Exhibit 13

YORKSHIRE

Tumwater, WA

TRAFFIC IMPACT ANALYSIS (TIA)

August 22, 2023

HEATH & ASSOCIATES

Transportation Planning & Engineering

YORKSHIRE
TRAFFIC IMPACT ANALYSIS

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08/22/2023

August 22, 2023

Mary Heather Ames
City of Tumwater Transportation and Engineering
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Subject: Revisions to Yorkshire Traffic Impact Analysis

This letter is in response to Tumwater's review memo dated July 31, 2023 from Mary Heather Ames regarding the TIA for the Yorkshire project.

Pierce County Comments

- Please expand the study intersections for full build-out to include any intersections with 25 or more PM Peak Hour trips. I expect to see a few added intersections – most notably to the north on Littlerock and/or Tyee and perhaps to the east at Tumwater Boulevard and Henderson. This is not an exhaustive list.

  All AM and PM trip distribution figures have been adjusted to include any major intersection that supports more than 25 trips. The TIA has been updated accordingly.

- Study intersections for the initial evaluation should include the new roundabout on Tumwater Boulevard at Tyee, as well as the intersections on Tumwater Boulevard at Littlerock and the I-5 north- and south- bound ramps.

  The roundabouts listed above were analyzed as part of the revised TIA.

- Include a "Development Phases Summary Table" that summarizes all phases by year, land use being developed during that phase, amount of units/SF, and total for the development. Also include an "Analysis Scenarios Summary Table" that summarizes all analysis scenarios by year, roadway conditions assumptions, development assumptions, AM peak hour traffic volumes assumptions, and PM peak hour traffic volumes assumptions.

  The Project Description on page 3 of the revised TIA now includes a breakdown of the anticipated phases. Each phase is anticipated to have an approximate two-year horizon. Keeping with the original study, two analysis scenarios were performed: Phase 1 and Full Build. This is made clear in the revised TIA.

- Update the narrative to remove confusing language in identifying phases versus analysis scenarios and to clearly state assumptions.

  Comment acknowledged. Language has been updated.

- Section 3.1 Table 1 – What is the source of functional classification for the listed streets?

  The previously listed classifications were taken from a GIS map titled "Tumwater Streets" on the City's arcgis website page. The roadways are now simply labeled arterial, collector, etc. per Figure 2 of the TMP.

- Ensure that all traffic volumes are based on pre-COVID counts grown to current (2023) at a 2% rate.

  Only post-COVID volumes were available for the AM peak hour counts. These counts were adjusted by SCJ Alliance and have been previously approved by the city for use.

  All PM peak hour volumes, where available, were based on pre-COVID volumes. Post-COVID volumes (two intersections) utilized adjustment factors by comparing historic nearby pre-pandemic counts. Section 3.3 of the revised TIA describes how baseline 2023 volumes were established.

- Was non-motorist traffic from 2015 or 2022 grown to 2023?

  Pedestrian numbers are no longer listed in the TIA due to using historic counts. The previously referenced volumes were based on 2015 data. Existing non-motorist facilities are described in the revised TIA.

- Ensure that trip distributions/assignments add up across all intersections in the figures.

  Comment acknowledged.

- Section 3.2 Table 2 – we have a TIP for 2024 to 2029 at this point. Might as well use the most up to date information. Also double check dollar amounts.

  Table 2 in Section 3.2 has been updated to include the latest 2024 to 2029 TIP.

- Figure 5a does not show the complete trip distribution for project trips on Tumwater Boulevard and on Linderson Way. Additionally, Linderson Way should be labelled on the figure.

  The updated distributions include any intersection receiving 25 or more trips per the TAZ map provided by the Thurston Regional Planning Council (TRPC). Linderson Way is now labeled.

- Please note the degradation in LOS at Tumwater Boulevard & Linderson Way during the 2031 PM peak hour and provide mitigation.

  Per the TAZ map provided by the TRPC, the intersection of Tumwater Boulevard SW & Linderson Way SW supports 2.4% of project traffic. During the PM peak hour this equates to 11 trips. This is below the 25 trips analysis threshold and this intersection was therefore not included in analysis.

Please call if you require anything further.

Sincerely,

Aaron Van Aken, P.E., PTOE

YORKSHIRE
TRAFFIC IMPACT ANALYSIS

CONTENTS

TABLES

FIGURES

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TRAFFIC IMPACT ANALYSIS

1. INTRODUCTION

The main goals of this study focus on the analysis of existing roadway conditions and forecasts of newly generated project traffic. The first task includes the review of general roadway information on the adjacent street system, baseline vehicular volumes, and existing operational analysis. 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.

2. PROJECT DESCRIPTION

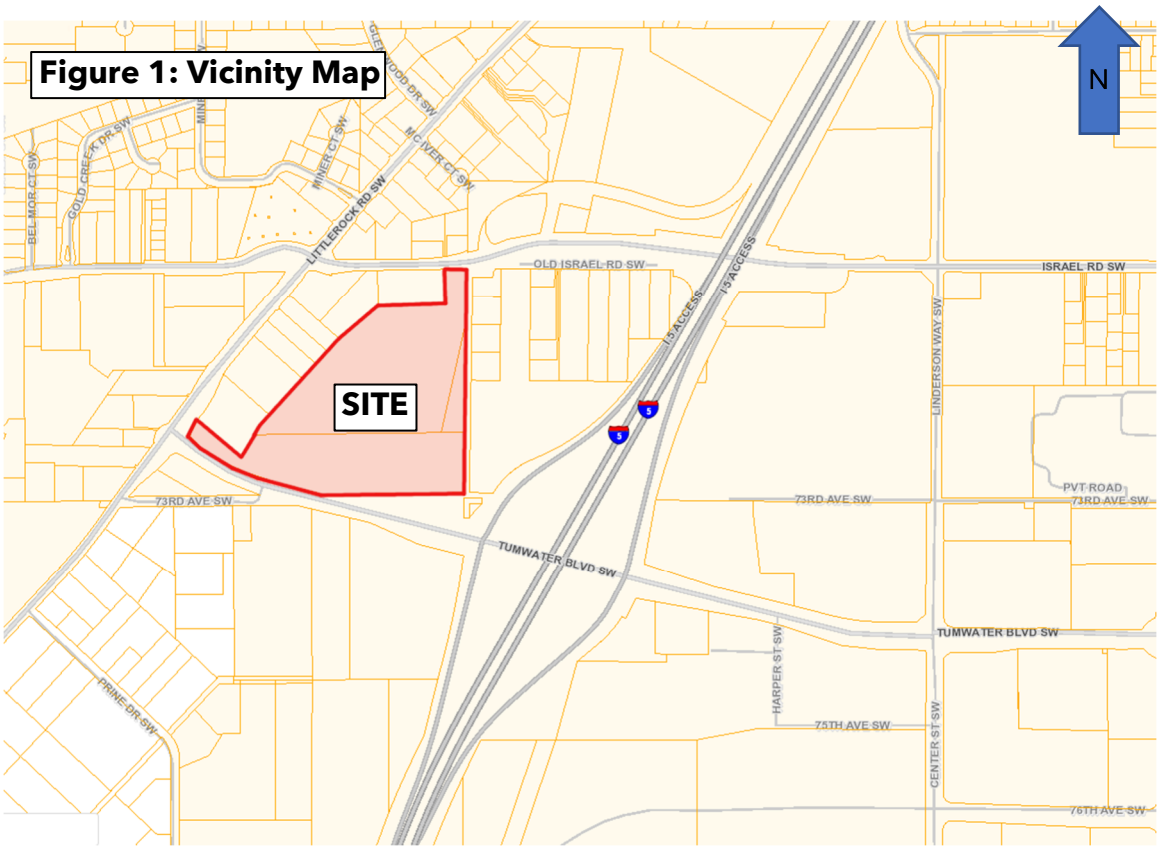
The Yorkshire project is a proposed mixed-use development comprised of approximately 1150 multi-family dwelling units, 324 self-storage units, and 9,000 square feet of commercial space located within the city of Tumwater. The subject site is situated on 25.52-acres of undeveloped land within tax parcel #'s: 127044-40103; -40100; -31300 (see Figure 1 for vicinity map). The development is intended to be constructed in a total of four phased segments. A total of seven residential buildings (with Building 4 containing the commercial space) and a single self-storage building are proposed. The phasing of the project is planned as follows:

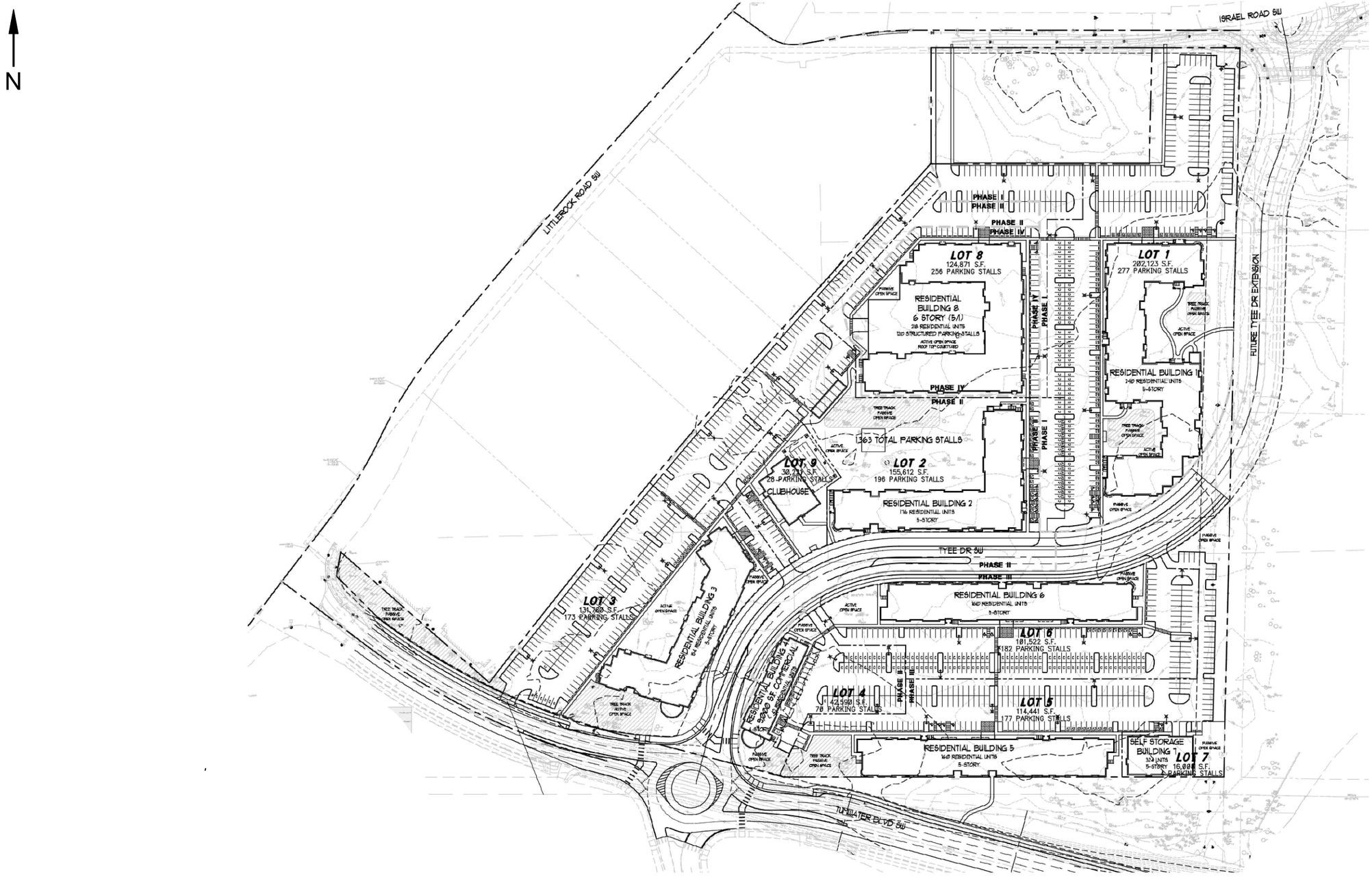
Phase 1: Residential Building 1 – 240 dwelling units (d.u.)
Phase 2: Residential Building 2 – 176 d.u.
Residential Building 3 – 154 d.u.
Residential Building 4 – 42 d.u. and 9,000 s.f. commercial space
Phase 3: Residential Building 5 – 160 d.u.
Residential Building 6 – 160 d.u.
Self-Storage Building 7 – 324 storage units
Phase 4: Residential Building 8 – 218 d.u.

The initial phase—Phase 1—would begin with Residential Building 1 totaling 240 multi-family dwelling units and is anticipated to be constructed within two years. The balance of construction is proposed to be completed in three additional phases with two years assumed for each phase. This report groups Phases 2-4 under a Full Build scenario at an assumed buildout year of 2031.

Access for Phase 1 is proposed via a single right-in, right-out access onto Israel Road SW located just west of the Tyee Drive SW intersection. Phase 1 will not construct any portion of the Tyee Drive SW connection.

The Full Build scenario is to encompass full north-south connectivity through the site by means of an extension of Tyee Drive SW. This extension will run through the site and extend Tyee Drive SW from the Israel Road SW intersection to Tumwater Boulevard SW, which will include construction of a new roundabout. The right-in, right-out access onto Israel Road SW is anticipated to remain at full build but is subject to City approval. A second right-in, right-out access onto Tumwater Boulevard SW near the western edge of the site will be constructed during Phase 2.





SITE PLAN

SCALE: 1"=80'

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3. EXISTING CONDITIONS

3.1 Existing Street System

The major roadways serving the subject site are listed and described in Table 1 below.

Table 1: Roadway Network

Functional Classification	Roadway	Speed Limit	Lanes	Street Parking	Sidewalk	Bike Facilities
Arterial	Tumwater Blvd SW	35 mph	Multi	No	~340 w/o I-5 Ramps	
Arterial	Littlerock Rd SW	20-35 mph	2-5	No	n/o Tumwater Blvd SW	
Collector	70th Ave SW/Israel Rd SW	20-35 mph	2-3	No	e/o Tumwater Place Office Park	
Arterial	Tyee Dr SW	25 mph	2-3	No	Yes	Yes

3.2 Roadway Improvements

A review of the City of Tumwater's Six Year Transportation Improvement Program 2024-2029 indicates that improvement projects are planned in the vicinity. Descriptions and summaries of each project are provided in Table 2 below.

