LOGAN'S LANDING
TRAFFIC IMPACT ANALYSIS

WOODLAND, WA

3/10/2022

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March 2022

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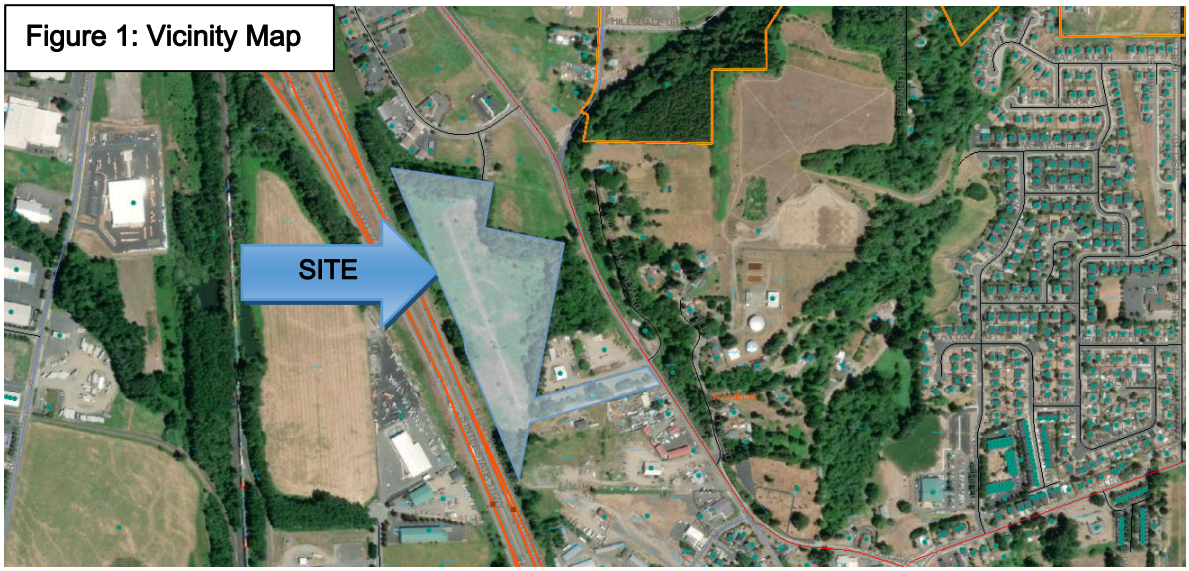
1. INTRODUCTION

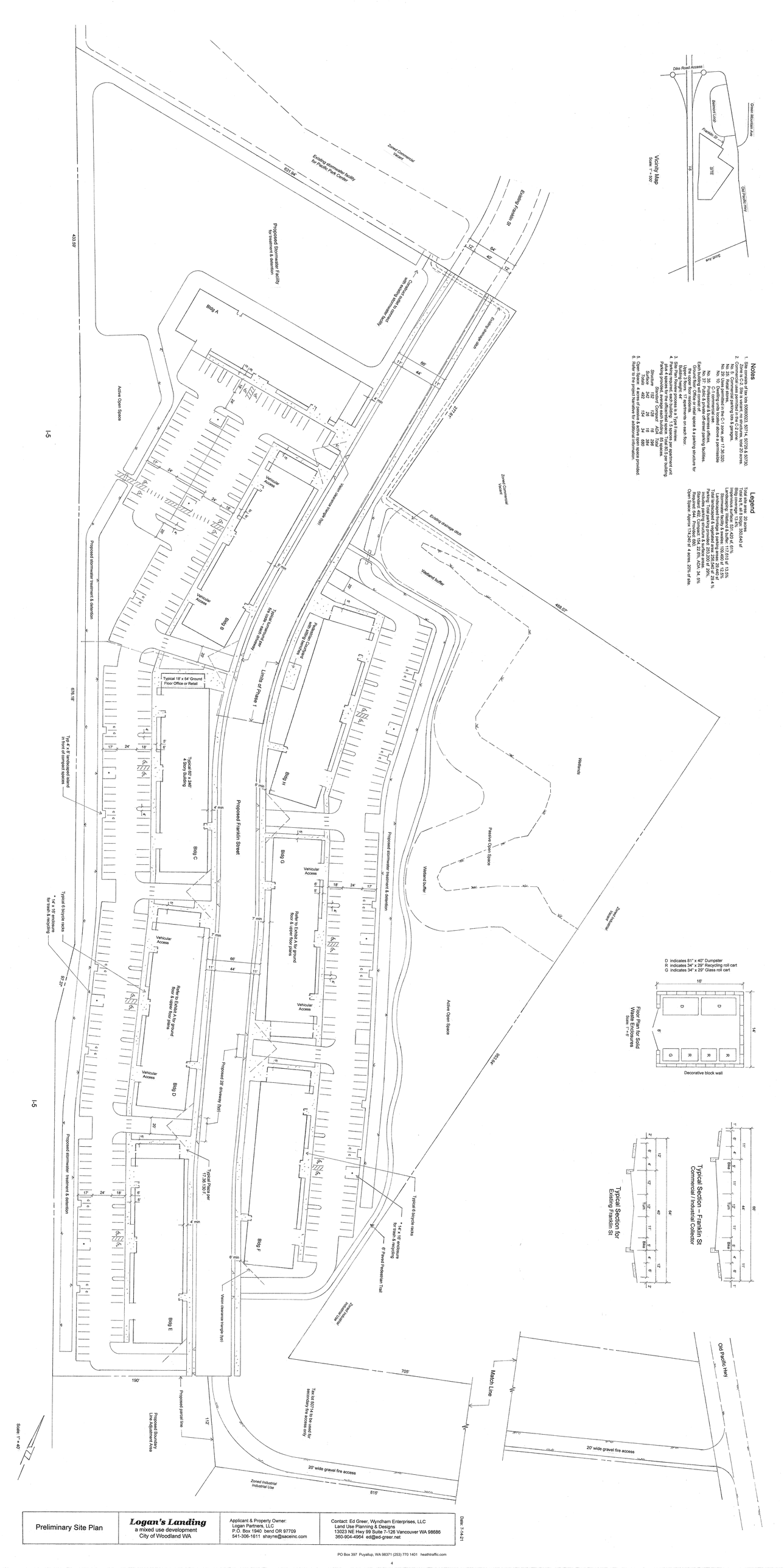
The main goals of this study focus on the assessment of existing roadway conditions and forecasts of newly generated project traffic. The first task includes the review of general roadway information on the adjacent streets serving the subject site and gathering existing vehicular volumes within a defined study area. Forecasts of future traffic and dispersion patterns on the street system are then determined using established trip generation and distribution techniques. As a final step, appropriate conclusions and mitigation measures are defined, if needed.

2. PROJECT DESCRIPTION

Logan's Landing is a proposed mixed-use development located within the city of Woodland. The subject site is located west of Old Pacific Highway and south of Belmont Loop. The subject site, comprised of four parcels (#: 50680023, 50714, 50729 and a portion of 50730), is situated on approximately 20 acres of undeveloped land. Development is proposed to consist of eight, four-story buildings, each with 972 square feet of office/retail space on the bottom floor (7,776 square feet total) and the top three floors will consist of 17 apartments units on each floor (408 total units). Access to and from the subject site is proposed via a southerly extension of Franklin Street by way of Belmont Loop. Moreover, a secondary emergency vehicle access will be provided via parcel #: 50714 with direct connection to Old Pacific Highway. Figure 1 below depicts the roadway network servicing the subject site. Figure 2 on the following page highlights the site layout.

Figure 1: Vicinity Map





Preliminary Site Plan	**Logan's Landing** a mixed use development City of Woodland WA	Applicant & Property Owner: Logan Partners, LLC P.O. Box 1940 bend OR 97709 541-306-1611 shayne@saceinc.com	Contact: Ed Greer, Wyndham Enterprises, LLC Land Use Planning & Designs 13023 NE Hwy 99 Suite 7-126 Vancouver WA 98686 360-904-4964 ed@ed-greer.net	Date: 7-14-21

3. EXISTING CONDITIONS

3.1 Surrounding Roadways

The street network serving the proposed project consists of a variety of roadways. The major roadways and arterials surrounding the site are listed and described in Table 1 below.

Table 1: Roadway Network

Functional Classification	Roadway	Speed Limit	Travel Lanes	Street Parking	Sidewalk	Bike Facilities
Minor Arterial	Dike Access Rd	35-mph	2	No	Discontinuous	No
	Old Pacific Hwy	35-mph	2	No	Discontinuous	No
	Lewis River Rd	35-mph	2	No	Discontinuous	No
Local	Belmont Loop	25-mph*	2	Yes	Discontinuous	No

* No posted speed limit observed so 25 mph assumed.

3.2 Peak Hour Volumes

In order to establish baseline traffic volume conditions in the study area, data were obtained from a recent Traffic Impact Analysis (TIA), *Oak Village Apartments* (8/19/2021) performed by Lancaster Mobley which had a similar multifamily development proposal in the nearby vicinity. The aforementioned TIA compared vehicular volumes near the I-5/Dike Access interchanges pre- to post-COVID and developed an adjustment factor of 1.3881 due to the potential effects from the ongoing pandemic as it relates to travel patterns. Therefore, the counts displayed herein reflect the growth factor in addition to a 2.3 percent growth rate to bring up to 2022 baseline conditions as the data were obtained in March of 2021. This growth rate was based on the City's Comprehensive Plan and consistent with the TIA methodology.

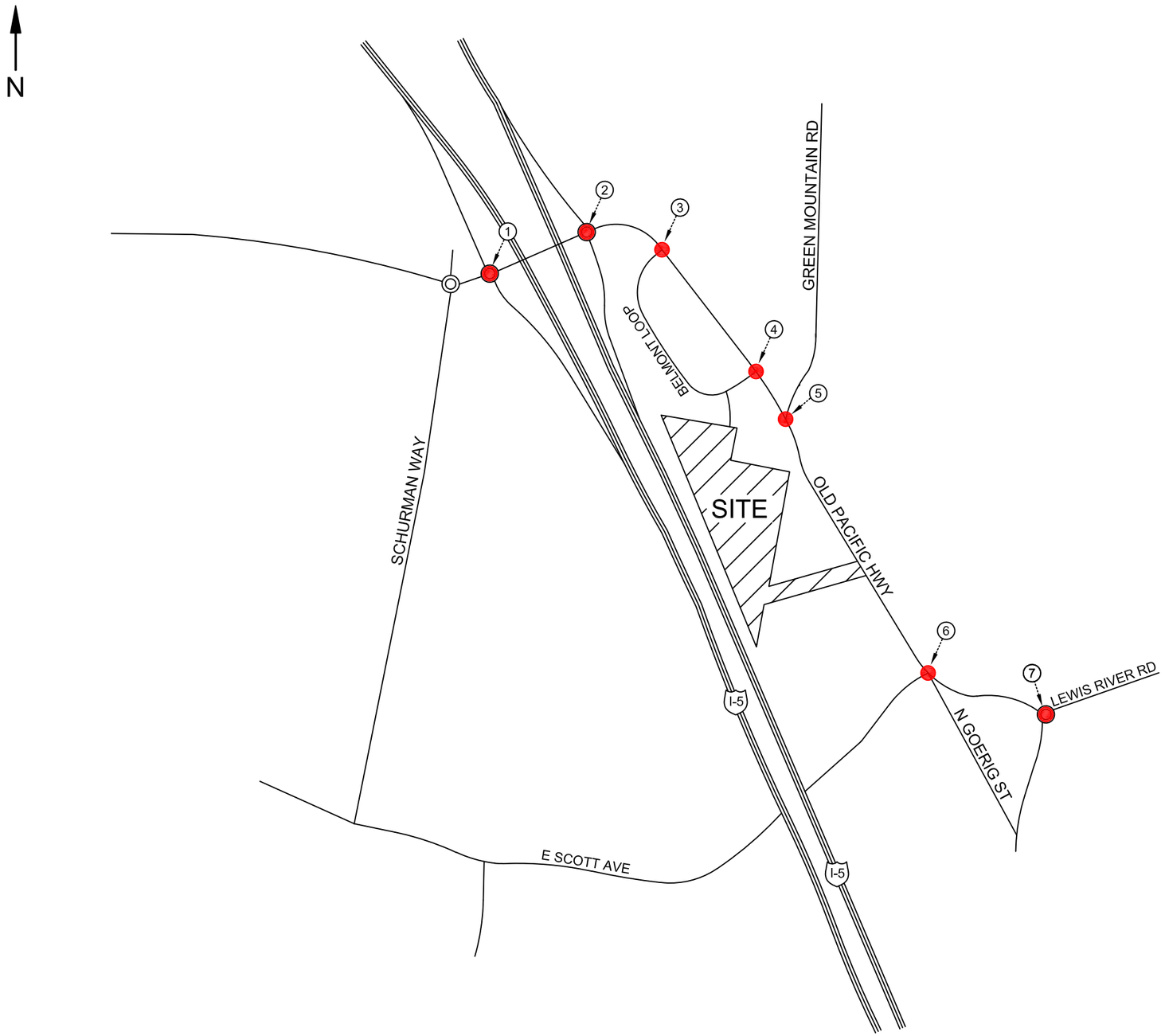
In addition, our firm collected a new traffic count in March of 2022 at the intersection of Old Pacific Highway & Belmont Loop (South) as this location was not included in the prior traffic study and would be impacted as part of Logan's Landing. All traffic counts were collected between the hours of 4:00-6:00 PM with utilizing the highest observed hour for capacity evaluation purposes.

It should be noted that the recently collected traffic volumes were comparable in terms of volumes with respect to the unadjusted March 2021 peak hour volumes indicating the

impacts from COVID may still play a role. However, there were no count comparisons outside of the I-5 Interchanges so the actual pandemic influence along Old Pacific Highway and other locations within the city are unknown. There is also reason to believe that some permanent changes may continue to persist as a result of COVID (e.g., larger portion of work-from-home, more hybrid schedules, etc.). However, to remain consistent with the prior traffic study submittal, our traffic volumes were similarly adjusted up using the 1.3381 growth factor. See below for all count and study locations.

Table 2: Study Intersections

Ref	Intersection	Control Type	Source	Date
1	Dike Access Road & SB I-5 Ramps	Roundabout	Oak Village Apartments	March, 2021
2	Dike Access Road & NB I-5 Ramps	Roundabout	Oak Village Apartments	March, 2021
3	Old Pacific Highway & Belmont Loop (North)	Minor Stop-Controlled	Oak Village Apartments	March, 2021
4	Old Pacific Highway & Belmont Loop (South)	Minor Stop-Controlled	Heath & Associates	March, 2022
5	Old Pacific Highway & Green Mountain Rd	Minor Stop-Controlled	Oak Village Apartments	March, 2021
6	Old Pacific Highway & E Scott Avenue	All-Way Stop-Controlled	Oak Village Apartments	March, 2021
7	E Scott Avenue & Lewis River Road	Roundabout	Oak Village Apartments	March, 2021



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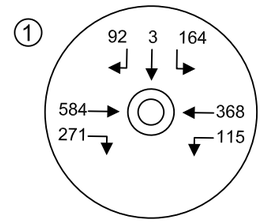

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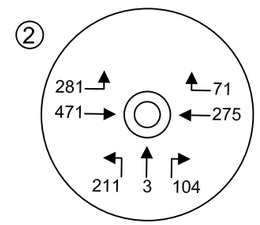
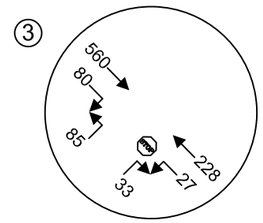


BELMONT LOOP (N) & OLD PACIFIC HWY



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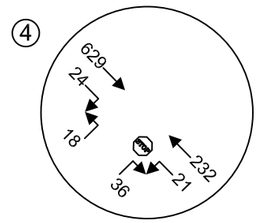
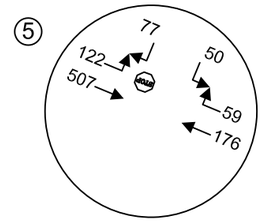
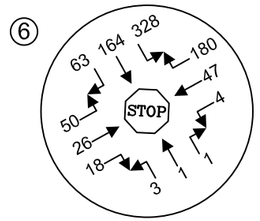


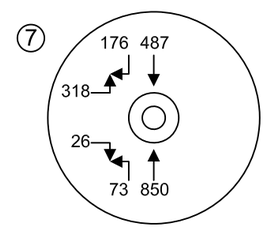
GREEN MOUNTAIN RD & OLD PACIFIC HWY



E SCOTT AVENUE & OLD PACIFIC HWY



E SCOTT AVENUE & LEWIS RIVER ROAD



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TRAFFIC AND CIVIL ENGINEERING

LOGAN'S LANDING
BASELINE 2022 PM PEAK HOUR VOLUMES
FIGURE 3

3.3 Non-Motorist Infrastructure

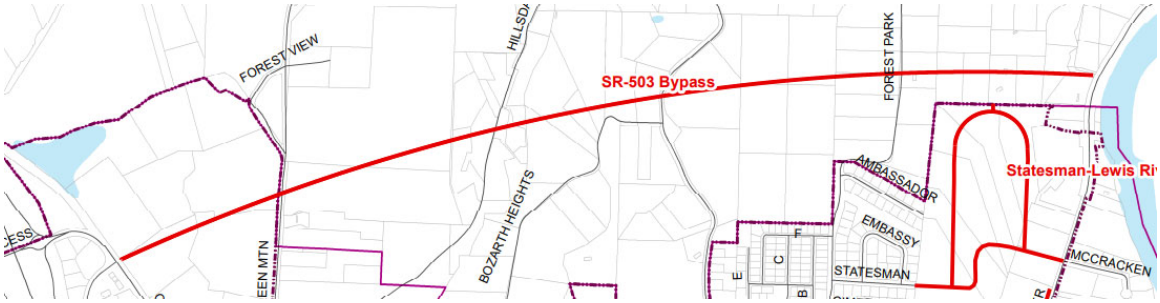
Currently, there are some segments of sidewalk available along Belmont Loop. However, Old Pacific Highway generally has no non-motorist infrastructure present. In review of the traffic counts and on-site observations, no pedestrians or bicycle transport were observed along Old Pacific Highway. The only intersections receiving minor foot-traffic were near the I-5 Ramps and Lewis River Road & E Scott Avenue roundabout—likely due to the presence of commercial and retail opportunities.

3.5 Roadway Improvements

A review of the current City of Woodland's Six-Year (2022-2027) Transportation Improvement Program indicates the following planned projects in the general area.

SR-503 Bypass

This project intends to construct an SR 503 bypass route extending from Lewis River Road to Old Pacific Highway thereby providing a more direct route with access via I-5/Dike Access Road. This could provide congestion relief to the south. The first phase is expected to begin in 2027 though no project costs or funding status is available at this time.



Hillsdale-Old Pacific Hwy Extension

This project intends to extend Hillsdale Drive from its current terminus point at Green Mountain Road and extend easterly to intersection with Old Pacific Highway roughly mid-point between Belmont Loop (north and south). The first phase is expected to begin in 2026 though no project costs or funding status is available at this time.

Green Mountain/Old Pacific Hwy Intersection

No specific details could be located with respect to project details though some form of improvements are planned at this location. The first phase is expected to begin in 2026 though no project costs or funding status is available at this time.

Franklin Loop-Old Pacific Hwy

This project intends to extend Franklin Street from its current terminus point approximately 275-feet south from Belmont Loop and continue south, jogging easterly to tie into Old Pacific Highway at Woodland View. A portion of this project would be constructed as part of Logan's Landing.

Franklin Loop/E Scott Extension

This project would create a Franklin Street extension from the above project which would extend south and intersection with E Scott Avenue. The first phase is expected to begin in 2027 though no project costs or funding status is available at this time.

East Scott/Old Pacific Intersection Improvements

While details are not specific under the City's current Six-Year Plan, improvements are planned at this intersection. The project has a total cost of $3,200,000 with preliminary engineering starting in 2025 and construction anticipated to commence in 2027.

3.6 Sight Distance at Access

The primary access intersection of Belmont Loop Road and Franklin Street was examined in terms of available sight lines. In accordance with AASHTO's Greenbook Standards for a 25-mph roadway, approximately 280-feet of visibility is required for traffic departing Franklin Street and entering Belmont Loop. Based on review of the existing intersection geometry, sight lines are available to 280-feet in either east/west direction with clear visibility to Old Pacific Highway. No sight distance deficiencies are identified.

4. FUTURE TRAFFIC CONDITIONS

4.1 Trip Generation

Trip generation is defined by the number of vehicular movements that enter or exit a site during a particular timeframe such as a specific hour or an entire day. Trip generation estimates provided herein for the proposed 408 multi-family dwelling units and 7,776 square feet of commercial space were obtained from the July 9, 2021 *Logan's Landing Trip Generation & Distribution Analysis* prepared by Lancaster Mobley (attached). The report utilized data from the Institute of Transportation Engineer's publication *Trip Generation Manual.* See table below for trip generation summary with more detailed calculations and derivations provided in the appendix.

Table 3: Project Trip Generation—408 Apartment Dwelling Units & 7,776 sf Commercial

Trip Type	AWDT	AM Peak-Hour Trips			PM Peak-Hour Trips		
		In	Out	Total	In	Out	Total
Primary	2364	38	102	140	111	78	189
Pass-by	94	1	1	2	5	5	10
Total	**2270**	37	101	**138**	106	73	**179**

As summarized above, trips to and from the site are broken into primary and pass-by. Primary trips are considered new trips to the adjacent street network whereas pass-by trips are trips already passing the site along the subject property—a common trip type with commercial uses.

