



TECHNICAL MEMORANDUM #6

FUTURE CONDITIONS SUMMARY

Date: March 17, 2025

To: Oregon Department of Transportation, Region 3

From: Angela Rogge, PE, Janet Jones, PE and Michael Bronsen, EIT, David Evans and Associates, Inc.

Subject: I-5 Exits 124/125 Interchange Area Management Plan & Garden Valley Corridor Plan

This memorandum describes future “No Build” transportation system operations within the study area of the I-5 Exits 124 and 125 Interchange Area Management Plan (IAMP) and the Garden Valley Corridor Plan (GVCP). The information in this memorandum provides an evaluation of transportation conditions with future land use and traffic growth projections. It will inform the identification and analysis of potential projects for the IAMP and GVCP.

FUTURE POPULATION AND EMPLOYMENT

The analysis utilizes the Roseburg Travel Demand Model to develop future traffic volumes within the study area. The model has a base year of 2019 and forecast year of 2045. The model is consistent with the Statewide Integrated Model (SWIM) and was created by calibrating and validating the Oregon Small Urban Model (OSUM) for the Roseburg area. Table 1 summarizes the trip basis assumptions used in the Roseburg model.

TABLE 1. 2019-2045 ROSEBURG MODEL AREA LAND USE GROWTHS

SCENARIO	HOUSEHOLDS	EMPLOYEES	INDUSTRIAL	RETAIL	SERVICES	SCHOOL ENROLLMENT
Model Base 2019	21,174	26,442	2,405	3,639	13,523	9,258
Future 2045	26,743	32,987	2,465	3,832	16,653	11,636
2019-2045 Growth	5,569	6,545	60	203	3,130	2,378
2019-2045 % Growth	26%	25%	2%	6%	23%	26%

Sources: City of Roseburg Base Year 2019 and Future Year 2045 Scenario Travel Demand Forecasting Model (July 2022), Oregon Department of Transportation

Currently, there are approximately 24,000 residents in the city of Roseburg¹ and there is a daytime population of approximately 60,000². The daytime influx may be due to the many employment

¹ https://data.census.gov/profile/Roseburg_city,_Oregon

² <https://www.cityofroseburg.org/visitors/city-profile>, accessed 9/4/2024.

opportunities and community resources located in Roseburg such as retail, government and medical services.

FUTURE (YEAR 2045) TRAFFIC VOLUMES

Future No Build traffic volume forecasts were developed using the Roseburg travel demand model forecasting. The transportation network used in the travel demand model forecast does not include any capacity increasing improvements, however, the future no build operations modeling includes the recently constructed project described in the next section.

FUTURE TRANSPORTATION NETWORK

A dedicated northbound right-turn lane was recently constructed, opening June 2024, at the NW Garden Valley Boulevard/NW Mulholland Drive/I-5 Northbound Off-Ramp intersection, study intersection number 10. This improvement was not complete when traffic counts were collected in 2023, so its impact on traffic was not included in the existing conditions analysis documented in *Technical Memorandum #5*. The future analysis reflects the changes to the transportation network that includes the new right-turn lane and associated signal timing updates. The new turn lane provides additional storage and is provided in addition to the existing dedicated northbound left-turn and northbound through lanes.

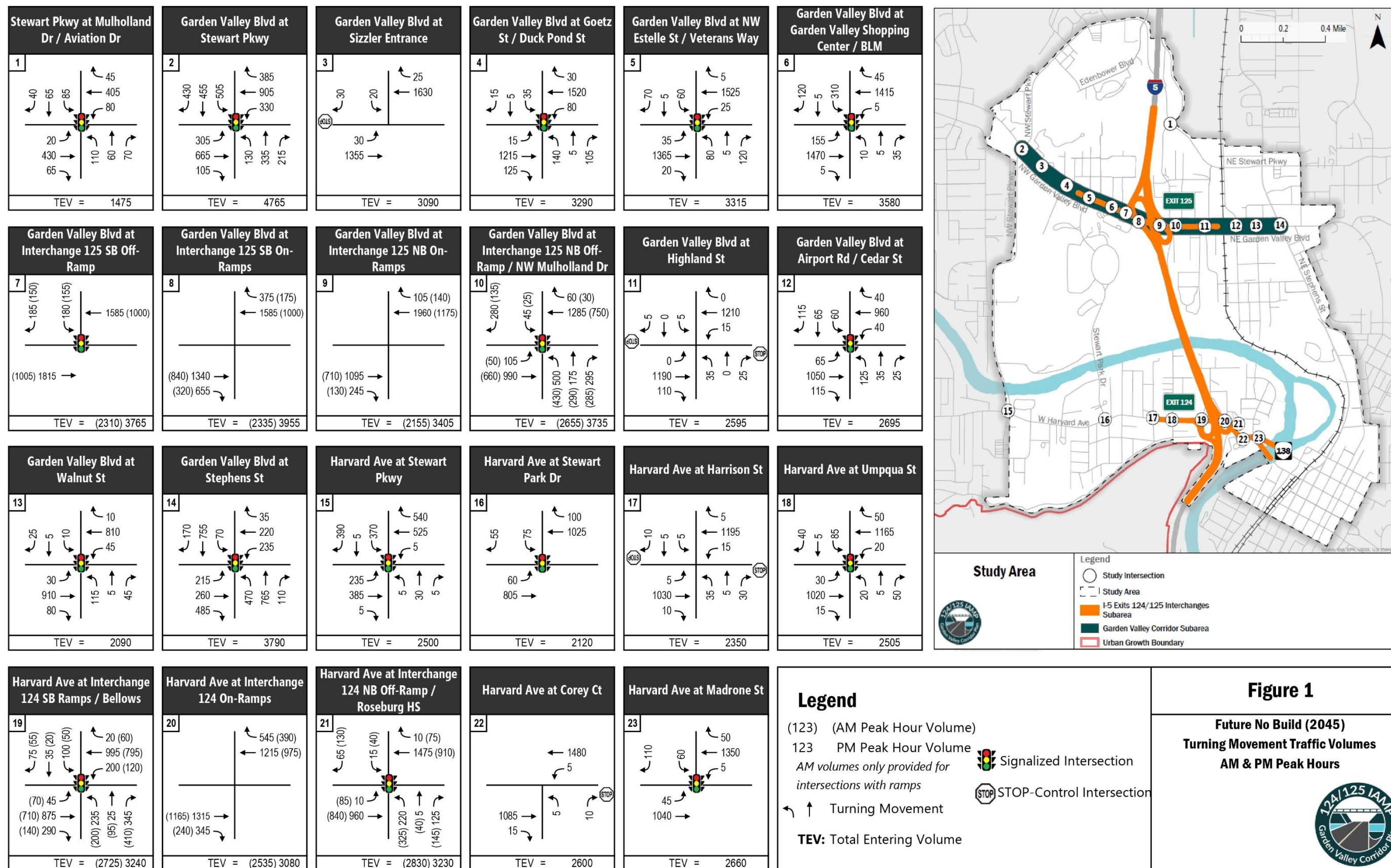
While there is a recently adopted Urban Growth Boundary (UGB) swap of land being added and removed from the City's UGB, the changes in traffic demand patterns are not expected to have a significant impact on future volumes. We reviewed the *City of Roseburg Urban Growth Boundary Transportation Analysis* prepared for the UGB swap (dated August 23, 2021) to understand how it may impact future traffic volumes in the study area. While the trips assigned at study area intersections in the 2021 study were not insignificant, the difference in the future year (year 2040) volumes presented in the 2021 study and the future No Build (year 2045) volumes prepared for the IAMP and GVCP show the UGB swap is not expected to have a significant impact on the study area. The trips assigned in the 2021 study show a 2%-6% increase in trips for the study area intersections overall. Furthermore, the UGB swap traffic study concluded the potential UGB swap would have no significant impact on the IAMP study area intersections. Therefore, the future Roseburg travel demand model volumes were utilized without applying any adjustments for the UGB swap.