Table 2: Transportation Improvement Projects

Name	Improvement	Cost
Tumwater Boulevard Interchange (Map ID# 7)	Design, acquire ROW, and construct improvements to the Tumwater Blvd/I-5 Interchange. Phased project with an interim signal followed by a roundabout, a second roundabout and overpass widening. Funds shown are for a temporary signal and two roundabouts. This project is listed as partially funded. *This project is being coordinated with WSDOT*	$13,950,000
Trosper Road, Littlerock Road to I-5 (Map ID# 8)	Planning and preliminary engineering for future project to address capacity and safety issues.	$200,000
Israel Road & Linderson Way Pedestrian & Bicycle Improvements (Map ID# 25)	Roadway and multi-modal improvements: refuge island, signal improvements, reconstruction of sidewalk, curb ramps, bike lanes, etc.	$1,985,000

As previously mentioned, this report will analyze the Full Build site at a horizon year of 2031. For this future analysis it is assumed that the I-5 and Tumwater Boulevard SW interchange will have both ramps constructed as roundabouts. Preliminary geometry of both roundabouts was provided by the city of Tumwater and is shown in the level of service analysis outputs, which can be found in the appendix.

3.3 Existing Peak Hour Volumes and Travel Patterns

Vehicular turning movement counts were obtained from the City, our firm and SCJ Alliance at the following intersections to determine existing roadway operations and capacity analysis:

1. Israel Road SW & Littlerock Road SW (City – 6/24/2015)
2. Israel Rd SW & Tyee Drive SW (Heath – 5/11/2022)
3. Israel Rd SW & Linderson Way SW (AM: SCJ – 7/26/2022, PM: City – 6/24/2015)
4. Tumwater Boulevard SW & Littlerock Rd SW (City – 6/24/2015)
5. Tumwater Blvd SW & Southbound I-5 Ramp (AM: SCJ – 7/26/2022, PM: City – 6/24/2015)
6. Tumwater Blvd SW & Northbound I-5 Ramp (AM: SCJ – 7/26/2022, PM: City – 6/24/2015)
7. Capitol Boulevard & Israel Road (City - 6/24/2015)
8. Tumwater Boulevard & Capitol Boulevard (City - 6/24/2015)
9. Tumwater Blvd SE & Henderson Blvd SE (City - 11/13/2014)
10. Littlerock Rd SW & Miner Dr SW (Heath – 8/17/2023)
11. Littlerock Rd SW & Kingswood Dr SW (City - 11/13/2014)

AM Peak Hour Analysis

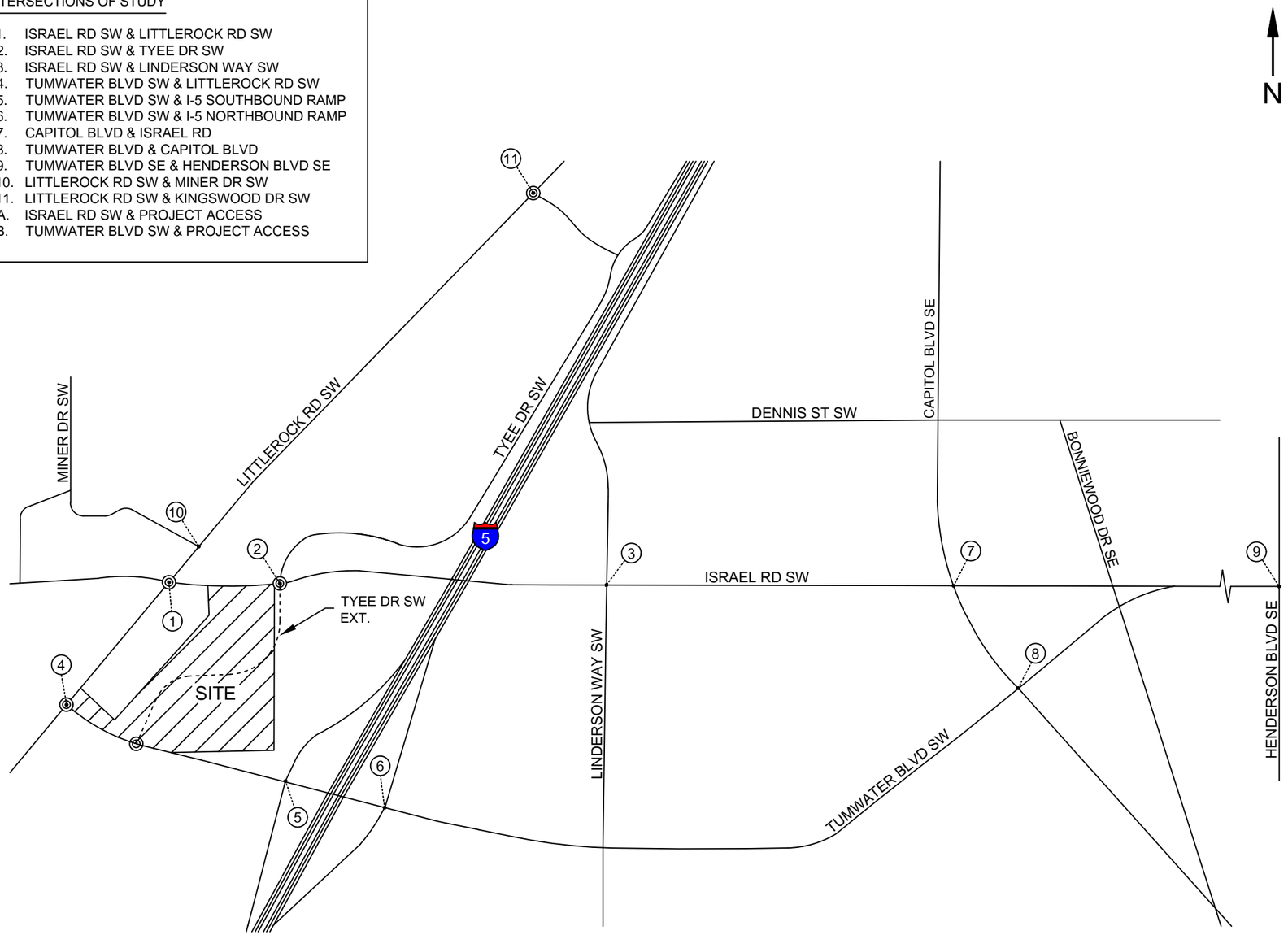
A total of three intersections were requested by the City for AM evaluation (#3, #5, & #6). All field data was gathered from 7:00 AM - 9:00 AM. The one-hour which reflects the highest volumes from each field count, known as the peak hour, is then used for analysis to identify operations at peak congestion. AM peak hour data used for analysis was derived from a previous SCJ Alliance study that established adjustment factors at the above listed intersections to account for travel pattern skews associated with COVID-19. Volumes in the vicinity are still below pre-pandemic levels due to many State office buildings being vacant (located northwest of Tumwater Blvd SW & Linderson Way SW).

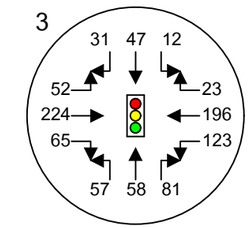
Adjustment factors were established by SCJ Alliance by a historic count comparison to reflect current volumes retuning back to pre-COVID levels. Baseline 2023 AM peak hour volumes are presented in Figure 3. Full count sheets and adjustment factors are attached in the appendix.