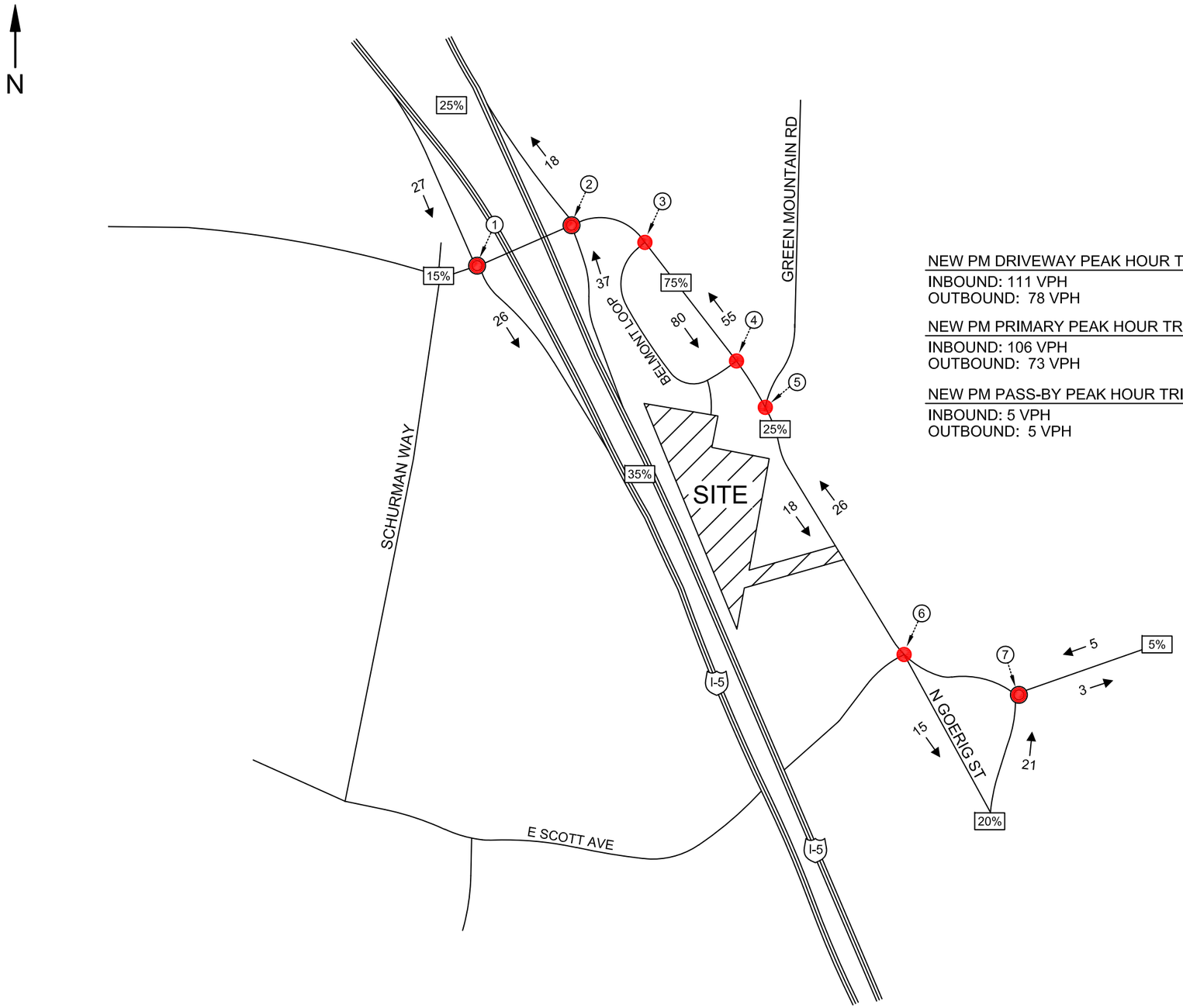
In total, 2,270 average weekday daily trips are expected with 138 AM and 179 PM peak hour trips as a result of the proposed development.

4.2 Distribution & Assignment

Trip distribution describes the anticipated travel routes for inbound and outbound project traffic during the peak hour study periods. Trips generated by the project are expected to follow the general pattern as shown in Figure 4. Percentages are based on previous projects/submittals in the past. All traffic was assigned via the single access to Franklin Street via Belmont Loop and subsequently Old Pacific Highway. Subsequently, an approximate 75/25 north/south split is anticipated.

4.3 Peak Hour Volumes

A 3-year horizon of 2025 was used for future traffic delay analysis and to present conditions assuming project buildout. Forecast 2025 background traffic volumes were derived by applying a 2.3 percent compound annual growth rate to the existing volumes shown in Figure 3. This growth rate was derived from the City's Comprehensive Plan based on their population growth forecasts. Forecast 2025 background peak hour volumes (without project) and volumes with the addition of project-generated traffic are presented in Figures 5 and 6, respectively. Forecast peak hour volumes also included *Oak Village Apartments* as pipeline.

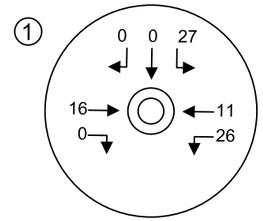


NEW PM DRIVEWAY PEAK HOUR TRIPS
INBOUND: 111 VPH
OUTBOUND: 78 VPH

NEW PM PRIMARY PEAK HOUR TRIPS
INBOUND: 106 VPH
OUTBOUND: 73 VPH

NEW PM PASS-BY PEAK HOUR TRIPS
INBOUND: 5 VPH
OUTBOUND: 5 VPH

I-5 SB & DIKE ACCESS RD



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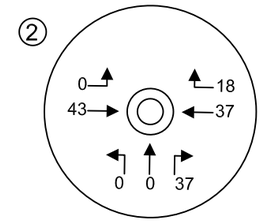

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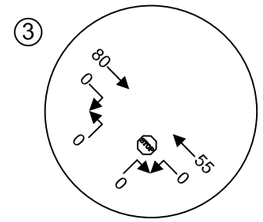
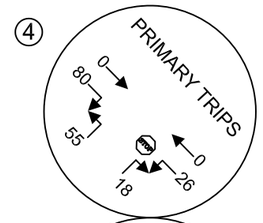
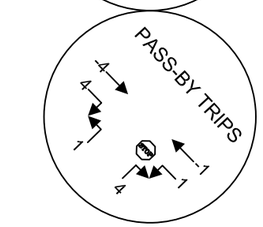
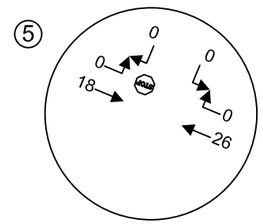


BELMONT LOOP (S) & OLD PACIFIC HWY





GREEN MOUNTAIN RD & OLD PACIFIC HWY



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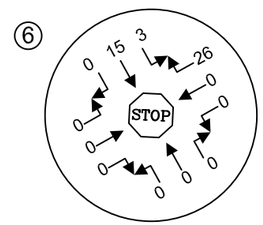

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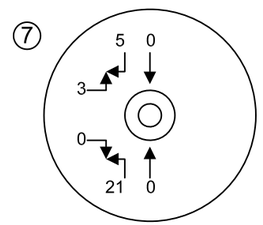

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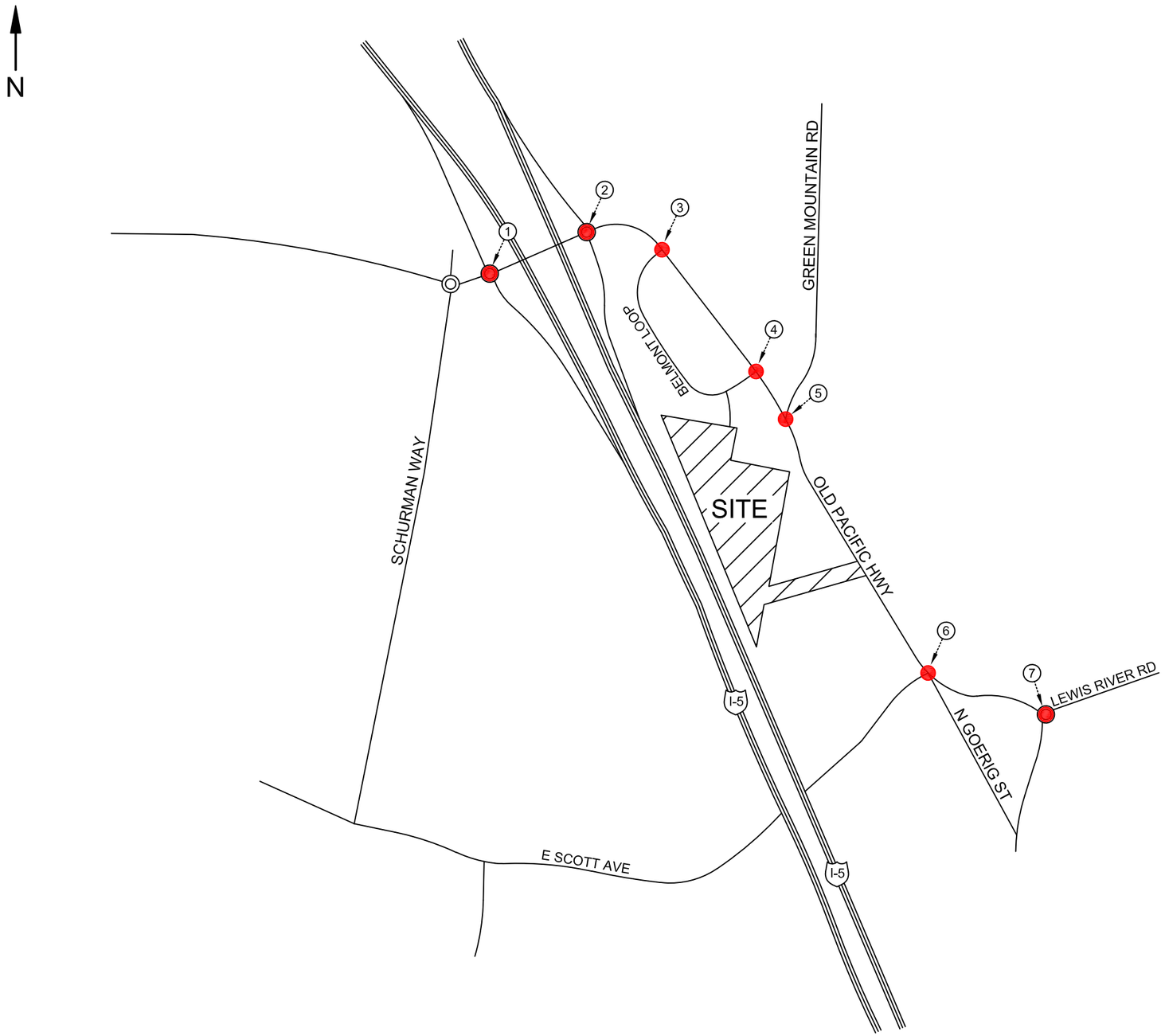
LOGAN'S LANDING
PM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT
FIGURE 4



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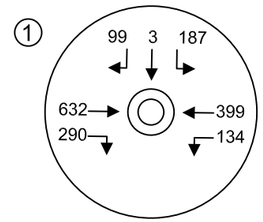

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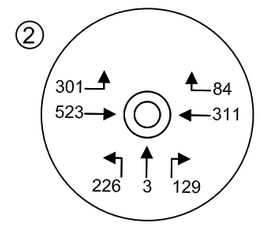
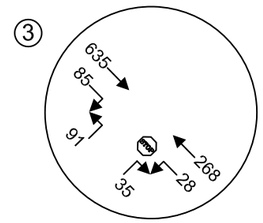


BELMONT LOOP (N) & OLD PACIFIC HWY



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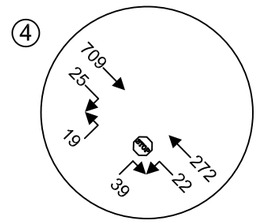

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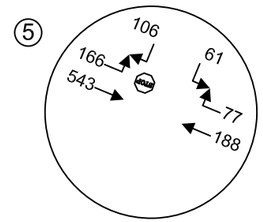
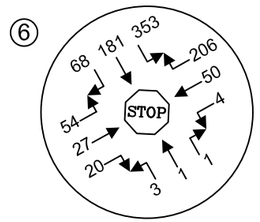
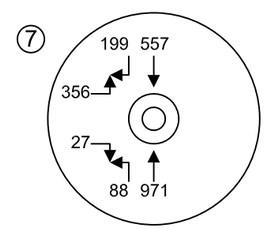


E SCOTT AVENUE & OLD PACIFIC HWY



E SCOTT AVENUE & LEWIS RIVER ROAD



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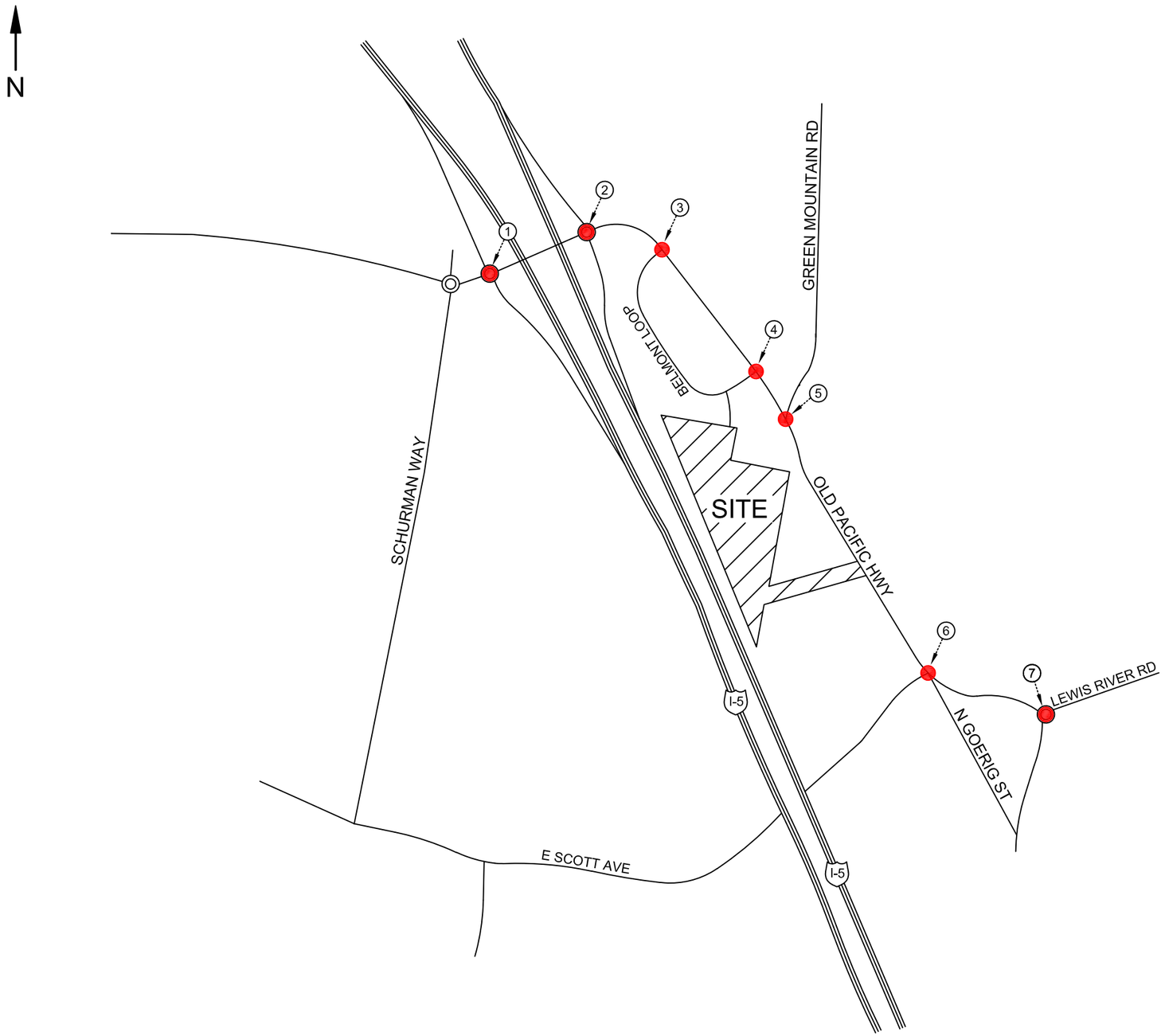
TRAFFIC AND CIVIL ENGINEERING

LOGAN'S LANDING

FORECAST 2025 PM PEAK HOUR VOLUMES WITHOUT PROJECT

FIGURE 5



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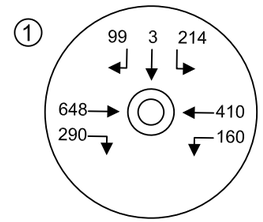

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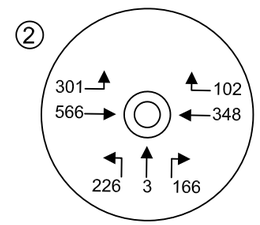

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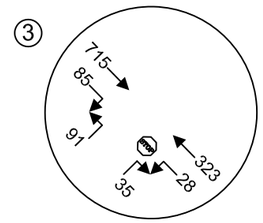

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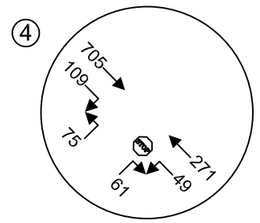

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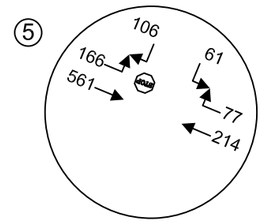

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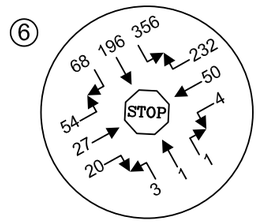

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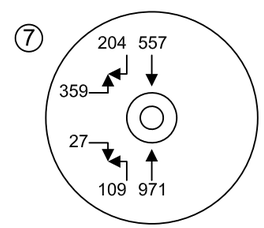

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LOGAN'S LANDING

FORECAST 2025 PM PEAK HOUR VOLUMES WITH PROJECT

FIGURE 6

PO Box 397 Puyallup, WA 98371 (253) 770 1401 heathtraffic.com

4.4 Level of Service

Existing and forecast 2025 peak hour delays were determined through the use of the *Highway Capacity Manual* 6th Edition. Capacity analysis is used to determine level of service (LOS) which is an established measure of congestion for transportation facilities. The range[1] for intersection level of service is LOS A to LOS F ranging from low control delays to heavy control delays. Level of service calculations derived from *Synchro 11* and *SIDRA Intersection 9.0.* For roundabout (RAB) and all-way stop control (AWSC) intersections, LOS is determined by the intersection's overall average delay. For side-street stop-controlled intersections, LOS is determined by the approach with the highest delay. Summarized below are LOS conditions for baseline and forecast 2025 conditions.

Table 4: Existing & Forecast 2025 PM Peak Hour Level of Service

Delays given in seconds per vehicle

					Forecast 2025			
			Existing		Without Proj.		With Proj.	
Ref #	Intersection	Control	LOS	Delay	LOS	Delay	LOS	Delay
1	I-5 SB Ramps & Dike Access	RAB	B	16.4	C	28.3	D	35.8
2	I-5 NB Ramps & Dike Access	RAB	A	9.9	B	12.0	B	14.7
3	Belmont Loop (N) & Old Pacific Hwy	Stop	C	21.4	D	27.1	E	36.1
4	Belmont Loop (S) & Old Pacific Hwy	Stop	C	16.5	C	17.8	D	29.2
5	Green Mtn Road & Old Pacific Hwy	Stop	C	20.5	D	30.0	D	34.0
6	E Scott Ave & Old Pacific Hwy	AWSC	D	25.7	D	32.5	E	38.8
7	E Scott Avenue & Lewis River Rd	RAB	B	17.1	D	41.4	D	45.5

[1] *Signalized Intersections - Level of Service*

Level of Service	Control Delay per Vehicle (sec)
A	≤10
B	> 10 and ≤20
C	> 20 and ≤35
D	> 35 and ≤55
E	> 55 and ≤80
F	> 80

Stop Controlled Intersections – Level of Service

Level of Service	Control Delay per Vehicle (sec)
A	≤10
B	> 10 and ≤15
C	> 15 and ≤25
D	> 25 and ≤35
E	> 35 and ≤50
F	> 50

Highway Capacity Manual, 6th Edition

The City of Woodland has adopted LOS D standards. A performance summary of the intersections shown to exceed LOS standards are provided below:

Belmont Loop South & Old Pacific Highway: is shown to operate at LOS D without and LOS E with project. It should also be taken into consideration that the traffic volumes captured in the existing counts were adjusted up close to 40 percent due to COVID. Our recent counts collected in 2022 indicate levels are still significantly lower and therefore the results may be considered conservative. Notwithstanding adjustment factors, substandard delays would be experienced by side-street traffic intending to enter Old Pacific Highway. Based on the forecast operations, queues are shown to be around three vehicles which would not spillover or block any nearby driveways. A traffic signal warrant analysis was conducted in the *Oak Village Apartments* TIA (8/19/2021) which indicated a signal would not be warranted. Based on inspection of the added volumes from Logan's Landing, a traffic signal would still not be warranted as no additional traffic is expected from the side-street.

The City may want to monitor this intersection in the future to determine whether improvements are necessary at this location. Given the queuing demand estimates and conservative growth assumption, no project specific mitigation is identified.

E Scott Avenue & Old Pacific Highway: is shown to operate at LOS D without and LOS E with project. The City has this intersection on their Six-Year Plan with approximately $3,200,000 budgeted for improving the intersection. While specific improvements were not identified under their current plan, conditions would likely subsequently improve with acceptable service levels and increased capacity. No project specific mitigation is identified.

All other intersection locations are shown to operate with acceptable LOS conditions. Several City-planned projects were identified within the study area that would result in improved conditions such as the SR 503 Bypass project and other street connections and extensions further expanding travel routes and providing relief in certain corridors.

5. SUMMARY & MITIGATION

Logan's Landing is a proposed mixed-used development consisting of 408 multi-family dwelling units and 7,776 square feet of ground-level commercial space. The subject property is situated south of Belmont Loop, east of I-5 and west of Old Pacific Highway. Access to and from the development is proposed via a southerly extension Franklin Street. A secondary, 20-foot emergency vehicle only access would be available south of the project with connection to Old Pacific Highway. See figure 2 for site plan of project layout.

In total, the project is estimated to generate 2,270 average weekday daily trips with 138 trips occurring in the AM peak hour and 179 in the PM peak hour. Project-generated trips were then assigned and distributed within the study area that examined seven intersections listed in Table 2. All study intersections currently operate at LOS D or better—meeting City LOS D standards. It should also be noted that baseline traffic volumes were factored up by approximately 40 percent to account for COVID-related impacts. However, traffic volumes observed in March of 2022 along Old Pacific Highway were similar to those collected in March of 2021 indicating potential permanent changes in traffic patterns (e.g., larger portion of work-from-home, etc.). Nonetheless, the COVID-adjusted volumes were assumed to be baseline conditions. A three-year horizon of 2025 included a general background growth rate along with pipeline development to evaluate future intersection capacity. All but two intersections were shown to continue meeting city standards.

