

# Technical Memorandum #2 Technical Appendices

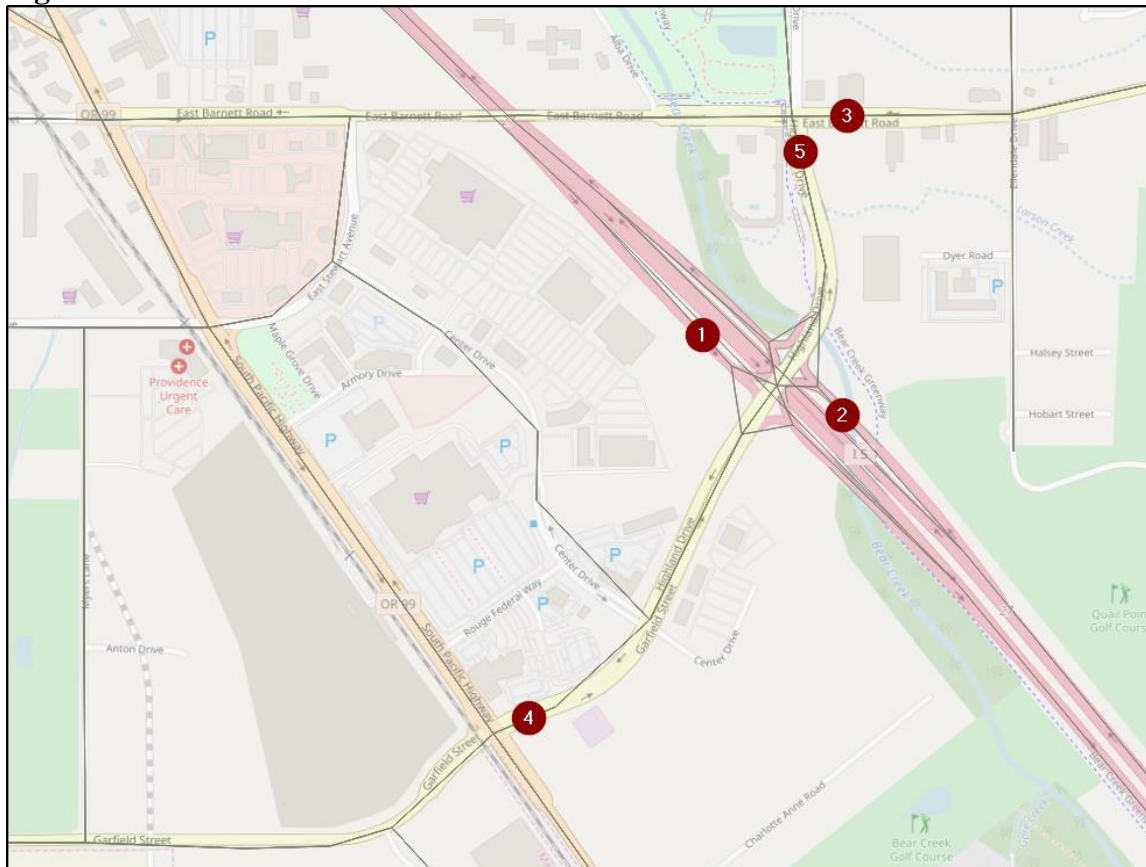
## Appendix F – Select-Link Analysis

### Methodology

TPAU used the current Rogue Valley MPO (RVMPO, version 4.3) JEMnR (Joint Estimated Model in R) model to determine the routing of the traffic around the project area. The current RVMPO v. 4.3 model is calibrated for PM peak hour; AM peak hour factors were developed to provide an AM peak hour scenario. Select-link analysis was completed on both the AM and PM peak scenarios for the locations shown in Figure F-1.

1. Southbound I-5 off-ramp
2. Northbound I-5 off-ramp
3. East leg of Barnett Road/Highland Drive intersection, both directions
4. South leg of Barnett Road/Highland Drive intersection, both directions
5. Northeast leg of Garfield Street/OR99 intersection, both directions

**Figure F-1 – Select-Link Locations**

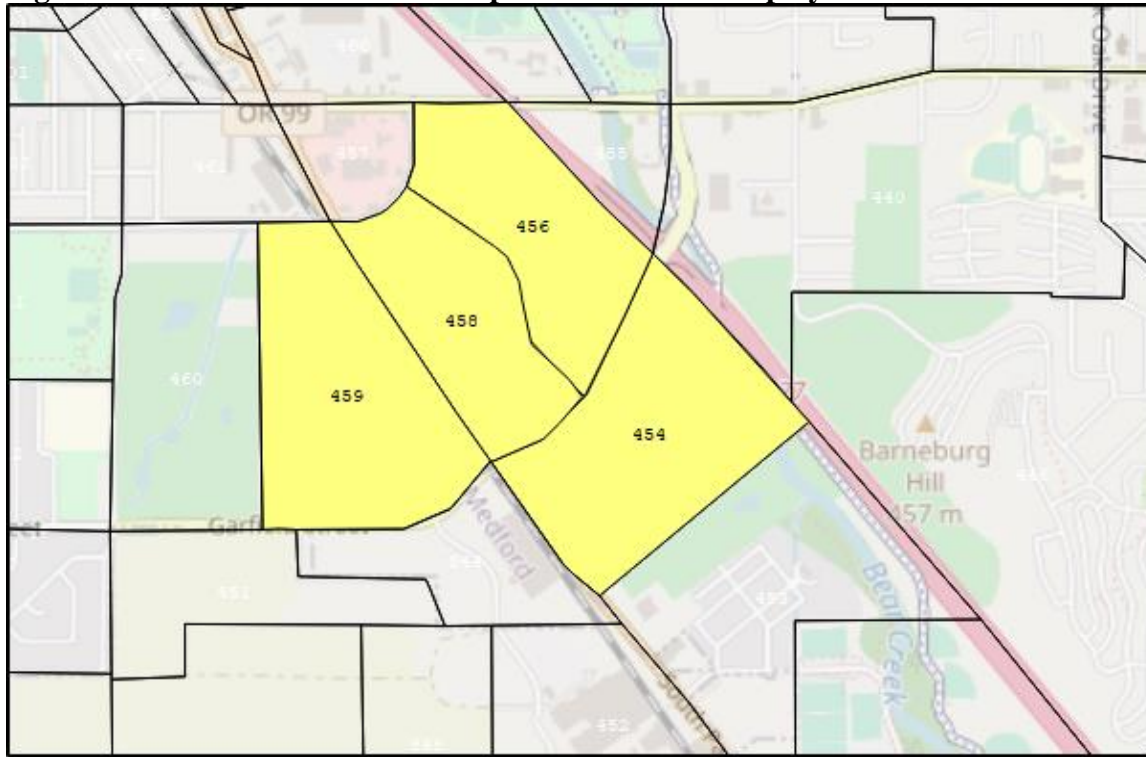


A comparison select link analysis was requested, with additional land use. Table F-1 lists the additional land uses in the scenario; the two (2) projects not modelled do not create transportation issues. Figure F-2 shows the locations which had changes of additional land use.

**Table F-1: Additional Land Uses provided by the City of Medford 5/28/2020**

TAZ No.	Project Number	Project Description	Building Square Feet	Employees	Employment Category
<b>Projects already built, added to model scenario</b>					
454	AC-18-126	KFC drive through restaurant	2,849	8	Service
456	AC-16-150	Holiday Inn Express 93 room hotel	13,850	15	Service
458	AC-16-134	Rogue Credit Union New office/CU	41,728	120	Financial
459	AC-16-044	Providence Urgent Care - new medical building	66,837	150	Service
456	AC-17-167	IHOP New restaurant	4,485	20	Service
<b>Projects planned, added to model scenario</b>					
454	AC-20-012	Commercial Gas/Convenience Store	3,141 plus canopy	3	Retail
	FP-19-005	Charlotte Ann Rd Connection			
456	FP-19-018	2 lot partition/ commercial property			
454	PL-19-024 PL-19-025	92 room hotel	51,198	50	Service
459	AC-17-066	134 Unit Multi-family residential	185,024		
<b>Projects not modelled</b>					
	SV-19-048	Vacation of easement	No construction associated.		
	Ellendale Overlay	Street Pavement Overlay	No construction associated.		

**Figure F-2 – TAZ Locations with Updated Landuse/Employment**



## Results

Figures F-3 through Figure F-28 show the percent traffic volume that travels to/from the selected links in the model run with the original land use.

### Exit 27 Southbound (SB) off ramp, Table F-2

Figure F-3 and Figure F-4 show nearly half the Exit 27 southbound off ramp traffic volume is getting on I-5 at Exit 30 to the north (46% AM peak, 57% PM peak), about evenly split coming from west and east of the freeway. Another 26-27% got onto the freeway at then next exit to the north, Exit 33, as seen in Figure F-5 and Figure F-6.

Figures F-7 and F-8 show that the Exit 27 southbound off ramp traffic volume is then splitting between going south on Garfield Street (AM peak 53%; PM peak 59%) and northbound on Garfield Street (AM peak 46%; PM peak 41%). Of the traffic going southbound, 18% turns north on Center Drive towards shopping areas (Walmart, Fred Meyer, Harry and David's), motels, and restaurants; ~27% makes the left turn to go south on OR 99. The Exit 27 southbound off ramp traffic that goes north on Garfield Street predominantly is going to turn right to go east on Barnett Road (AM peak 40%, PM peak 37%).

**Table F-2 – Traffic Percentages to and from Exit 27 Southbound off Ramp**

Exit 27 SB Off Ramp	Percent Traffic			Figure(s)
	AM Peak Hour	PM Peak Hour		
<b>From</b>				
Exit 30 SB on ramps	46%	57%	Even split from west, east of freeway.	Figure F-3 Figure F-4
Exit 33 SB on ramps	27%	28%	AM~8% from east of freeway; PM 12.5% from east of freeway; rest from west of freeway	Figure F-5 Figure F-6
<b>To</b>				
South on Garfield St	53%	59%		Figure F-7 Figure F-8
North on Center Dr	18%	18%		
South on OR 99	26%	27%		
North on Garfield St	46%	41%		
East on Barnett Rd	40%	37%		
North on Highland Dr	5%	1%		
West on Barnett Rd	4%	<1%		

Figure F-3 – AM Peak Hour SB I-5 Off-Ramp Percent Traffic from Exit 30

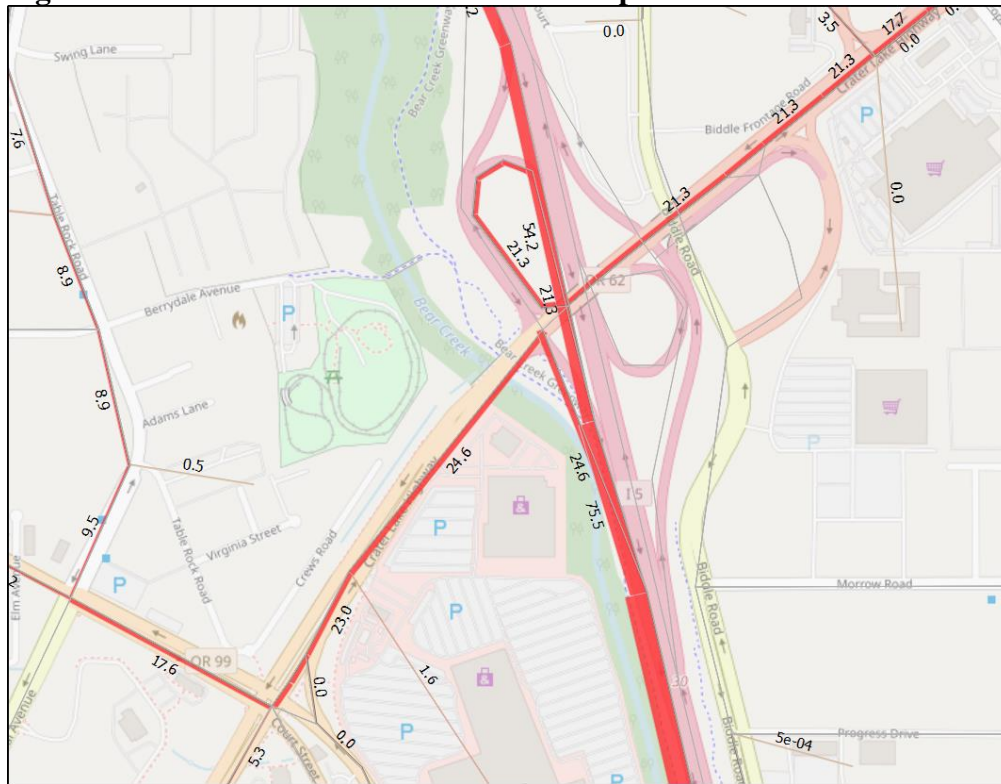
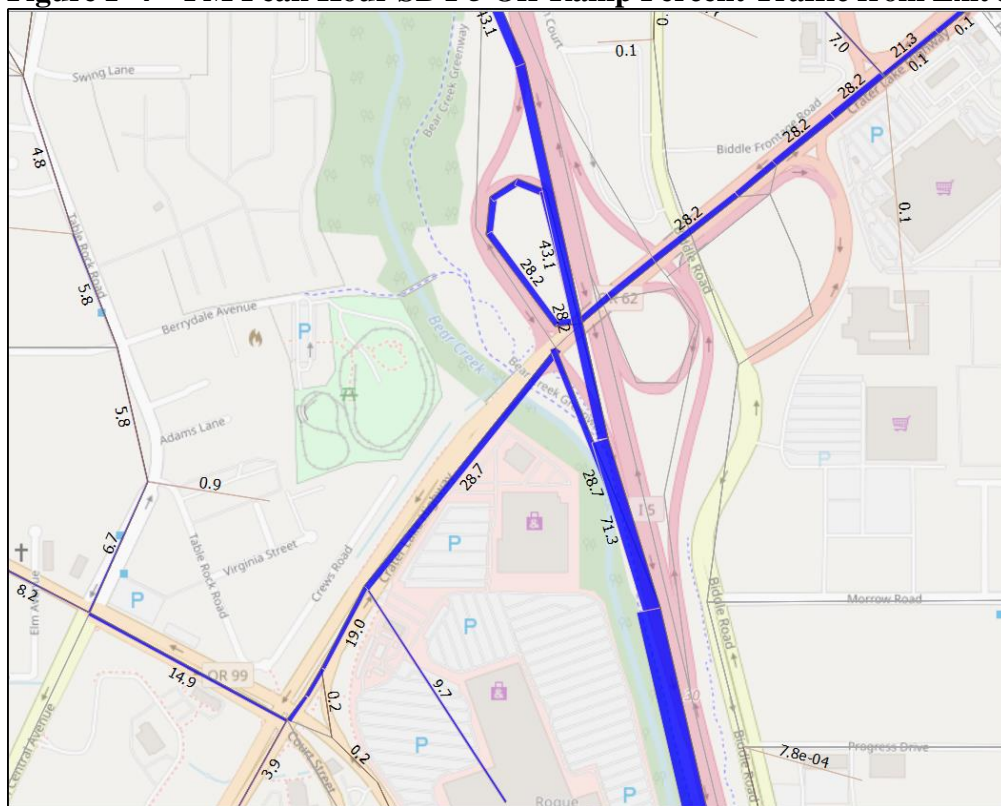
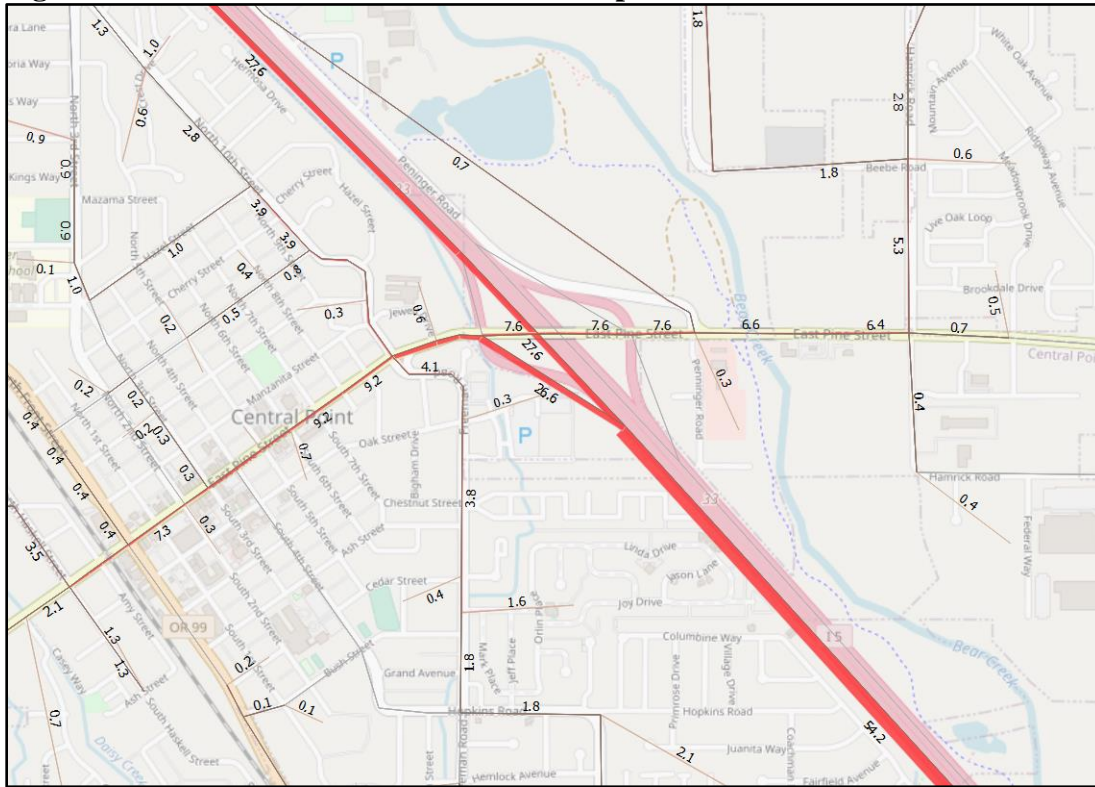