No adjustments were made to the future year Roseburg travel demand volumes using the ODOT Statewide Integrated Model. The post-processing was completed in accordance with APM procedures and the National Cooperative Highway Research Program (NCRHP) Report 765 methodology.

DESIGN HOURLY VOLUMES

The future (year 2045) No Build turning movement volumes are presented in Figure 1. The detailed volume development worksheets are presented in the Appendix.

FIGURE 1. FUTURE (YEAR 2045) TURNING MOVEMENT VOLUMES



FUTURE (YEAR 2045) TRAFFIC OPERATIONS

OPERATIONAL CRITERIA

The traffic operations analysis was performed in accordance with the methodologies outlined in the Highway Capacity Manual 6th Edition (HCM6), as well as guidelines provided in ODOT's Analysis Procedures Manual, Version 2 (APM). Intersection operations analysis was performed using Synchro 12 software and freeway operations analysis was performed using Highway Capacity Software (HCS) 7. ODOT uses volume-to-capacity (v/c) ratios to assess intersection operations. The overall v/c ratios for signalized intersections were calculated manually per APM guidelines. The City of Roseburg uses both v/c and Level of Service (LOS) to assess intersection operations³.

Table 2 presents the mobility targets for the study area that will be used to aid in the identification of operational and intersection capacity concerns. The v/c target ratio for merge, diverge, weaving, and mainline sections of I-5 was based on Interstate Highways, outside Metro, and both inside and outside an Urban Growth Boundary (UGB).

TABLE 2. STUDY AREA MOBILITY TARGETS

JURISDICTION	FACILITY TYPE	EXISTING / NO BUILD MOBILITY TARGET ^{1,2}
Roseburg	Arterial, Collector, and Local roadways	0.95 v/c, LOS E
ODOT	Ramp Terminals	0.85 v/c
ODOT	Regional Highways, Non-MPO, ≤ 35 mph	0.90 v/c
ODOT	I-5, Non-MPO, ≥ 45 mph	0.80 v/c (inside UGB) 0.70 v/c (outside UGB)

1. City intersections shall be analyzed at a peak hour factor of 1.0, *Roseburg Transportation System Plan*, 2019, page 39.

2. *1999 Oregon Highway Plan* (Including amendments November 1999 through January 2023), Table 6.

SimTraffic software was also utilized to evaluate 95th percentile queues and corridor delays during the peak hour. The simulation from the SimTraffic analysis aids in evaluating if queue spillbacks to adjacent street intersections are present under existing conditions. Under saturated conditions, SimTraffic queuing and delays present results that reflect how congested intersections impact each other, while Synchro represents intersection performance in isolation and may reflect better performance results.

CALIBRATION

The Synchro and SimTraffic models were calibrated for local conditions based on data collected at a site visit on Thursday, June 6, 2024, during the period that represents the analysis time (4:30 – 5:30 PM) for existing conditions. The same model calibration was maintained for the future conditions analysis.

³ [City of Roseburg Code 12.06.020C.1.b](#)

TRAFFIC OPERATIONS

This section summarizes the intersection operations and 95th percentile queues for the AM and PM Peak Hours.

Study Intersection Operations – PM Peak Hour

All study area intersections were analyzed for the PM peak hour. Table 3 summarizes the results.