Belmont Loop (south) & Old Pacific Highway was shown to operate at LOS E under future conditions with project. However, delays are experienced by side-street (Belmont Loop) motorists with approximately three-vehicle queues under peak conditions. With a conservative growth assumption and estimated queuing demands, no specific mitigation is identified at this time. Similarly, E Scott Avenue & Old Pacific Highway was shown to operate at LOS E with project traffic under future conditions. However, this intersection is outlined under the City's Six-Year Transportation Improvement Plan for future improvements and therefore no project-specific mitigation is identified. All other locations were shown to meet City standards.

Based on the analysis above, and with the city planned projects, no project-specific mitigation is identified at this time.

LOGAN'S LANDING
TRAFFIC IMPACT ANALYSIS

APPENDIX

INTERSECTION COUNT SHEETS

Heath & Associates

PO Box 397
Puyallup, WA 98371

File Name : 4855
Site Code : 00004855
Start Date : 3/1/2022
Page No : 1

Groups Printed- Passenger + - Heavy

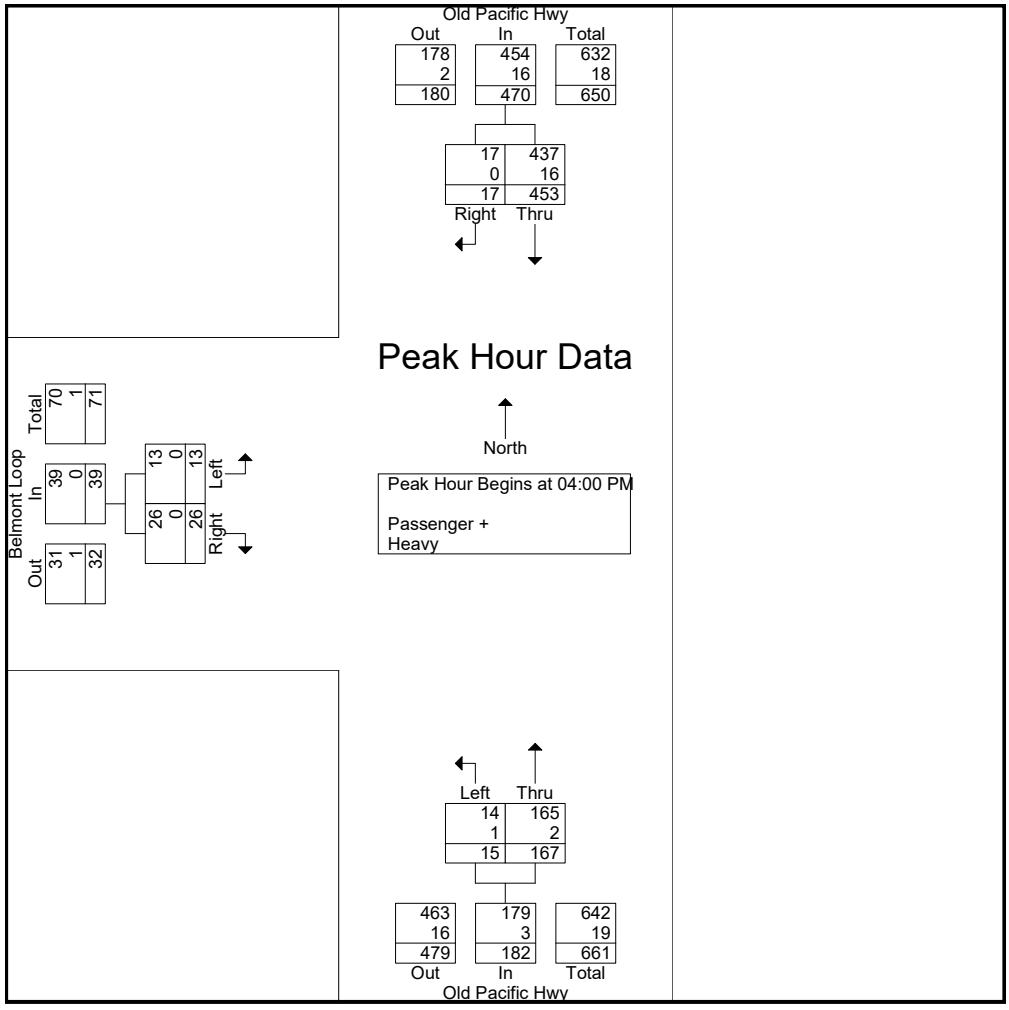
	Old Pacific Hwy Southbound			Old Pacific Hwy Northbound			Belmont Loop Eastbound			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
04:00 PM	8	145	153	49	6	55	10	2	12	220
04:15 PM	5	107	112	43	5	48	7	5	12	172
04:30 PM	2	97	99	38	1	39	3	3	6	144
04:45 PM	2	104	106	37	3	40	6	3	9	155
Total	17	453	470	167	15	182	26	13	39	691
05:00 PM	2	93	95	27	1	28	5	2	7	130
05:15 PM	1	88	89	36	2	38	2	1	3	130
05:30 PM	1	112	113	41	3	44	8	3	11	168
05:45 PM	1	119	120	41	0	41	12	2	14	175
Total	5	412	417	145	6	151	27	8	35	603
Grand Total	22	865	887	312	21	333	53	21	74	1294
Apprch %	2.5	97.5		93.7	6.3		71.6	28.4		
Total %	1.7	66.8	68.5	24.1	1.6	25.7	4.1	1.6	5.7	
Passenger +	22	843	865	308	20	328	53	21	74	1267
% Passenger +	100	97.5	97.5	98.7	95.2	98.5	100	100	100	97.9
Heavy	0	22	22	4	1	5	0	0	0	27
% Heavy	0	2.5	2.5	1.3	4.8	1.5	0	0	0	2.1

Heath & Associates

PO Box 397
Puyallup, WA 98371

File Name : 4855
Site Code : 00004855
Start Date : 3/1/2022
Page No : 2

	Old Pacific Hwy Southbound			Old Pacific Hwy Northbound			Belmont Loop Eastbound			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:00 PM										
04:00 PM	**8**	**145**	**153**	**49**	**6**	**55**	**10**	2	**12**	**220**
04:15 PM	5	107	112	43	5	48	7	**5**	12	172
04:30 PM	2	97	99	38	1	39	3	3	6	144
04:45 PM	2	104	106	37	3	40	6	3	9	155
Total Volume	17	453	470	167	15	182	26	13	39	691
% App. Total	3.6	96.4		91.8	8.2		66.7	33.3		
PHF	.531	.781	.768	.852	.625	.827	.650	.650	.813	.785
Passenger +	17	437	454	165	14	179	26	13	39	672
% Passenger +	100	96.5	96.6	98.8	93.3	98.4	100	100	100	97.3
Heavy	0	16	16	2	1	3	0	0	0	19
% Heavy	0	3.5	3.4	1.2	6.7	1.6	0	0	0	2.7



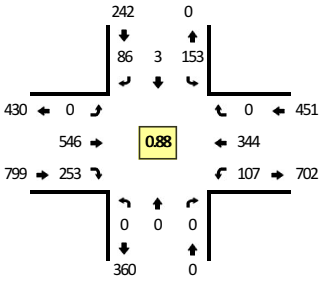
Type of peak hour being reported: Intersection Peak

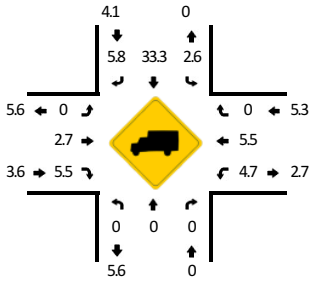
Method for determining peak hour: Total Entering Volume

LOCATION: I-5 SB Ramps -- Dike Access Rd
CITY/STATE: Cowlitz, WA

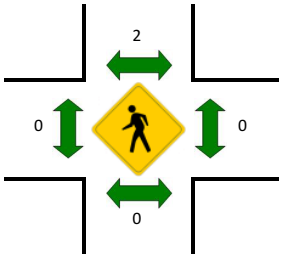
QC JOB #: 15099204
DATE: Wed, Oct 9 2019

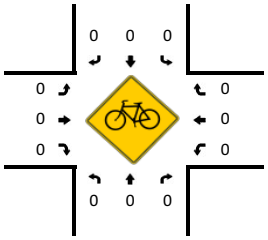
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:00 PM -- 4:15 PM

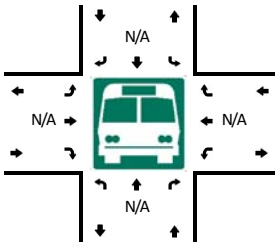


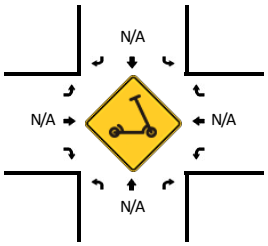


Quality Counts
DATA THAT DRIVES COMMUNITIES









5-Min Count Period Beginning At	I-5 SB Ramps (Northbound)				I-5 SB Ramps (Southbound)				Dike Access Rd (Eastbound)				Dike Access Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	17	0	8	0	0	62	28	0	5	22	0	0	142	
4:05 PM	0	0	0	0	15	0	5	0	0	54	21	0	11	42	0	1	149	
4:10 PM	0	0	0	0	11	2	8	0	0	51	18	0	10	29	0	2	131	
4:15 PM	0	0	0	0	7	0	8	0	0	70	26	0	8	15	0	0	134	
4:20 PM	0	0	0	0	13	0	4	0	0	57	19	0	5	24	0	0	122	
4:25 PM	0	0	0	0	19	0	7	0	0	37	20	0	5	23	0	0	111	
4:30 PM	0	0	0	0	14	0	5	0	0	39	24	0	16	20	0	0	118	
4:35 PM	0	0	0	0	16	0	8	0	0	39	26	0	11	30	0	0	130	
4:40 PM	0	0	0	0	11	1	10	0	0	33	25	0	7	23	0	0	110	
4:45 PM	0	0	0	0	4	0	8	0	0	26	14	0	9	36	0	0	97	
4:50 PM	0	0	0	0	15	0	6	0	0	43	11	0	9	39	0	0	123	
4:55 PM	0	0	0	0	11	0	9	0	0	35	21	0	8	41	0	0	125	1492
5:00 PM	0	0	0	0	8	0	12	0	0	35	22	0	15	28	0	0	120	1470
5:05 PM	0	0	0	0	12	0	5	0	0	45	22	0	13	36	0	0	133	1454
5:10 PM	0	0	0	0	15	0	9	0	0	53	16	0	10	31	0	0	134	1457
5:15 PM	0	0	0	0	9	1	5	0	0	40	22	0	13	32	0	0	122	1445
5:20 PM	0	0	0	0	17	0	10	0	0	29	20	0	14	26	0	0	116	1439
5:25 PM	0	0	0	0	13	0	11	0	0	35	19	0	1	34	0	1	114	1442
5:30 PM	0	0	0	0	13	0	10	0	0	35	23	0	3	19	0	0	103	1427
5:35 PM	0	0	0	0	10	0	9	0	0	43	20	0	7	25	0	0	114	1411
5:40 PM	0	0	0	0	9	0	9	0	0	34	9	0	4	28	0	0	93	1394
5:45 PM	0	0	0	0	8	0	9	0	0	47	14	0	5	25	0	0	108	1405
5:50 PM	0	0	0	0	12	0	7	0	0	25	9	0	6	33	0	0	92	1374
5:55 PM	0	0	0	0	9	1	6	0	0	26	19	0	4	24	0	0	89	1338

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	172	8	84	0	0	668	268	0	104	372	0	12	1688
Heavy Trucks	0	0	0		4	4	4		0	48	12		4	32	0		108
Buses																	
Pedestrians		0				8				0				0			8
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 3/10/2021 10:33 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

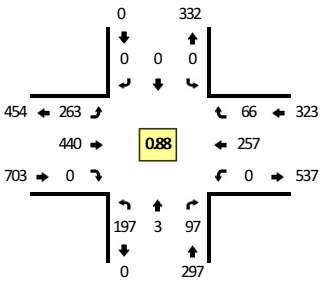
Type of peak hour being reported: Intersection Peak

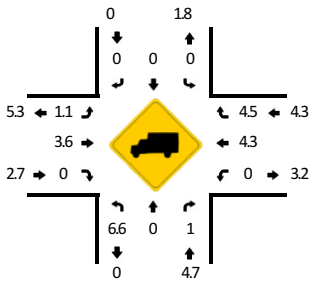
Method for determining peak hour: Total Entering Volume

LOCATION: I-5 NB Ramps -- Dike Access Rd
CITY/STATE: Cowlitz, WA

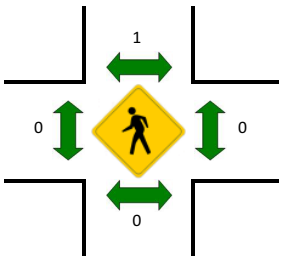
QC JOB #: 15099202
DATE: Wed, Oct 9 2019

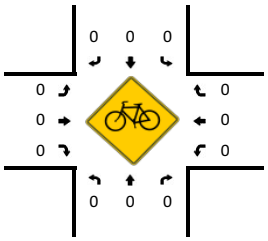
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:00 PM -- 4:15 PM

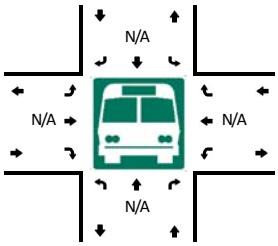


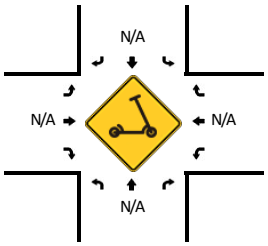


Quality Counts
DATA THAT DRIVES COMMUNITIES









5-Min Count Period Beginning At	I-5 NB Ramps (Northbound)				I-5 NB Ramps (Southbound)				Dike Access Rd (Eastbound)				Dike Access Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	9	0	11	0	0	0	0	0	24	53	0	0	0	17	6	0	120	
4:05 PM	28	0	3	0	0	0	0	0	20	51	0	0	0	27	5	0	134	
4:10 PM	18	0	6	0	0	0	0	0	25	42	0	0	0	24	6	0	121	
4:15 PM	8	0	8	0	0	0	0	0	34	40	0	0	0	12	8	0	110	
4:20 PM	17	0	6	0	0	0	0	0	32	40	0	0	0	12	4	0	111	
4:25 PM	14	0	9	0	0	0	0	0	21	35	0	0	0	15	8	0	102	
4:30 PM	10	0	8	0	0	0	0	0	20	35	0	0	0	28	8	0	109	
4:35 PM	19	0	7	0	0	0	0	0	15	37	0	0	0	24	2	0	104	
4:40 PM	12	0	8	0	0	0	0	0	22	26	0	0	0	16	3	0	87	
4:45 PM	20	0	11	0	0	0	0	0	14	14	0	0	0	29	3	0	91	
4:50 PM	22	3	10	0	0	0	0	0	21	39	0	0	0	25	6	0	126	
4:55 PM	20	0	10	0	0	0	0	0	15	28	0	0	0	28	7	0	108	1323
5:00 PM	18	0	3	0	0	0	0	0	13	30	0	0	0	24	3	0	91	1294
5:05 PM	24	1	7	0	0	0	0	0	20	35	0	0	0	25	12	0	124	1284
5:10 PM	19	0	5	0	0	0	0	0	33	36	0	0	0	21	8	0	122	1285
5:15 PM	21	0	6	0	0	0	0	0	9	39	0	0	0	26	7	0	108	1283
5:20 PM	18	0	6	0	0	0	0	0	10	37	0	0	0	20	10	0	101	1273
5:25 PM	19	0	5	0	0	0	0	0	12	36	0	0	0	17	10	0	99	1270
5:30 PM	10	0	6	0	0	0	0	0	18	32	0	0	0	12	5	0	83	1244
5:35 PM	24	0	8	0	0	0	0	0	22	32	0	0	0	12	4	0	102	1242
5:40 PM	15	0	4	0	0	0	0	0	16	27	0	0	0	14	6	0	82	1237
5:45 PM	13	0	9	0	0	0	0	0	15	39	0	0	0	17	6	0	99	1245
5:50 PM	19	0	9	0	0	0	0	0	10	26	0	0	0	18	6	0	88	1207
5:55 PM	17	0	8	0	0	0	0	0	10	25	0	0	0	12	9	0	81	1180

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	220	0	80	0	0	0	0	0	276	584	0	0	0	272	68	0	1500
Heavy Trucks	20	0	0		0	0	0		4	48	0		0	16	4		92
Buses																	
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 3/10/2021 10:34 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

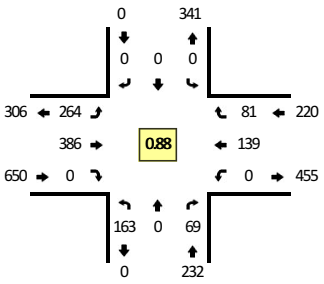
Type of peak hour being reported: Intersection Peak

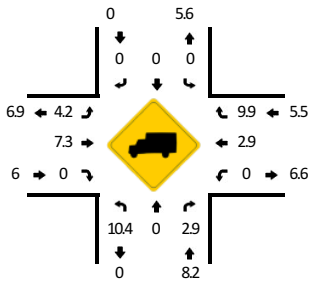
Method for determining peak hour: Total Entering Volume

LOCATION: I-5 NB Ramps -- Dike Access Rd
CITY/STATE: Woodland, WA

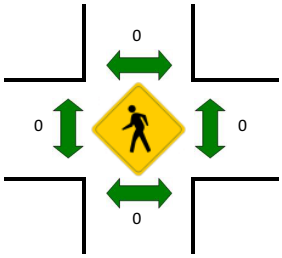
QC JOB #: 15381001
DATE: Thu, Mar 4 2021

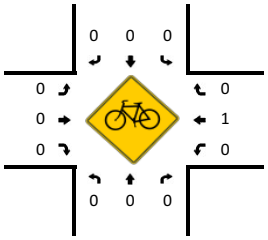
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:10 PM -- 4:25 PM

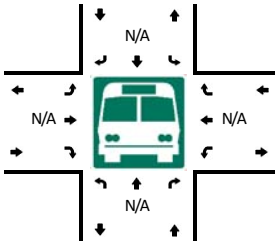


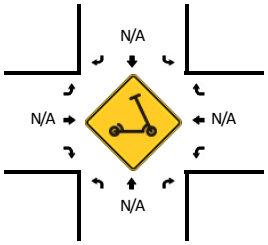


Quality Counts
DATA THAT DRIVES COMMUNITIES









5-Min Count Period Beginning At	I-5 NB Ramps (Northbound)				I-5 NB Ramps (Southbound)				Dike Access Rd (Eastbound)				Dike Access Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	14	0	3	0	0	0	0	0	25	42	0	0	0	9	8	0	101	
4:05 PM	16	0	3	0	0	0	0	0	19	39	0	0	0	15	3	0	95	
4:10 PM	17	0	6	0	0	0	0	0	32	37	0	0	0	15	8	0	115	
4:15 PM	14	0	9	0	0	0	0	0	26	32	0	0	0	10	4	0	95	
4:20 PM	13	0	9	0	0	0	0	0	20	41	0	1	0	14	6	0	104	
4:25 PM	13	0	4	0	0	0	0	0	14	33	0	0	0	7	8	0	79	
4:30 PM	12	0	9	0	0	0	0	0	18	20	0	1	0	13	11	0	84	
4:35 PM	11	0	8	0	0	0	0	0	25	35	0	1	0	16	12	0	108	
4:40 PM	14	0	5	0	0	0	0	0	24	22	0	0	0	9	9	0	83	
4:45 PM	14	0	4	0	0	0	0	0	17	25	0	1	0	13	3	0	77	
4:50 PM	6	0	4	0	0	0	0	0	15	33	0	0	0	13	3	0	74	
4:55 PM	19	0	5	0	0	0	0	0	25	27	0	0	0	5	6	0	87	1102
5:00 PM	18	0	8	0	0	0	0	0	15	28	0	0	0	18	8	0	95	1096
5:05 PM	19	0	7	0	0	0	0	0	22	26	0	0	0	14	5	0	93	1094
5:10 PM	13	0	6	0	0	0	0	0	18	27	0	0	0	19	4	0	87	1066
5:15 PM	16	1	6	0	0	0	0	0	20	33	0	0	0	11	3	0	90	1061
5:20 PM	17	0	10	0	0	0	0	0	22	31	0	0	0	15	5	0	100	1057
5:25 PM	14	0	8	0	0	0	0	0	14	33	0	0	0	19	5	0	93	1071
5:30 PM	12	0	7	0	0	0	0	0	20	26	0	0	0	15	1	0	81	1068
5:35 PM	12	1	4	0	0	0	0	0	7	28	0	0	0	12	6	0	70	1030
5:40 PM	13	1	8	0	0	0	0	0	9	35	0	0	0	11	6	0	83	1030
5:45 PM	16	0	6	0	0	0	0	0	12	27	0	0	0	12	3	0	76	1029
5:50 PM	13	0	4	0	0	0	0	0	10	29	0	0	0	6	7	0	69	1024
5:55 PM	13	0	8	0	0	0	0	0	11	12	0	0	0	12	2	0	58	995

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	176	0	96	0	0	0	0	0	312	440	0	4	0	156	72	0	1256
Heavy Trucks	24	0	0		0	0	0		0	36	0		0	4	8		72
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	4	0		4
Scooters																	

Comments:

Report generated on 3/10/2021 10:35 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

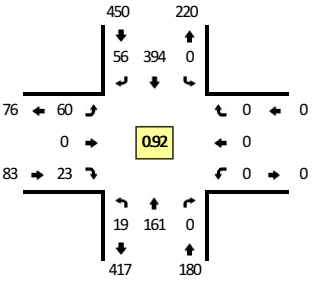
Type of peak hour being reported: Intersection Peak

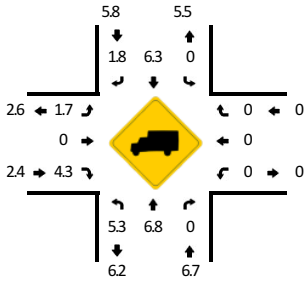
Method for determining peak hour: Total Entering Volume