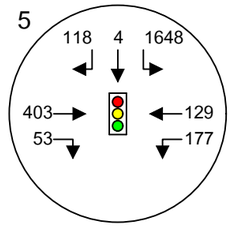
INTERSECTIONS OF STUDY

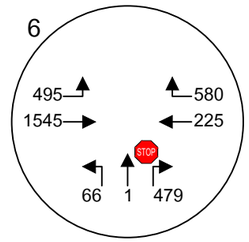
1. ISRAEL RD SW & LITTLEROCK RD SW
2. ISRAEL RD SW & TYEE DR SW
3. ISRAEL RD SW & LINDERSON WAY SW
4. TUMWATER BLVD SW & LITTLEROCK RD SW
5. TUMWATER BLVD SW & I-5 SOUTHBOUND RAMP
6. TUMWATER BLVD SW & I-5 NORTHBOUND RAMP
7. CAPITOL BLVD & ISRAEL RD
8. TUMWATER BLVD & CAPITOL BLVD
9. TUMWATER BLVD SE & HENDERSON BLVD SE
10. LITTLEROCK RD SW & MINER DR SW
11. LITTLEROCK RD SW & KINGSWOOD DR SW

A. ISRAEL RD SW & PROJECT ACCESS
B. TUMWATER BLVD SW & PROJECT ACCESS









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BASELINE 2023 AM PEAK HOUR VOLUMES
FIGURE 3

PM Peak Hour Analysis

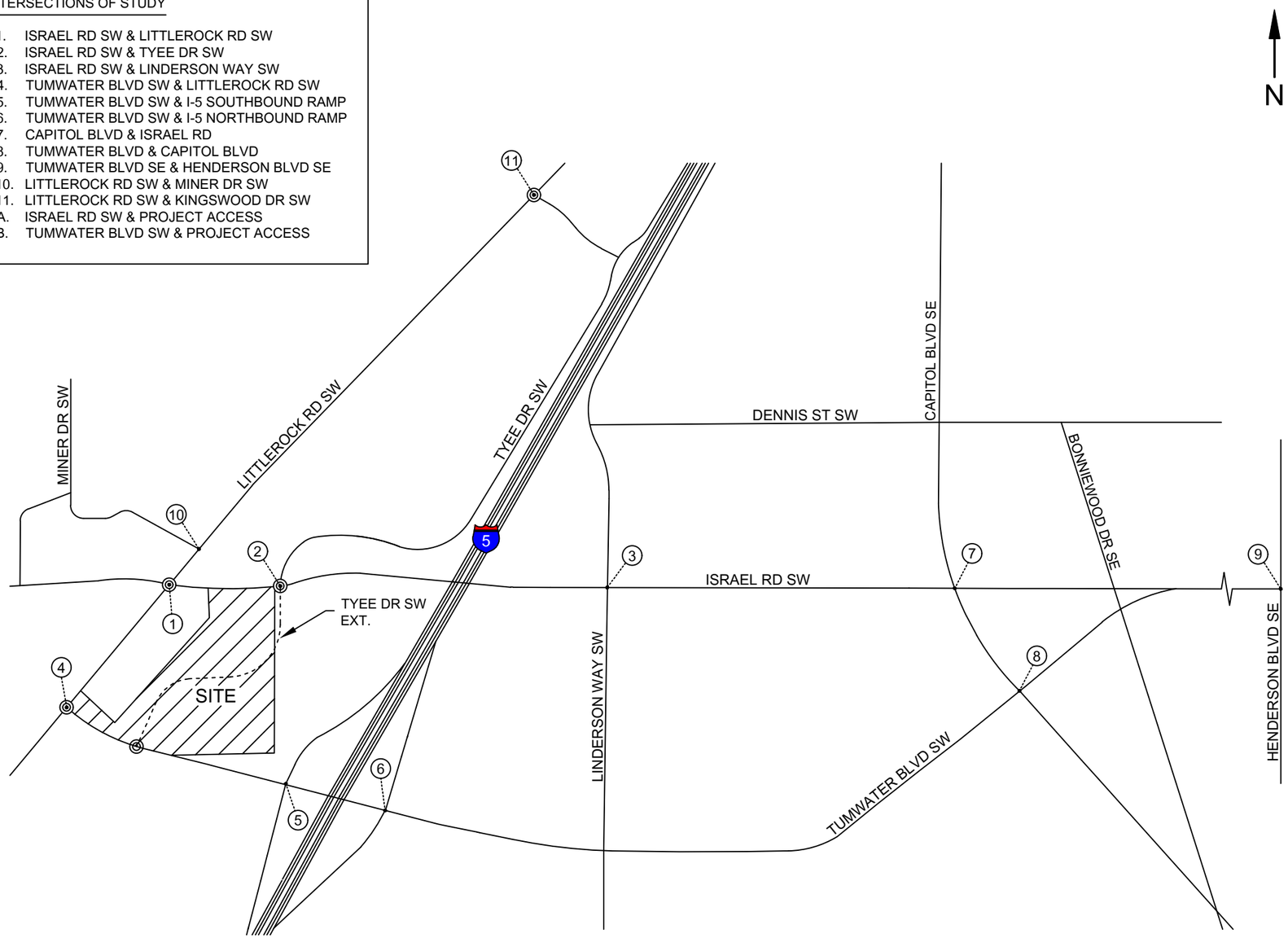
Discussions with the City of Tumwater indicated a preference to utilize pre-COVID data. As such, counts captured by the City in 2015 were primarily utilized for analysis. As no historic count data were available at Tyee Drive & Israel Road SW and Littlerock Rd SW & Miner Dr SW, our firm collected counts in May of 2022 and August of 2023, respectively. All field data was gathered from 4:00 PM - 6:00 PM, with the peak hour then being derived and for analysis to identify operations at peak congestion.

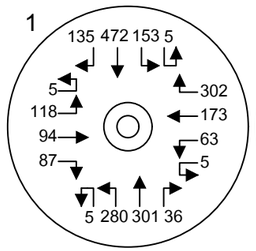
Per discussions with the City, historic 2015 turning movement counts were grossed up by a compound annual growth rate of 2.0 percent to establish baseline 2023 PM peak hour conditions. Volumes at Tyee Drive SW & Israel Road SW were grossed up by 24% to account for travel pattern skews associated with COVID-19. This rate was derived by comparing historic 2015 and 2022 volumes at the nearby intersection of Littlerock Road SW & 70th Avenue SW/Israel Road SW.

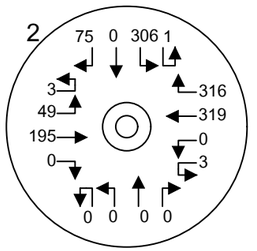
The intersection of Littlerock Road SW & Miner Drive SW had volume changes based on the adjusted 2023 PM peak hour volumes at Littlerock Road SW & Israel Road SW. By comparing shared north-south volumes these two intersections would support it was found that volumes at the Littlerock Road SW & Miner Drive SW intersection needed to be adjusted up by 48 percent. Baseline 2023 PM peak hour volumes are presented in Figure 4. Full count sheets have been attached in the appendix.