TABLE 3. FUTURE (YEAR 2045) PM PEAK HOUR TRAFFIC OPERATIONS ANALYSIS RESULTS

ID	INTERSECTION (CONTROL TYPE)	CRITICAL MOVEMENT ¹	V/C RATIO ²	LOS ³	JURISDICTION	MOBILITY TARGET(S) ^{4,5}
1	Stewart Pkwy at Mulholland Dr / Aviation Dr (Signal)	Overall	0.32 (0.34)	B	Roseburg	0.95, LOS E
2	Garden Valley Blvd at Stewart Pkwy (Signal)	Overall	0.81 (0.85)	D	Roseburg	0.95, LOS E
3	Garden Valley Blvd at Sizzler entrance (TWSC)	SBL+R	0.29	D	Roseburg	0.95, LOS E
4	Garden Valley Blvd at Goetz St / Duck Pond St (Signal)	Overall	0.67 (0.73)	C	Roseburg	0.95, LOS E
5	Garden Valley Blvd at Estelle St / Veterans Way (Signal)	Overall	0.62 (0.695)	D	Roseburg	0.95, LOS E
6	Garden Valley Blvd at Garden Valley Shopping Center / BLM (Signal)	Overall	0.84 (0.916)	C	Roseburg	0.95, LOS E
7	Garden Valley Blvd at Southbound Off-Ramp (Signal)	Overall	0.74 (0.76)	A	ODOT	0.85
8	Garden Valley Blvd at Southbound On-Ramps (Uncontrolled)	N/A	N/A	N/A	ODOT	0.85
9	Garden Valley Blvd at Northbound On-Ramps (Uncontrolled)	N/A	N/A	N/A	ODOT	0.85
10	Garden Valley Blvd at Northbound Off-Ramp/NW Mulholland Dr (Signal)	Overall	1.11 (1.08)	E	ODOT	0.85
11	Garden Valley Blvd at Highland St (TWSC)	NBL+R	0.27	D	Roseburg	0.95, LOS E
12	Garden Valley Blvd at Airport Rd/Cedar St (Signal)	Overall	0.68 (0.70)	C	Roseburg	0.95, LOS E
13	Garden Valley Blvd at Walnut St (Signal)	Overall	0.60 (0.46)	D	Roseburg	0.95, LOS E
14	Garden Valley Blvd at Stephens St (Signal)	Overall	0.85 (0.84)	D	Roseburg	0.95, LOS E
15	Harvard Ave at Stewart Pkwy (Signal)	Overall	0.65 (0.68)	C	Roseburg	0.95, LOS E
16	Harvard Ave at Stewart Park Dr (Signal)	Overall	0.49 (0.57)	A	Roseburg	0.95, LOS E
17	Harvard Ave at Harrison St (TWSC)	NBLTR	0.82	F	Roseburg	0.95, LOS E

TABLE 3. FUTURE (YEAR 2045) PM PEAK HOUR TRAFFIC OPERATIONS ANALYSIS RESULTS

ID	INTERSECTION (CONTROL TYPE)	CRITICAL MOVEMENT ¹	V/C RATIO ²	LOS ³	JURISDICTION	MOBILITY TARGET(S) ^{4,5}
18	Harvard Ave at Umpqua St (Signal)	Overall	0.50 (0.51)	B	Roseburg	0.95, LOS E
19	Harvard Ave at Southbound Ramps / Bellows St (Signal)	Overall	0.76 (0.76)	D	ODOT	0.85
20	Harvard Ave at Northbound On-Ramps (Uncontrolled)	N/A	N/A	N/A	ODOT	0.85
21	Harvard Ave at Northbound Off-Ramp / Roseburg High School (Signal)	Overall	0.76 (0.72)	B	ODOT	0.85
22	Harvard Ave at Corey Ct (TWSC)	NBL	0.03	D	ODOT	0.90
23	Harvard Ave at Madrone St (Signal)	Overall	0.56 (0.56)	A	ODOT	0.90

Source: David Evans and Associates, Inc.

Acronyms: EB = eastbound; WB = westbound; NB = northbound; and SB = southbound. L = left; T = through; and R = right; TWSC = two-way stop control; Signal = signal control.

Intersections exceeding the applicable mobility target are **bold and shaded**.

Notes:

1. At signalized intersections, the overall results are reported; at all-way stop-controlled intersections, and at unsignalized intersections the results are reported for the worst major and minor movements that must stop or yield the right of travel to other traffic flows.
2. Overall v/c ratio calculated using methodology in ODOT's APM based on HCM6 and HCM2000 results, as appropriate; overall v/c reported using HCM6 hand calculations methodology and HCM 2000 v/c results reported in (parentheses) for comparison only.
3. Level of Service (LOS) reported using HCM6 methodology.
4. 1999 Oregon Highway Plan (OHP), Table 6, Policy 1F.
5. The City of Roseburg Land Use and Development Regulations (LUDR) code section 12.06.020.C.1.b designates the traffic operations standard on City facilities and defers to ODOT standards for intersections with state highways within the city.

As shown in Table 3, two intersections exceed applicable mobility targets during the PM Peak Hour for future year 2045. The intersection of Garden Valley Boulevard at the Northbound Off-Ramp/NW Mulholland Drive is expected to operate at over 1.0, exceeding the OHP target of a v/c of 0.85 as well as the capacity of the intersection. This is expected to result in long queues that would impact adjacent intersections. The queueing results are further detailed in the 95th Percentile Queues section (page 8). The intersection of Harvard Avenue at Harrison Street is expected to operate at LOS F under future No Build conditions, although it meets the v/c target. The intersection is currently unsignalized. Both minor street approaches are projected to operate with a delay greater than 60 seconds due to high through volumes on Harvard Avenue. However, the future peak hour volume on Harrison Street does not meet ODOT's volume threshold to warrant signalization at this location.⁴

⁴ 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-Roadway Engineer will make the final decision on the installation of a signal.

While the demand at the intersection of Garden Valley Boulevard at Stewart Parkway is projected to increase by approximately 18% from existing conditions to future No Build conditions in year 2045, this intersection is still projected to operate within the City of Roseburg’s mobility standard of 0.95 v/c. The City’s currently adopted Transportation System Plan (TSP) projected this intersection failing mobility standards in the previously analyzed year 2040 conditions. However, we note two key differences between the future year 2040 volumes and the future year 2045 volumes: 1) the future year 2040 volumes were based on pre-COVID traffic volumes while the current year 2045 future volumes are projected based on post-COVID counts, which are overall lower on Garden Valley Boulevard, and 2) the future volume projections come from two different travel demand models with different population and employment assumptions.

Study Intersection Operations – AM Peak Hour

AM Peak Hour operations were analyzed for the ramp terminal intersections at the I-5 Exits 124 and 125 interchanges. As presented in Table 4, all ramp terminals are projected to operate within ODOT’s mobility target of 0.85 v/c during the AM peak hour.