Figure F-4 – PM Peak Hour SB I-5 Off-Ramp Percent Traffic from Exit 30

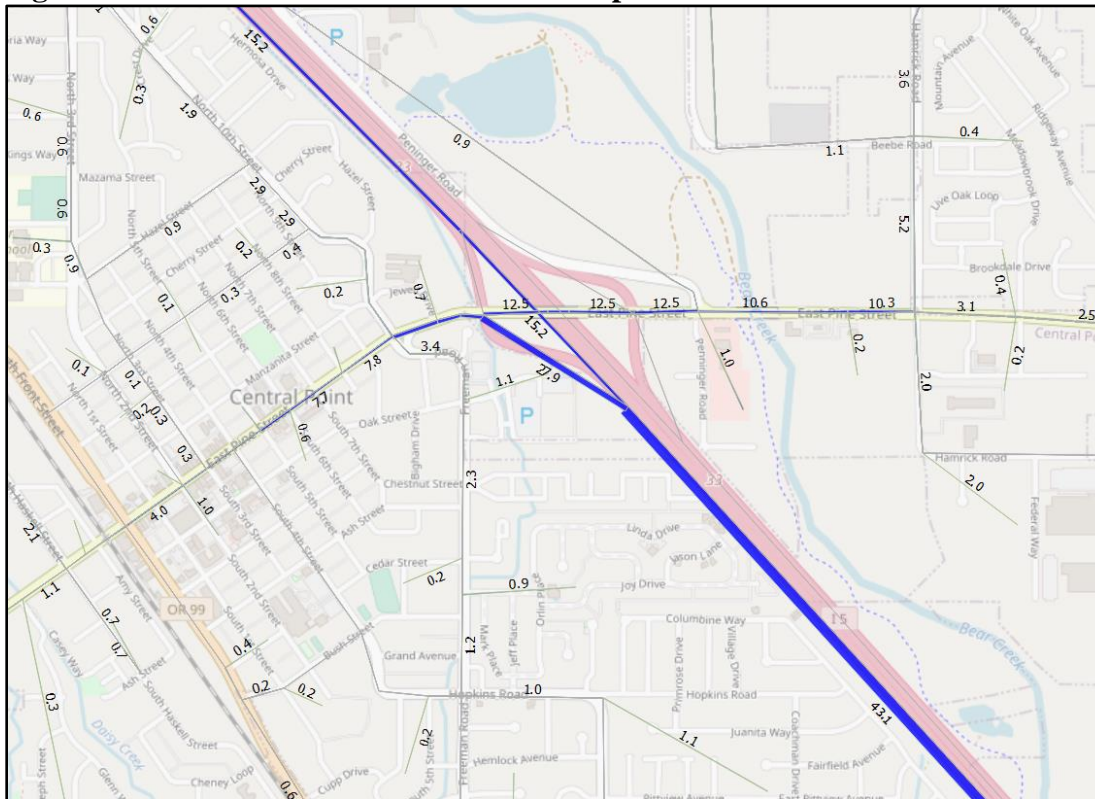




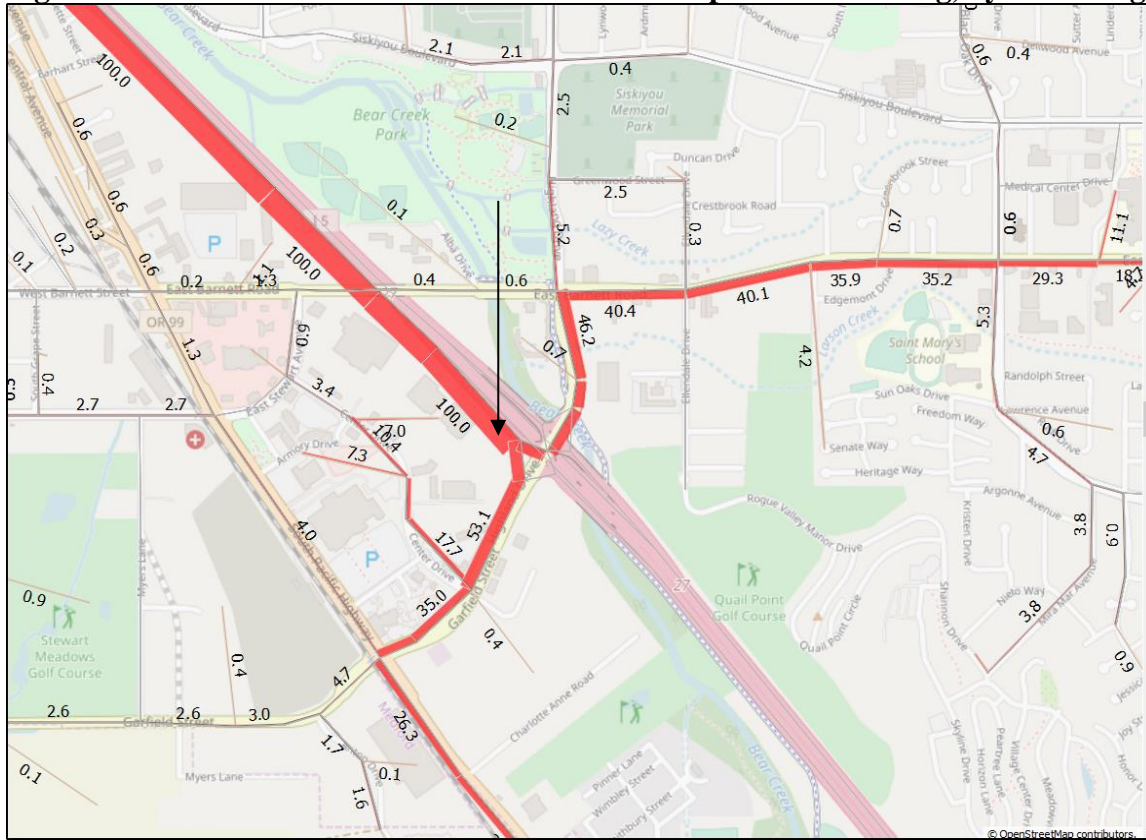
**Figure F-5 – AM Peak Hour SB I-5 Off-Ramp Percent Traffic from Exit 33**



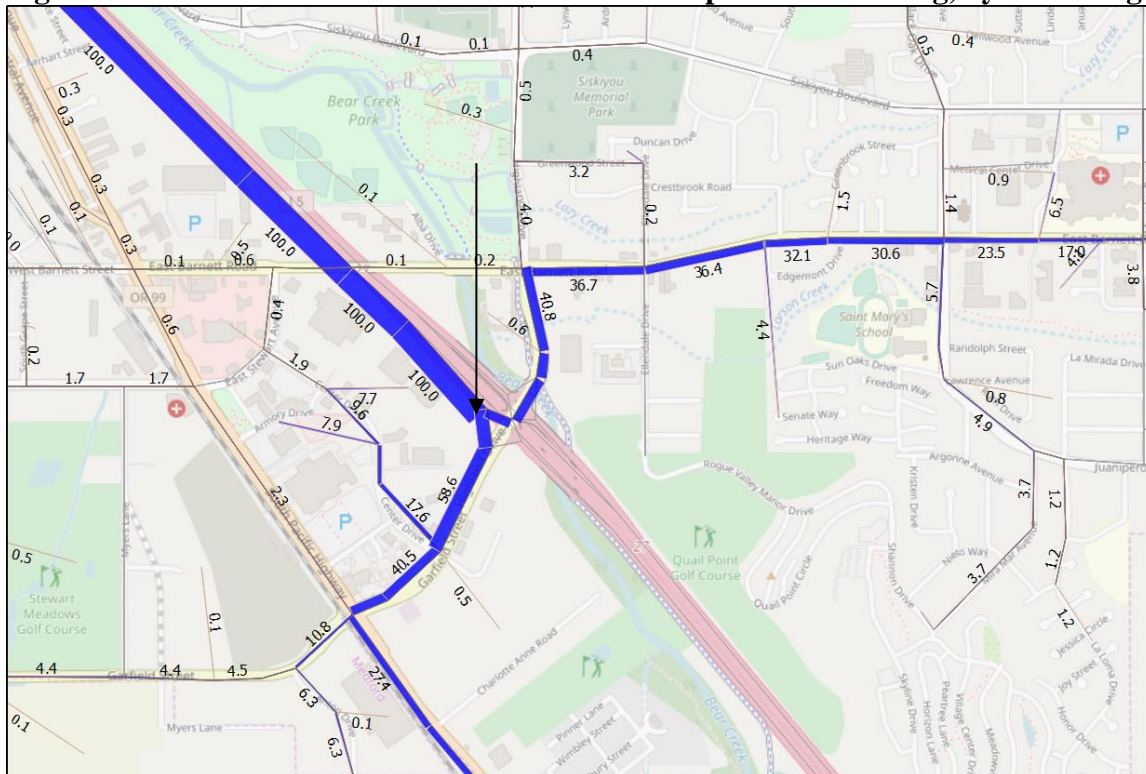
**Figure F-6 – PM Peak Hour SB I-5 Off-Ramp Percent Traffic from Exit 33**



**Figure F-7 – AM Peak Hour where SB I-5 Off-Ramp Traffic is Going, by Percentage**



**Figure F-8 – PM Peak Hour where SB I-5 Off-Ramp Traffic is Going, by Percentage**



Exit 27 Northbound (NB) off ramp, Table F-3

The Exit 27 northbound off ramp has traffic volume coming from on ramps at Exit 24 (Figure F-9, AM peak 15%; Figure F-10, PM peak 19%), about evenly split from west and east of the freeway. Additional traffic volume is getting on at Exit 21 (Figure F-11, AM peak 21%; Figure F-12, PM peak 12%) and Exit 19 (Figure F-13, AM peak 25%; Figure F-14, PM peak 20%), mostly from west of the freeway at both these exits. The remaining traffic volume (AM peak 39%, PM peak 49%) is coming from farther south.

Figures F-15 and F-16 show that the Exit 27 northbound off ramp traffic volume splits between going south on Garfield Street (AM peak 26%; PM peak 34%) and north on Garfield Street (AM peak 73%; PM peak 66%).

Of the traffic volume going south, 9% turns north on Center Drive towards shopping areas (Walmart, Fred Meyer, Harry and David’s), motels, and restaurants. Of the remaining southbound traffic on Garfield, 10% goes northbound on OR 99 in the AM peak, 16.5% in the PM peak.