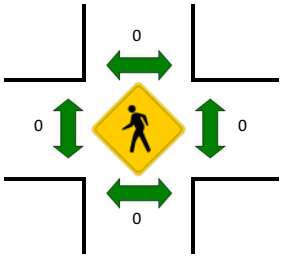
LOCATION: Old Pacific Hwy -- Belmont Loop (north)
CITY/STATE: Woodland, WA

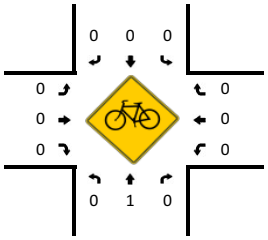
QC JOB #: 15381002
DATE: Thu, Mar 4 2021

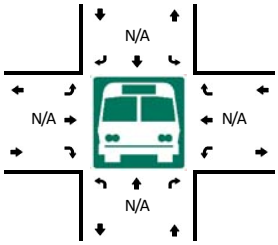
Peak-Hour: 4:05 PM -- 5:05 PM
Peak 15-Min: 4:10 PM -- 4:25 PM

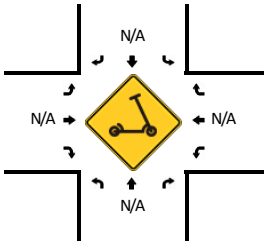












5-Min Count Period Beginning At	Old Pacific Hwy (Northbound)				Old Pacific Hwy (Southbound)				Belmont Loop (north) (Eastbound)				Belmont Loop (north) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	4	11	0	0	0	39	4	0	7	0	1	0	0	0	0	0	66	
4:05 PM	0	17	0	0	0	37	4	0	7	0	3	0	0	0	0	0	68	
4:10 PM	1	16	0	0	0	38	5	0	2	0	0	0	0	0	0	0	62	
4:15 PM	1	14	0	0	0	39	4	0	0	0	0	0	0	0	0	0	58	
4:20 PM	1	11	0	0	0	41	10	0	6	0	3	1	0	0	0	0	73	
4:25 PM	0	9	0	0	0	29	2	0	8	0	1	0	0	0	0	0	49	
4:30 PM	0	19	0	0	0	28	3	0	6	0	2	0	0	0	0	0	58	
4:35 PM	2	17	0	0	0	39	7	0	4	0	3	0	0	0	0	0	72	
4:40 PM	3	11	0	0	0	23	3	0	5	0	1	0	0	0	0	0	46	
4:45 PM	3	12	0	0	0	34	0	0	4	0	1	0	0	0	0	0	54	
4:50 PM	3	12	0	0	0	28	6	0	2	0	3	0	0	0	0	0	54	
4:55 PM	3	7	0	0	0	29	4	0	5	0	4	0	0	0	0	0	52	712
5:00 PM	2	16	0	0	0	29	8	0	10	0	2	0	0	0	0	0	67	713
5:05 PM	1	16	0	0	0	21	9	0	5	0	3	0	0	0	0	0	55	700
5:10 PM	1	11	0	0	0	31	4	0	7	0	7	0	0	0	0	0	61	699
5:15 PM	3	18	0	0	0	38	6	0	2	0	1	0	0	0	0	0	68	709
5:20 PM	1	12	0	0	0	30	4	0	8	0	2	0	0	0	0	0	57	693
5:25 PM	2	15	0	0	0	33	9	0	4	0	1	0	0	0	0	0	64	708
5:30 PM	2	6	0	0	0	30	6	0	9	0	2	0	0	0	0	0	55	705
5:35 PM	0	15	0	0	0	26	6	0	6	0	5	0	0	0	0	0	58	691
5:40 PM	1	8	0	0	0	37	5	0	5	0	1	0	0	0	0	0	57	702
5:45 PM	0	11	0	0	0	29	3	0	4	0	0	0	0	0	0	0	47	695
5:50 PM	0	10	0	0	0	25	7	0	3	0	2	0	0	0	0	0	47	688
5:55 PM	1	9	0	0	0	17	3	0	5	0	3	0	0	0	0	0	38	674

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	164	0	0	0	472	76	0	32	0	12	4	0	0	0	0	772
Heavy Trucks	0	12	0		0	36	0		4	0	0		0	0	0		52
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

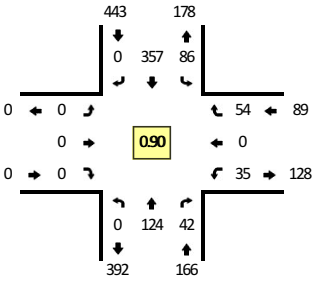
Report generated on 3/10/2021 10:35 AM

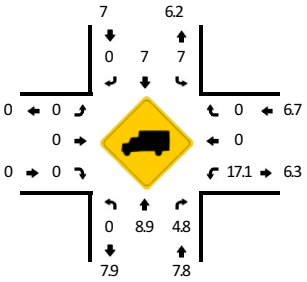
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

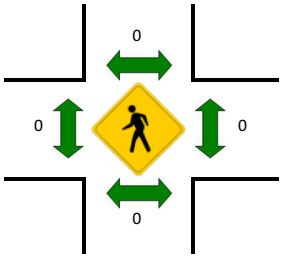
LOCATION: Old Pacific Hwy -- Green Mountain Rd | **QC JOB #:** 15381003
CITY/STATE: Woodland, WA | **DATE:** Thu, Mar 4 2021

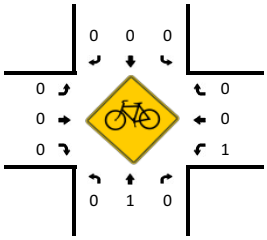
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:00 PM -- 4:15 PM

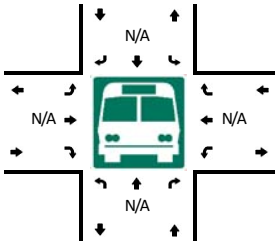


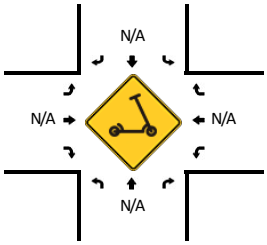


Quality Counts
DATA THAT DRIVES COMMUNITIES









5-Min Count Period Beginning At	Old Pacific Hwy (Northbound)				Old Pacific Hwy (Southbound)				Green Mountain Rd (Eastbound)				Green Mountain Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	10	7	0	8	38	0	0	0	0	0	0	2	0	4	0	69	
4:05 PM	0	9	6	0	5	37	0	0	0	0	0	0	4	0	6	0	67	
4:10 PM	0	14	2	0	4	32	0	0	0	0	0	0	2	0	4	0	58	
4:15 PM	0	12	2	0	9	29	0	0	0	0	0	0	3	0	4	0	59	
4:20 PM	0	9	4	0	11	33	0	0	0	0	0	0	2	0	3	0	62	
4:25 PM	0	9	6	0	7	27	0	0	0	0	0	0	0	0	2	0	51	
4:30 PM	0	12	9	0	6	23	0	0	0	0	0	0	6	0	7	0	63	
4:35 PM	0	11	1	0	10	36	0	0	0	0	0	0	3	0	8	0	69	
4:40 PM	0	8	2	0	6	20	0	0	0	0	0	0	3	0	8	0	47	
4:45 PM	0	10	1	0	9	27	0	0	0	0	0	0	3	0	2	0	52	
4:50 PM	0	13	1	0	7	25	0	0	0	0	0	0	5	0	3	0	54	
4:55 PM	0	7	1	0	4	30	0	0	0	0	0	0	2	0	3	0	47	698
5:00 PM	0	11	2	0	4	26	0	0	0	0	0	0	2	0	7	0	52	681
5:05 PM	0	11	6	0	6	19	0	0	0	0	0	0	2	0	4	0	48	662
5:10 PM	0	8	3	0	9	28	0	0	0	0	0	0	2	0	4	0	54	658
5:15 PM	0	17	1	0	9	32	0	0	0	0	0	0	0	0	4	0	63	662
5:20 PM	0	10	2	0	8	25	0	0	0	0	0	0	1	0	5	0	51	651
5:25 PM	0	12	4	0	6	31	0	0	0	0	0	0	4	0	3	0	60	660
5:30 PM	0	11	5	0	12	22	0	0	0	0	0	0	1	0	0	0	51	648
5:35 PM	0	9	1	0	5	30	0	0	0	0	0	0	4	0	5	0	54	633
5:40 PM	0	5	2	0	12	28	0	0	0	0	0	0	0	0	3	0	50	636
5:45 PM	0	7	4	0	10	24	0	0	0	0	0	0	3	0	3	0	51	635
5:50 PM	0	9	3	0	4	25	0	0	0	0	0	0	0	0	2	0	43	624
5:55 PM	0	8	5	0	6	15	0	0	0	0	0	0	2	0	2	0	38	615

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	132	60	0	68	428	0	0	0	0	0	0	32	0	56	0	776
Heavy Trucks	0	12	8		16	60	0		0	0	0		4	0	0		100
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	4	0		0	0	0		0	0	0		4	0	0		8
Scooters																	

Comments:

Report generated on 3/10/2021 10:35 AM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

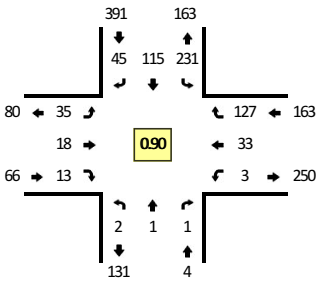
Type of peak hour being reported: Intersection Peak

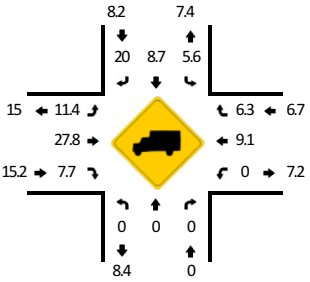
Method for determining peak hour: Total Entering Volume

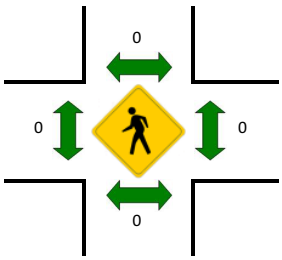
LOCATION: Old Pacific Hwy -- E Scott Ave
CITY/STATE: Woodland, WA

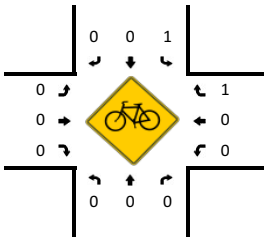
QC JOB #: 15381004
DATE: Thu, Mar 4 2021

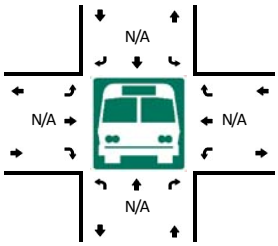
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:05 PM -- 4:20 PM

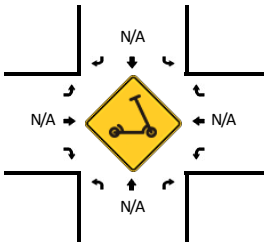












5-Min Count Period Beginning At	Old Pacific Hwy (Northbound)				Old Pacific Hwy (Southbound)				E Scott Ave (Eastbound)				E Scott Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	25	8	4	0	6	1	1	0	0	2	10	0	57	
4:05 PM	0	0	0	0	26	9	6	0	3	1	1	0	0	3	10	0	59	
4:10 PM	0	0	0	0	21	10	6	0	2	1	1	0	0	2	13	0	56	
4:15 PM	1	0	0	0	25	9	2	0	4	3	2	0	1	1	10	0	58	
4:20 PM	0	0	0	0	18	5	4	0	2	2	1	0	0	0	10	0	42	
4:25 PM	0	0	0	0	18	14	1	0	5	4	1	0	0	4	9	0	56	
4:30 PM	0	1	0	0	10	11	4	0	4	0	1	0	0	1	20	0	52	
4:35 PM	0	0	1	0	22	12	4	0	1	0	0	0	0	2	10	0	52	
4:40 PM	1	0	0	0	17	10	1	0	1	2	0	0	1	2	7	0	42	
4:45 PM	0	0	0	0	10	9	7	0	5	2	5	0	0	9	8	0	55	
4:50 PM	0	0	0	0	21	11	3	0	1	1	0	0	0	4	12	0	53	
4:55 PM	0	0	0	0	18	7	3	0	1	1	0	0	1	3	8	0	42	624
5:00 PM	0	0	1	0	19	6	6	0	1	3	1	0	0	5	12	0	54	621
5:05 PM	0	0	0	0	14	7	1	0	3	1	0	0	0	4	11	0	41	603
5:10 PM	0	1	0	0	20	9	2	0	2	2	2	0	0	5	8	0	51	598
5:15 PM	0	0	0	0	17	6	2	0	0	0	0	0	1	5	16	0	47	587
5:20 PM	0	0	0	0	21	7	3	0	5	3	0	0	1	6	10	0	56	601
5:25 PM	0	0	0	0	20	11	3	0	3	0	1	0	0	4	14	0	56	601
5:30 PM	0	0	0	0	11	10	0	0	2	1	0	0	1	3	11	0	39	588
5:35 PM	0	0	0	0	24	10	3	0	0	1	1	0	1	4	9	0	53	589
5:40 PM	0	0	0	0	17	6	3	0	1	1	0	0	0	2	8	0	38	585
5:45 PM	0	0	0	0	18	12	3	0	1	2	0	0	0	3	10	0	49	579
5:50 PM	0	0	0	0	16	7	0	0	2	1	1	0	0	3	12	0	42	568
5:55 PM	0	0	0	0	15	2	1	0	2	0	1	0	0	5	10	0	36	562

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	0	0	0	288	112	56	0	36	20	16	0	4	24	132	0	692
Heavy Trucks	0	0	0		20	24	12		8	4	4		0	4	8		84
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		4	0	0		0	0	0		0	0	0		4
Scooters																	

Comments:

Report generated on 3/10/2021 10:35 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

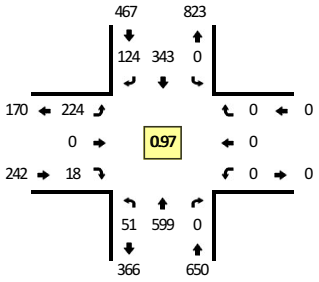
Type of peak hour being reported: Intersection Peak

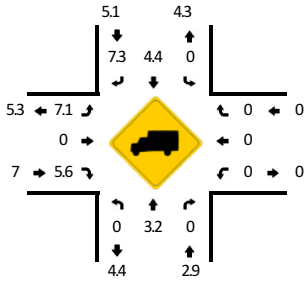
Method for determining peak hour: Total Entering Volume

LOCATION: Lewis River Rd -- E Scott Ave
CITY/STATE: Woodland, WA

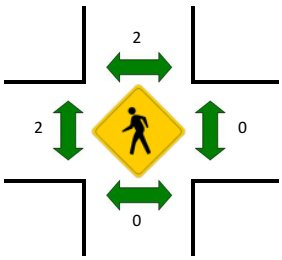
QC JOB #: 15381005
DATE: Thu, Mar 4 2021

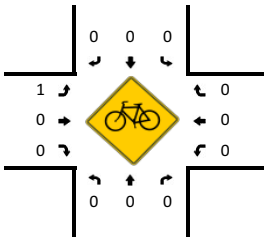
Peak-Hour: 4:10 PM -- 5:10 PM
Peak 15-Min: 4:20 PM -- 4:35 PM

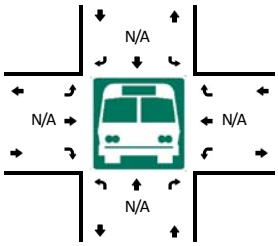


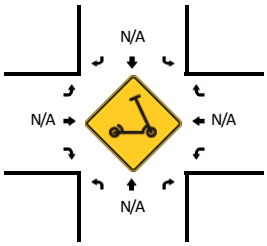


Quality Counts
DATA THAT DRIVES COMMUNITIES









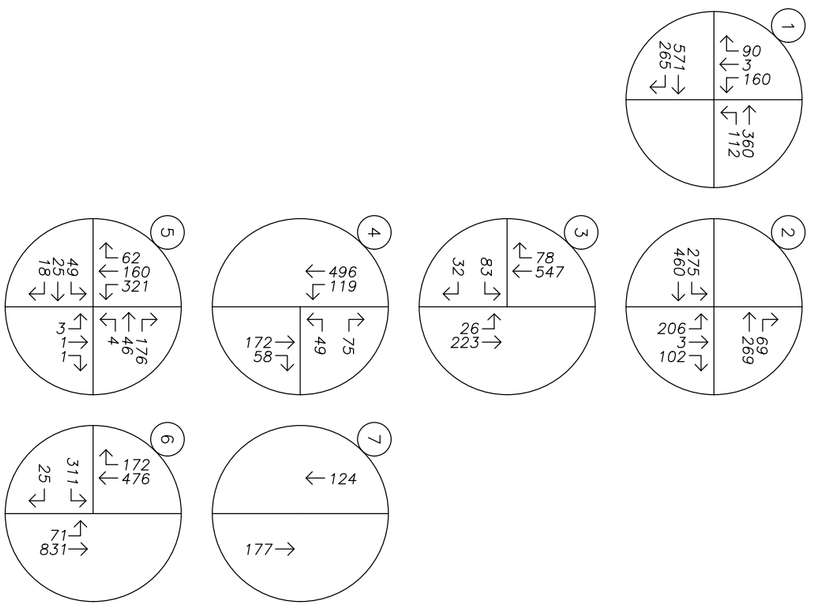
5-Min Count Period Beginning At	Lewis River Rd (Northbound)				Lewis River Rd (Southbound)				E Scott Ave (Eastbound)				E Scott Ave (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	4	37	0	0	0	30	9	0	27	0	2	0	0	0	0	0	109	
4:05 PM	4	41	0	0	0	28	10	1	20	0	3	0	0	0	0	0	107	
4:10 PM	3	46	0	1	0	28	12	0	25	0	0	0	0	0	0	0	115	
4:15 PM	5	48	0	0	0	20	7	0	23	0	4	0	0	0	0	0	107	
4:20 PM	3	55	0	0	0	29	6	0	25	0	0	0	0	0	0	0	118	
4:25 PM	3	54	0	0	0	30	11	0	20	0	0	0	0	0	0	0	118	
4:30 PM	6	56	0	2	0	24	15	0	13	0	0	0	0	0	0	0	116	
4:35 PM	4	57	0	0	0	27	8	0	14	0	4	0	0	0	0	0	114	
4:40 PM	3	46	0	0	0	31	6	0	18	0	3	0	0	0	0	0	107	
4:45 PM	4	39	0	0	0	37	13	0	12	0	0	0	0	0	0	0	105	
4:50 PM	4	56	0	0	0	29	13	0	20	0	1	0	0	0	0	0	123	
4:55 PM	5	39	0	1	0	34	7	0	18	0	1	0	0	0	0	0	105	1344
5:00 PM	3	47	0	1	0	25	14	0	21	0	5	0	0	0	0	0	116	1351
5:05 PM	3	56	0	0	0	29	12	0	15	0	0	0	0	0	0	0	115	1359
5:10 PM	7	39	0	0	0	22	9	0	19	0	2	0	0	0	0	0	98	1342
5:15 PM	6	37	0	0	0	25	16	0	18	0	1	0	0	0	0	0	103	1338
5:20 PM	6	45	0	0	0	19	9	0	22	0	1	0	0	0	0	0	102	1322
5:25 PM	2	54	0	0	0	24	15	1	15	0	2	0	0	0	0	0	113	1317
5:30 PM	4	44	0	0	0	22	12	1	11	0	1	0	0	0	0	0	95	1296
5:35 PM	6	48	0	0	0	26	8	0	22	0	2	0	0	0	0	0	112	1294
5:40 PM	4	45	0	0	0	13	6	1	23	0	0	0	0	0	0	0	92	1279
5:45 PM	6	47	0	1	0	19	9	0	17	0	0	0	0	0	0	0	99	1273
5:50 PM	4	38	0	0	0	24	10	0	15	0	1	0	0	0	0	0	92	1242
5:55 PM	4	50	0	0	0	22	9	0	19	0	1	0	0	0	0	0	105	1242

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	48	660	0	8	0	332	128	0	232	0	0	0	0	0	0	0	1408
Heavy Trucks	0	16	0		0	20	16		12	0	0		0	0	0		64
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 3/10/2021 10:35 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212



No Scale

PO Box 397 Puyallup, WA 98371 (253) 770 1401 heathtraffic.com

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TRAFFIC VOLUMES

Year 2021 Existing Conditions

PM Peak Hour

Figure 4

Oak Village Apartments

8/18/2021

Peak Hour Forecast Intersection Volumes

Annual Growth Rate: 2.3 % # of Years to Baseline: 1
# of Years to Horizon: 3 Horizon Year: 2025

PM

*Pipeline Projects
1. Oak Village Apartments (2021)
2. Woodland Creek Subdivision

1. Dike Access Road & SB I-5 Ramp

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Existing 2021	90	3	160	0	360	112	0	0	0	265	571	0
Baseline 2022	92	3	164	0	368	115	0	0	0	271	584	0
Project Trips	0	0	27	0	11	26	0	0	0	0	16	0
Pipeline	0	0	12	0	5	11	0	0	0	0	7	0
Without	99	3	187	0	399	134	0	0	0	290	632	0
With	99	3	214	0	410	160	0	0	0	290	648	0

2. Dike Access Road & NB I-5 Ramp

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Existing 2021	0	0	0	69	269	0	102	3	206	0	460	275
Baseline 2022	0	0	0	71	275	0	104	3	211	0	471	281
Project Trips	0	0	0	18	37	0	37	0	0	0	43	0
Pipeline	0	0	0	8	16	0	17	0	0	0	19	0
Without	0	0	0	84	311	0	129	3	226	0	523	301
With	0	0	0	102	348	0	166	3	226	0	566	301

3. Old Pacific Highway & Northern Belmont Loop

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Existing 2021	78	547	0	0	0	0	0	223	26	32	0	83
Baseline 2022	80	560	0	0	0	0	0	228	27	33	0	85
Project Trips	0	80	0	0	0	0	0	55	0	0	0	0
Pipeline	0	36	0	0	0	0	0	24	0	0	0	0
Without	85	635	0	0	0	0	0	268	28	35	0	91
With	85	715	0	0	0	0	0	323	28	35	0	91

4. Old Pacific Highway & Southern Belmont Loop

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Existing 2021	0	0	0	0	0	0	0	0	0	0	0	0
Baseline 2022	24	629	0	0	0	0	0	232	21	36	0	18
Project Trips	84	-4	0	0	0	0	0	-1	27	22	0	56
Pipeline	0	36	0	0	0	0	0	24	0	0	0	0
Without	25	709	0	0	0	0	0	272	22	39	0	19
With	109	705	0	0	0	0	0	271	49	61	0	75

5. Old Pacific Highway & Green Mountain Road

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Existing 2021	0	496	119	75	0	49	58	172	0	0	0	0
Baseline 2022	0	507	122	77	0	50	59	176	0	0	0	0
Project Trips	0	18	0	0	0	0	0	26	0	0	0	0
Pipeline	0	0	36	24	0	7	13	0	0	0	0	0
Without	0	543	166	106	0	61	77	188	0	0	0	0
With	0	561	166	106	0	61	77	214	0	0	0	0

6. Old Pacific Highway/N Goerig Street & E Scott Avenue

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Existing 2021	62	160	321	176	46	4	1	1	3	18	25	49
Baseline 2022	63	164	328	180	47	4	1	1	3	18	26	50
Project Trips	0	15	3	26	0	0	0	0	0	0	0	0
Pipeline	0	6	1	13	0	0	0	0	0	0	0	0
Without	68	181	353	206	50	4	1	1	3	20	27	54
With	68	196	356	232	50	4	1	1	3	20	27	54

7. E Scott Avenue & Lewis River Road

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Existing 2021	172	476	0	0	0	0	0	831	71	25	0	311
Baseline 2022	176	487	0	0	0	0	0	850	73	26	0	318
Project Trips	5	0	0	0	0	0	0	0	21	0	0	3
Pipeline	11	36	0	0	0	0	0	61	10	0	0	15
Without	199	557	0	0	0	0	0	971	88	27	0	356
With	204	557	0	0	0	0	0	971	109	27	0	359

LOGAN'S LANDING
TRAFFIC IMPACT ANALYSIS

APPENDIX

TRIP GENERATION REPORT

lancaster mobley

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Portland, OR 97204
503.248.0313
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7/9/2021

DANIEL STUMPF
STATE OF WASHINGTON
57946
REGISTERED
PROFESSIONAL ENGINEER

Memorandum

To: Shayne Olsen

From: Daniel Stumpf, PE

Date: July 9, 2021

Subject: Logan's Landing
Trip Generation & Distribution Analysis

Introduction

This memorandum reports and evaluates the trip generation impacts related to the proposed Logan's Landing development, to be located on four properties south of Belmont Loop, west of Old Pacific Highway, and east of Interstate 5 in Woodland, Washington. Specifically, the facility will include the construction of eight, four-story mixed-use buildings, each with approximately 972 square feet of ground floor office/retail space (7,776 square feet total) and 51 apartment units on the upper floors (408 total units). Main access to the site will be provided via Franklin Street along Belmont Loop while an emergency vehicle access onto Old Pacific Highway will be available along the southern edge of the site.