TABLE 4. FUTURE (YEAR 2045) AM PEAK HOUR TRAFFIC OPERATIONS ANALYSIS RESULTS

ID	INTERSECTION (CONTROL TYPE)	CRITICAL MOVEMENT ¹	V/C RATIO ²	LOS	JURISDICTION	MOBILITY TARGET ³
7	Garden Valley Blvd at Southbound Off-Ramp (Signal)	Overall	0.45 (0.47)	A	ODOT	0.85
8	Garden Valley Blvd at Southbound On-Ramps (Uncontrolled)	N/A	N/A	N/A	ODOT	0.85
9	Garden Valley Blvd at Northbound On-Ramps (Uncontrolled)	N/A	N/A	N/A	ODOT	0.85
10	Garden Valley Blvd at Northbound Off-Ramp/NW Mulholland Dr (Signal)	Overall	0.69 (0.70)	C	ODOT	0.85
19	Harvard Ave at Southbound Ramps / Bellows St (Signal)	Overall	0.58 (0.62)	D	ODOT	0.85
20	Harvard Ave at Northbound On-Ramps (Uncontrolled)	N/A	N/A	N/A	ODOT	0.85
21	Harvard Ave at Northbound Off-Ramp / Roseburg High School (Signal)	Overall	0.67 (0.66)	B	ODOT	0.85

Source: David Evans and Associates, Inc.

Acronyms: EB = eastbound; WB = westbound; NB = northbound; and SB = southbound. L = left; T = through; and R = right; TWSC = two-way stop control; Signal = signal control.

Intersections exceeding the applicable mobility target are **bold and shaded**.

Notes:

1. At signalized intersections, the overall results are reported; at all-way stop-controlled intersections, and at unsignalized intersections the results are reported for the worst major and minor movements that must stop or yield the right of travel to other traffic flows.
2. Overall v/c ratio calculated using methodology in ODOT’s APM based on HCM6 and HCM2000 results, as appropriate; overall v/c reported using HCM6 hand calculations methodology and HCM2000 methodology results reported in (parentheses) for comparison only.
3. 1999 Oregon Highway Plan (OHP), Table 6, Policy 1F applies to existing conditions.

95th Percentile Queues

PM Peak Hour

SimTraffic was run for the peak period to determine 95th percentile queues. Eleven (11) SimTraffic simulation seeds were run, and any outliers were omitted. The five most consistent runs were averaged to obtain an average model run. Calibration notes, simulation reports and queuing outputs are provided in the appendix.

Table 5 summarizes the PM peak hour 95th percentile queues by movement at each study area intersection. The table also highlights locations where the 95th percentile queue either exceeds available storage/extends beyond the nearest driveway or extends beyond the nearest upstream public street intersection.

TABLE 5. FUTURE (YEAR 2045) PM PEAK HOUR 95TH PERCENTILE QUEUES

ID	INTERSECTION (CONTROL TYPE)	APPROACH / MOVEMENT	95TH PERCENTILE QUEUE (FEET)	STRIPED / EFFECTIVE STORAGE (FEET) ¹
1	Stewart Pkwy at Mulholland Dr / Aviation Dr (Signal)	EBL	50	105
		EBT	125	>1,000
		EBT+R	125	>1,000
		WBL	75	105/150
		WBT	100	>1,000
		WBT+R	100	>1,000
		NBL	125	60/90
		NBT+R	100	>1,000
		SBL	100	85
		SBT+R	75	>1,000
2	Garden Valley Blvd at Stewart Pkwy (Signal)	EBL	250	155/>250
		EBT	950	235/>1,000
		EBT+R	900	235/>1,000
		WBL	225	125/>250
		WBT	875	210/>1,000
		WBT	925	210/>1,000
		WBR	375	110
		NBL	200	175/220
		NBT	225	220
		NBT	200	220
		NBR	175	190
		SBL	325	195/420
		SBL	400	150/200
		SBT	425	965
		SBT	325	965
		SBR	275	125
3	Garden Valley Blvd at Sizzler entrance (TWSC)	SBL+R	150	65
		EBL	75	225

TABLE 5. FUTURE (YEAR 2045) PM PEAK HOUR 95TH PERCENTILE QUEUES

ID	INTERSECTION (CONTROL TYPE)	APPROACH / MOVEMENT	95TH PERCENTILE QUEUE (FEET)	STRIPED / EFFECTIVE STORAGE (FEET) ¹
4	Garden Valley Blvd at Goetz St / Duck Pond St (Signal)	EBL	75	100/300
		EBT	325	300/>1,000
		EBT+R	375	300/>1,000
		WBL	150	110/215
		WBT	275	215
		WBT+R	300	215
		NBL+T	200	140/160
		NBR	175	280
		SBLTR	100	345
5	Garden Valley Blvd at Estelle St / Veterans Way (Signal)	EBL	75	65/235
		EBT	300	355
		EBT+R	325	355
		WBL	125	75/210
		WBT	350	210
		WBT+R	350	210
		NBL+T	125	490
		NBR	125	125
		SBL+T	100	100
6	Garden Valley Blvd at Garden Valley Shopping Center / BLM (Signal)	SBR	75	440
		EBL	200	90/255
		EBT	525	150/255
		EBT+R	875	150/255
		WBL	50	100/140
		WBT	450	140/290
		WBT+R	500	140/290
		NBL	50	65
		NBT+R	75	160
7	Garden Valley Blvd at Southbound Off-Ramp (Signal)	SBL	275	35
		SBT+R	325	35
		EBT	275	290
		EBT	875	290
		WBT	175	1,000
		WBT	200	1,000
8	Garden Valley Blvd at Southbound On-Ramps (Uncontrolled)	SBL	225	600
		SBR	125	>600
9	Garden Valley Blvd at Northbound On-Ramps (Uncontrolled)	N/A	N/A	N/A
9	Garden Valley Blvd at Northbound On-Ramps (Uncontrolled)	N/A	N/A	N/A

