceed the applicable OHP mobility standard under future traffic conditions, including:
    - N Main Street (OR99)/Wimer Street
    - E Main Street (OR99 SB)/Oak Street
    - Lithia Way (OR99 NB)/Oak Street
        - Preliminary signal warrants were not met at these intersections.

- Six study intersections were found to have 95th percentile queues on one or more approach that exceed the available storage capacity under future no-build traffic conditions.
- The results of the MMLOS analysis indicates that there are no significant differences between the existing and future no-build traffic conditions, which suggests that an increase in traffic volumes does not have a significant impact on the overall multimodal system. Rather improvements to pedestrian and bicycle facilities, including the landscape strips, streets trees, buffered bike lanes, pedestrian and bicycle crossing treatments, etc. in addition to the consolidation of driveways will create significant changes in the multi-modal system.

Future Funding Forecast

- Intergovernmental revenues, fees, and bond proceeds will likely continue to be the primary sources of revenue for the Street Fund in future budget cycles. However the City should continue to explore alternative funding sources, including modifications to the existing system development charges.

REFERENCE

1. City of Ashland, Economic Opportunities Analysis. 2007.
2. National Cooperative Highway Research Program, Highway traffic Data for Urbanized Area Project Planning and Design (Report 255). 1982.
3. Oregon Department of Transportation, Highway Design Manual. 2003
4. Oregon Department of Transportation, Analysis Procedures Manual. 2006.
5. National Cooperative Highway Research Program, Multimodal Level-of-Service Analysis for Urban Streets: NCHRP Project 3-70. 2008

ATTACHMENTS

A. City Population Data
B. RVMPO2 Model Data
C. Year 2034 Traffic Operational Analysis Worksheets
D. Signal Warrant Analysis Worksheets
E. Queuing Analysis Worksheets
F. Multimodal Level-of-Service Worksheets