The purpose of this memorandum is to examine and address transportation-related impacts from the proposed development. This study reviews the proposed development's trip generation and distribution for the morning peak hour, evening peak hour, and typical weekday.

Location Description

Project Site Description

The subject site is located south of Belmont Loop, west of Old Pacific Highway, and east of Interstate 5 in a developing area of Woodland, with a mix of small commercial, industrial, low-density residential, as well as undeveloped land, surrounding the site in all directions. The site includes four properties (parcels 50729, 50680023, 50730, and 50714) which encompass an approximate total of 24 acres. The site is currently vacant, but upon development will take access to the greater transportation system via Franklin Street to the north. In addition, an emergency vehicle access will be available via a gravel driveway on lot 50714 which directly connects to Old Pacific Highway.

Figure 1 presents an aerial image of the nearby vicinity with the project site outlined in yellow.

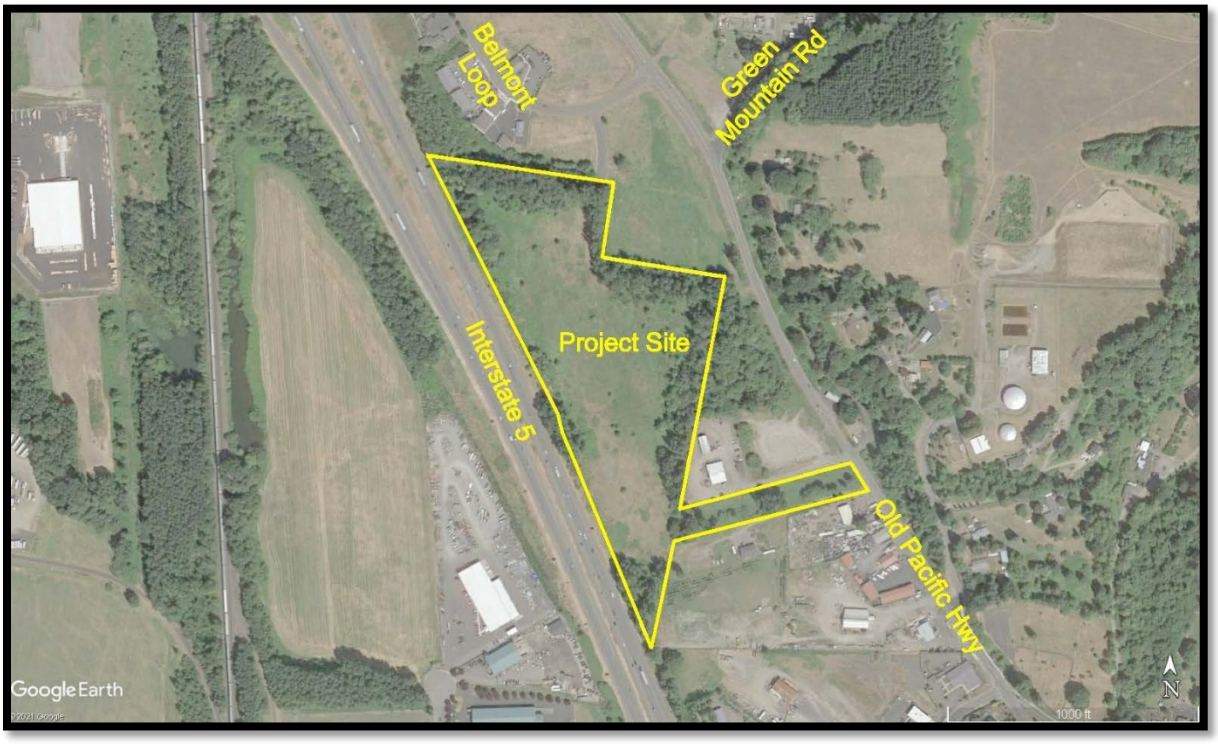


Figure 1: Aerial Photo of Site Vicinity (Image from Google Earth)

Vicinity Streets

The proposed development is expected to impact seven roadways near the site. Table 1 provides a description of each of the vicinity roadways.

Table 1: Vicinity Roadway Descriptions

Street Name	Jurisdiction	Functional Classification	Speed (MPH)	On-Street Parking	Curbs & Sidewalks	Bicycle Lanes
Dike Access Road	WSDOT/City of Woodland	Minor Arterial	35	Not Permitted	Partial Both Sides	None
Belmont Loop	City of Woodland	Local Street	25	Permitted Both Sides	Partial Both Sides	None
Old Pacific Highway	City of Woodland	Minor Arterial	35	Not Permitted	Partial Both Sides	Partial Both Sides
Green Mountain Road	City of Woodland	Major Collector	50	Not Permitted	None	None

Table Notes: Functional classification based on WSDOT Functional Classification Map.
Statutory speed based on Washington State Code Section RCW 46.61.400.

Table 1: Vicinity Roadway Descriptions (Continued)

Street Name	Jurisdiction	Functional Classification	Speed (MPH)	On-Street Parking	Curbs & Sidewalks	Bicycle Lanes
E Scott Avenue	City of Woodland	Major Collector	25	Not Permitted	Partial Both Sides	Partial Both Sides
NE Goerig Street	City of Woodland	Local Street	25	Not Permitted	None	None
Lewis River Road	WSDOT	Minor Arterial	35	Not Permitted	Partial Both Sides	Partial Both Sides

Table Notes: Functional classification based on WSDOT Functional Classification Map.
Statutory speed based on Washington State Code Section RCW 46.61.400.

Trip Generation

The proposed development will include the construction of eight, four-story mixed buildings consisting of a total 7,776 square feet of ground floor office/retail space and 408 residential dwelling units on the 2nd, 3rd, and 4th floors. To estimate the number of trips that will be generated by the proposed use, trip rates/equations from the *Trip Generation Manual*[1] were used. Data from land use code 221, *Multifamily Housing (Mid-Rise)*, was used to estimate trip generation of the residential portion of the proposed development based on the number of dwelling units. For the commercial portion of the proposed development, data from land use code 820, *Shopping Center*, was used to estimate trip generation based on the square footage of the gross building floor area. Although the commercial space could be tenanted by office uses, for the purposes of maintaining a conservative estimate of site trip generation it is assumed all the commercial space would serve retail-related uses.

Internal Trip Rates

Given the variety of land uses that are proposed for development within the project site (i.e. residential and assumed retail), some trips generated are expected to be shared or internally captured between each use and will not impact the nearby transportation system. Using the NCHRP Report 684, internal capture rates of 2 percent for the morning peak hour and 6 percent for the evening peak hour were calculated. It is assumed the weekday internal capture would approximately match the evening peak hour rate.

Pass-by Trip Rates

The retail portion of the proposed development is expected to attract pass-by and diverted trips to the site. Pass-by trips are trips that leave the adjacent roadway to patronize a land use and then continue in their original direction of travel. Similar to pass-by trips, diverted trips are trips that divert from a nearby roadway not adjacent to the site to patronize a land use before continuing to their original destination. Pass-by trips do not add additional vehicles to the surrounding transportation system; however, they do add additional turning

[1] Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 10th Edition, 2017.

movements at site access intersections. Diverted trips may add turning movements at both site access and other nearby intersections.

Pass-by and diverted trip rates were determined using data provided within the *Trip Generation Handbook*[2] . Data from land use code 820 was used to determine evening peak hour pass-by and diverted rates for the retail portion of the proposed development. It is assumed that the morning peak hour and weekday rates would approximately match the 34 percent evening peak hour. For the purposes of this analysis, diverted trips were treated as primary trips.

Trip Generation Analysis

The trip generation calculations show that the proposed development is projected to generate 138 net new morning peak hour trips, 179 net new evening peak hour trips, and 2,270 net new average weekday trips. The trip generation estimates are summarized in Table 1. Detailed trip generation calculations are included as an attachment to this memorandum.

Table 2: Trip Generation Summary

	ITE Code	Size	Morning Peak Hour			Evening Peak Hour			Weekday Total
			Enter	Exit	Total	Enter	Exit	Total	
Residential Units									
Multifamily Housing	221	408 units	35	101	136	104	67	171	2,222
Internal Trips		*2% (6%)*	*1*	*2*	*3*	*6*	*4*	*10*	*134*
External (Primary) Trips			34	99	133	98	63	161	2,088
Commercial Space									
Shopping Center	820	7,776 SF	4	3	7	14	16	30	294
Internal Trips		*2% (6%)*	*0*	*0*	*0*	*1*	*1*	*2*	*18*
External Trips			4	3	7	13	15	28	276
Pass-by Trips		*34% (34%)*	*1*	*1*	*2*	*5*	*5*	*10*	*94*
Primary Trips			3	2	5	8	10	18	182
Total Development									
Net New Total Trips			**37**	**101**	**138**	**106**	**73**	**179**	**2,270**

Table Notes: *AM peak hour, PM peak hour, and daily internal capture & pass-by rates denoted as AM (PM/ADT)*
Pass-by rate only applied to the external trips generated by the shopping center.

[2] Institute of Transportation Engineers (ITE), *Trip Generation Handbook*, 3rd Edition, 2017.

Trip Distribution

The directional distribution of site trips to and from the proposed development was referenced from the distribution utilized in the *Oak Village Apartments Transportation Impact Study*, dated June 16, 2021. This distribution was estimated based on locations of likely trip destinations, locations of major transportation facilities in the site vicinity, and existing travel patterns at the study intersections.

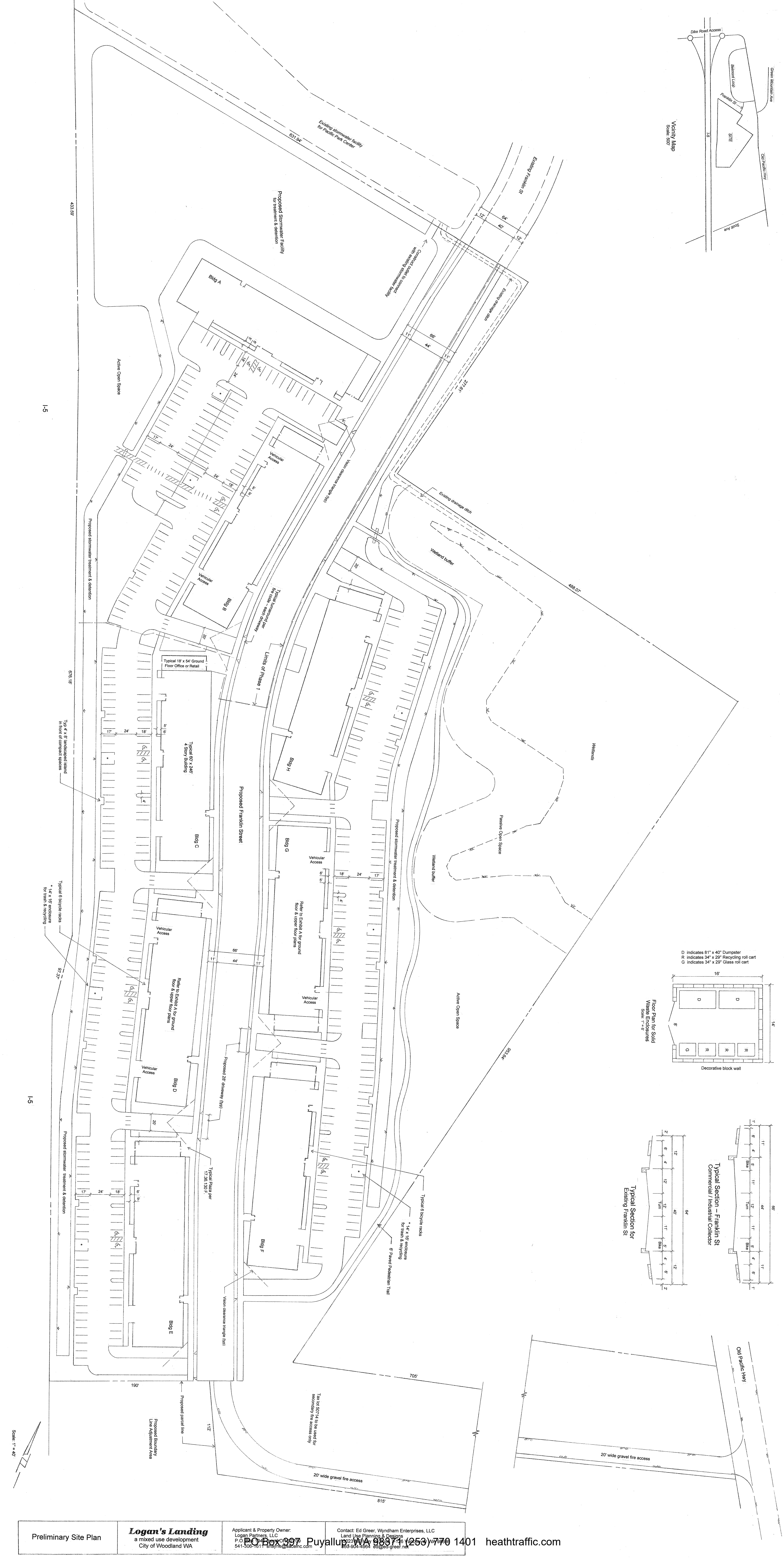
The following trip distribution is projected:

- Approximately 35 percent of site trips will travel to/from the south along I-5 (south of Dike Access Road);
- Approximately 25 percent of site trips will travel to/from the north along I-5 (north of Dike Access Road);
- Approximately 20 percent of site trips will travel to/from the south along Lewis River Road (south of N Goerig Street);
- Approximately 15 percent of site trips will travel to/from the west along Dike Access Road (west of I-5); and
- Approximately 5 percent of site trips will travel to/from the east along Lewis River Road (east/north of E Scott Avenue).

Conclusions

The trip generation calculations show that the proposed development is projected to generate 138 net new morning peak hour trips, 179 net new evening peak hour trips, and 2,270 net new average weekday trips.

If you have any questions regarding the preparation of this trip generation study, please don't hesitate to contact us.


Preliminary Site Plan
Logan's Landing
a mixed use development
City of Woodland WA
Proposed Franklin Street
Vicinity Map
Wetlands
Active Open Space
Passive Open Space
Limits of Phase 1
Bldg A
Bldg B
Bldg C
Bldg D
Bldg E
Bldg F
Bldg G
Bldg H
I-5
Existing Franklin St
Old Pacific Hwy
20' wide gravel fire access
Typical Section – Franklin St
Commercial / Industrial Collector
Typical Section for
Existing Franklin St
Floor Plan for Solid
Waste Enclosures
Decorative block wall

TRIP GENERATION CALCULATIONS

Land Use: Multifamily Housing (Mid-Rise)
Land Use Code: 221
Setting/Location General Urban/Suburban
Variable: Dwelling Units
Variable Value: 408

AM PEAK HOUR

Trip Equation: Ln(T)=0.98Ln(X)-0.98

	Enter	Exit	Total
Directional Distribution	26%	74%	
Trip Ends	**35**	**101**	**136**

PM PEAK HOUR

Trip Equation: Ln(T)=0.96Ln(X)-0.63

	Enter	Exit	Total
Directional Distribution	61%	39%	
Trip Ends	**104**	**67**	**171**

WEEKDAY

Trip Equation: T=5.45(X)-1.75

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**1,111**	**1,111**	**2,222**

SATURDAY

Trip Equation: T=3.04(X)+417.11

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	**829**	**829**	**1,658**

Source: TRIP GENERATION, Tenth Edition

TRIP GENERATION CALCULATIONS

Land Use: Shopping Center
Land Use Code: 820
Setting/Location General Urban/Suburban
Variable: 1,000 Sq. Ft. GFA
Variable Value: 7.776

AM PEAK HOUR

Trip Rate: 0.94

	Enter	Exit	Total
Directional Distribution	62%	38%	
Trip Ends	4	3	7

PM PEAK HOUR

Trip Rate: 3.81

	Enter	Exit	Total
Directional Distribution	48%	52%	
Trip Ends	14	16	30

WEEKDAY

Trip Rate: 37.75

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	147	147	294

SATURDAY

Trip Rate: 46.12

	Enter	Exit	Total
Directional Distribution	50%	50%	
Trip Ends	179	179	358

Source: Trip Generation Manual, Tenth Edition

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	Logan's Landing	**Organization:**	Lancaster Engineering
Project Location:	Woodland, WA	**Performed By:**	Daniel Stumpf, PE
Scenario Description:	Buildout Conditions	**Date:**	
Analysis Year:	2023	**Checked By:**	
Analysis Period:	**AM Street Peak Hour**	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	820	7,776	SF of GFA	7	4	3
Restaurant				0		
Cinema/Entertainment				0		
Residential	221	408	Dwelling Units	136	35	101
Hotel				0		
All Other Land Uses[2]				0		
Total				143	39	104

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail	1.25	0%	0%	1.25	0%	0%
Restaurant						
Cinema/Entertainment						
Residential	1.25	0%	0%	1.25	0%	0%
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	1	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	179	49	130
Internal Capture Percentage	2%	4%	2%
External Vehicle-Trips[3]	139	37	102
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	20%	25%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	2%	1%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	Logan's Landing
Analysis Period:	**AM Street Peak Hour**

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.25	4	5	1.25	3	4
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.25	35	44	1.25	101	126
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	1		1	0	1	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	3	1	25	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		2	0	0	0	0
Retail	0		0	0	1	0
Restaurant	0	0		0	2	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	1	0	0		0
Hotel	0	0	0	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	1	4	5	3	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	1	43	44	34	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	1	3	4	2	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	1	125	126	100	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 8-51 Internal Trip Capture Estimation Tool			
Project Name:	Logan's Landing	**Organization:**	Lancaster Engineering
Project Location:	Woodland, WA	**Performed By:**	Daniel Stumpf, PE
Scenario Description:	Buildout Conditions	**Date:**	
Analysis Year:	2023	**Checked By:**	
Analysis Period:	**PM Street Peak Hour**	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail	820	7,776	SF of GFA	30	14	16
Restaurant				0		
Cinema/Entertainment				0		
Residential	221	408	Dwelling Units	171	104	67
Hotel				0		
All Other Land Uses[2]				0		
Total				201	118	83

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office						
Retail	1.25	0%	0%	1.25	0%	0%
Restaurant						
Cinema/Entertainment						
Residential	1.25	0%	0%	1.25	0%	0%
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	5	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	2	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	252	148	104
Internal Capture Percentage	6%	5%	7%
External Vehicle-Trips[3]	191	113	78
External Transit-Trips[4]	0	0	0
External Non-Motorized Trips[4]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	11%	25%
Restaurant	N/A	N/A
Cinema/Entertainment	N/A	N/A
Residential	4%	2%
Hotel	N/A	N/A

[1]Land Use Codes (LUCs) from *Trip Generation Informational Report*, published by the Institute of Transportation Engineers.

[2]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

[3]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[4]Person-Trips

*Indicates computation that has been rounded to the nearest whole number.