TABLE 5. FUTURE (YEAR 2045) PM PEAK HOUR 95TH PERCENTILE QUEUES

ID	INTERSECTION (CONTROL TYPE)	APPROACH / MOVEMENT	95TH PERCENTILE QUEUE (FEET)	STRIPED / EFFECTIVE STORAGE (FEET) ¹
10	Garden Valley Blvd at Northbound Off-Ramp/NW Mulholland Dr (Signal)	EBL	150	60/>1,000
		EBT	350	800/>1,000
		EBT	400	800/>1,000
		WBT	<u>>1,000</u>	100/220
		WBT+R	<u>>1,000</u>	100/220
		NBL	<u>>1,000</u>	195/770
		NBT	<u>>1,000</u>	>770
		NBR	<u>500</u>	285
		SBL	<u>150</u>	80/130
		SBR	350	130/>1,000
11	Garden Valley Blvd at Highland St (TWSC)	WBL	<u>100</u>	55
		NBL+R	625	135/>1,000
12	Garden Valley Blvd at Airport Rd/Cedar St (Signal)	EBL	175	140
		EBT	375	260/620
		EBT+R	400	260/620
		WBL	<u>175</u>	85
		WBT	<u>>1,000</u>	185
		WBT+R	<u>>1,000</u>	185
		NBL	<u>250</u>	80/140
		NBT+R	<u>900</u>	840
		SBL	<u>200</u>	85/105
		SBT+R	750	105/>1,000
13	Garden Valley Blvd at Walnut St (Signal)	EBL	50	110
		EBT	100	180/430
		EBT+R	100	180/430
		WBL	125	75
		WBT	<u>550</u>	75/450
		WBT+R	<u>>1,000</u>	75/450
		NBL+T	<u>175</u>	85
		NBR	425	830
		SBL+T	50	50
		SBR	<u>75</u>	50
14	Garden Valley Blvd at Stephens St (Signal)	EBL	<u>300</u>	235/260
		EBT	375	460
		EBR	300	240/470
		WBL	200	115/200
		WBT+R	<u>600</u>	200/295
		NBL	<u>350</u>	240/290
		NBL	<u>375</u>	240/290
		NBT	<u>625</u>	215/415
		NBT+R	<u>550</u>	215/415
		SBL	250	115/490
		SBT	<u>>1,000</u>	265/490
		SBT+R	<u>>1,000</u>	265/490

TABLE 5. FUTURE (YEAR 2045) PM PEAK HOUR 95TH PERCENTILE QUEUES

ID	INTERSECTION (CONTROL TYPE)	APPROACH / MOVEMENT	95TH PERCENTILE QUEUE (FEET)	STRIPED / EFFECTIVE STORAGE (FEET) ¹
15	Harvard Ave at Stewart Pkwy (Signal)	EBL	225	105/220
		EBT	250	395
		EBT+R	175	395
		WBL	25	100/185
		WBT	825	185/520
		WBT	>1,000	185/520
		WBR	275	100
		NBL	25	55/100
		NBT+R	75	260
		SBL	725	85/135
		SBT+R	350	>1,000
16	Harvard Ave at Stewart Park Dr (Signal)	EBL	75	90/165
		EBT	100	165
		EBT	125	165
		WBT	175	175
		WBT+R	250	175
		SBL	100	260
		SBR	75	80/100
17	Harvard Ave at Harrison St (TWSC)	EBL	25	210
		WBL	50	175/410
		NBLTR	125	75/460
		SBLTR	75	765
18	Harvard Ave at Umpqua St (Signal)	EBL	100	70/160
		EBT	200	70/415
		EBT+R	250	70/415
		WBL	75	80/115
		WBT	225	115/640
		WBT+R	250	115/640
		NBLTR	125	25/350
		SBLTR	175	90/965
19	Harvard Ave at Southbound Ramps / Bellows St (Signal)	EBL	125	135/235
		EBT	375	370/655
		EBT	400	370/655
		EBR	250	90/135
		WBL	325	285/400
		WBT	400	760
		WBT+R	400	760
		NBL	300	205
		NBT	150	450
		NBR	225	>450
		SBL	175	110/205
		SBT+R	175	505
20	Harvard Ave at Northbound On-Ramps (Uncontrolled)	N/A	N/A	N/A

TABLE 5. FUTURE (YEAR 2045) PM PEAK HOUR 95TH PERCENTILE QUEUES

ID	INTERSECTION (CONTROL TYPE)	APPROACH / MOVEMENT	95TH PERCENTILE QUEUE (FEET)	STRIPED / EFFECTIVE STORAGE (FEET) ¹
21	Harvard Ave at Northbound Off-Ramp / Roseburg High School (Signal)	EBL	50	100/210
		EBT	200	755
		EBT+R	225	755
		WBT	<u>450</u>	85
		WBT+R	<u>475</u>	85
		NBL	<u>250</u>	80
		NBT+R	200	>1,000
		SBL	50	180/220
22	Harvard Ave at Corey Ct (TWSC)	SBR	100	180/220
		WBL	25	40/130
		NBL	50	40/340
23	Harvard Ave at Madrone St (Signal)	NBR	<u>50</u>	40
		EBL	75	100/190
		EBT	100	150/470
		EBT	125	150/470
		WBU	25	30
		WBT	350	>1,000
		WBT+R	400	>1,000
		SBL	125	260/590
		SBR	125	205

Bold and highlighted indicates queue exceeds available storage; ***Italic and underlined*** indicates queue is excessive and/or may impact upstream traffic

Notes:

1. Striped distance is reported as either the length of the turn pocket for turn lanes or the distance to the nearest upstream, driveway for through lanes, as applicable. Effective distance is reported as the distance to the nearest upstream driveway or public street intersection for turn lanes or the distance to the nearest upstream public street intersection for through lanes.

As presented in Table 5, there are 17 intersections with queues that extend past the effective storage. Of those 17 intersections, eight (8) intersections have queuing deficiencies that are projected to impact signalized intersections:

- Intersection 6 – Garden Valley Blvd at Garden Valley Shopping Center / BLM
- Intersection 7 – Garden Valley Blvd at Southbound Off-Ramp
- Intersection 10 – Garden Valley Blvd at Northbound Off-Ramp/NW Mulholland Dr
- Intersection 12 – Garden Valley Blvd at Airport Rd/Cedar St
- Intersection 13 – Garden Valley Blvd at Walnut St
- Intersection 14 – Garden Valley Blvd at Stephens St
- Intersection 15 – Harvard Ave at Stewart Pkwy
- Intersection 21 – Harvard Ave at Northbound Off-Ramp / Roseburg High School