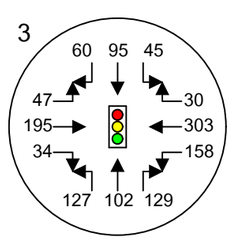
INTERSECTIONS OF STUDY

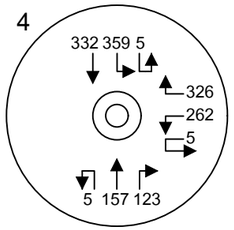
1. ISRAEL RD SW & LITTLEROCK RD SW
2. ISRAEL RD SW & TYEE DR SW
3. ISRAEL RD SW & LINDERSON WAY SW
4. TUMWATER BLVD SW & LITTLEROCK RD SW
5. TUMWATER BLVD SW & I-5 SOUTHBOUND RAMP
6. TUMWATER BLVD SW & I-5 NORTHBOUND RAMP
7. CAPITOL BLVD & ISRAEL RD
8. TUMWATER BLVD & CAPITOL BLVD
9. TUMWATER BLVD SE & HENDERSON BLVD SE
10. LITTLEROCK RD SW & MINER DR SW
11. LITTLEROCK RD SW & KINGSWOOD DR SW
A. ISRAEL RD SW & PROJECT ACCESS
B. TUMWATER BLVD SW & PROJECT ACCESS

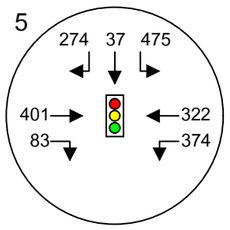


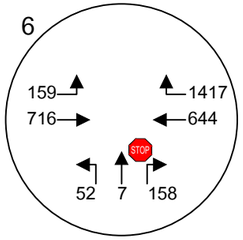


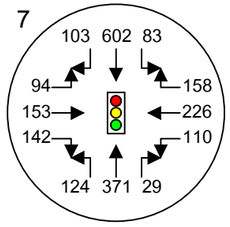


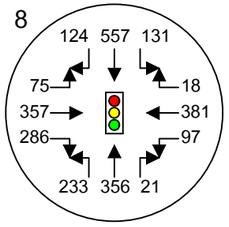


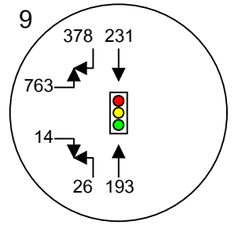


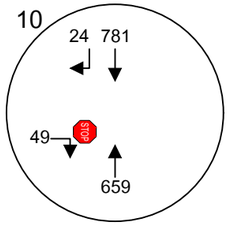


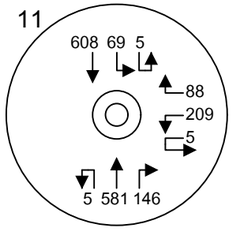












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BASELINE 2023 PM PEAK HOUR VOLUMES
FIGURE 4

3.4 Existing Level of Service

Baseline intersection delays were determined through the use of the *Highway Capacity Manual, 7*th 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 with the former indicating the best operating conditions with low control delays and the latter indicating the worst conditions with heavy control delays. Detailed descriptions of intersection LOS are given in the Highway Capacity Manual.

Level of service calculations were made through the use of the *Synchro 12* analysis program for stop-controlled and signalized intersections. *SIDRA 9* was used for roundabout analysis. Delays presented represent overall weighted average delays for roundabout and signalized control. For side-street, stop-controlled intersections, LOS is determined by the approach with the highest delay. Table 3, on the following page, portrays baseline 2023 AM and PM peak hour LOS delays for the key intersections of study.

[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, 7th Edition

Table 3: Baseline 2023 Weekday Peak Hour Level of Service

Delays given in seconds per vehicle

Ref. #	Intersection	Control	AM Peak Hour		PM Peak Hour	
			LOS	Delay	LOS	Delay
1	Israel Rd SW & Littlerock Rd SW	RAB	-	-	A	8.7
2	Israel Rd SW & Tyee Dr SW	RAB	-	-	A	6.5
3	Israel Rd SW & Linderson Way SW	Signal	B	14.6	B	17.3
4	Tumwater Blvd SW & Littlerock Rd SW	RAB	-	-	A	7.5
5	Tumwater Blvd SW & I-5 Southbound Ramp	Signal	F	100+	C	27.2
6	Tumwater Blvd SW & I-5 Northbound Ramp	TWSC	F	100+	F	100+
7	Capitol Blvd & Israel Rd	Signal	-	-	C	21.7
8	Tumwater Blvd & Capitol Blvd	Signal	-	-	C	25.4
9	Tumwater Blvd SE & Henderson Blvd SE	Signal	-	-	D	41.9
10	Littlerock Rd SW & Miner Dr SW	TWSC	-	-	C	16.0
11	Littlerock Rd SW & Kingswood Dr SW	RAB	-	-	A	6.0

TWSC: Two-Way Stop Control; RAB: Roundabout

The city of Tumwater maintains a level of service standard of D or better at the intersections of study. With the exception of Tumwater Boulevard SW & I-5 interchange, baseline 2023 peak hour delays are all shown to fall within the LOS D or better range indicating stable operations during the critical peak hour of travel. It should be noted that significant and conservative adjustment factors were added to the I-5 Tumwater ramps to account for commercial-related traffic volumes returning subsequent to COVID-19's travel impacts. As such, existing delays may not be as substantial as reported.

3.5 Non-Motorist Facilities

Israel Road SW currently supports bike lanes and sidewalk along the project frontage. Crosswalks are provided at major intersections. Likewise, Tyee Drive SW and Littlerock Road SW (north of Tumwater Boulevard SW) both have bike lanes, sidewalks, and marked crossings.

Sidewalk is currently unavailable along the Tumwater Boulevard SW project frontage. Project frontage improvements will include sidewalk and bike lanes. The future improvements at the I-5 Interchange on Tumwater Boulevard SW

are expected to connect pedestrian facilities to existing infrastructure just east of the northbound ramps.

School-aged children would likely attend either Michael T Simmons Elementary or Tumwater Middle School. Continuous sidewalk and bike lane routes are provided between the subject site and Tumwater Middle School. Elementary school-aged children would have access to school bus services, as the facility is in excess of 2-miles walking-distance from the subject site.

3.6 Transit Service

A review of Intercity Transit and Twin Transit service systems indicates that Routes 12, 13 and the Green Line are within walking distance of the proposed Yorkshire development. Specifications of these service lines are summarized in Table 4 below.

Table 4: Bus Routes

Route	Description	Weekday Service	Saturday	Sunday	Nearest Stop
12	West Tumwater: Olympia TC to L&I Building	6:00 AM – 9:09 PM (every ~30 min.)	7:30 AM – 9:09 PM (every ~30 min.)	7:30 AM – 7:39 PM (every ~30 min.)	Project Israel Rd Frontage
13	East Tumwater: Olympia TC to L&I Building	6:15 AM – 9:09 PM (every ~30 min.)	7:45 AM – 9:09 PM (every ~30 min.)	7:45 AM – 9:09 PM (every ~30 min.)	~2,400'
Green Line	Olympia: Mellen St e-Transit Station to Olympia TC	7:00 AM – 6:00 PM (every ~120 min.)	8:00 AM – 3:00 PM (every ~120 min.)	8:00 AM – 3:00 PM (every ~120 min.)	~2,550'

Given the proximity to frequent transit service, use can be expected from the incoming project. Refer to the Intercity Transit and Twin Transit service schedules for more detailed information.