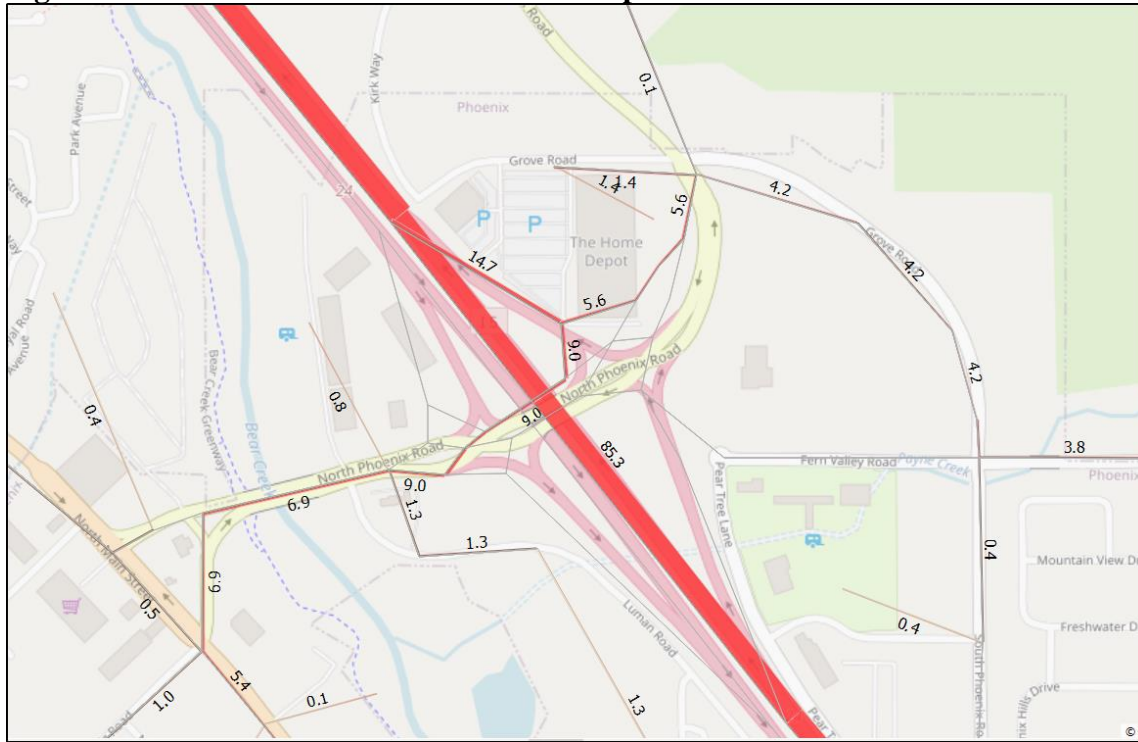
Northbound from the northbound off ramp, traffic volume turns left at Barnett, then right to go north on OR 99 (AM peak 25%; PM peak 15%); continues north on Highland Drive (AM peak 21%, PM peak 29%), or turns right onto eastbound Barnett (AM peak 12%, PM peak 9%).

**Table F-3 – Traffic Percentages to and from Exit 27 Northbound off Ramp**

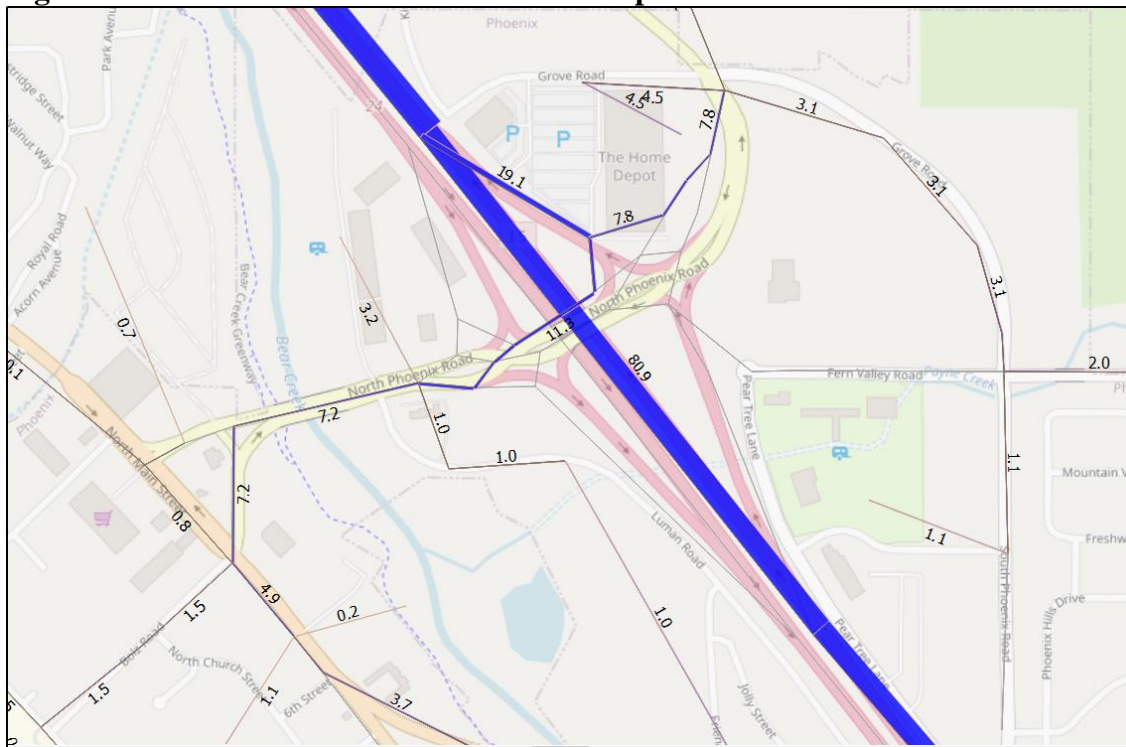
Exit 27 NB Off Ramp	Percent Traffic			Figure(s)
	AM Peak Hour	PM Peak Hour		
<b>From</b>				
Exit 24 on ramp	15%	19%	~ even split from west, east of I-5	Figure F-9 Figure F-10
Exit 21 on ramp	21%	12%	Most from west of I-5	Figure F-11 Figure F-12
Exit 19 on ramp	25%	20%	Most from west of I-5	Figure F-13 Figure F-14
farther south	39%	49%		
<b>To</b>				
South on Garfield St	26%	34%		Figure F-15 Figure F-16
North on Center Dr	9%	9%		
South on OR 99	4%	2%		
West on Garfield St	4%	6%		
North on OR 99	10%	17%		
North on Garfield St	73%	66%		
North on OR 99 from Barnett Rd	25%	15%		
North on Highland Dr	21%	29%		
East on Barnett Rd	12%	10%		



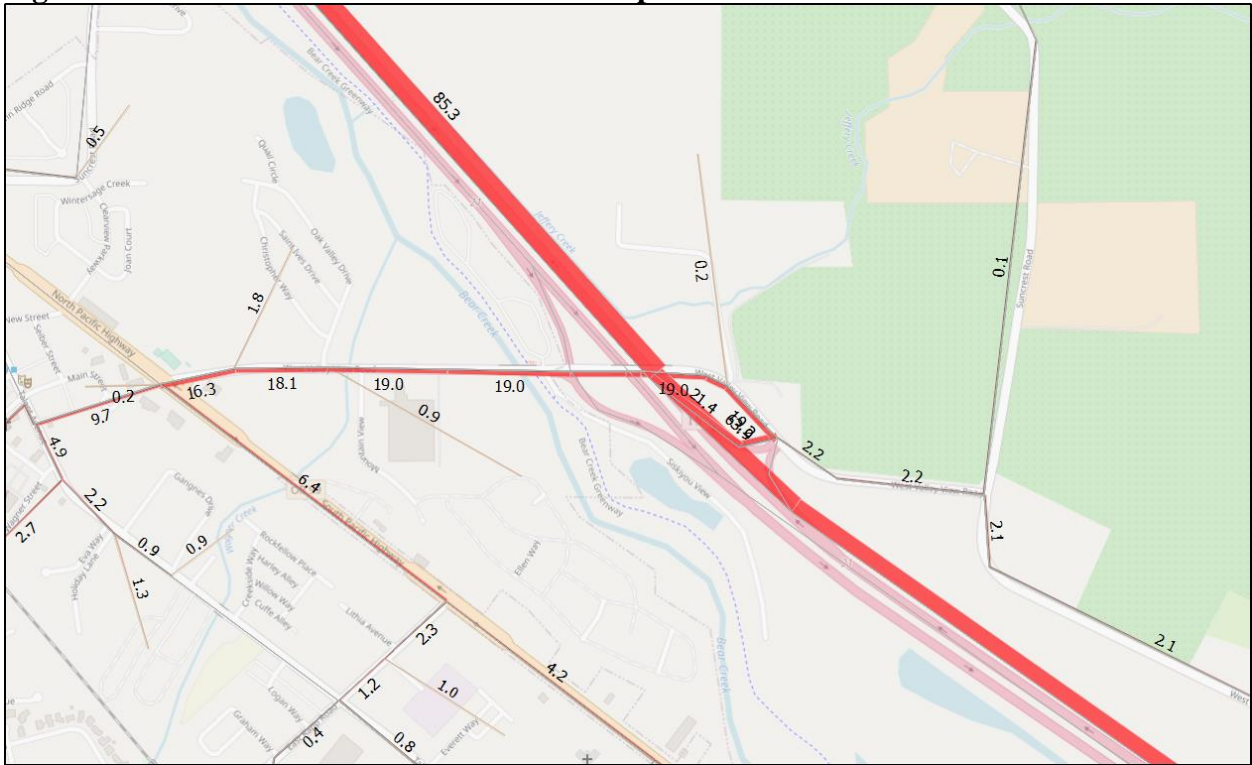
**Figure F-9 – AM Peak Hour NB I-5 Off-Ramp Percent Traffic from Exit 24**



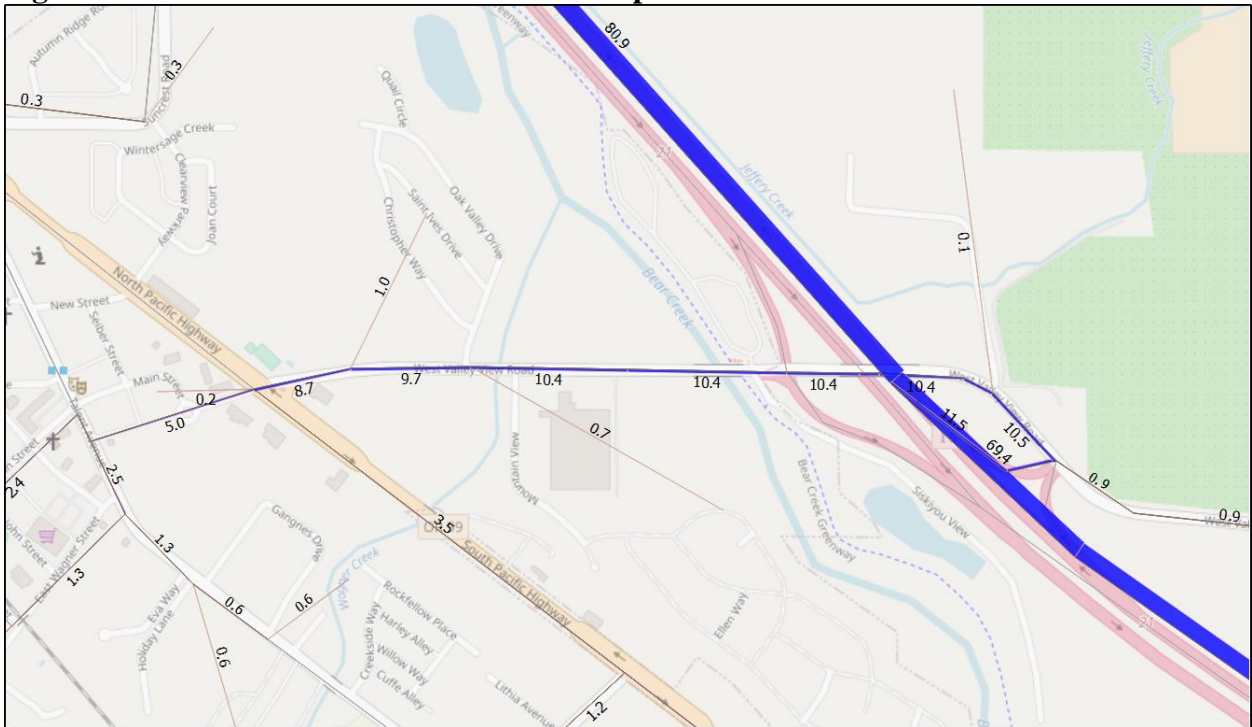
**Figure F-10 – PM Peak Hour NB I-5 Off-Ramp Percent Traffic from Exit 24**



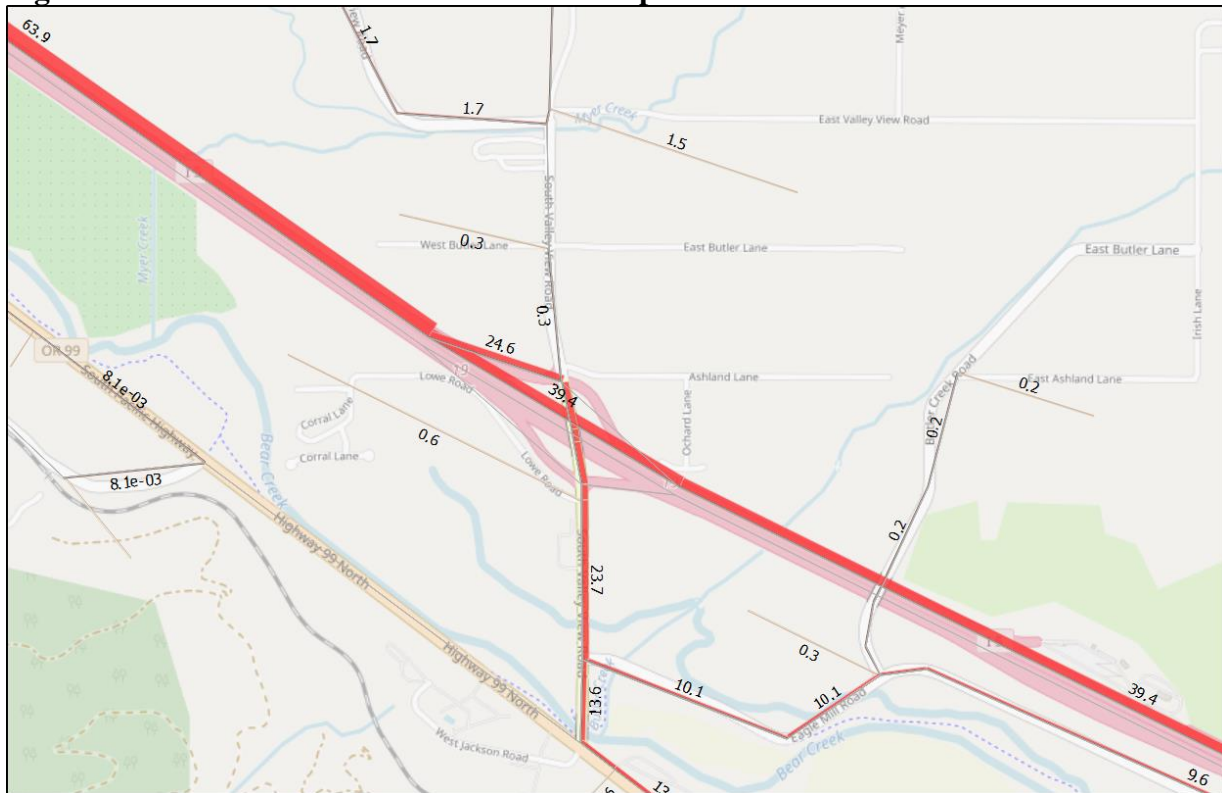
**Figure F-11 – AM Peak Hour NB I-5 Off-Ramp Percent Traffic from Exit 21**