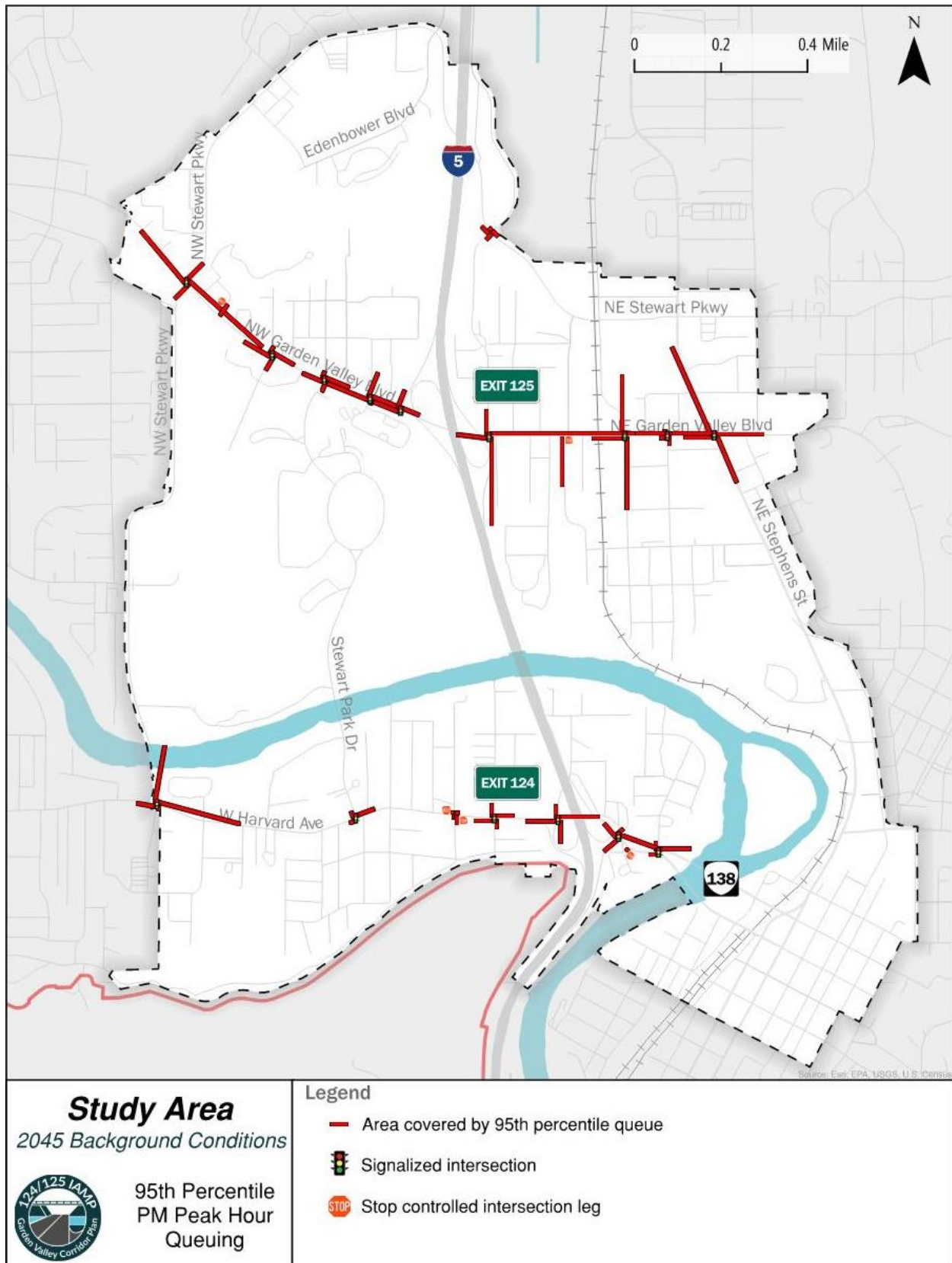
Along Garden Valley Boulevard, westbound through queues at the shopping center extend past the I-5 Southbound Off-Ramp. Similarly, westbound through queues at the I-5 Southbound Off-Ramp extend past the I-5 Southbound Entrance Loop Ramp, which blocks drivers from accessing the loop ramp. Most

notably, the westbound queue at the I-5 Northbound Off-Ramp is projected to spill back past the railroad crossing. Queuing in the westbound direction is also projected at the Airport Road and Walnut Street intersections with Garden Valley Boulevard, extending to Stephens Street.

Along Harvard Avenue, long queues are projected for the outer westbound through lane at Stewart Parkway, likely a result of queues that exceed available storage in the westbound right-turn lane. At the I-5 Northbound Off-Ramp opposite the high school, the westbound queue is projected to spill back to Madrone Street.

Overall, queues are expected to be similar or slightly worse compared with existing conditions at most intersections. The future PM peak hour, 95th percentile queue projections are presented in Figure 2.

FIGURE 2. FUTURE YEAR 95TH PERCENTILE QUEUING



AM Peak Hour

Table 6 presents the AM peak hour 95th percentile queues for ramp terminals only. We note the results for the AM peak hour queuing analysis may not reflect actual conditions due to lack of AM peak hour data for several intersections which may impact queue spillback at the ramp terminals.

TABLE 6. FUTURE (YEAR 2045) AM PEAK HOUR 95TH PERCENTILE QUEUES

ID	INTERSECTION (CONTROL TYPE)	APPROACH / MOVEMENT	95TH PERCENTILE QUEUE (FEET)	STRIPED / EFFECTIVE STORAGE (FEET) ¹
7	Garden Valley Blvd at Southbound Off-Ramp (Signal)	EBT	125	290
		EBT	175	290
		WBT	125	1,000
		WBT	125	1,000
		SBL	200	600
		SBR	75	>600
8	Garden Valley Blvd at Southbound On-Ramps (Uncontrolled)	N/A	N/A	N/A
9	Garden Valley Blvd at Northbound On-Ramps (Uncontrolled)	N/A	N/A	N/A
10	Garden Valley Blvd at Northbound Off-Ramp/NW Mulholland Dr (Signal)	EBL	75	60/>1,000
		EBT	150	800/>1,000
		EBT	150	800/>1,000
		WBT	350	100/220
		WBT+R	325	100/220
		NBL	775	195/770
		NBT	625	>770
		NBR	300	285
		SBL	100	80/130
19	Harvard Ave at Southbound Ramps / Bellows St (Signal)	SBR	200	130/>1,000
		EBL	150	135/235
		EBT	275	370/655
		EBT	250	370/655
		EBR	125	90/135
		WBL	225	285/400
		WBT	300	760
		WBT+R	325	760
		NBL	250	205
		NBT	150	450
		NBR	150	>450
		SBL	100	110/205
20	Harvard Ave at Northbound On-Ramps (Uncontrolled)	SBT+R	125	505
		N/A	N/A	N/A