Estimation Tool Developed by the Texas Transportation Institute

Project Name:	Logan's Landing
Analysis Period:	**PM Street Peak Hour**

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends

Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	0	0	1.00	0	0
Retail	1.25	14	18	1.25	16	20
Restaurant	1.00	0	0	1.00	0	0
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.25	104	130	1.25	67	84
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		6	1	5	1
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	3	35	18	0		3
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1	0	0	5	0
Retail	0		0	0	60	0
Restaurant	0	9		0	21	0
Cinema/Entertainment	0	1	0		5	0
Residential	0	2	0	0		0
Hotel	0	0	0	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	2	16	18	13	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	5	125	130	100	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles[1]	Transit[2]	Non-Motorized[2]
Office	0	0	0	0	0	0
Retail	5	15	20	12	0	0
Restaurant	0	0	0	0	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	2	82	84	66	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses[3]	0	0	0	0	0	0

[1]Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

[2]Person-Trips

[3]Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

Table 7.1a Adjusted Internal Trip Capture Rates for Trip Origins within a Multi-Use Development			
Land Use Pairs		Weekday	
		AM Peak Hour	PM Peak Hour
From OFFICE	To Office	0.0%	0.0%
	To Retail	28.0%	20.0%
	To Restaurant	63.0%	4.0%
	To Cinema/Entertainment	0.0%	0.0%
	To Residential	1.0%	2.0%
	To Hotel	0.0%	0.0%
From RETAIL	To Office	29.0%	2.0%
	To Retail	0.0%	0.0%
	To Restaurant	13.0%	29.0%
	To Cinema/Entertainment	0.0%	4.0%
	To Residential	14.0%	26.0%
	To Hotel	0.0%	5.0%
From RESTAURANT	To Office	31.0%	3.0%
	To Retail	14.0%	41.0%
	To Restaurant	0.0%	0.0%
	To Cinema/Entertainment	0.0%	8.0%
	To Residential	4.0%	18.0%
	To Hotel	3.0%	7.0%
From CINEMA/ENTERTAINMENT	To Office	0.0%	2.0%
	To Retail	0.0%	21.0%
	To Restaurant	0.0%	31.0%
	To Cinema/Entertainment	0.0%	0.0%
	To Residential	0.0%	8.0%
	To Hotel	0.0%	2.0%
From RESIDENTIAL	To Office	2.0%	4.0%
	To Retail	1.0%	42.0%
	To Restaurant	20.0%	21.0%
	To Cinema/Entertainment	0.0%	0.0%
	To Residential	0.0%	0.0%
	To Hotel	0.0%	3.0%
From HOTEL	To Office	75.0%	0.0%
	To Retail	14.0%	16.0%
	To Restaurant	9.0%	68.0%
	To Cinema/Entertainment	0.0%	0.0%
	To Residential	0.0%	2.0%
	To Hotel	0.0%	0.0%

Table 7.2a Adjusted Internal Trip Capture Rates for Trip Destinations within a Multi-Use Development			
Land Use Pairs		Weekday	
		AM Peak Hour	PM Peak Hour
To OFFICE	From Office	0.0%	0.0%
	From Retail	4.0%	31.0%
	From Restaurant	14.0%	30.0%
	From Cinema/Entertainment	0.0%	6.0%
	From Residential	3.0%	57.0%
	From Hotel	3.0%	0.0%
To RETAIL	From Office	32.0%	8.0%
	From Retail	0.0%	0.0%
	From Restaurant	8.0%	50.0%
	From Cinema/Entertainment	0.0%	4.0%
	From Residential	17.0%	10.0%
	From Hotel	4.0%	2.0%
To RESTAURANT	From Office	23.0%	2.0%
	From Retail	50.0%	29.0%
	From Restaurant	0.0%	0.0%
	From Cinema/Entertainment	0.0%	3.0%
	From Residential	20.0%	14.0%
	From Hotel	6.0%	5.0%
To CINEMA/ENTERTAINMENT	From Office	0.0%	1.0%
	From Retail	0.0%	26.0%
	From Restaurant	0.0%	32.0%
	From Cinema/Entertainment	0.0%	0.0%
	From Residential	0.0%	0.0%
	From Hotel	0.0%	0.0%
To RESIDENTIAL	From Office	0.0%	4.0%
	From Retail	2.0%	46.0%
	From Restaurant	5.0%	16.0%
	From Cinema/Entertainment	0.0%	4.0%
	From Residential	0.0%	0.0%
	From Hotel	0.0%	0.0%
To HOTEL	From Office	0.0%	0.0%
	From Retail	0.0%	17.0%
	From Restaurant	4.0%	71.0%
	From Cinema/Entertainment	0.0%	1.0%
	From Residential	0.0%	12.0%
	From Hotel	0.0%	0.0%

LOGAN'S LANDING
TRAFFIC IMPACT ANALYSIS

APPENDIX

LEVEL OF SERVICE

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	85	33	27	228	560	80
Future Vol, veh/h	85	33	27	228	560	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	80	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	7	7	6	6
Mvmt Flow	92	36	29	248	609	87

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	959	653	696	0	-	0
Stage 1	653	-	-	-	-	-
Stage 2	306	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.17	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.263	-	-	-
Pot Cap-1 Maneuver	285	467	877	-	-	-
Stage 1	518	-	-	-	-	-
Stage 2	747	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	276	467	877	-	-	-
Mov Cap-2 Maneuver	276	-	-	-	-	-
Stage 1	501	-	-	-	-	-
Stage 2	747	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	21.4	1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	877	-	276	467	-	-
HCM Lane V/C Ratio	0.033	-	0.335	0.077	-	-
HCM Control Delay (s)	9.2	-	24.5	13.3	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.4	0.2	-	-

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Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	18	36	21	232	629	24
Future Vol, veh/h	18	36	21	232	629	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	115	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	1	1	7	7	4	4
Mvmt Flow	20	41	24	264	715	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1041	729	742	0	-	0
Stage 1	729	-	-	-	-	-
Stage 2	312	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.17	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.263	-	-	-
Pot Cap-1 Maneuver	256	425	843	-	-	-
Stage 1	479	-	-	-	-	-
Stage 2	744	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	249	425	843	-	-	-
Mov Cap-2 Maneuver	249	-	-	-	-	-
Stage 1	466	-	-	-	-	-
Stage 2	744	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.5	0.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	843	-	249	425	-	-
HCM Lane V/C Ratio	0.028	-	0.082	0.096	-	-
HCM Control Delay (s)	9.4	-	20.7	14.4	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	0.3	-	-

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Intersection	
Int Delay, s/veh	3.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	50	77	176	59	122	507
Future Vol, veh/h	50	77	176	59	122	507
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	7	7	8	8	7	7
Mvmt Flow	56	86	196	66	136	563

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1064	229	0	0	262	0
Stage 1	229	-	-	-	-	-
Stage 2	835	-	-	-	-	-
Critical Hdwy	6.47	6.27	-	-	4.17	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.363	-	-	2.263	-
Pot Cap-1 Maneuver	241	798	-	-	1274	-
Stage 1	797	-	-	-	-	-
Stage 2	417	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	204	798	-	-	1274	-
Mov Cap-2 Maneuver	204	-	-	-	-	-
Stage 1	797	-	-	-	-	-
Stage 2	352	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.5	0	1.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	372	1274	-
HCM Lane V/C Ratio	-	-	0.379	0.106	-
HCM Control Delay (s)	-	-	20.5	8.2	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.7	0.4	-

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Intersection	
Intersection Delay, s/veh	25.7
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	50	26	18	4	47	180	3	1	1	328	164	63
Future Vol, veh/h	50	26	18	4	47	180	3	1	1	328	164	63
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	15	15	15	7	7	7	0	0	0	8	8	8
Mvmt Flow	56	29	20	4	52	200	3	1	1	364	182	70
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	10.8	12	9	34
HCM LOS	B	B	A	D

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	60%	53%	2%	59%
Vol Thru, %	20%	28%	20%	30%
Vol Right, %	20%	19%	78%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	5	94	231	555
LT Vol	3	50	4	328
Through Vol	1	26	47	164
RT Vol	1	18	180	63
Lane Flow Rate	6	104	257	617
Geometry Grp	1	1	1	1
Degree of Util (X)	0.009	0.183	0.39	0.881
Departure Headway (Hd)	5.931	6.317	5.468	5.145
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	601	567	657	703
Service Time	3.988	4.37	3.513	3.172
HCM Lane V/C Ratio	0.01	0.183	0.391	0.878
HCM Control Delay	9	10.8	12	34
HCM Lane LOS	A	B	B	D
HCM 95th-tile Q	0	0.7	1.8	10.8

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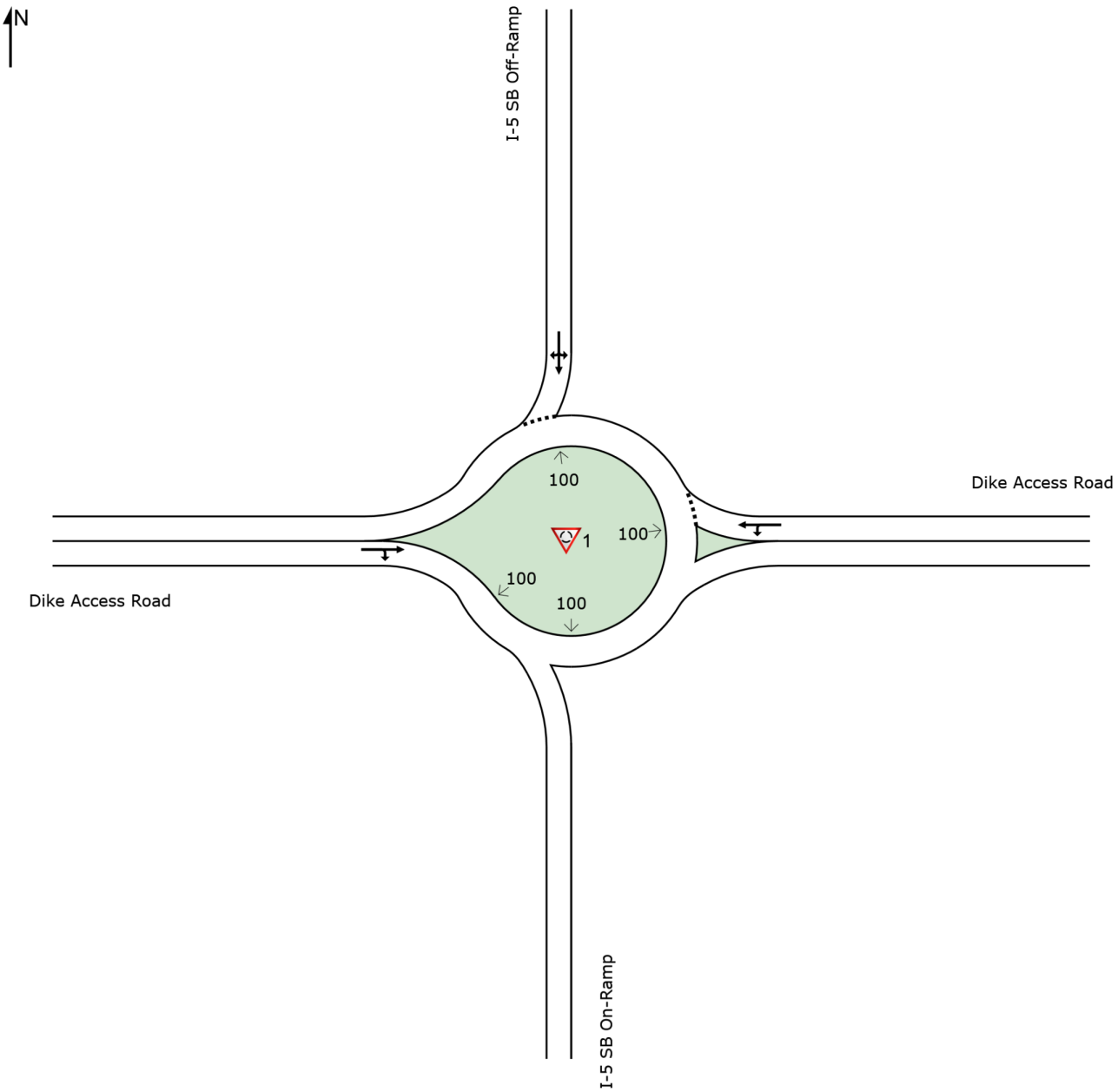
SITE LAYOUT

Site: 1 [I-5 SB Ramps & Dike Access Road (Site Folder: General)]

Existing 2022 PM Peak Hour
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: T:\Sidra\4855\1. Existing 2022 PM.sip9

MOVEMENT SUMMARY

Site: 1 [I-5 SB Ramps & Dike Access Road (Site Folder: General)]

Existing 2022 PM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: Dike Access Road														
1	L2	115	5.3	131	5.3	0.410	9.8	LOS A	0.0	0.0	0.00	0.47	0.00	37.3
6	T1	368	5.3	418	5.3	0.410	3.8	LOS A	0.0	0.0	0.00	0.47	0.00	37.3
Approach		483	5.3	549	5.3	0.410	5.2	LOS A	0.0	0.0	0.00	0.47	0.00	37.3
North: I-5 SB Off-Ramp														
7	L2	164	4.1	186	4.1	0.337	13.7	LOS B	2.0	52.3	0.67	0.80	0.67	33.9
4	T1	3	4.1	3	4.1	0.337	7.7	LOS A	2.0	52.3	0.67	0.80	0.67	33.8
14	R2	92	4.1	105	4.1	0.337	7.8	LOS A	2.0	52.3	0.67	0.80	0.67	32.9
Approach		259	4.1	294	4.1	0.337	11.6	LOS B	2.0	52.3	0.67	0.80	0.67	33.5
West: Dike Access Road														
2	T1	584	3.6	664	3.6	0.958	24.1	LOS E	28.6	734.4	1.00	1.29	1.92	28.4
12	R2	271	3.6	308	3.6	0.958	24.2	LOS E	28.6	734.4	1.00	1.29	1.92	27.7
Approach		855	3.6	972	3.6	0.958	24.1	LOS C	28.6	734.4	1.00	1.29	1.92	28.2
All Vehicles		1597	4.2	1815	4.2	0.958	16.4	LOS B	28.6	734.4	0.64	0.97	1.14	31.3

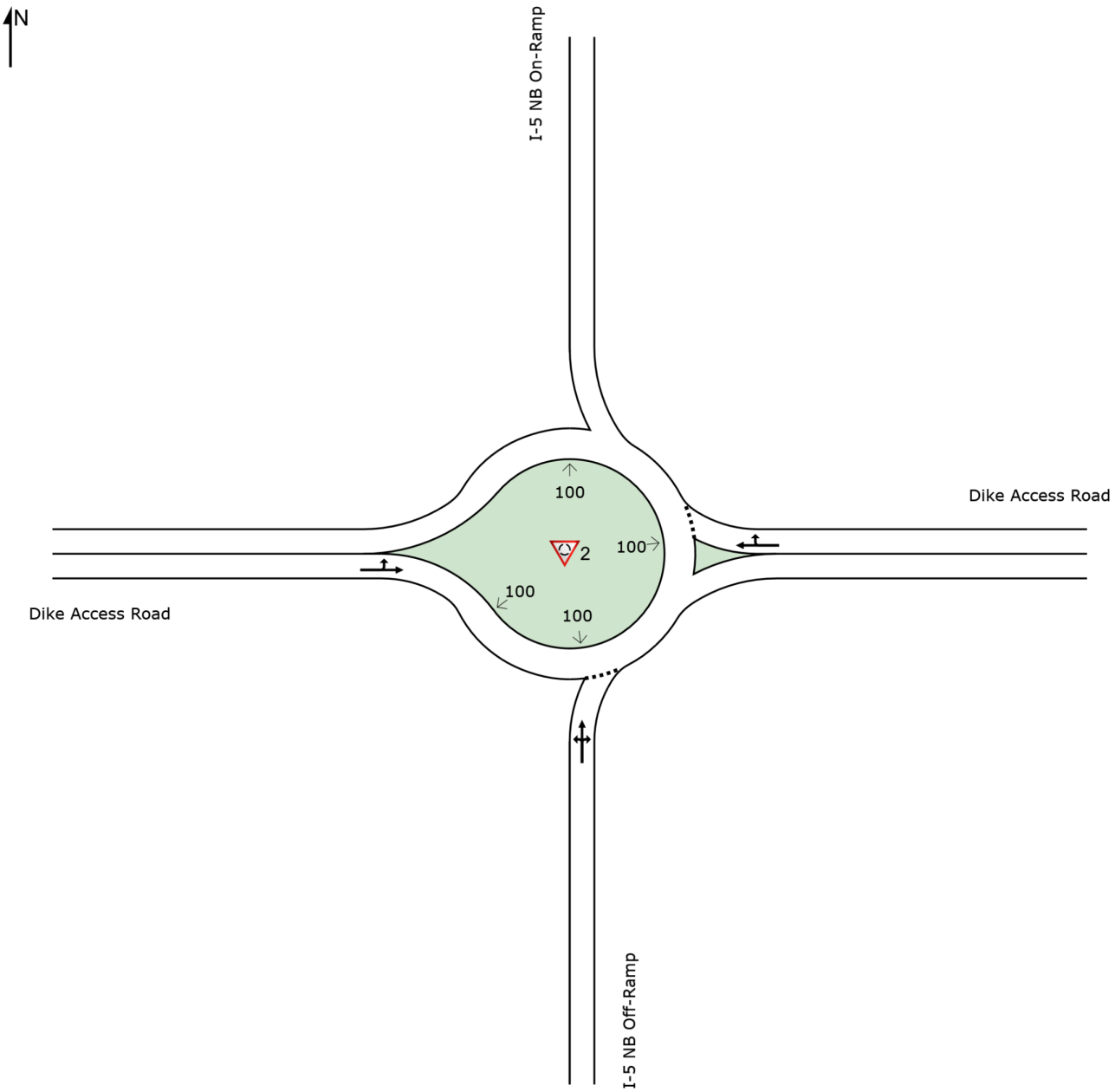
Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 2 [I-5 NB Ramp & Dike Access Road (Site Folder: General)]

Exsiting 2022 PM Peak Hour
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: T:\Sidra\4855\1. Existing 2022 PM.sip9

MOVEMENT SUMMARY

Site: 2 [I-5 NB Ramp & Dike Access Road (Site Folder: General)]

Exsiting 2022 PM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: I-5 NB Off-Ramp														
3	L2	211	4.7	240	4.7	0.550	21.7	LOS C	4.9	126.2	0.88	1.08	1.21	30.2
8	T1	3	4.7	3	4.7	0.550	15.7	LOS B	4.9	126.2	0.88	1.08	1.21	30.2
18	R2	104	4.7	118	4.7	0.550	15.8	LOS B	4.9	126.2	0.88	1.08	1.21	29.4
Approach		318	4.7	361	4.7	0.550	19.7	LOS B	4.9	126.2	0.88	1.08	1.21	30.0
East: Dike Access Road														
6	T1	275	4.3	313	4.3	0.500	9.4	LOS A	4.0	103.3	0.81	0.87	0.91	34.9
16	R2	71	4.3	81	4.3	0.500	9.5	LOS A	4.0	103.3	0.81	0.87	0.91	33.8
Approach		346	4.3	393	4.3	0.500	9.4	LOS A	4.0	103.3	0.81	0.87	0.91	34.6
West: Dike Access Road														
5	L2	281	2.7	319	2.7	0.639	9.7	LOS A	0.0	0.0	0.00	0.52	0.00	36.9
2	T1	471	2.7	535	2.7	0.639	3.7	LOS A	0.0	0.0	0.00	0.52	0.00	36.9
Approach		752	2.7	855	2.7	0.639	6.0	LOS A	0.0	0.0	0.00	0.52	0.00	36.9
All Vehicles		1416	3.5	1609	3.5	0.639	9.9	LOS A	4.9	126.2	0.40	0.73	0.49	34.6

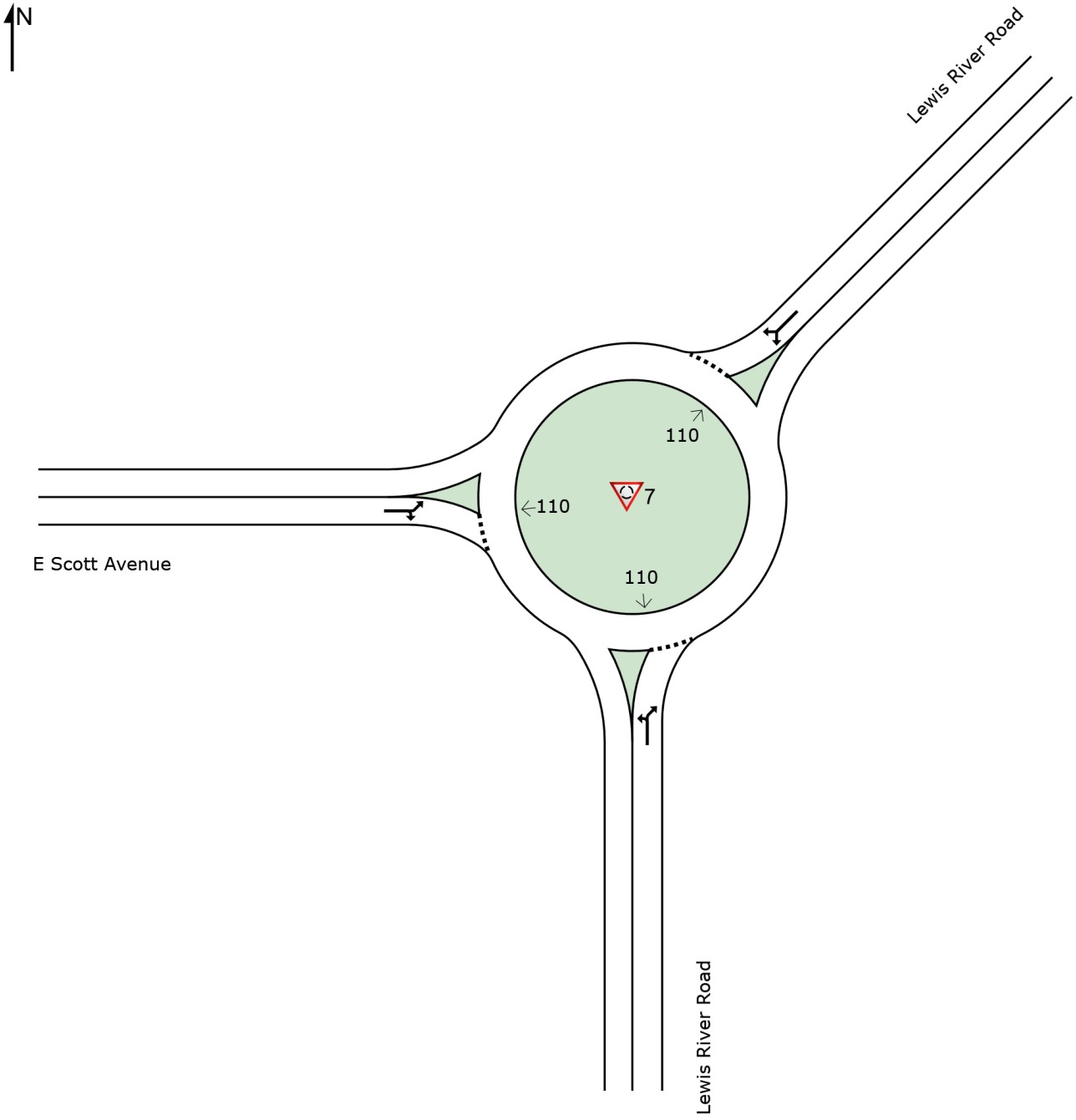
Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 7 [E Scott Ave & Lewis River Road (Site Folder: General)]