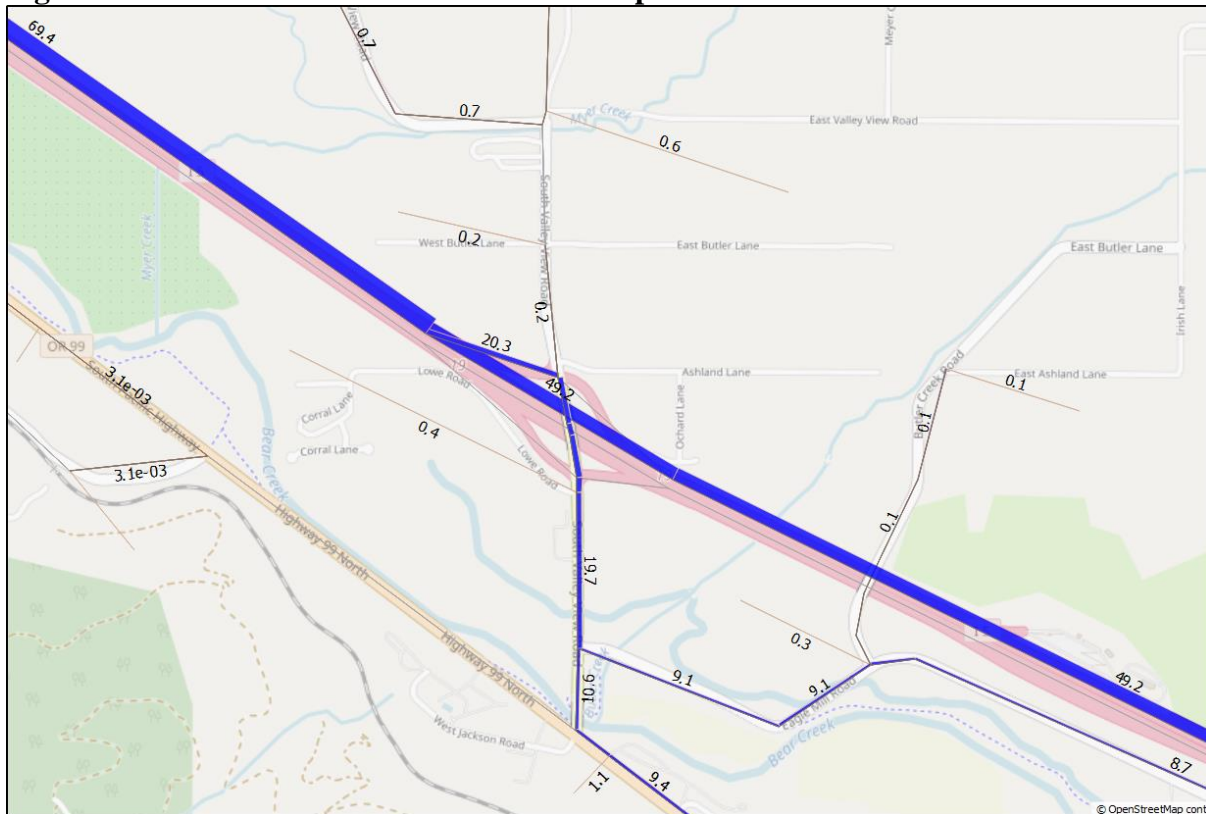
**Figure F-12 – PM Peak Hour NB I-5 Off-Ramp Percent Traffic from Exit 21**



**Figure F-13 – AM Peak Hour NB I-5 Off-Ramp Percent Traffic from Exit 19**

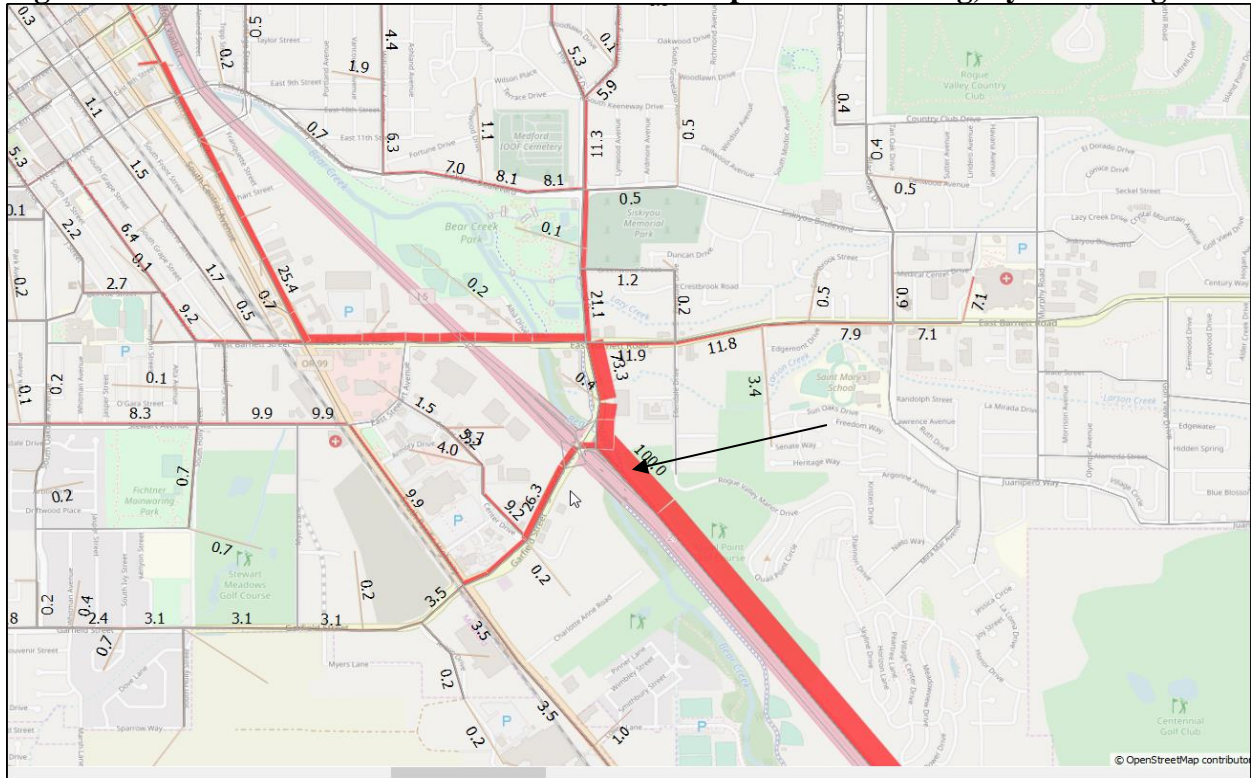


**Figure F-14 – PM Peak Hour NB I-5 Off-Ramp Percent Traffic from Exit 19**

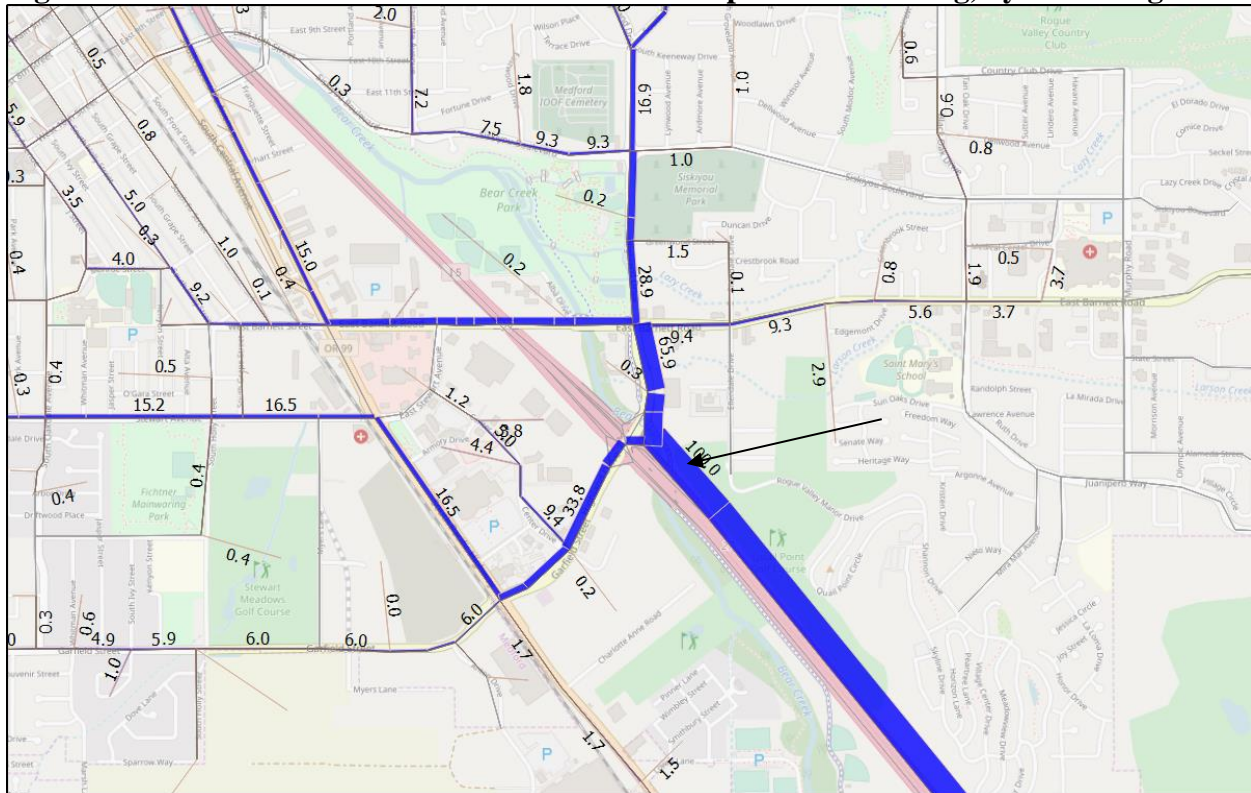




**Figure F-15 – AM Peak Hour where NB I-5 Off-Ramp Traffic is Going, by Percentage**



**Figure F-16 – PM Peak Hour where NB I-5 Off-Ramp Traffic is Going, by Percentage**





Barnett Road at Garfield Street; Table F-4, Table F-5, Table F-6, and Table F-7

Figures F-17 and F-18 show where traffic volumes going through EB Barnett Road, east of the Highland Drive intersection are coming from and going to. Traffic is coming from EB Barnett Road (AM peak 31%, PM peak 47%); from the Exit 27 southbound off ramp (AM peak 35%, PM peak 26%), from Garfield Street east of OR 99 (AM peak 10%, PM peak 8%), and from the Exit 27 northbound off ramp (AM peak 11%, PM peak 7%). Traffic volumes from this link are going south on Hilldale Avenue (AM and PM peak 14%), south on Black Oak Drive (AM peak 14%, PM peak 12%), north into the Asante Medical Center (AM peak 30%, PM peak 17%) and continuing east (AM peak 38%, PM peak 47%).

**Table F-4 – Traffic Percentages to and from EB Barnett Rd, east of Highland Drive**

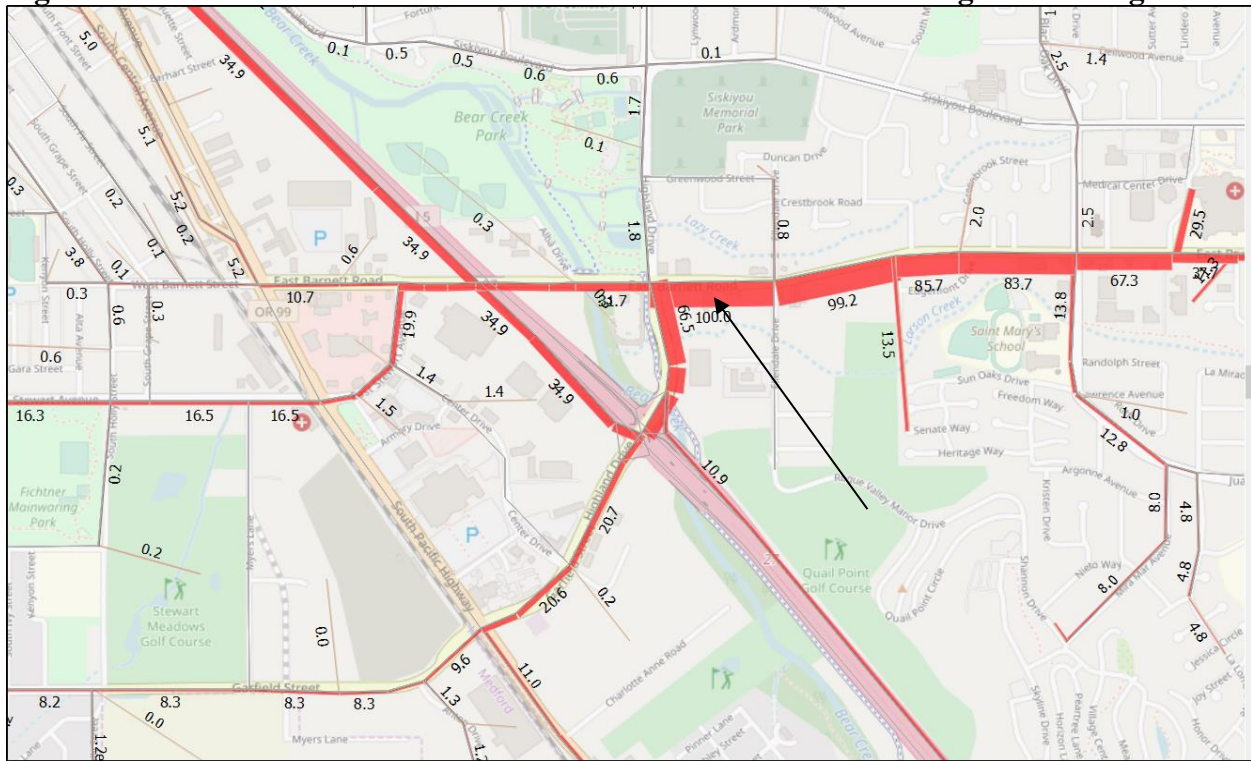
EB Barnett Rd, East of Highland Drive	Percent Traffic		Figure(s)
	AM Peak Hour	PM Peak Hour	
<b>From</b>			
EB Barnett Rd	31%	47%	Figure F-17 Figure F-18
Exit 27 SB off ramp	35%	26%	
WB Garfield St east of OR 99	10%	8%	
Exit 27 NB off ramp	11%	7%	
<b>To</b>			
South on Hilldale Ave	14%	14%	Figure F-17 Figure F-18
South on Black Oak Dr	14%	12%	
North into Asante Medical Center	30%	17%	
continuing east	38%	47%	

Figures F-19 and F-20 show where traffic volumes going through WB Barnett Road, east of the Highland Drive intersection are coming from and going to. Traffic is coming from Hilldale Avenue to the south (AM peak 14%, PM peak 12%), from Black Oak Drive to the south (AM peak 12%, PM peak 11%), from the Asante Medical Center north of Barnett Road (AM peak 15%, PM peak 27%) and from farther east (AM peak 44%, PM peak 39%). Traffic is going south on Garfield Street (AM peak 55%, PM peak 56%), west on Barnett Road (AM peak 43%, PM peak 42%), and north on Highland Drive (2% AM, PM peak).