4. FORECAST TRAFFIC DEMAND & ANALYSIS

4.1 Project Trip Generation

Phase 1

Phase 1 of the proposed development plans to construct Residential Building 1 that will support a total of 240 dwelling units. Vehicle trip generation for the proposed project was derived from the Institute of Transportation Engineers (ITE) publication, *Trip Generation Manual,* 11th Edition. The utilized Land Use Code (LUC) for Phase 1 is defined under ITE's *LUC 221 – Multifamily Housing (Mid-Rise).* Dwelling units were applied as the input variable and average rates were used in determining trip ends.

Table 5: Phase 1 - Project Trip Generation

Land Use	Variable	AWDT	AM Peak-Hour Trips			PM Peak-Hour Trips		
			In	Out	Total	In	Out	Total
Multi-Family (Mid-Rise) – LUC 221	240 D.U.	**1090**	20	69	**89**	57	37	**94**

Based on ITE data, Phase 1 of the project is estimated to generate approximately 1,090 daily weekday trips with 89 trips (20 inbound / 69 outbound) occurring in the AM peak hour and 94 trips (57 inbound / 37 outbound) In the PM peak hour.

Full Build:

The utilized Land Use Codes (LUC) at Full Build are defined under ITE's *LUC 221 – Multifamily Housing (Mid-Rise), LUC 151-Mini-Warehouse, and LUC – 712 Small Office Building*. For the self-storage component in Phase 3, *LUC 151 – Mini-Warehouse* using storage units was used to derive trips. However, it should be taken into consideration that the self-storage is primarily intended and expected to be utilized by residents from the multi-family portion of the project where trips would remain internal to the site. Moreover, no tenant is established at the time of the evaluation for the commercial space. Therefore, *LUC 712 – Small Office* was utilized as a probable tenant assumption. See Table 6 on the following page for the Full Build trip generation summary.

Table 6: Full Build-Out - Project Trip Generation

Land Use	Variable	AWDT	AM Peak-Hour Trips			PM Peak-Hour Trips		
			In	Out	Total	In	Out	Total
Multi-Family (Mid-Rise) – LUC 221	1150 D.U.	5221	98	328	426	274	175	449
Mini-Warehouse – LUC 151	324 units	58	2	2	4	2	3	5
Small Office–LUC 712	9.0 KSF	130	12	3	15	6	13	19
Total Project Trips		**5409**	112	333	**445**	282	191	**473**

Based on ITE data, full buildout of the project is estimated to generate approximately 5,409 daily weekday trips with 445 trips (112 inbound / 333 outbound) occurring in the AM peak hour and 473 trips (282 inbound / 191 outbound) in the PM peak hour.

4.2 Distribution and Assignment

Phase 1: Trip Distribution & Assignment
Phase 1 trip distribution and assignment was based on Thurston Regional Planning Council's (TRPC) Transportation Analysis Zone (TAZ) 259. The modeling for Phase 1 assumed only connectivity to and from the north by way of a new right-in, right-out access onto Israel Road SW. Phase 1 will not include any segment of the Tyee Drive SW Extension. See Figure 5 and Figure 6 for AM and PM peak hour Phase 1 trip distributions and assignments. Included are the project's total AM and PM peak hour trips as identified in Table 5.

Full Build: Trip Distribution & Assignment
The full build trip distribution and assignment was similarly based on TAZ 259. However, the Full Build scenario encompasses full project build-out with a Tyee Road SW connection northerly to Israel Road SW and southerly to Tumwater Boulevard SW, which will be constructed with a new roundabout. This is anticipated to yield a change of overall project-generated assignment patterns, which are shown in Figures 7 and Figure 8. Included are the total project's AM and PM peak hour trips as identified in Table 6.

Two right-in, right-out entrances are proposed with one onto Israel Road SW and one onto Tumwater Boulevard SW. For a conservative analysis all project-generated trips were consolidated to the existing roundabout at Israel Road

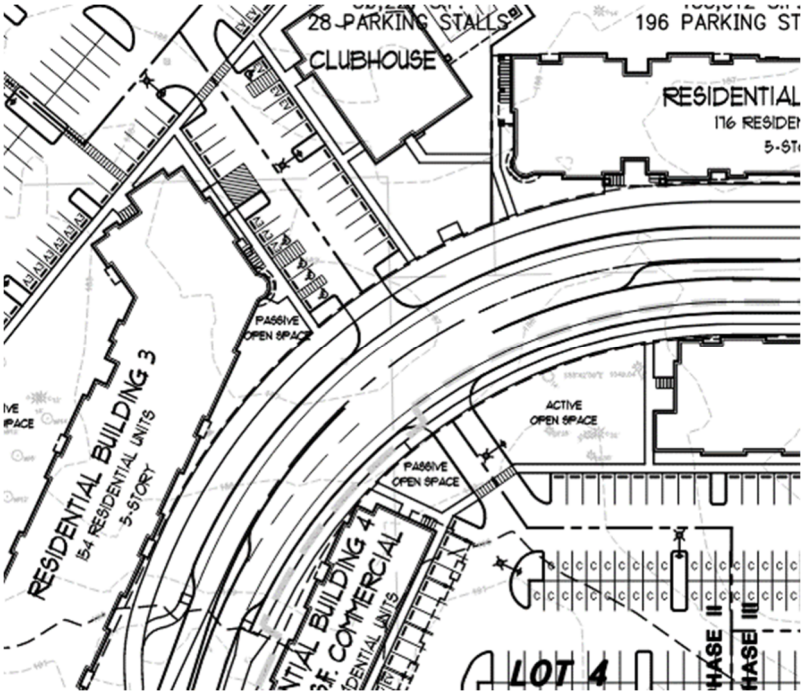
SW & Tyee Drive SW and at the proposed roundabout at Tumwater Boulevard SW & Tyee Drive SW. See appendix for complete TAZ maps.

Lastly, project-generated trips anticipated to travel through the Tumwater I-5 Interchange to the south as identified from the TAZ 259 map are outlined in the respective trip distribution figures. Fore Phase 1, approximately 14 AM and 26 PM peak hour project trips are identified to travel through the I-5 interchanges. At Full Build, approximately 214 AM and 228 PM peak hour total project trips are anticipated to impact the intersections.

Tyee Drive SW Extension – Cross-Section

Additional analysis was conducted to determine whether the Tyee Drive extension through the project site (between Israel and Tumwater Blvd) could be a three-lane cross-section as opposed to a five-lane. The report (attached) evaluated a comprehensive growth analysis of several undeveloped parcels in addition to existing travel patterns. In working with TRPC for modeling and the City of Tumwater, the analysis indicated a three-lane cross-section would maintain acceptable volume-to-capacity ratios under the forecast 2050 peak hour scenario. Therefore, the Tyee Drive extension would comprise a three-lane section.

With roundabouts at either end of the Tyee Drive extension, all driveways along the corridor would be restricted to right-turns only with the exception of left-turns being permitted at the southernmost driveways (shown to the right).