TABLE 6. FUTURE (YEAR 2045) AM PEAK HOUR 95TH PERCENTILE QUEUES

ID	INTERSECTION (CONTROL TYPE)	APPROACH / MOVEMENT	95TH PERCENTILE QUEUE (FEET)	STRIPED / EFFECTIVE STORAGE (FEET) ¹
21	Harvard Ave at Northbound Off-Ramp / Roseburg High School (Signal)	EBL	125	100/210
		EBT	250	755
		EBT+R	300	755
		WBT	150	85
		WBT+R	175	85
		NBL	325	80
		NBT+R	350	>1,000
		SBL	75	180/220
		SBR	125	180/220

Bold and highlighted indicates queue exceeds available storage; ***Italic and underlined*** indicates queue is excessive and/or may impact upstream traffic

Notes:

1. Striped distance is reported as either the length of the turn pocket for turn lanes or the distance to the nearest upstream, driveway for through lanes, as applicable. Effective distance is reported as the distance to the nearest upstream driveway or public street intersection for turn lanes or the distance to the nearest upstream public street intersection for through lanes.

The AM peak hour queuing analysis does not indicate any significant queue spillback issues at the ramp terminals. The most significant queue is the northbound left-turning movement at the I-5 Exit 124 Northbound Off-Ramp at Harvard Avenue. This queue does not spillback to any public street intersections and can be accommodated in the combined approach lane upstream of the signal. This is consistent with existing conditions.

Railroad Operations

As noted in *Technical Memorandum #5: Existing Conditions Summary*, there are at-grade railroad crossings with NE Garden Valley Boulevard (potential impacts to interchange 125 and the GVC) as well as with SE Washington Avenue and SE Oak Avenue (potential impacts to interchange 124).

The projected queues are expected to back up from the interchange to the railroad during the PM peak hour. Based on observation and as noted under existing conditions, the passage of trains currently results in long vehicular queues extending along the local street network that impede regular movement at adjacent intersections, particularly in downtown Roseburg. This is expected to continue under future year 2045 conditions if no improvements are made.

FREEWAY OPERATIONS

It is also important to evaluate how the interchange ramps interact with the mainline highway traffic on I-5 through an analysis of the points where traffic enters or merges onto the highway and where it exits or diverges from the highway. These analyses were conducted in accordance with the methodology prescribed in ODOT's APM to determine v/c ratio performance. A select-link analysis was run to determine the approximate volume of traffic projected to utilize the Exit 124 Northbound On-Ramp and the Exit 125 Northbound Off-Ramp in the future for purposes of accurately performing the weave analysis between the two exits. The results of the analysis are summarized in Table 7.

TABLE 7. FUTURE (YEAR 2045) PM PEAK HOUR FREEWAY OPERATIONS

Direction/Location	Mile Point		V/C Ratio ¹	
	Begin	End	Design Hour ²	OHP Target ³
I-5 Northbound				
Mainline South of Exit 124 (W Harvard Ave)	123.50	123.80	0.50	0.80
Diverge: Northbound Exit 124 Off-Ramp			0.33	0.80
Mainline North of Exit 124 Off-Ramp	123.80	124.20	0.42	0.80
Merge: Exit 124 Northbound Loop On-Ramp			0.33	0.80
Mainline North of Exit 124 Loop On-Ramp	124.20	124.80	0.52	0.80
Weave: Exit 124 to Exit 125	124.20	124.80	0.61	0.80
Mainline North of Exit 125 Off-Ramp (Garden Valley Blvd)	124.80	125.07	0.40	0.80
Merge: Exit 125 Northbound Loop On-Ramp			0.26	0.80
Mainline North of Exit 125 Loop On-Ramp (Garden Valley Blvd)	125.07	125.32	0.47	0.80
Merge: Exit 125 Northbound On-Ramp			0.49	0.80
Mainline North of Exit 125 (Garden Valley Blvd)	125.32	126.00	0.52	0.80
I-5 Southbound				
Mainline North of Exit 125 (Garden Valley Blvd)	126.00	125.36	0.46	0.80
Diverge: Southbound Exit 125 Off-Ramp			0.30	0.80
Mainline South of Exit 125 Off-Ramp	125.36	125.10	0.34	0.80
Merge: Exit 125 Southbound Loop On-Ramp			0.29	0.80
Mainline South of Exit 125 Loop On-Ramp (W Harvard Ave)	125.10	124.87	0.44	0.80
Merge: Exit 125 Southbound On-Ramp			0.39	0.80
Mainline South of Exit 125 On-Ramp	124.87	124.14	0.62	0.80
Diverge: Southbound Exit 124 Loop Off-Ramp			0.40	0.80
Mainline South of Exit 124 Loop Off-Ramp (W Harvard Ave)	124.14	123.91	0.46	0.80
Merge: Southbound Exit 124 On-Ramp			0.39	0.80
Mainline South of Exit 124 On-Ramp	123.91	123.50	0.60	0.80

1. Volume to Capacity (V/C) ratio.

2. Design Hour freeway volumes were calculated by TPAU and balanced to the future background ramp volumes. Design Hour v/c calculated with HSC7.

3. OHP Targets from 1999 Oregon Highway Plan (Including amendments November 1999 through January 2023), Table 6.

The merge, diverge, and weaving analyses for the design hour between 4:30 PM and 5:30 PM show that the freeway and the merge and diverge points associated with the Roseburg interchange ramps are projected to operate below the mobility standard of 0.85. During this period, the northbound direction has the higher directional flow on the freeway.

FUTURE MULTIMODAL CONDITIONS

PEDESTRIANS

Pedestrian conditions are unlikely to change significantly as there are currently no known programmed projects within the study area. The future pedestrian system assessment assumed that existing sidewalks and crossings will be maintained at current levels, resulting in no change to the pedestrian system assessment produced for *Technical Memorandum #5: Existing Conditions*.