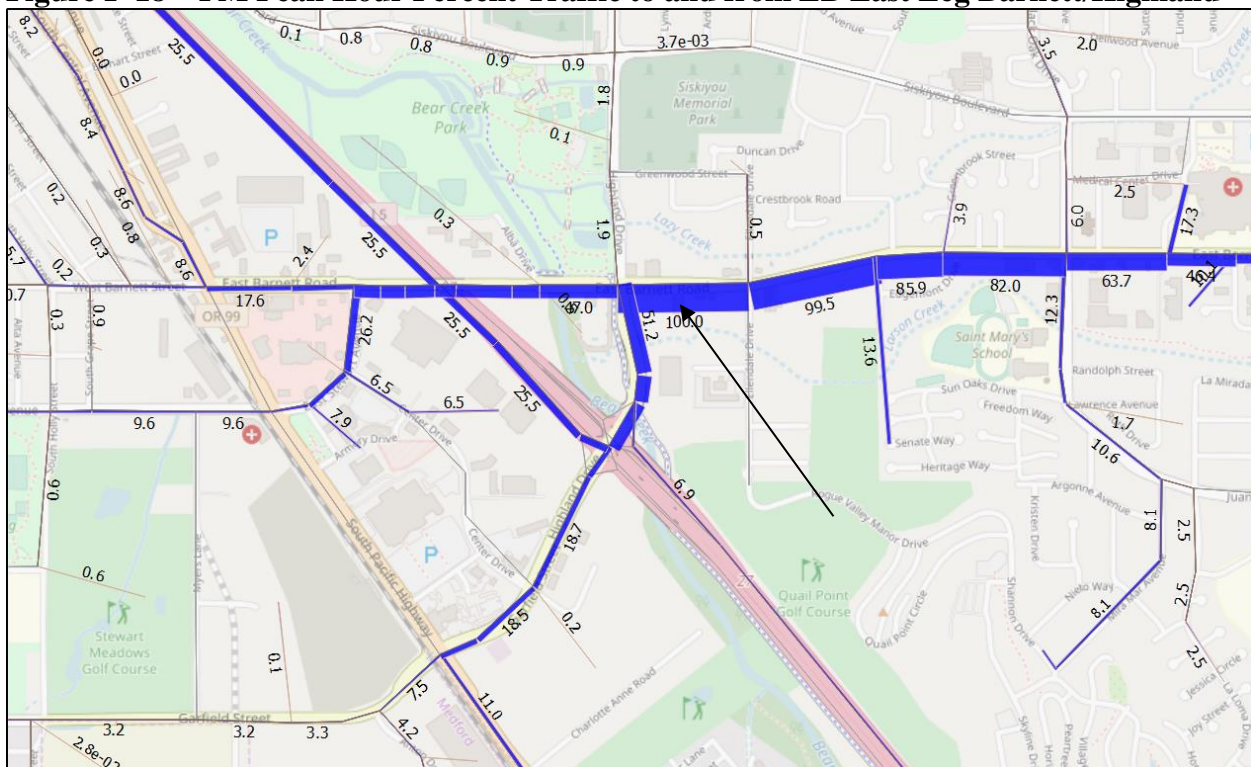
**Table F-5 – Traffic Percentages to and from WB Barnett Rd, east of Highland Drive**

WB Barnett Rd, East of Highland Drive	Percent Traffic		Figure(s)
	AM Peak Hour	PM Peak Hour	
<b>From</b>			
NB Hilldale Ave	14%	12%	Figure F-19 Figure F-20
NB Black Oak Dr	12%	11%	
SB from Asante Medical Center	15%	27%	
WB Barnett Rd	44%	39%	
<b>To</b>			
South on Garfield St	55%	56%	Figure F-19
West on Barnett	43%	42%	Figure F-20
North on Highland Dr	2%	2%	

**Figure F-17 – AM Peak Hour Percent Traffic to and from EB East Leg Barnett/Highland**

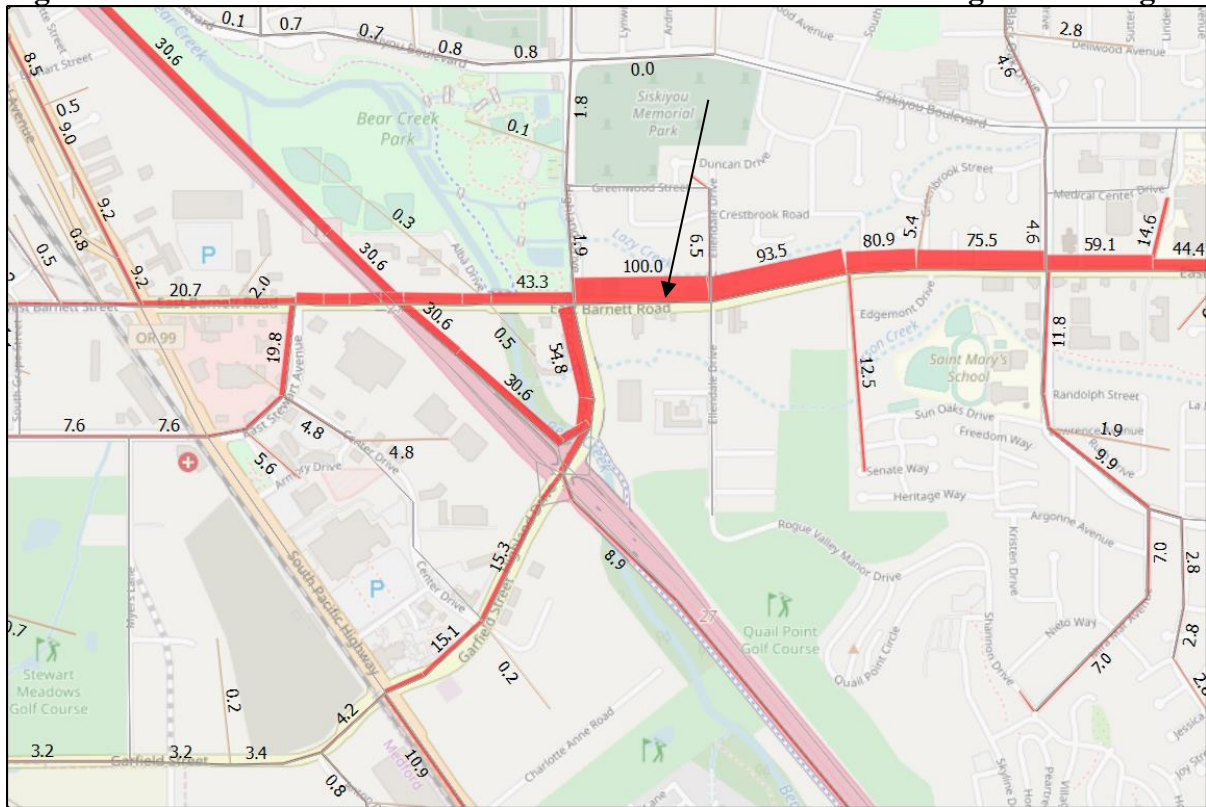


**Figure F-18 – PM Peak Hour Percent Traffic to and from EB East Leg Barnett/Highland**

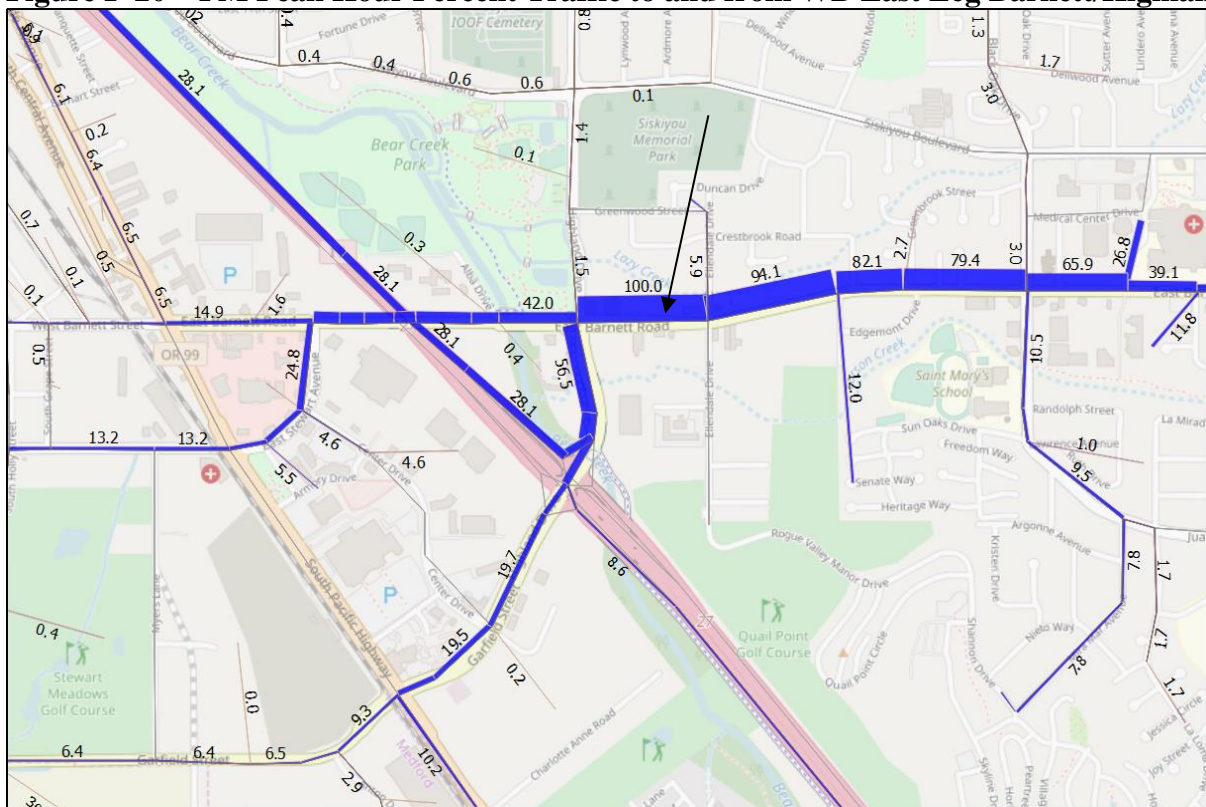




**Figure F-19 – AM Peak Hour Percent Traffic to and from WB East Leg Barnett/Highland**



**Figure F-20 – PM Peak Hour Percent Traffic to and from WB East Leg Barnett/Highland**



Figures F-21 and F-22 show where traffic volumes going through northbound Highland Drive approaching Barnett Road are coming from and going to. Traffic volume is coming from the Exit 27 southbound off ramp (AM peak 30%, PM peak 27%), from Garfield Street west of OR 99 (10% AM and PM peak), from northbound OR 99 (AM peak 10%, PM peak 16%), and from the Exit 27 northbound off ramp (AM peak 50%, PM peak 46%). Half the traffic volume is going EB on Barnett Road (AM peak 50%, PM peak 49%). The rest splits between continuing northbound on Highland Drive (AM peak 22 %, PM peak 32%) and turning left to go west on Barnett Road (AM peak 28%, PM peak 20%).

**Table F-6 – Traffic Percentages to and from NB Highland Drive at Barnett Road**

NB Highland Drive at Barnett Road	Percent Traffic		Figure(s)
	AM Peak Hour	PM Peak Hour	
<b>From</b>			
Exit 27 SB off ramp	30%	27%	Figure F-21 Figure F-22
EB Garfield St west of OR 99	10%	10%	
NB OR 99	10%	16%	
Exit 27 NB off ramp	50%	46%	
<b>To</b>			
West on Barnett Rd	28%	20%	Figure F-21 Figure F-22
North on Highland Dr	22%	32%	
East on Barnett Rd	50%	49%	

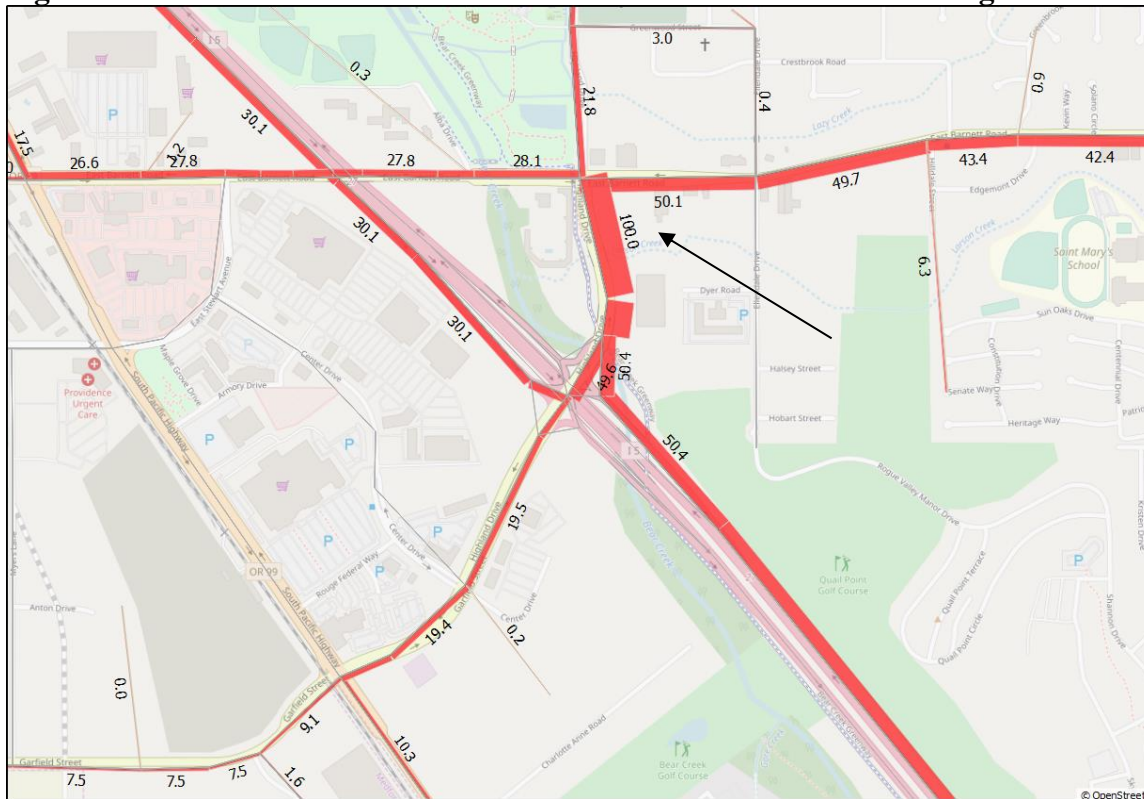
Figures F-23 and F-24 show where traffic volumes going through southbound Highland Drive exiting the Barnett Road intersections are coming from and going to. Most of the volume is coming from WB Barnett Road (AM peak 54%, PM peak 60%). The rest comes from through traffic on southbound Highland Drive (AM peak 32%, PM peak 25%) and from EB Barnett Road turning right (AM peak 15%, PM peak 16%). 33% of the volume is going onto the Exit 27 northbound on ramp both AM and PM peak, 6% west on Garfield Street past OR 99 (6% AM peak, 12% PM peak), south on OR 99 (18% AM peak, 15% PM peak), and south onto the Exit 27 southbound on ramp (43% AM peak, 40% PM peak).