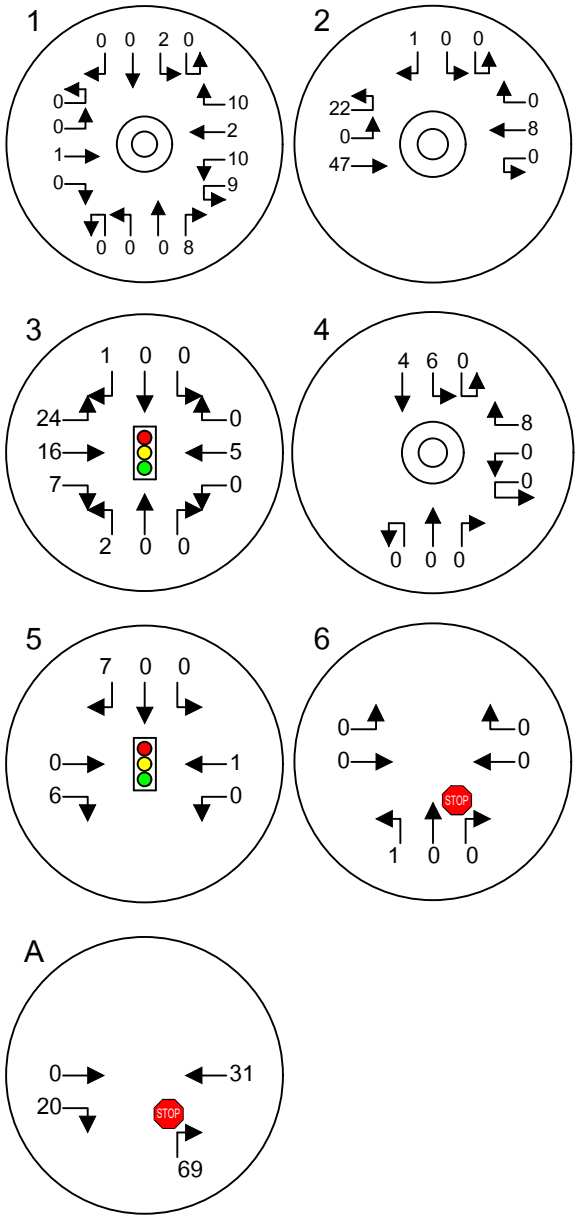
4.3 Future Peak Hour Volumes

A 3-year horizon of 2026 was used for Phase 1 future traffic delay analysis. An 8-year horizon of 2031 was used for Full Build future traffic delay analysis. Forecast background traffic volumes were derived by applying a 4 percent compound annual growth rate to the baseline 2023 AM and PM peak hour volumes shown in Figures 3 and 4. This growth rate was required by the City during the scoping process. Moreover, pipeline volumes associated with the following projects were included in future traffic estimations: Belmont Flats, Bertch Thurston County, Bishop Road Apartments, Kingswood Apartments, Kingswood Commercial, Kirsop Crossing, Littlerock Storage, L & I Training Center, New Market Apartments, OSOS Library Archive Building, Skyview Estates, South Sound Commerce Center, Trestlewood, and Tyee Landing Apartments.

AM pipeline volumes were derived from the PM summations in the appendix as trip distributions during the AM time periods were not available for most pipeline projects. Directional splits were reversed to account for the change in travel patterns typically seen between AM and PM peak hours of travel. AM and PM peak hour pipeline volumes are illustrated in Figure 9 and Figure 10 in the appendix.

Forecast 2026 PM peak hour volumes without project-generated traffic is illustrated in Figure 11. Figure 12 shows forecast 2026 PM peak hour volumes with Phase 1 traffic. As overall trip generation and impacts to the surrounding roadway system lower for Phase 1 when compared with the full build-out scenario, only the right-in, right-out access is analyzed under this scenario. Through volumes at the access were obtained from the Israel Road SW & Littlerock Road SW intersection (Intersection #1) as volumes at this intersection is based on historic, pre-Covid data.

Forecast analysis with project encompasses a new north-south Tyee Drive SW connection between Israel Road SW and Tumwater Road SW. This new roadway connection is anticipated to reroute/redistribute traffic on the surrounding roadway system. The new route will serve local access to/from the Tumwater Boulevard / I-5 Interchanges and commercialism along Tyee Drive SW to the north. Rerouted traffic volumes that were applied to Figure 16 (Full Build-forecast 2031 PM peak hour volumes with project), and are based off of TRPC modeling, are illustrated in Figure A in the appendix. Forecast 2031 AM and PM peak hour background volumes (pipeline and growth rate) are illustrated in Figures 13 and 14. Figures 15 and 16 illustrate forecast 2031 PM peak hour volumes with Full Build project traffic included, respectively.



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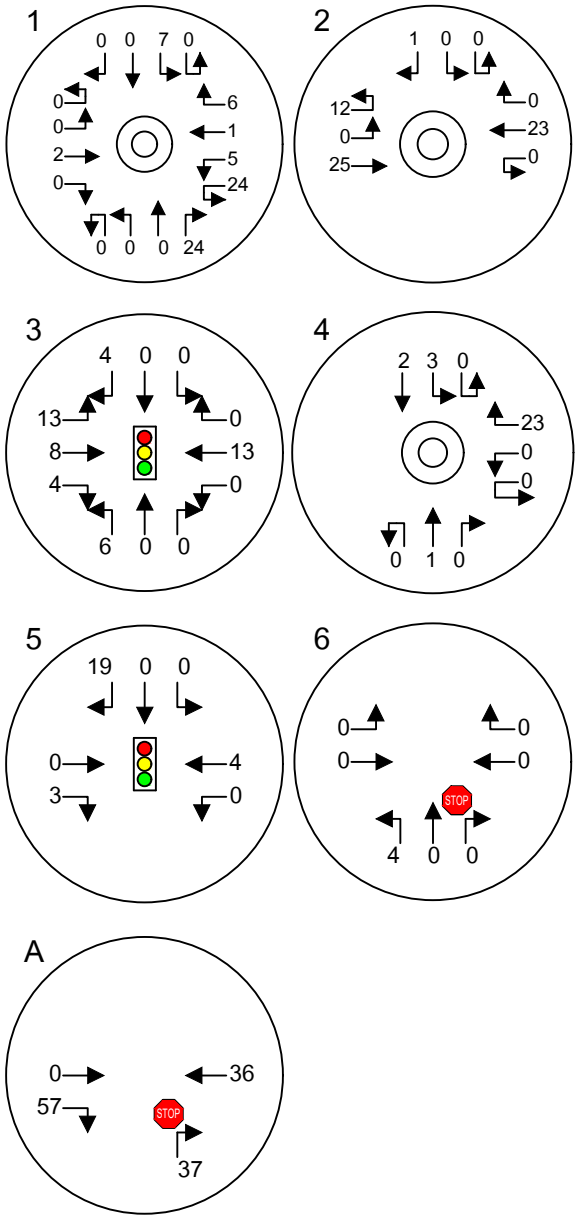
PHASE 1: AM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT
FIGURE 5

INTERSECTIONS OF STUDY

1. ISRAEL RD SW & LITTLEROCK RD SW
2. ISRAEL RD SW & TYEE DR SW
3. ISRAEL RD SW & LINDERSON WAY SW
4. TUMWATER BLVD SW & LITTLEROCK RD SW
5. TUMWATER BLVD SW & I-5 SB RAMPS
6. TUMWATER BLVD SW & I-5 NB RAMPS
A. ISRAEL RD SW & PROJECT ACCESS