Existing 2022 PM Peak Hour
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: T:\Sidra\4855\1. Existing 2022 PM.sip9

MOVEMENT SUMMARY

Site: 7 [E Scott Ave & Lewis River Road (Site Folder: General)]

Existing 2022 PM Peak Hour
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Lewis River Road														
3	L2	73	2.9	75	2.9	0.971	31.5	LOS E	29.2	746.0	1.00	1.34	2.00	28.2
18a	R1	850	2.9	876	2.9	0.971	24.8	LOS E	29.2	746.0	1.00	1.34	2.00	27.9
Approach		923	2.9	952	2.9	0.971	25.3	LOS C	29.2	746.0	1.00	1.34	2.00	27.9
NorthEast: Lewis River Road														
1ax	L1	487	5.1	502	5.1	0.563	9.4	LOS A	5.7	148.9	0.45	0.55	0.45	34.8
16ax	R1	176	5.1	181	5.1	0.563	3.9	LOS A	5.7	148.9	0.45	0.55	0.45	34.9
Approach		663	5.1	684	5.1	0.563	7.9	LOS A	5.7	148.9	0.45	0.55	0.45	34.8
West: E Scott Avenue														
5a	L1	318	7.0	328	7.0	0.440	12.9	LOS B	3.1	82.1	0.76	0.84	0.78	33.2
12	R2	26	7.0	27	7.0	0.440	8.0	LOS A	3.1	82.1	0.76	0.84	0.78	32.5
Approach		344	7.0	355	7.0	0.440	12.5	LOS B	3.1	82.1	0.76	0.84	0.78	33.1
All Vehicles		1930	4.4	1990	4.4	0.971	17.1	LOS B	29.2	746.0	0.77	0.98	1.25	30.9

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	91	35	28	268	635	85
Future Vol, veh/h	91	35	28	268	635	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	80	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	7	7	6	6
Mvmt Flow	99	38	30	291	690	92

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1087	736	782	0	-	0
Stage 1	736	-	-	-	-	-
Stage 2	351	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.17	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.263	-	-	-
Pot Cap-1 Maneuver	239	419	814	-	-	-
Stage 1	474	-	-	-	-	-
Stage 2	713	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	230	419	814	-	-	-
Mov Cap-2 Maneuver	230	-	-	-	-	-
Stage 1	456	-	-	-	-	-
Stage 2	713	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	27.1	0.9	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	814	-	230	419	-	-
HCM Lane V/C Ratio	0.037	-	0.43	0.091	-	-
HCM Control Delay (s)	9.6	-	32	14.4	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	2	0.3	-	-

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Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	19	39	22	272	709	25
Future Vol, veh/h	19	39	22	272	709	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	115	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	7	7	4	4
Mvmt Flow	21	42	24	296	771	27

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1129	785	798	0	-	0
Stage 1	785	-	-	-	-	-
Stage 2	344	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.17	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.263	-	-	-
Pot Cap-1 Maneuver	227	394	803	-	-	-
Stage 1	451	-	-	-	-	-
Stage 2	720	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	220	394	803	-	-	-
Mov Cap-2 Maneuver	220	-	-	-	-	-
Stage 1	437	-	-	-	-	-
Stage 2	720	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17.8	0.7	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	803	-	220	394	-	-
HCM Lane V/C Ratio	0.03	-	0.094	0.108	-	-
HCM Control Delay (s)	9.6	-	23.1	15.2	-	-
HCM Lane LOS	A	-	C	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	0.4	-	-

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Intersection	
Int Delay, s/veh	5.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	61	106	188	77	166	543
Future Vol, veh/h	61	106	188	77	166	543
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	7	8	8	7	7
Mvmt Flow	66	115	204	84	180	590

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1196	246	0	0	288	0
Stage 1	246	-	-	-	-	-
Stage 2	950	-	-	-	-	-
Critical Hdwy	6.47	6.27	-	-	4.17	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.363	-	-	2.263	-
Pot Cap-1 Maneuver	201	781	-	-	1246	-
Stage 1	783	-	-	-	-	-
Stage 2	368	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	158	781	-	-	1246	-
Mov Cap-2 Maneuver	158	-	-	-	-	-
Stage 1	783	-	-	-	-	-
Stage 2	289	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	30	0	2
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	320	1246	-
HCM Lane V/C Ratio	-	-	0.567	0.145	-
HCM Control Delay (s)	-	-	30	8.4	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	3.3	0.5	-

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Intersection	
Intersection Delay, s/veh	32.5
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	54	27	20	4	50	206	3	1	1	353	181	68
Future Vol, veh/h	54	27	20	4	50	206	3	1	1	353	181	68
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	11	28	8	1	9	6	0	0	0	6	8	20
Mvmt Flow	59	29	22	4	54	224	3	1	1	384	197	74
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.1	12.7	9.3	44.8
HCM LOS	B	B	A	E

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	60%	53%	2%	59%
Vol Thru, %	20%	27%	19%	30%
Vol Right, %	20%	20%	79%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	5	101	260	602
LT Vol	3	54	4	353
Through Vol	1	27	50	181
RT Vol	1	20	206	68
Lane Flow Rate	5	110	283	654
Geometry Grp	1	1	1	1
Degree of Util (X)	0.009	0.196	0.431	0.946
Departure Headway (Hd)	6.122	6.421	5.492	5.202
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	581	557	653	700
Service Time	4.194	4.487	3.548	3.234
HCM Lane V/C Ratio	0.009	0.197	0.433	0.934
HCM Control Delay	9.3	11.1	12.7	44.8
HCM Lane LOS	A	B	B	E
HCM 95th-tile Q	0	0.7	2.2	13.5

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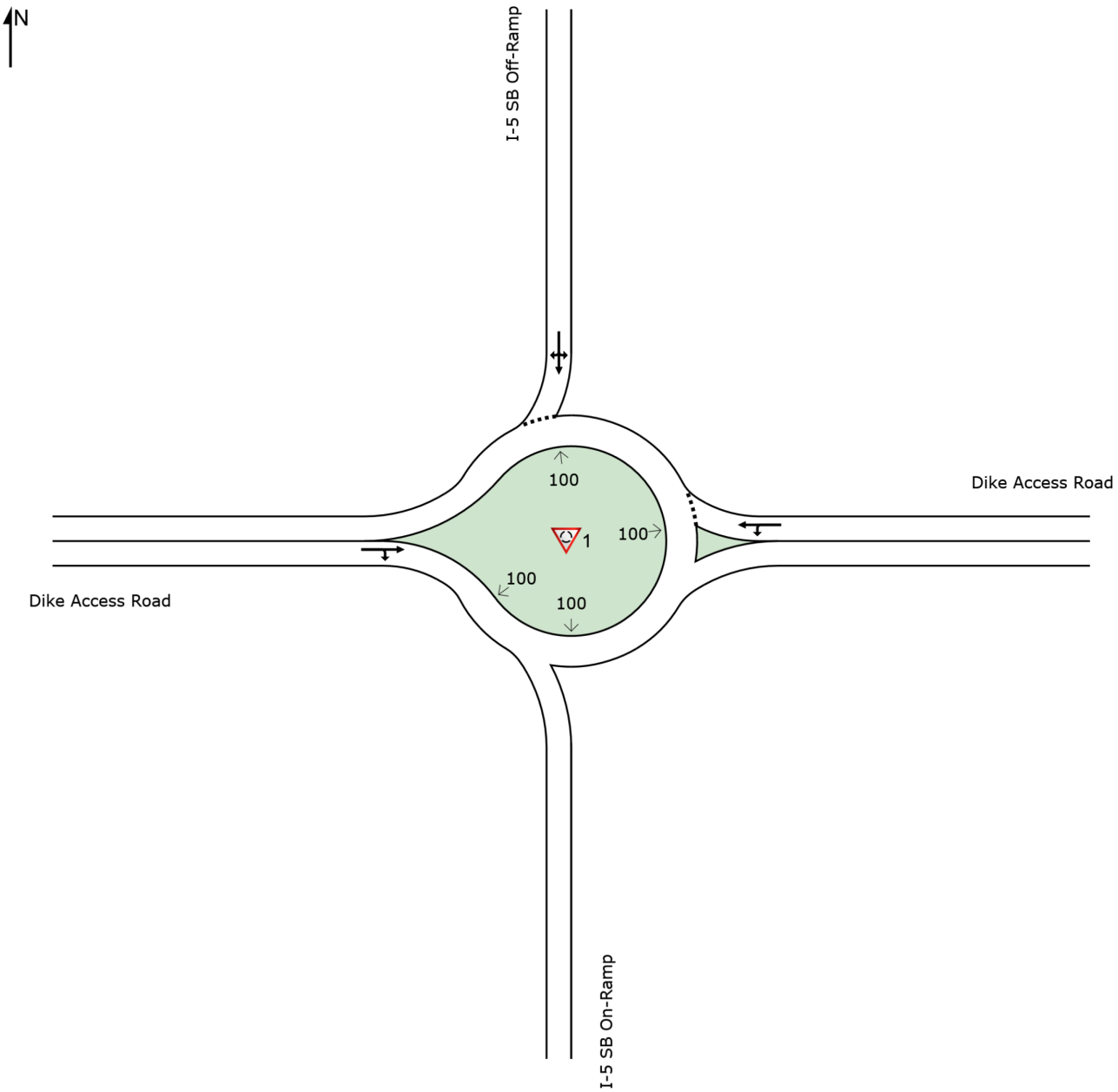
SITE LAYOUT

Site: 1 [I-5 SB Ramps & Dike Access Road (Site Folder: General)]

Forecast 2025 PM Peak Hour without Project
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: T:\Sidra\4855\2. Forecast 2025 without.sip9

MOVEMENT SUMMARY

Site: 1 [I-5 SB Ramps & Dike Access Road (Site Folder: General)]

Forecast 2025 PM Peak Hour without Project
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: Dike Access Road														
1	L2	134	5.3	152	5.3	0.442	9.8	LOS A	0.0	0.0	0.00	0.48	0.00	37.3
6	T1	399	5.3	453	5.3	0.442	3.8	LOS A	0.0	0.0	0.00	0.48	0.00	37.2
Approach		533	5.3	606	5.3	0.442	5.3	LOS A	0.0	0.0	0.00	0.48	0.00	37.2
North: I-5 SB Off-Ramp														
7	L2	187	4.1	213	4.1	0.378	14.2	LOS B	2.4	61.3	0.72	0.82	0.72	33.6
4	T1	3	4.1	3	4.1	0.378	8.2	LOS A	2.4	61.3	0.72	0.82	0.72	33.5
14	R2	99	4.1	113	4.1	0.378	8.3	LOS A	2.4	61.3	0.72	0.82	0.72	32.6
Approach		289	4.1	328	4.1	0.378	12.2	LOS B	2.4	61.3	0.72	0.82	0.72	33.2
West: Dike Access Road														
2	T1	632	3.6	718	3.6	1.046	46.6	LOS F	45.7	1175.3	1.00	1.83	3.04	22.1
12	R2	290	3.6	330	3.6	1.046	46.7	LOS F	45.7	1175.3	1.00	1.83	3.04	21.7
Approach		922	3.6	1048	3.6	1.046	46.6	LOS D	45.7	1175.3	1.00	1.83	3.04	22.0
All Vehicles		1744	4.2	1982	4.2	1.046	28.3	LOS C	45.7	1175.3	0.65	1.25	1.73	26.9

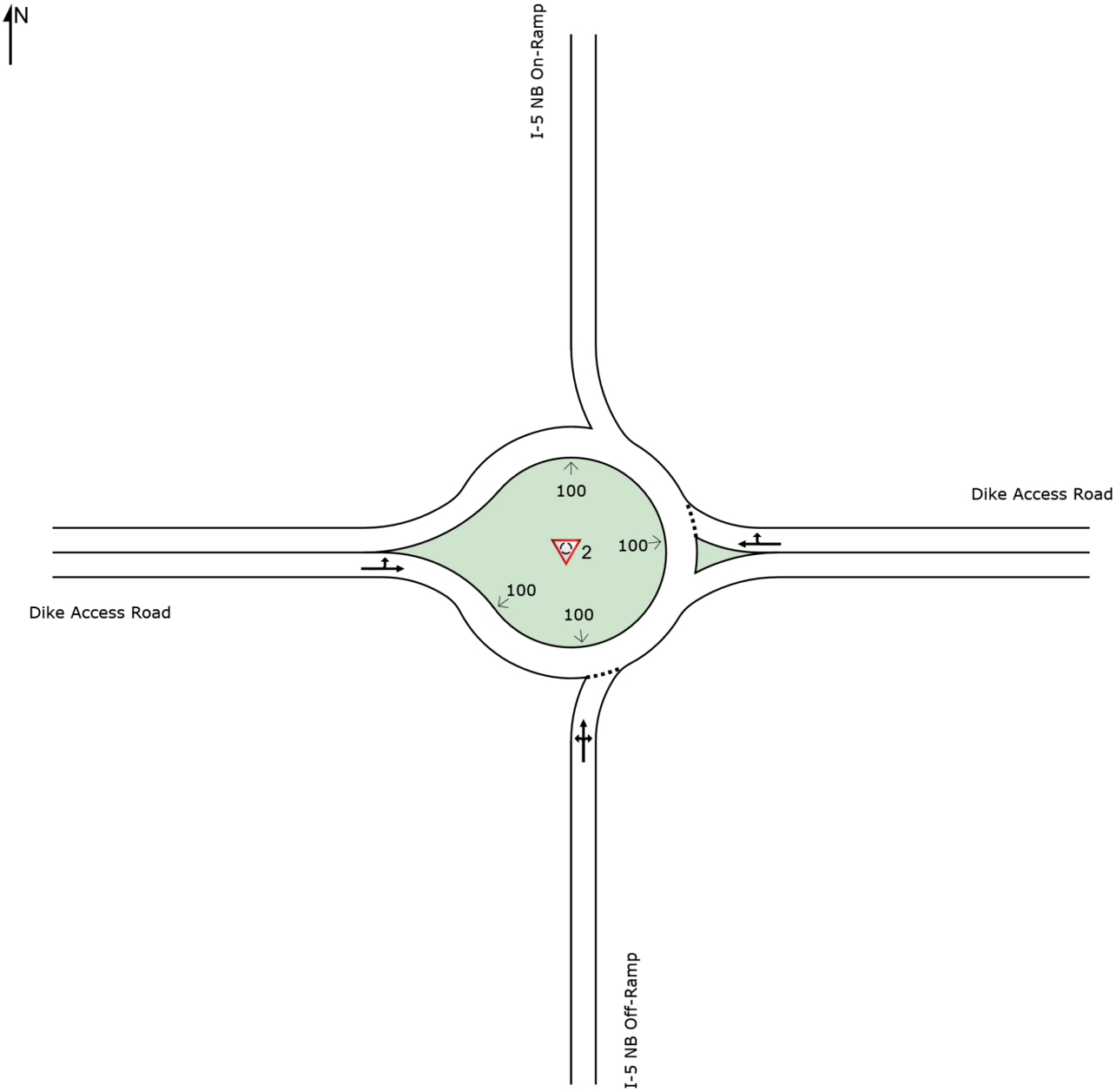
Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 2 [I-5 NB Ramp & Dike Access Road (Site Folder: General)]

Forecast 2025 PM Peak Hour without Project
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: T:\Sidra\4855\2. Forecast 2025 without.sip9

MOVEMENT SUMMARY

Site: 2 [I-5 NB Ramp & Dike Access Road (Site Folder: General)]

Forecast 2025 PM Peak Hour without Project
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: I-5 NB Off-Ramp														
3	L2	226	4.7	257	4.7	0.670	28.5	LOS C	7.5	195.5	0.96	1.22	1.61	27.8
8	T1	3	4.7	3	4.7	0.670	22.5	LOS C	7.5	195.5	0.96	1.22	1.61	27.8
18	R2	129	4.7	147	4.7	0.670	22.6	LOS C	7.5	195.5	0.96	1.22	1.61	27.1
Approach		358	4.7	407	4.7	0.670	26.3	LOS C	7.5	195.5	0.96	1.22	1.61	27.5
East: Dike Access Road														
6	T1	311	4.3	353	4.3	0.599	11.7	LOS B	5.7	148.2	0.88	0.99	1.12	33.6
16	R2	84	4.3	95	4.3	0.599	11.9	LOS B	5.7	148.2	0.88	0.99	1.12	32.7
Approach		395	4.3	449	4.3	0.599	11.8	LOS B	5.7	148.2	0.88	0.99	1.12	33.4
West: Dike Access Road														
5	L2	301	2.7	342	2.7	0.700	9.7	LOS A	0.0	0.0	0.00	0.52	0.00	37.0
2	T1	523	2.7	594	2.7	0.700	3.7	LOS A	0.0	0.0	0.00	0.52	0.00	36.9
Approach		824	2.7	936	2.7	0.700	5.9	LOS A	0.0	0.0	0.00	0.52	0.00	36.9
All Vehicles		1577	3.6	1792	3.6	0.700	12.0	LOS B	7.5	195.5	0.44	0.80	0.65	33.5

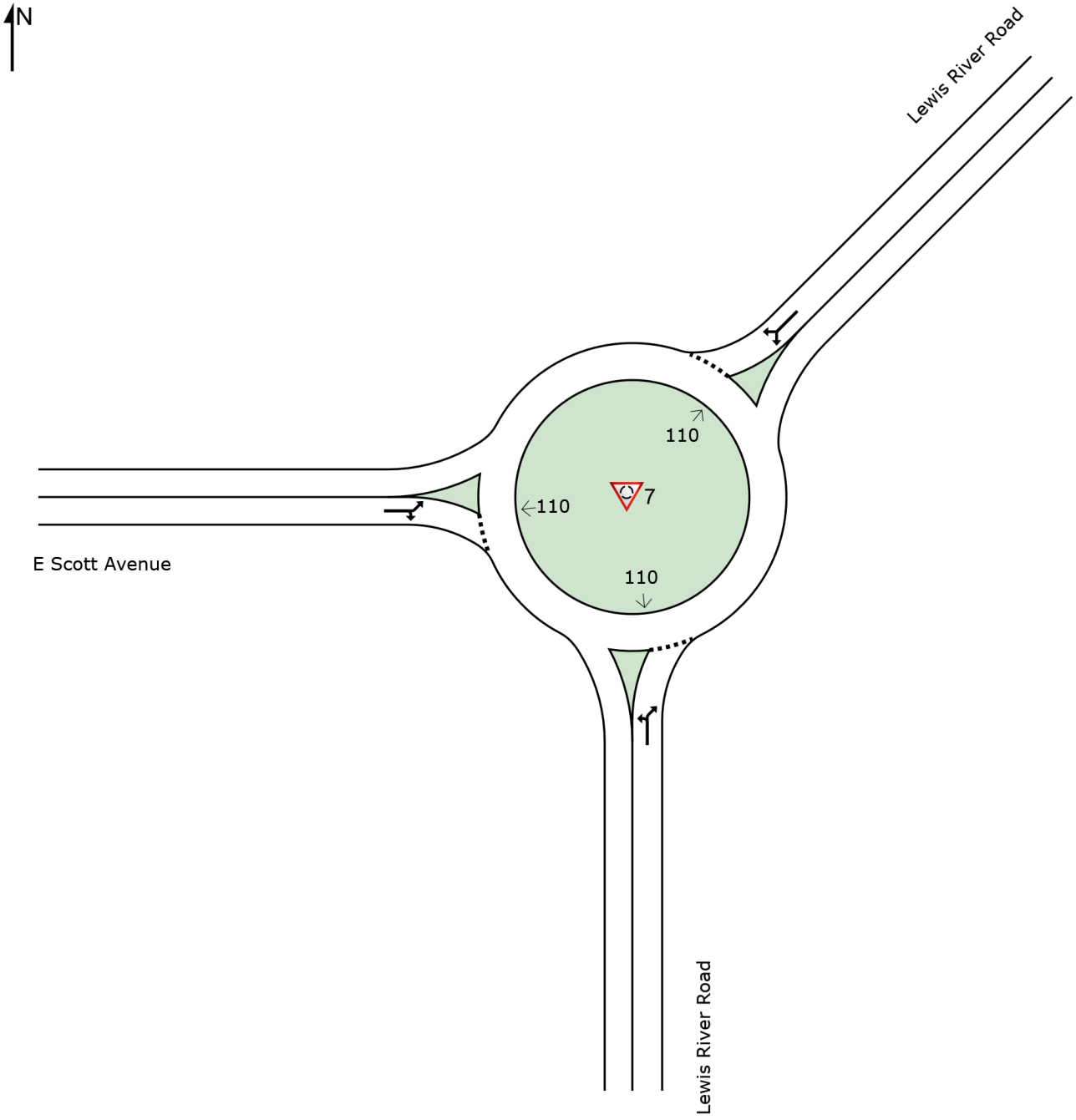
Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 7 [E Scott Ave & Lewis River Road (Site Folder: General)]

Forecast 2025 PM Peak Hour without Project
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: T:\Sidra\4855\2. Forecast 2025 without.sip9

MOVEMENT SUMMARY

Site: 7 [E Scott Ave & Lewis River Road (Site Folder: General)]