**Table F-7 – Traffic Percentages to and from SB Highland Drive at Barnett Road**

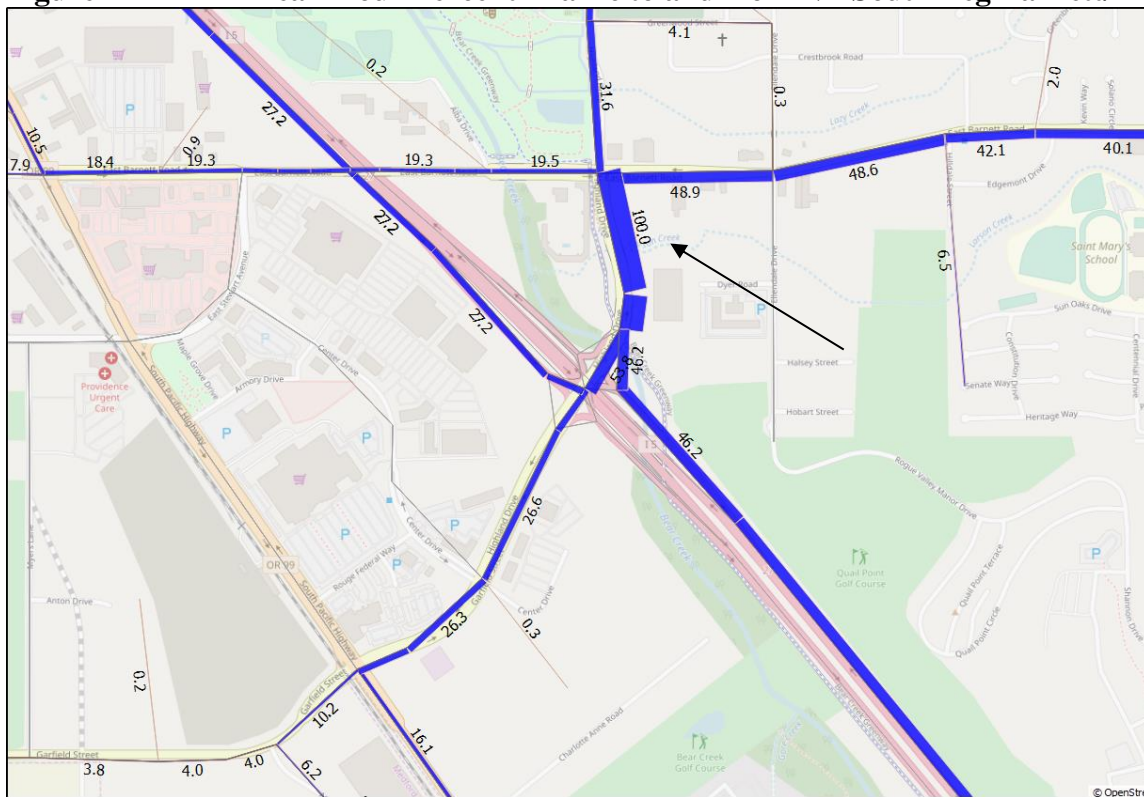
SB Highland Drive at Barnett Road	Percent Traffic		Figure(s)
	AM Peak Hour	PM Peak Hour	
<b>From</b>			
EB on Barnett Rd	15%	16%	Figure F-23 Figure F-24
SB on Highland Dr	32%	25%	
WB Barnett Rd	54%	60%	
<b>To</b>			
Exit 27 NB on ramp	33%	33%	Figure F-23 Figure F-24
West on Garfield St west of OR 99	6%	12%	
South on OR 99	18%	15%	
South on Exit 27 on ramp	43%	40%	



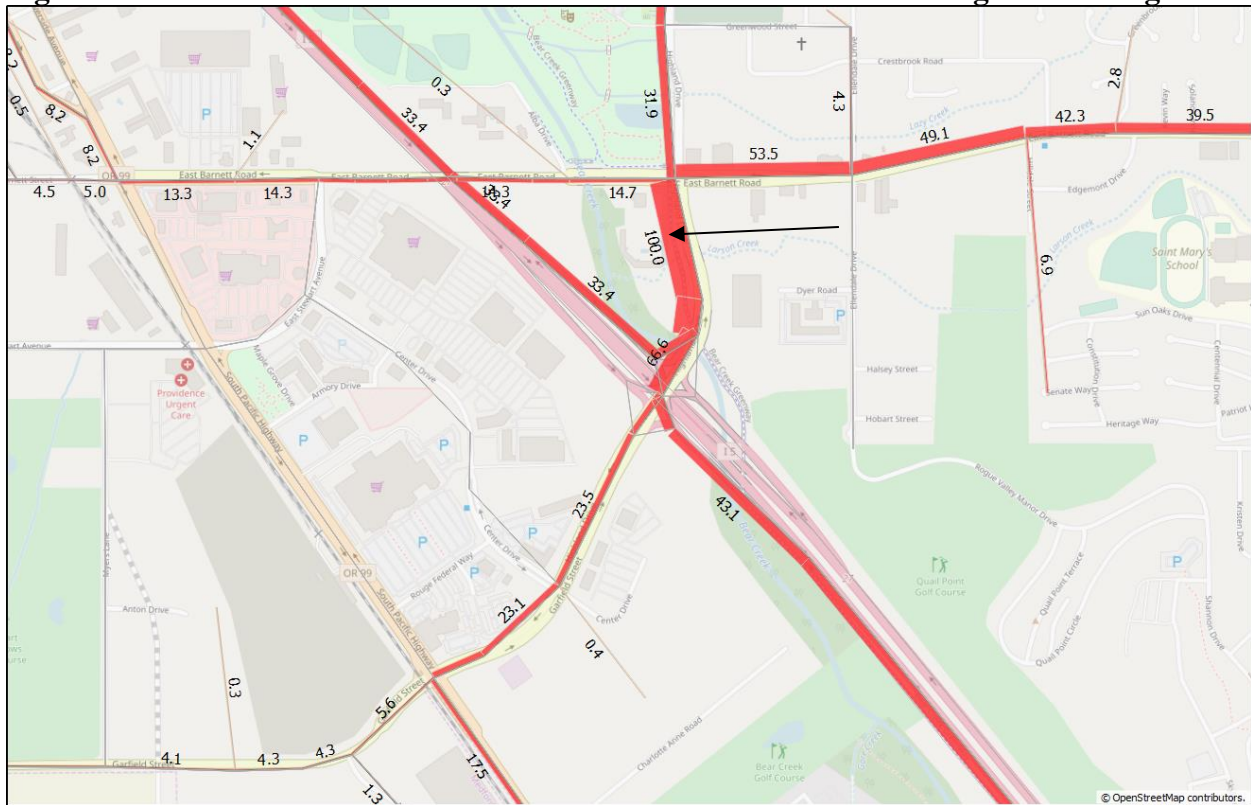
**Figure F-21 – AM Peak Hour Percent Traffic to and from NB South Leg Barnett/Highland**



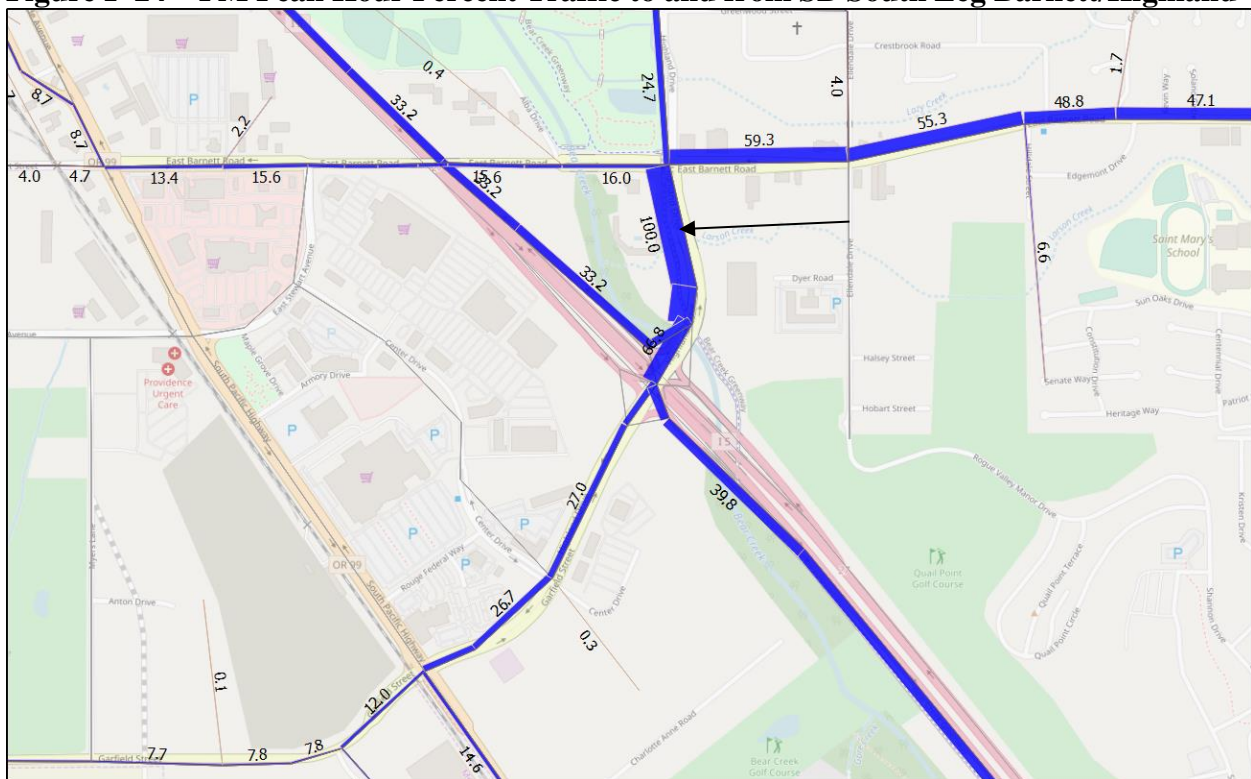
**Figure F-22 – PM Peak Hour Percent Traffic to and from NB South Leg Barnett/Highland**



**Figure F-23 – AM Peak Hour Percent Traffic to and from SB South Leg Barnett/Highland**



**Figure F-24 – PM Peak Hour Percent Traffic to and from SB South Leg Barnett/Highland**



Garfield Street at OR 99, Table F-8 and Table F-9

Figures F-25 and F-26 show where volumes going EB through the northeast leg of the Garfield Street intersection with OR 99 are coming from and going to. Traffic volume is coming from northbound OR 99 (43% AM and PM peak), from Garfield Street east of OR 99 (AM peak 34%, PM peak 25%), and from southbound OR 99 (AM peak 24%, PM peak 32%). Traffic volume is going to the Exit 27 northbound on ramp (AM peak 29%, PM peak 28%), continuing north on Garfield Street (AM peak 34%, PM peak 32%), and onto the Exit 27 southbound on ramp (AM peak 32%, PM peak 34%).

**Table F-8 – Traffic Percentages to and from EB Garfield Street at OR 99W**

EB Garfield Street at OR 99W	Percent Traffic		Figure(s)
	AM Peak Hour	PM Peak Hour	
<b>From</b>			
NB on OR 99	43%	43%	Figure F-25 Figure F-26
EB Garfield St east of OR 99	34%	25%	
SB on OR 99	24%	32%	
<b>To</b>			
Exit 27 NB on ramp	29%	28%	Figure F-25 Figure F-26
North on Garfield St	34%	32%	
Exit 27 SB on ramp	32%	34%	

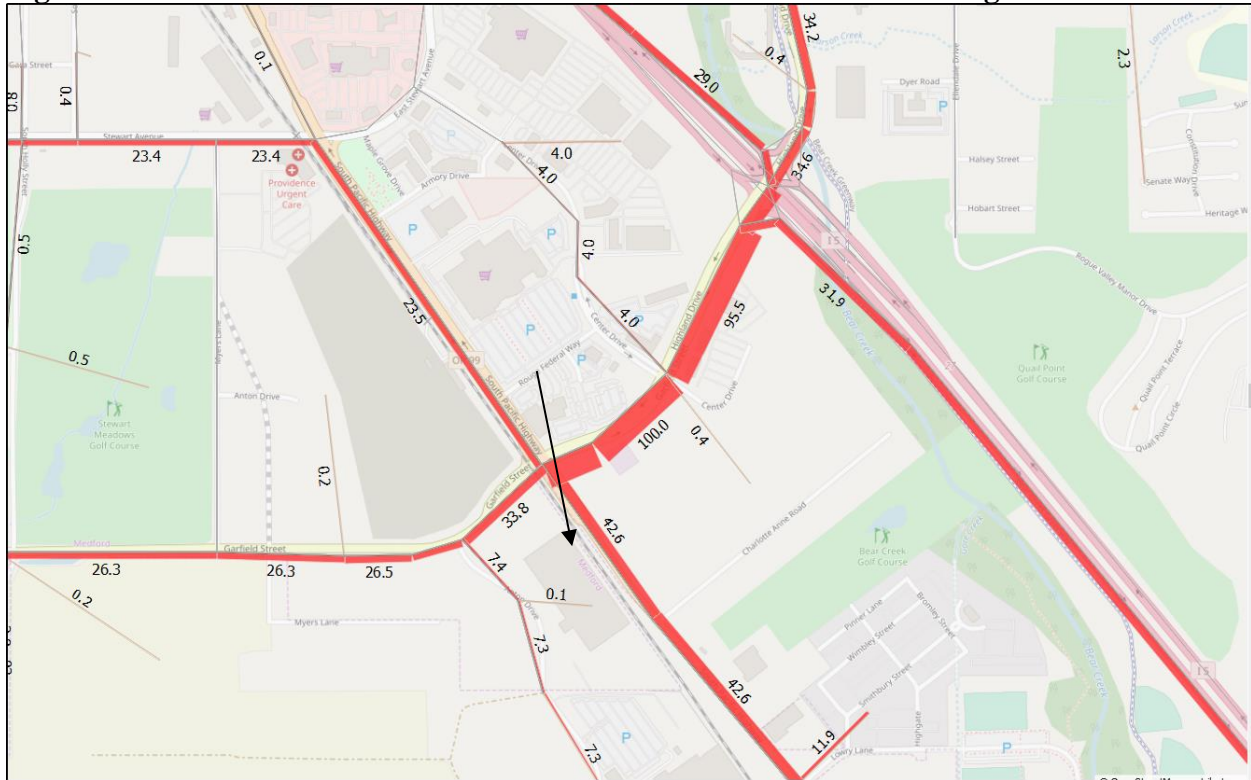
Figures F-27 and F-28 show where volumes going WB through the northeast leg of the Garfield Street intersection with OR 99 are coming from and going to. Traffic volume is coming from the Exit 27 southbound off ramp (AM peak 43%, PM peak 35%), continuing south from Barnett Road (AM peak 32%, PM peak 36%), and from the Exit 27 northbound off ramp (22% both AM and PM). Traffic volume is going to northbound OR 99 (AM peak 18%, PM peak 17%), onto Garfield Street east of OR 99 (AM peak 19%, PM peak 33%), and south on OR 99 (AM peak 63%, PM peak 50%).