CYCLING

Cycling conditions are unlikely to change significantly as there are currently no known programmed projects within the study area. The *2023 Roseburg Bike Routes Plan* identified short, medium and long-term projects but none have been included in a capital improvement list yet. The alternatives development for the IAMP and the GVCP will consider the projects identified in that plan.

The future cycling system assessment assumed that existing bicycle lanes, trails and crossings will be maintained at current levels, resulting in no change to the cycling system assessment produced for *Technical Memorandum #5: Existing Conditions*.

TRANSIT

Transit conditions are unlikely to improve at transit stops in the study area based on known planned projects. The future transit system assessment assumed that transit service will be maintained at current levels – reflecting present routes, service frequencies, stop amenities and connections to the pedestrian and bicycle networks, resulting in no change to the system assessment produced for *Technical Memorandum #5: Existing Conditions*. The 2022 Umpqua Public Transportation District Coordinated Transportation Plan was reviewed in *Technical Memorandum #1: Planning Context and Background*. The transit plan identifies areas of support needed to implement transit upgrades in Roseburg but there are no funded improvements that would impact future traffic operations.

OTHER MODES

Air

No new air travel needs were identified as part of the future conditions analysis.

Marine

No new marine travel needs were identified as part of the future conditions analysis.

Rail

No new rail travel needs were identified as part of the future conditions analysis. Without improvements, the increased vehicular queues on Garden Valley Boulevard are likely to result in more frequent conflicts with the at-grade rail crossing west of Airport Road/Cedar Street.

Pipeline

No new pipeline needs were identified as part of the future conditions analysis.

FUTURE SAFETY CONDITIONS

No new quantitative safety needs were identified as part of the future conditions analysis. However, the recent improvements at Garden Valley Boulevard at the Northbound Off-Ramp/NW Mulholland Drive are expected to improve some aspects of safety at this intersection, specifically turning and angle crashes. However, the dominant crashes at this location were rear end crashes resulting from the queuing on the northbound ramp terminal. The intersection improvements may have short-term reduction in queues and thus the likelihood of rear end crashes closer to the mainline. The forecasted conditions suggest queuing on the northbound off-ramp will continue to approach the mainline, creating future safety concerns.

The expected increases in vehicle queueing and the lack of programmed improvements in the bicycle and pedestrian network suggest that the existing safety concerns identified in *Technical Memorandum #5: Existing Conditions* will continue to persist or worsen as time goes on. In recent years the region has also seen natural hazard events that have highlighted the importance of maintaining a network of emergency and evacuation routes. Routes that serve these needs should be prioritized for safety improvements in the future.

Feedback and conversations from the advisory committee and this project's Fall 2024 Community Open House identified the following concerns for the project team to consider during alternatives development:

- There are driver expectancy issues with the perceived lack of deceleration space on I-5 at the Harvard interchange southbound exit ramp. The improvements at the ramp terminal intersection with Harvard Avenue appear to have addressed some of queuing backups.
- Limited sight distance on I-5 southbound due to Mt. Nebo.
- Awkward geometry for trucks entering I-5 via the westbound to southbound loop ramp.
- An uncomfortable environment for pedestrians walking on Garden Valley Boulevard east of the Garden Valley Shopping Center.
- An uncomfortable environment for pedestrians walking on Harvard Avenue through and near the I-5 ramp terminal intersections.

SUMMARY OF NO BUILD DEFICIENCIES

The future deficiencies are summarized in Table 8.

TABLE 8. SUMMARY OF NO BUILD DEFICIENCIES

Deficiencies	
Multimodal	
Pedestrian	<ul style="list-style-type: none"> • There are currently no funded projects that would impact the pedestrian network in the future. • No new pedestrian needs were identified as part of the future conditions analysis. • Improvements will be addressed in the future alternatives memorandum.
Bicycle	<ul style="list-style-type: none"> • There are currently no funded projects that would impact the bicycle network in the future. • No new cycling needs were identified as part of the future conditions analysis. • Improvements will be addressed in the future alternatives memorandum.
Transit	
Service	<ul style="list-style-type: none"> • There are currently no funded projects that would impact the transit service network in the future. • No new transit needs were identified as part of the future conditions analysis. • Improvements will be addressed in the future alternatives memorandum.
Traffic	
Traffic Operations	<p>The following intersections are projected to exceed applicable mobility targets by 2045, per HCM6 methodology:</p> <ul style="list-style-type: none"> • Garden Valley Blvd at the Northbound Off-Ramp/NW Mulholland Dr (v/c 1.11, LOS E) • Harvard Avenue at Harrison Street (v/c 0.82, LOS F)
Queuing	<ul style="list-style-type: none"> • Queuing is expected to slightly worsen at most intersections during the design hour (PM peak hour) from existing conditions. Spillbacks to adjacent signals are projected at the following locations: <ul style="list-style-type: none"> • Garden Valley Blvd at Garden Valley Shopping Center / BLM • Garden Valley Blvd at Southbound Off-Ramp • Garden Valley Blvd at Northbound Off-Ramp/NW Mulholland Dr (potential to extend to I-5 mainline safe stopping distance area) • Garden Valley Blvd at Airport Rd/Cedar St • Garden Valley Blvd at Walnut St • Garden Valley Blvd at Stephens St • Harvard Ave at Stewart Pkwy • Harvard Ave at Northbound Off-Ramp / Roseburg High School • Compounding queues on Garden Valley Boulevard in the westbound direction during the PM Peak Hour are expected to extend from I-5 to Stephens Street, impacting movements at driveways and location intersections along the corridor. • Queueing on Garden Valley Boulevard and Harvard Avenue at their intersections with Stewart Parkway extend beyond 1,000 feet for the westbound through movements during the PM Peak Hour. • Future improvements to address worsening queues will be addressed in the future alternatives memorandum.

Deficiencies	
Safety	
Crash History	<ul style="list-style-type: none">• Future improvements may be needed to address existing safety concerns and queuing, particularly at the Garden Valley Northbound Off-Ramp and the eastern segment of Garden Valley Boulevard.• Bicycle and pedestrian conflicts with vehicles will continue to persist or worsen as time goes on due to increased traffic congestion.• Improvements will be addressed in the future alternatives memorandum.