Forecast 2025 PM Peak Hour without Project
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Lewis River Road														
3	L2	88	2.9	91	2.9	1.127	81.2	LOS F	64.5	1649.4	1.00	2.35	4.16	17.3
18a	R1	971	2.9	1001	2.9	1.127	74.5	LOS F	64.5	1649.4	1.00	2.35	4.16	17.2
Approach		1059	2.9	1092	2.9	1.127	75.1	LOS E	64.5	1649.4	1.00	2.35	4.16	17.2
NorthEast: Lewis River Road														
1ax	L1	557	5.1	574	5.1	0.630	9.5	LOS A	7.1	186.0	0.51	0.55	0.51	34.7
16ax	R1	199	5.1	205	5.1	0.630	4.0	LOS A	7.1	186.0	0.51	0.55	0.51	34.7
Approach		756	5.1	779	5.1	0.630	8.0	LOS A	7.1	186.0	0.51	0.55	0.51	34.7
West: E Scott Avenue														
5a	L1	356	7.0	367	7.0	0.513	14.6	LOS B	4.3	113.2	0.84	0.93	0.96	32.4
12	R2	27	7.0	28	7.0	0.513	9.7	LOS A	4.3	113.2	0.84	0.93	0.96	31.7
Approach		383	7.0	395	7.0	0.513	14.2	LOS B	4.3	113.2	0.84	0.93	0.96	32.3
All Vehicles		2198	4.4	2266	4.4	1.127	41.4	LOS D	64.5	1649.4	0.80	1.48	2.35	23.2

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Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	91	35	28	323	715	85
Future Vol, veh/h	91	35	28	323	715	85
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	80	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	7	7	6	6
Mvmt Flow	99	38	30	351	777	92

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1234	823	869	0	-	0
Stage 1	823	-	-	-	-	-
Stage 2	411	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.17	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.263	-	-	-
Pot Cap-1 Maneuver	195	373	755	-	-	-
Stage 1	431	-	-	-	-	-
Stage 2	669	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	187	373	755	-	-	-
Mov Cap-2 Maneuver	187	-	-	-	-	-
Stage 1	414	-	-	-	-	-
Stage 2	669	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	36.1	0.8	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	755	-	187	373	-	-
HCM Lane V/C Ratio	0.04	-	0.529	0.102	-	-
HCM Control Delay (s)	10	-	44	15.7	-	-
HCM Lane LOS	A	-	E	C	-	-
HCM 95th %tile Q(veh)	0.1	-	2.7	0.3	-	-

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Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	75	61	49	271	705	109
Future Vol, veh/h	75	61	49	271	705	109
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	100	0	115	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	1	7	7	4	4
Mvmt Flow	82	66	53	295	766	118

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1226	825	884	0	-	0
Stage 1	825	-	-	-	-	-
Stage 2	401	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.17	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.263	-	-	-
Pot Cap-1 Maneuver	198	374	745	-	-	-
Stage 1	432	-	-	-	-	-
Stage 2	678	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	184	374	745	-	-	-
Mov Cap-2 Maneuver	184	-	-	-	-	-
Stage 1	401	-	-	-	-	-
Stage 2	678	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	29.2	1.6	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	745	-	184	374	-	-
HCM Lane V/C Ratio	0.071	-	0.443	0.177	-	-
HCM Control Delay (s)	10.2	-	39.3	16.7	-	-
HCM Lane LOS	B	-	E	C	-	-
HCM 95th %tile Q(veh)	0.2	-	2.1	0.6	-	-

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Intersection	
Int Delay, s/veh	6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	61	106	214	77	166	561
Future Vol, veh/h	61	106	214	77	166	561
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	7	7	8	8	7	7
Mvmt Flow	66	115	233	84	180	610

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1245	275	0	0	317	0
Stage 1	275	-	-	-	-	-
Stage 2	970	-	-	-	-	-
Critical Hdwy	6.47	6.27	-	-	4.17	-
Critical Hdwy Stg 1	5.47	-	-	-	-	-
Critical Hdwy Stg 2	5.47	-	-	-	-	-
Follow-up Hdwy	3.563	3.363	-	-	2.263	-
Pot Cap-1 Maneuver	188	752	-	-	1215	-
Stage 1	760	-	-	-	-	-
Stage 2	360	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	146	752	-	-	1215	-
Mov Cap-2 Maneuver	146	-	-	-	-	-
Stage 1	760	-	-	-	-	-
Stage 2	279	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	34	0	1.9
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	299	1215	-
HCM Lane V/C Ratio	-	-	0.607	0.149	-
HCM Control Delay (s)	-	-	34	8.5	0
HCM Lane LOS	-	-	D	A	A
HCM 95th %tile Q(veh)	-	-	3.7	0.5	-

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Intersection	
Intersection Delay, s/veh	38.8
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	54	27	20	4	50	232	3	1	1	356	196	68
Future Vol, veh/h	54	27	20	4	50	232	3	1	1	356	196	68
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	11	28	8	1	9	6	0	0	0	6	8	20
Mvmt Flow	59	29	22	4	54	252	3	1	1	387	213	74
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	11.3	13.7	9.4	55.1
HCM LOS	B	B	A	F

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	60%	53%	1%	57%
Vol Thru, %	20%	27%	17%	32%
Vol Right, %	20%	20%	81%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	5	101	286	620
LT Vol	3	54	4	356
Through Vol	1	27	50	196
RT Vol	1	20	232	68
Lane Flow Rate	5	110	311	674
Geometry Grp	1	1	1	1
Degree of Util (X)	0.009	0.2	0.481	0.991
Departure Headway (Hd)	6.292	6.568	5.567	5.293
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	564	543	644	687
Service Time	4.38	4.648	3.633	3.332
HCM Lane V/C Ratio	0.009	0.203	0.483	0.981
HCM Control Delay	9.4	11.3	13.7	55.1
HCM Lane LOS	A	B	B	F
HCM 95th-tile Q	0	0.7	2.6	15.5

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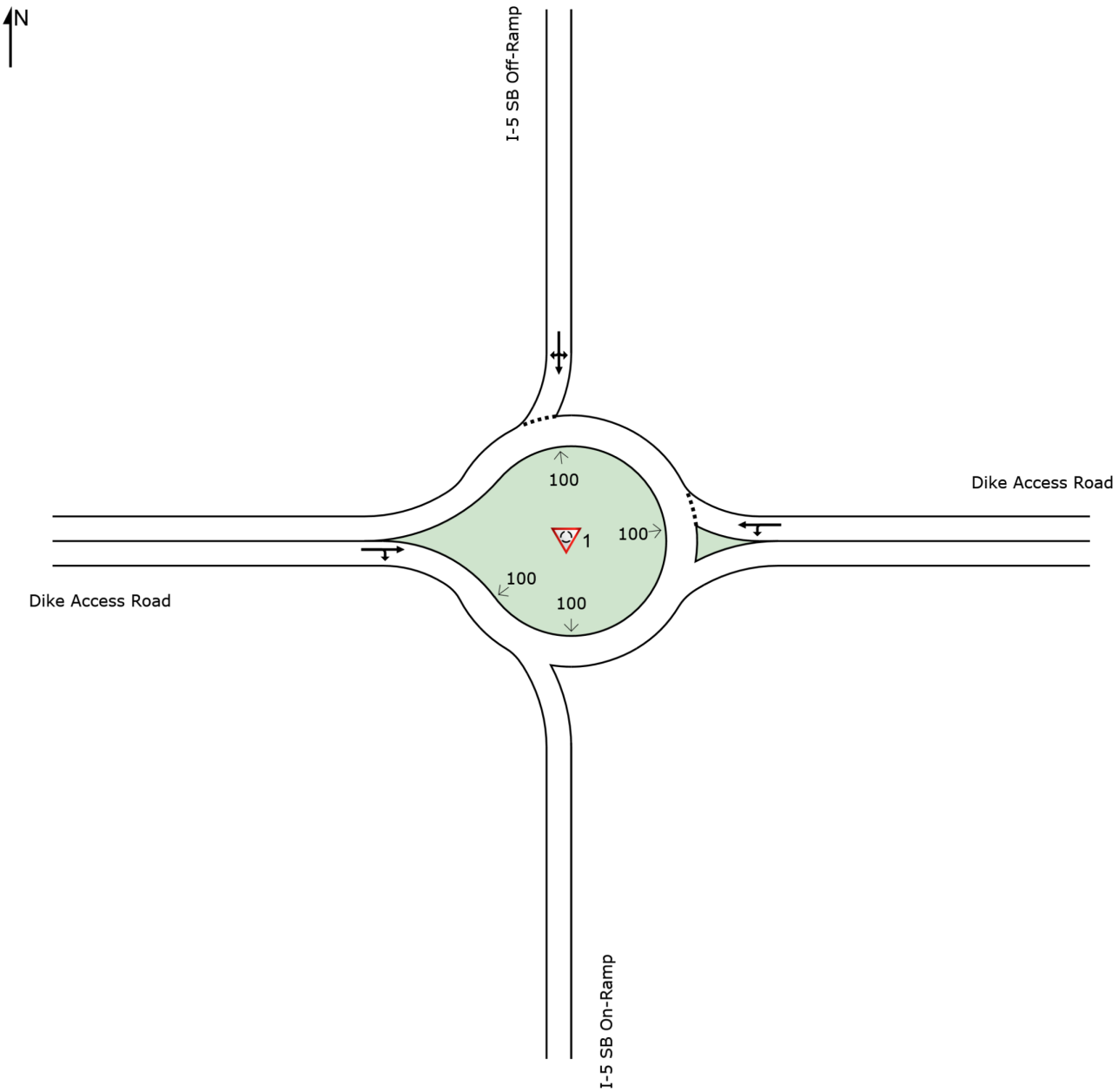
SITE LAYOUT

Site: 1 [I-5 SB Ramps & Dike Access Road (Site Folder: General)]

Forecast 2025 PM Peak Hour with Project
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



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Project: T:\Sidra\4855\3. Forecast 2025 with.sip9

MOVEMENT SUMMARY

Site: 1 [I-5 SB Ramps & Dike Access Road (Site Folder: General)]

Forecast 2025 PM Peak Hour with Project
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
East: Dike Access Road														
1	L2	160	5.3	178	5.3	0.462	9.8	LOS A	0.0	0.0	0.00	0.49	0.00	37.1
6	T1	410	5.3	456	5.3	0.462	3.8	LOS A	0.0	0.0	0.00	0.49	0.00	37.1
Approach		570	5.3	633	5.3	0.462	5.5	LOS A	0.0	0.0	0.00	0.49	0.00	37.1
North: I-5 SB Off-Ramp														
7	L2	214	4.1	238	4.1	0.413	14.7	LOS B	2.7	69.6	0.74	0.85	0.76	33.3
4	T1	3	4.1	3	4.1	0.413	8.7	LOS A	2.7	69.6	0.74	0.85	0.76	33.2
14	R2	99	4.1	110	4.1	0.413	8.8	LOS A	2.7	69.6	0.74	0.85	0.76	32.3
Approach		316	4.1	351	4.1	0.413	12.8	LOS B	2.7	69.6	0.74	0.85	0.76	33.0
West: Dike Access Road														
2	T1	648	3.6	720	3.6	1.086	62.0	LOS F	53.8	1382.6	1.00	2.17	3.81	19.2
12	R2	290	3.6	322	3.6	1.086	62.1	LOS F	53.8	1382.6	1.00	2.17	3.81	18.8
Approach		938	3.6	1042	3.6	1.086	62.0	LOS E	53.8	1382.6	1.00	2.17	3.81	19.1
All Vehicles		1824	4.2	2027	4.2	1.086	35.8	LOS D	53.8	1382.6	0.64	1.42	2.09	24.6

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
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SITE LAYOUT

Site: 2 [I-5 NB Ramp & Dike Access Road (Site Folder: General)]

Forecast 2025 PM Peak Hour with Project
Site Category: (None)
Roundabout

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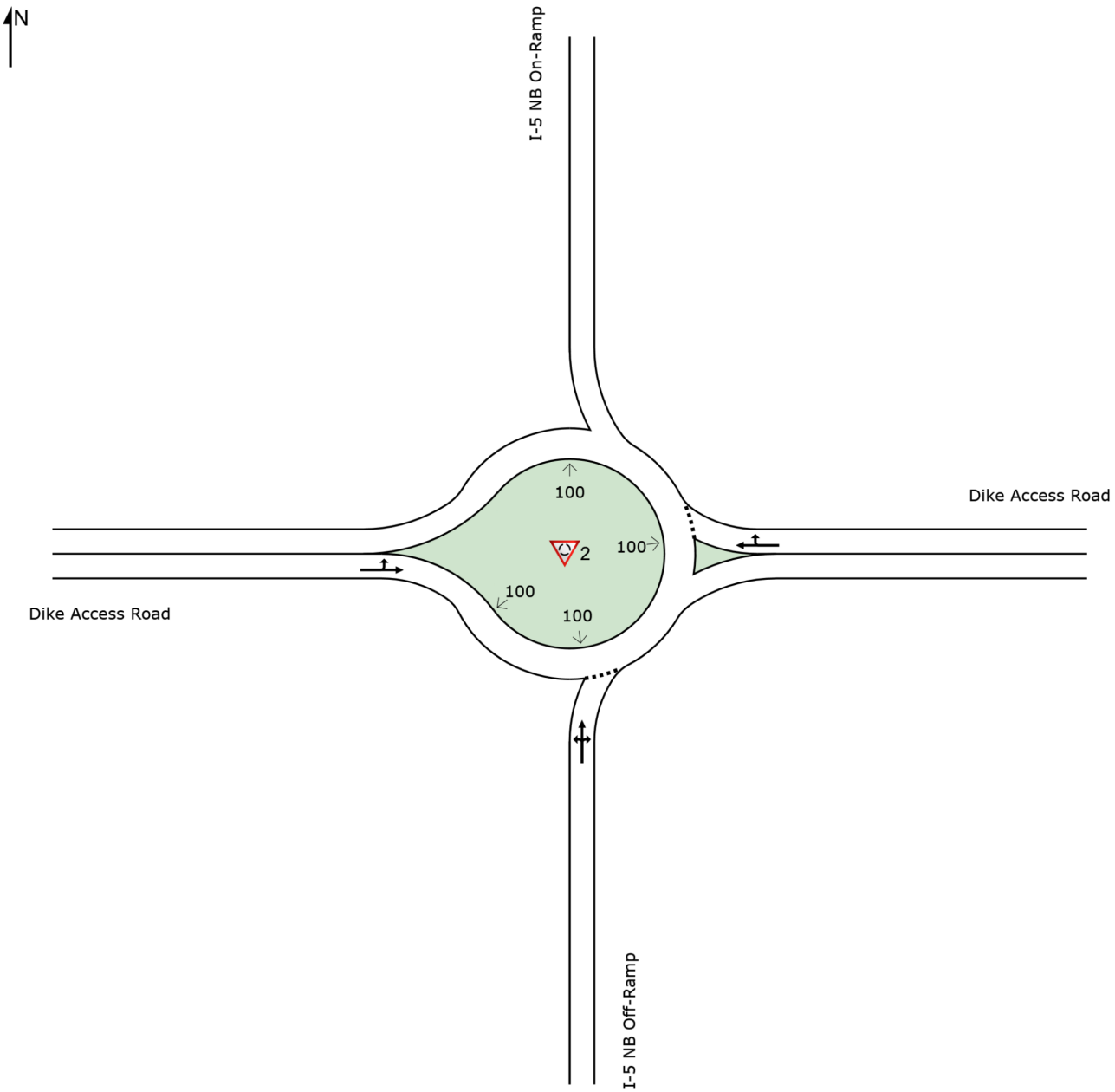

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Project: T:\Sidra\4855\3. Forecast 2025 with.sip9

MOVEMENT SUMMARY

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Forecast 2025 PM Peak Hour with Project
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Roundabout

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South: I-5 NB Off-Ramp														
3	L2	226	4.7	257	4.7	0.778	37.6	LOS D	11.2	290.4	1.00	1.40	2.08	25.1
8	T1	3	4.7	3	4.7	0.778	31.6	LOS C	11.2	290.4	1.00	1.40	2.08	25.1
18	R2	166	4.7	189	4.7	0.778	31.7	LOS C	11.2	290.4	1.00	1.40	2.08	24.5
Approach		395	4.7	449	4.7	0.778	35.1	LOS D	11.2	290.4	1.00	1.40	2.08	24.9
East: Dike Access Road														
6	T1	348	4.3	395	4.3	0.685	13.9	LOS B	7.7	199.8	0.93	1.08	1.30	32.6
16	R2	102	4.3	116	4.3	0.685	14.0	LOS B	7.7	199.8	0.93	1.08	1.30	31.7
Approach		450	4.3	511	4.3	0.685	13.9	LOS B	7.7	199.8	0.93	1.08	1.30	32.4
West: Dike Access Road														
5	L2	301	2.7	342	2.7	0.737	9.7	LOS A	0.0	0.0	0.00	0.51	0.00	37.0
2	T1	566	2.7	643	2.7	0.737	3.7	LOS A	0.0	0.0	0.00	0.51	0.00	37.0
Approach		867	2.7	985	2.7	0.737	5.8	LOS A	0.0	0.0	0.00	0.51	0.00	37.0
All Vehicles		1712	3.6	1945	3.6	0.778	14.7	LOS B	11.2	290.4	0.48	0.87	0.82	32.2

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Forecast 2025 PM Peak Hour with Project
Site Category: (None)
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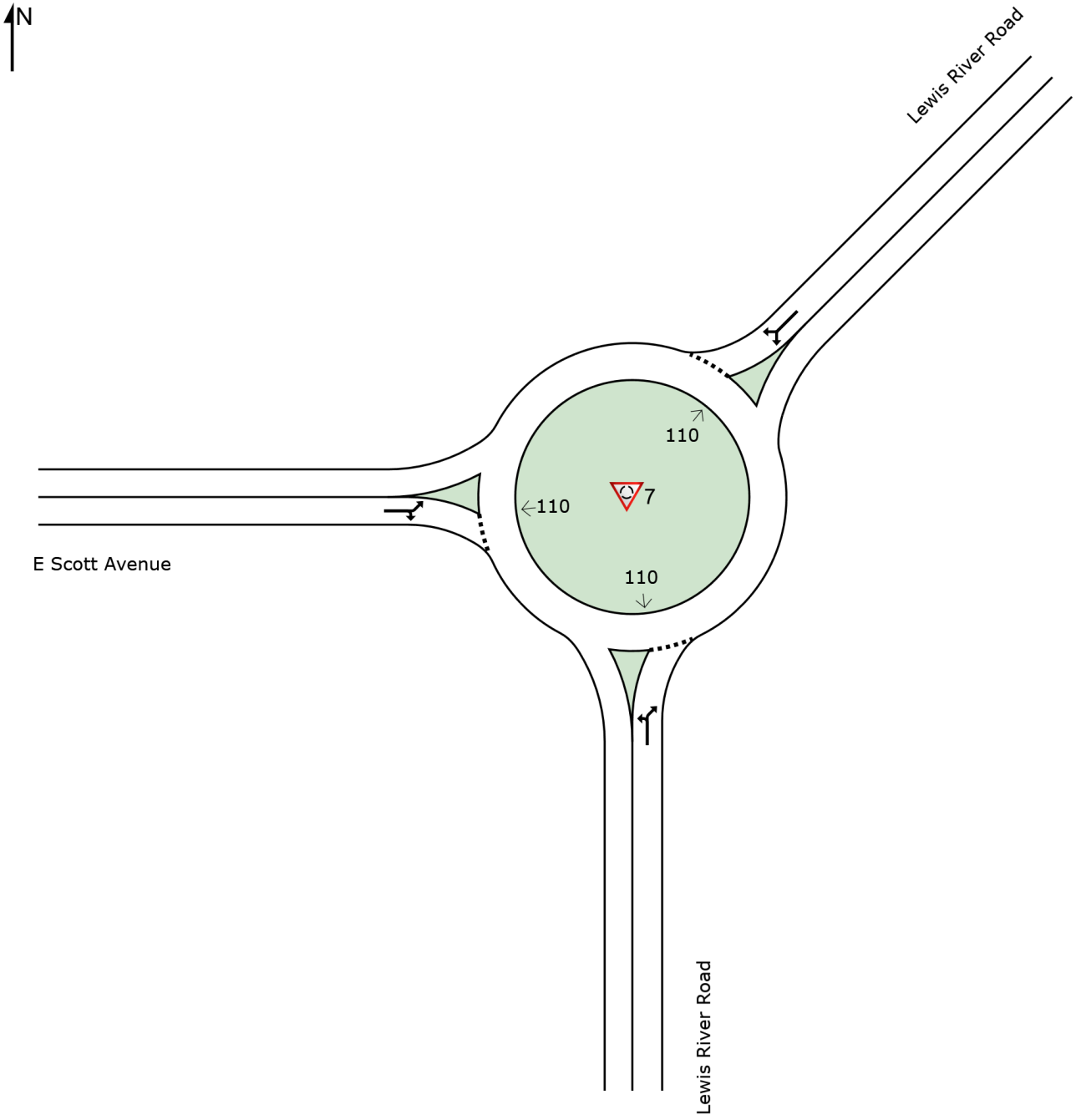

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Project: T:\Sidra\4855\3. Forecast 2025 with.sip9

MOVEMENT SUMMARY

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Forecast 2025 PM Peak Hour with Project
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Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] ft	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed mph
South: Lewis River Road														
3	L2	109	2.9	112	2.9	1.147	88.9	LOS F	69.9	1788.6	1.00	2.49	4.46	16.3
18a	R1	971	2.9	1001	2.9	1.147	82.2	LOS F	69.9	1788.6	1.00	2.49	4.46	16.2
Approach		1080	2.9	1113	2.9	1.147	82.9	LOS F	69.9	1788.6	1.00	2.49	4.46	16.3
NorthEast: Lewis River Road														
1ax	L1	557	5.1	574	5.1	0.643	9.6	LOS A	7.3	188.7	0.57	0.57	0.57	34.6
16ax	R1	204	5.1	210	5.1	0.643	4.2	LOS A	7.3	188.7	0.57	0.57	0.57	34.6
Approach		761	5.1	785	5.1	0.643	8.2	LOS A	7.3	188.7	0.57	0.57	0.57	34.6
West: E Scott Avenue														
5a	L1	359	7.0	370	7.0	0.518	14.6	LOS B	4.4	116.3	0.85	0.94	0.97	32.4
12	R2	27	7.0	28	7.0	0.518	9.7	LOS A	4.4	116.3	0.85	0.94	0.97	31.7
Approach		386	7.0	398	7.0	0.518	14.3	LOS B	4.4	116.3	0.85	0.94	0.97	32.3
All Vehicles		2227	4.4	2296	4.4	1.147	45.5	LOS D	69.9	1788.6	0.83	1.56	2.52	22.2

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
Intersection and Approach LOS values are based on average delay for all movements (v/c not used).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.