**Table F-9 – Traffic Percentages to and from WB Garfield Street at OR 99W**

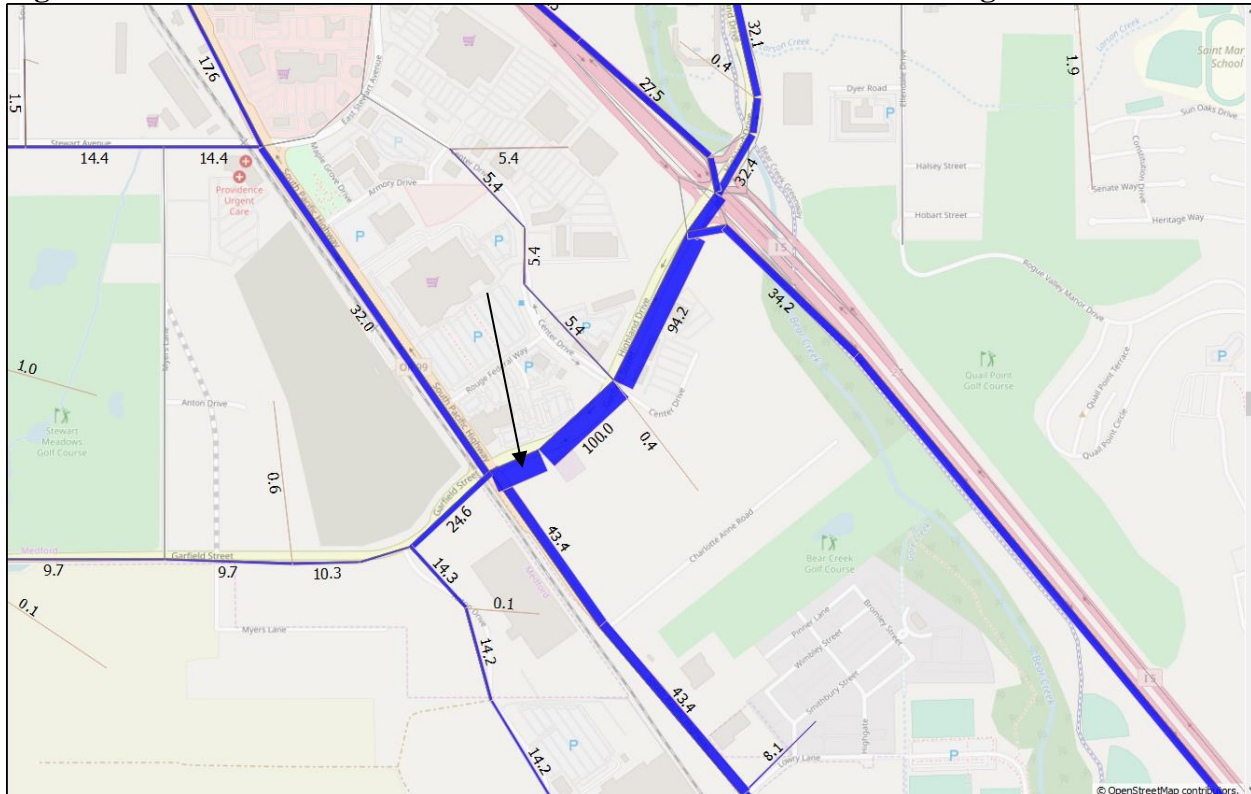
WB Garfield Street at OR 99W	Percent Traffic		Figure(s)
	AM Peak Hour	PM Peak Hour	
<b>From</b>			
Exit 27 SB off ramp	43%	35%	Figure F-27 Figure F-28
SB on Highland Dr/ Garfield St from Barnett Rd	32%	36%	
Exit 27 NB off ramp	22%	22%	
<b>To</b>			
North on OR 99	18%	17%	Figure F-27 Figure F-28
West on Garfield, east of OR 99	19%	33%	
South on OR 99	63%	50%	



**Figure F-25 – AM Peak Hour Percent Traffic to and from EB on NE Leg Garfield/OR99**

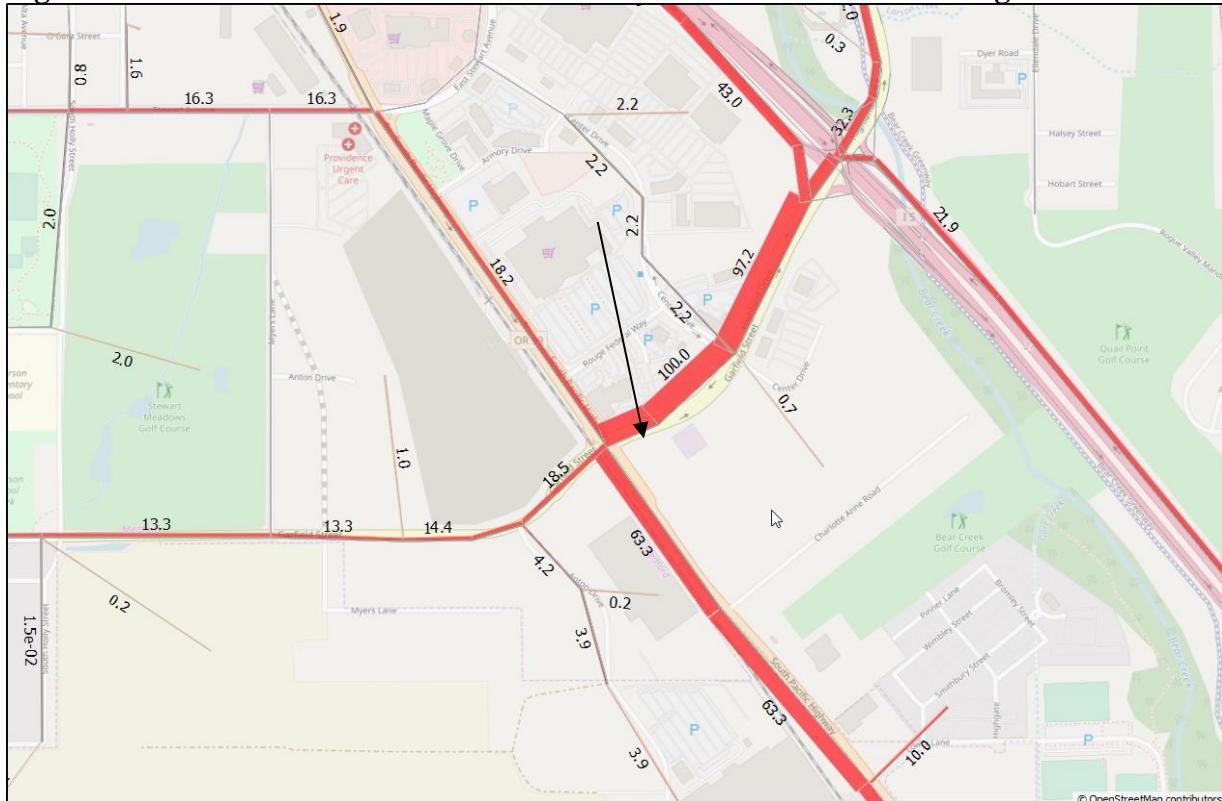


**Figure F-26 – PM Peak Hour Percent Traffic to and from EB on NE Leg Garfield/OR99**

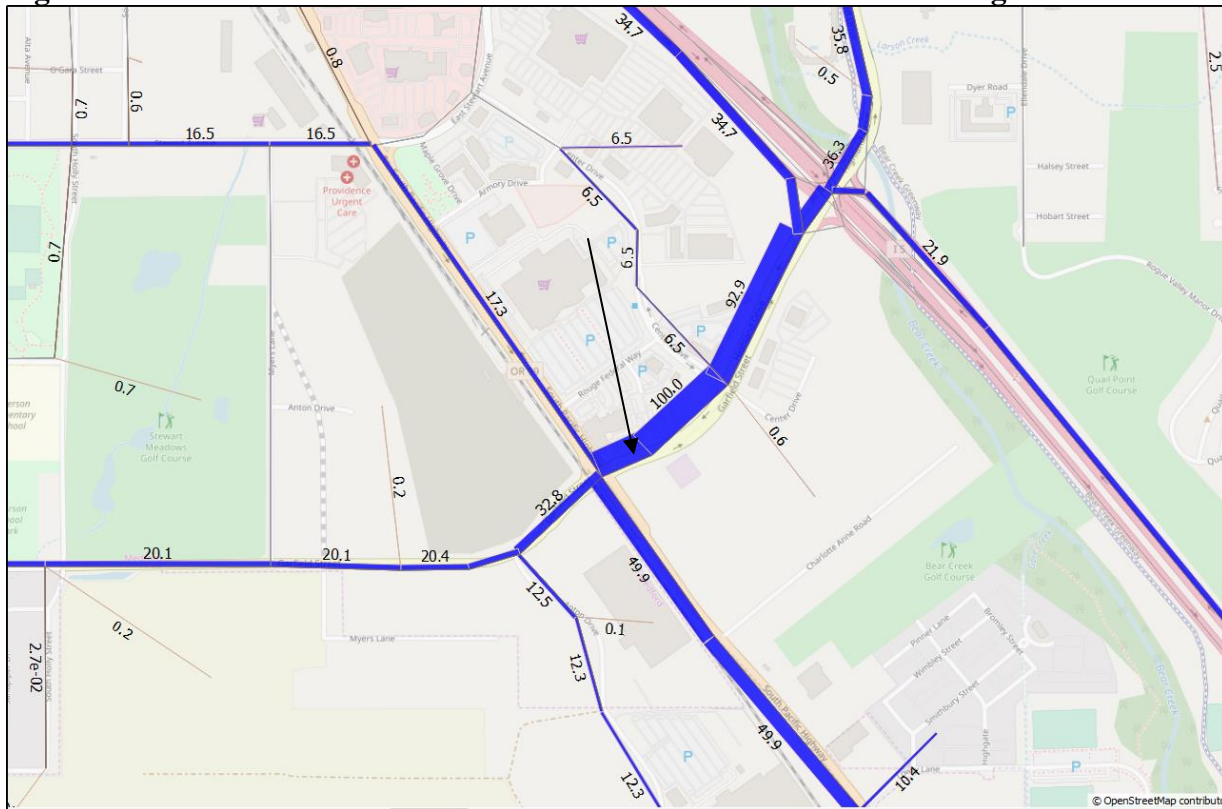




**Figure F-27 – AM Peak Hour Percent Traffic to and from WB on NE Leg Garfield/OR99**



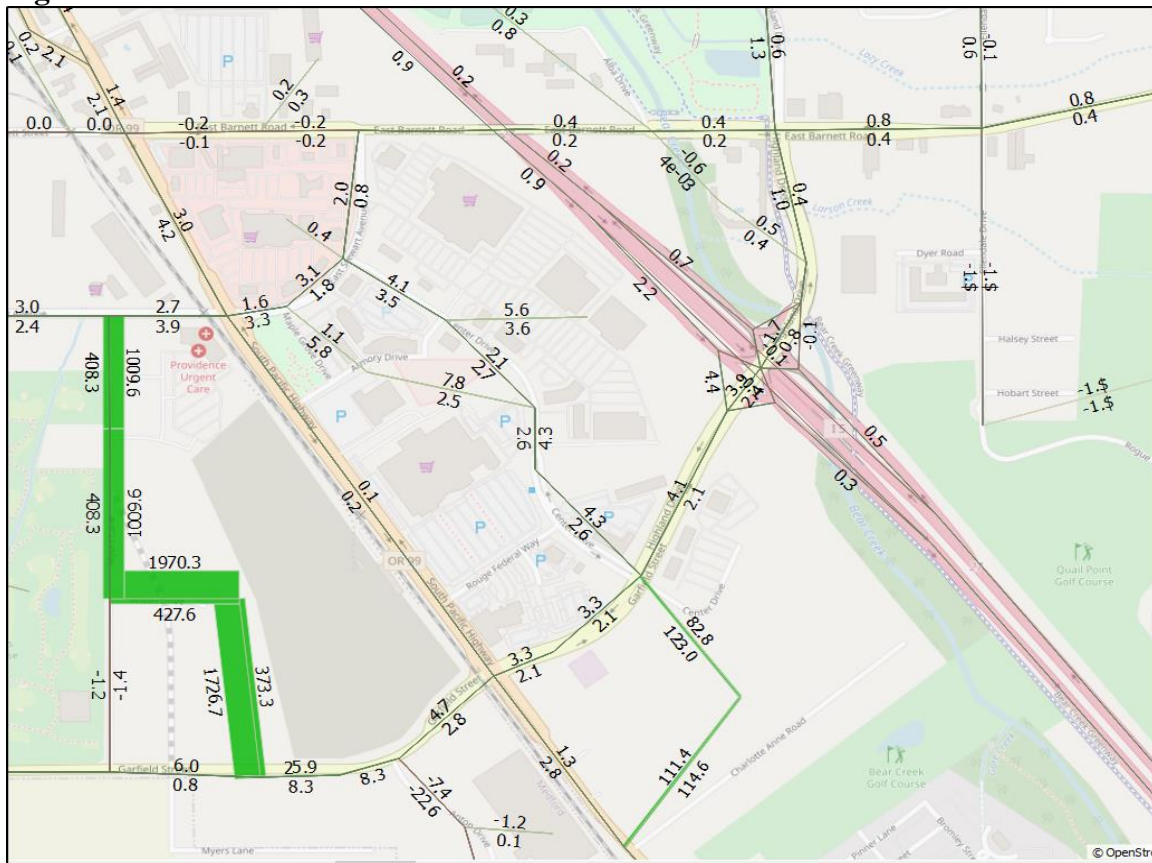
**Figure F-28 – PM Peak Hour Percent Traffic to and from WB on NE Leg Garfield/OR99**



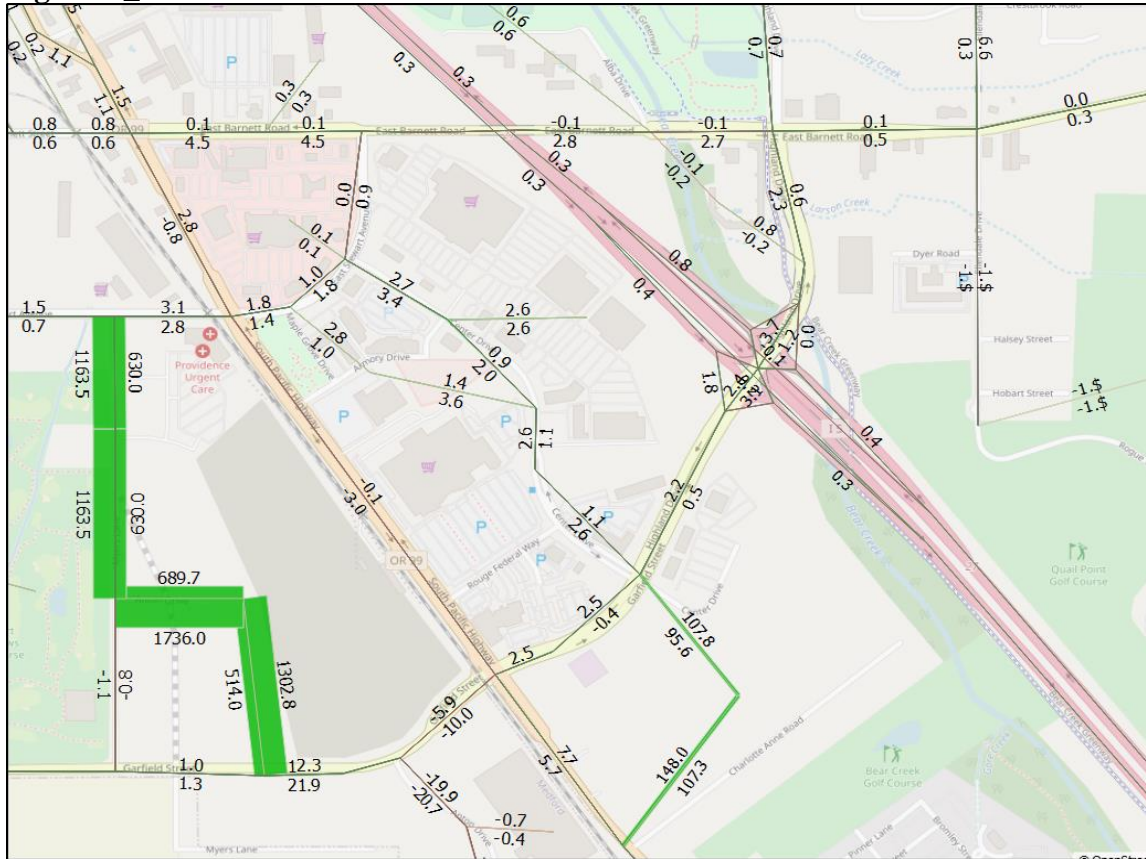
## Additional Land Use

Figures F-29 and F-30 show the total percent difference for the AM/PM peaks between the base 2017 model and the updated 2017 model with the additional land use. As expected, most of the percent change occurs where the multi family residence and medical center were added, TAZ 459. Changes less than 10% are not considered significant.

**Figure F-29 – AM Peak Difference Plot**



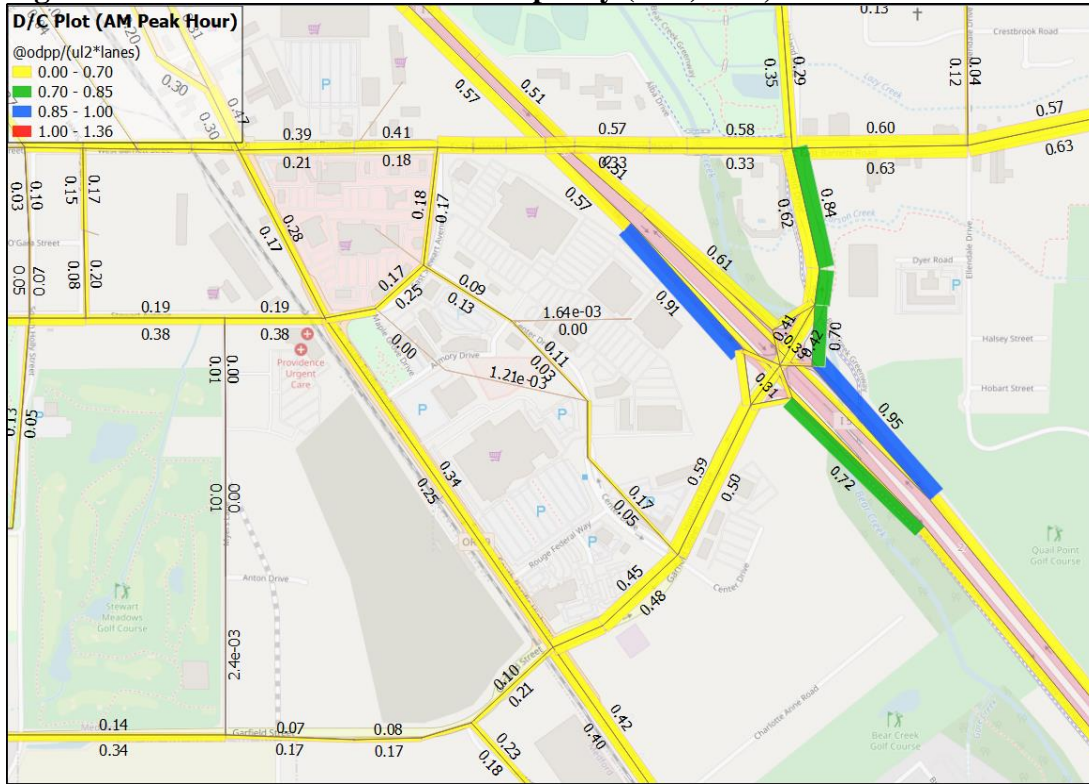
**Figure F\_30 – PM Peak Difference Plot**



Figures F-31 and F-33 show the demand to capacity (D/C) plot for the 2017 model, AM peak and PM peak; Figures F-32 and F-34 show the demand to capacity (D/C) plot for the updated 2017 scenarios with the additional land use projects listed in Table F-1. The D/C plots show little change between the base and the scenario with the updated land use.



**Figure F-31 – AM Peak Demand to Capacity (D/C) Plot, 2017 model Land Use**

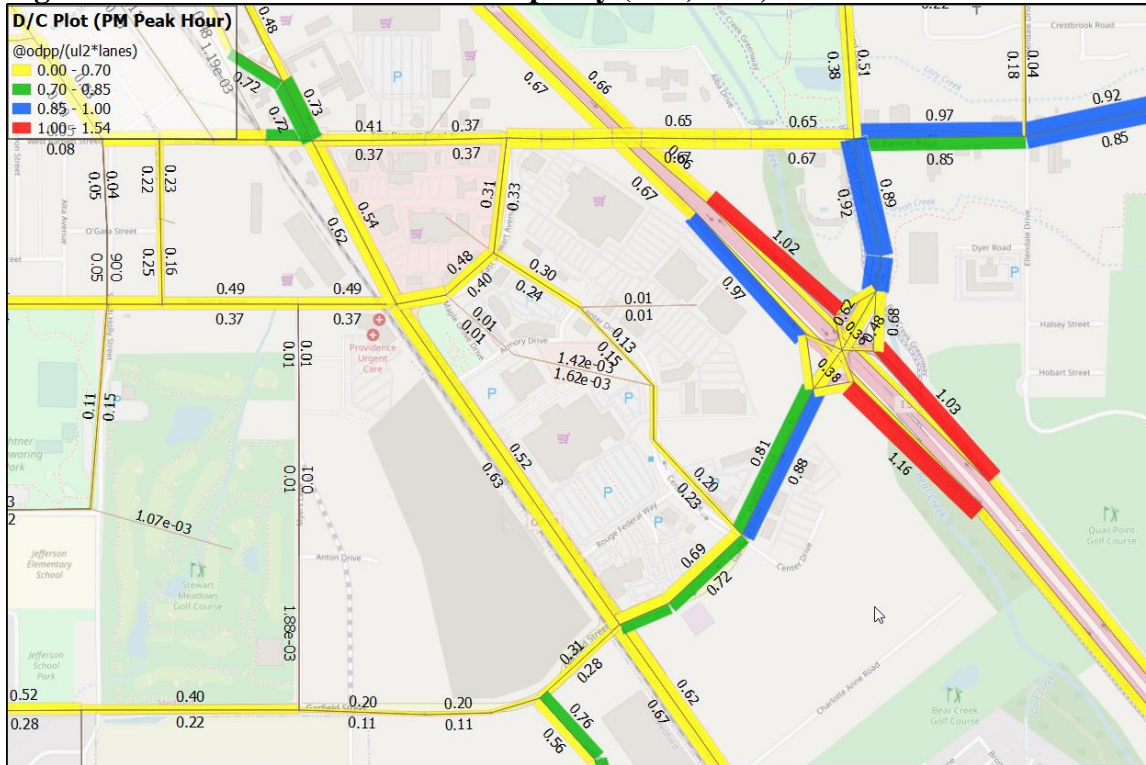


**Figure F-32 - AM Peak Demand to Capacity Plot, 2017 model with Additional Land Use**

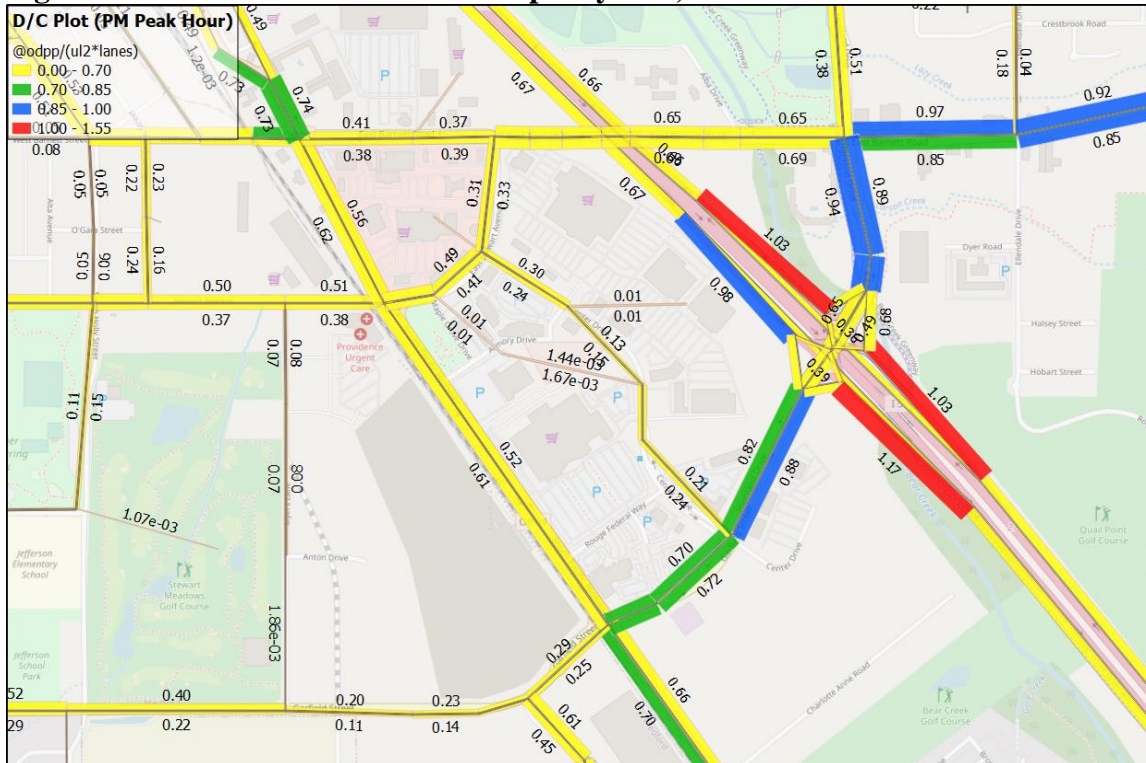




**Figure F-33 – PM Peak Demand to Capacity (D/C) Plot, 2017 model Land Use**



**Figure F-34 – PM Peak Demand to Capacity Plot, 2017 model with Additional Land Use**



## Conclusions

About half of the Exit 27 off ramp traffic volume comes from short freeway trips of eight miles or less: southbound from the interchange to the north (Exit 30, three miles away) and another quarter from Exit 33; and northbound from the three interchanges to the south (Exit 24, Exit 21, and Exit 19).

### Exit 27 Southbound (SB) off ramp

Nearly half the Exit 27 off ramp traffic volume gets onto I-5 at Exit 30, with a fairly even split coming from west and east of I-5. Another quarter of the Exit 27 southbound off-ramp volume enters the freeway at Exit 33.

Traffic volume off the Exit 27 southbound off ramp has a higher percentage of the traffic going northbound in the AM peak (46%) than in the PM peak (41%); and nearly 40% of the traffic volume is headed to eastbound Barnett Road (AM peak 40%, PM peak 37%).

18% of the traffic volume from the Exit 27 southbound off ramp goes north on Center Drive, to major shopping, food, and lodging attractors. More than a quarter of the Exit 27 southbound off ramp traffic volume heads south on OR 99 W.

### Exit 27 Northbound (NB) off ramp

The Exit 27 northbound off ramp gets roughly 50-60% of its traffic volume from the three previous on ramps, with some time of day differences at these ramps.

Traffic volumes from the Exit 27 northbound off ramp go primarily to the north (AM peak 73%, PM peak 66%), splitting between westbound, northbound, and eastbound directions from there.

The additional land use projects increase traffic volume west of OR99 north of Garfield, and south of Garfield Street on Center St. This traffic will spread onto the nearby road network. The D/C plots show little change between the base and the scenario with the updated land use.

### Barnett Road at Garfield Street

Traffic volumes EB on Barnett Road, east of Highland Drive, are coming ~one third from EB Barnett and one third from the Exit 27 southbound off ramp during the AM peak; in the PM peak a higher percentage of the traffic volume is coming from EB Barnett Road (AM peak 31%, PM peak 47%).

Traffic volumes EB on Barnett Road have higher percentages going to the Asante Medical Center in the AM peak (30%) than PM peak (17%). WB Barnett has higher percentage traffic volumes coming from the Asante Medical Center in PM peak (27%) than in the AM peak (15%).

Northbound Highland Drive at the Barnett Road intersection has higher percentage of traffic volume coming from the Exit 27 southbound and northbound off ramps in the AM peak (80%) than in the PM peak (73%) hour. There is a higher percentage of traffic volume from northbound OR 99 in the PM peak than in the AM peak (AM peak 10%, PM peak 16%).

Northbound Highland Drive from the Barnett Road intersection gets a high percentage of traffic volume from WB Barnett Road in both AM peak (54%) and PM peak (60%), so the WB Barnett Road left turn is heavily used during both peak periods.

### Garfield Street at OR 99

WB Garfield Street at OR 99 W has a higher percentage of traffic volume from the Exit 27 southbound off ramp in the AM peak (43%) than in the PM peak (35%). A high percentage of traffic volume is making the left turn to continue south on OR 99 in both AM peak (63%) and PM peak (50%).

### **Further Work and Recommendations**

Similar work is planned for the future scenario to understand the growth and any changes in traffic routing that may occur.

### **Contact Information**

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