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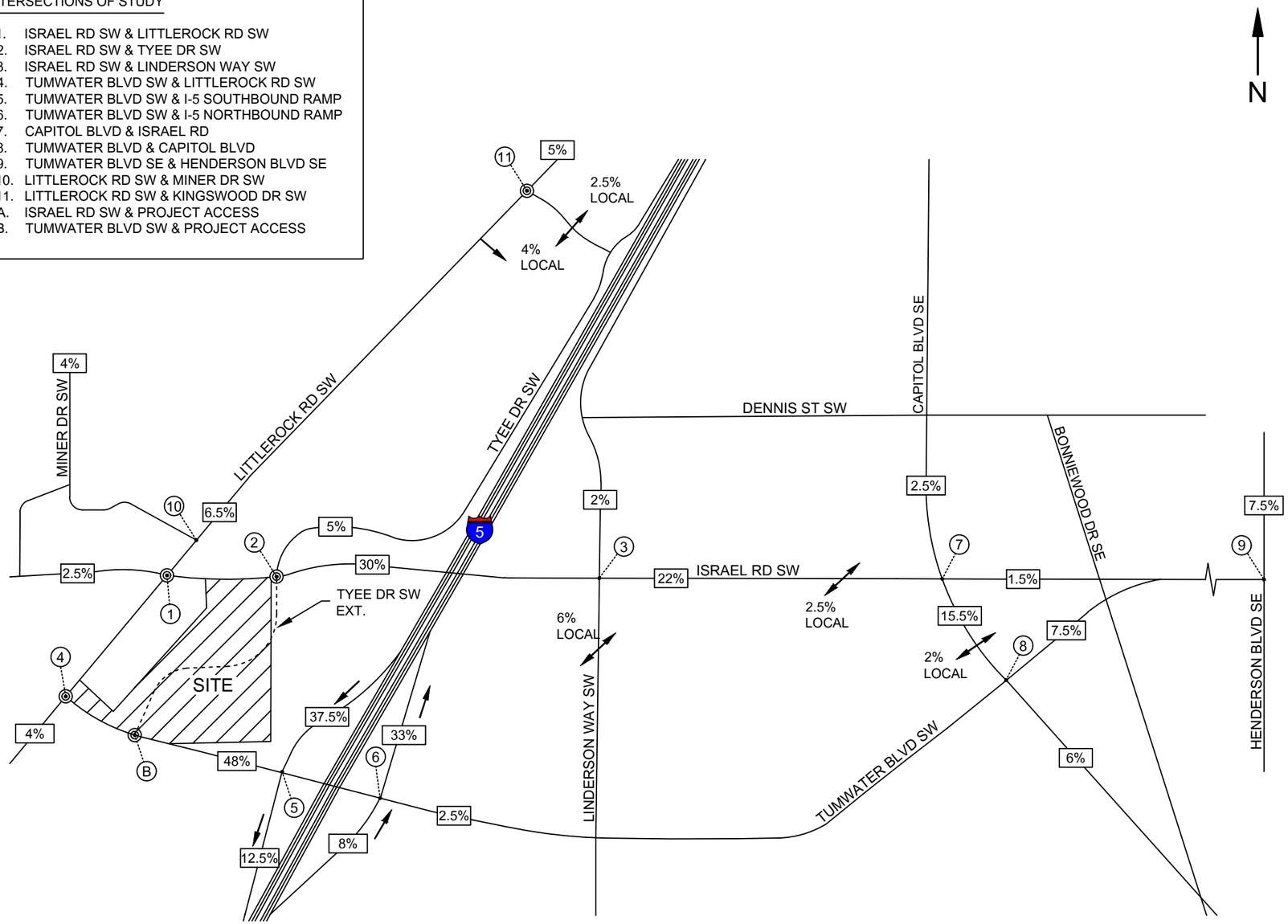
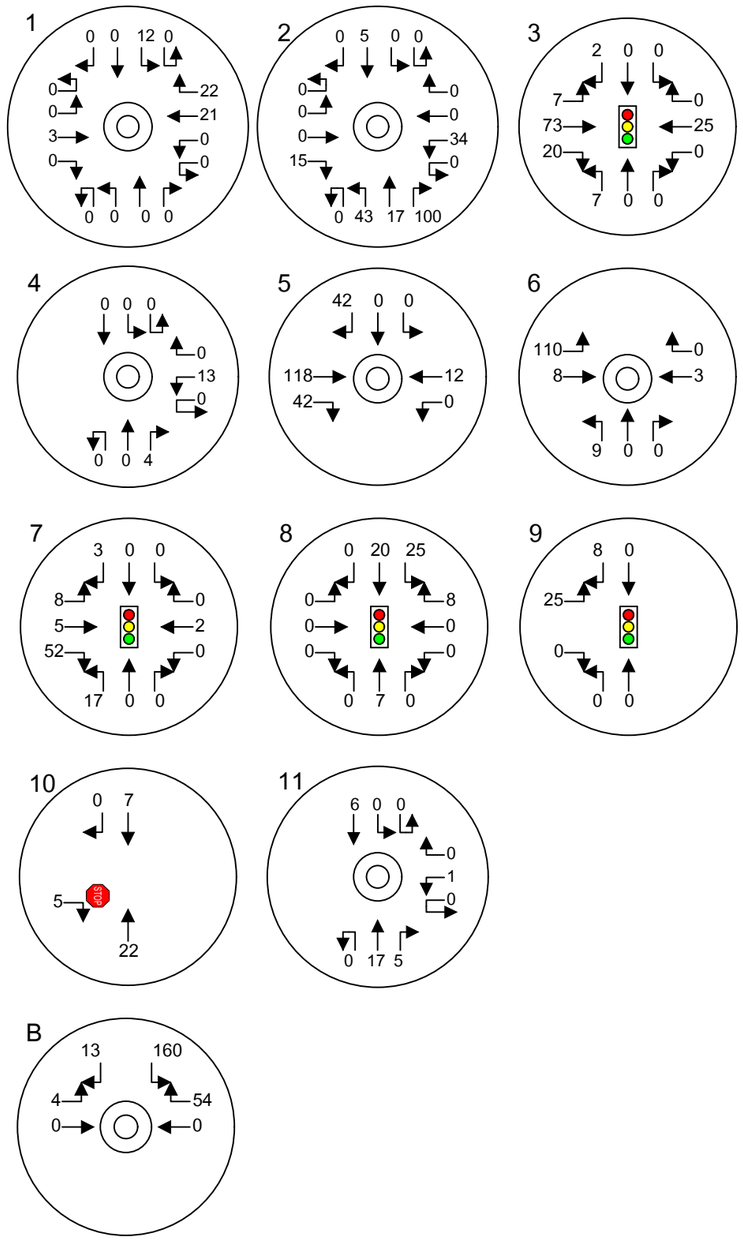
PHASE 1: PM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT
FIGURE 6

INTERSECTIONS OF STUDY

1. ISRAEL RD SW & LITTLEROCK RD SW
2. ISRAEL RD SW & TYEE DR SW
3. ISRAEL RD SW & LINDERSON WAY SW
4. TUMWATER BLVD SW & LITTLEROCK RD SW
5. TUMWATER BLVD SW & I-5 SOUTHBOUND RAMP
6. TUMWATER BLVD SW & I-5 NORTHBOUND RAMP
7. CAPITOL BLVD & ISRAEL RD
8. TUMWATER BLVD & CAPITOL BLVD
9. TUMWATER BLVD SE & HENDERSON BLVD SE
10. LITTLEROCK RD SW & MINER DR SW
11. LITTLEROCK RD SW & KINGSWOOD DR SW
A. ISRAEL RD SW & PROJECT ACCESS
B. TUMWATER BLVD SW & PROJECT ACCESS



FULL BUILDOUT
NEW AM PEAK HOUR TRIPS
INBOUND: 112 VPH
OUTBOUND: 333 VPH



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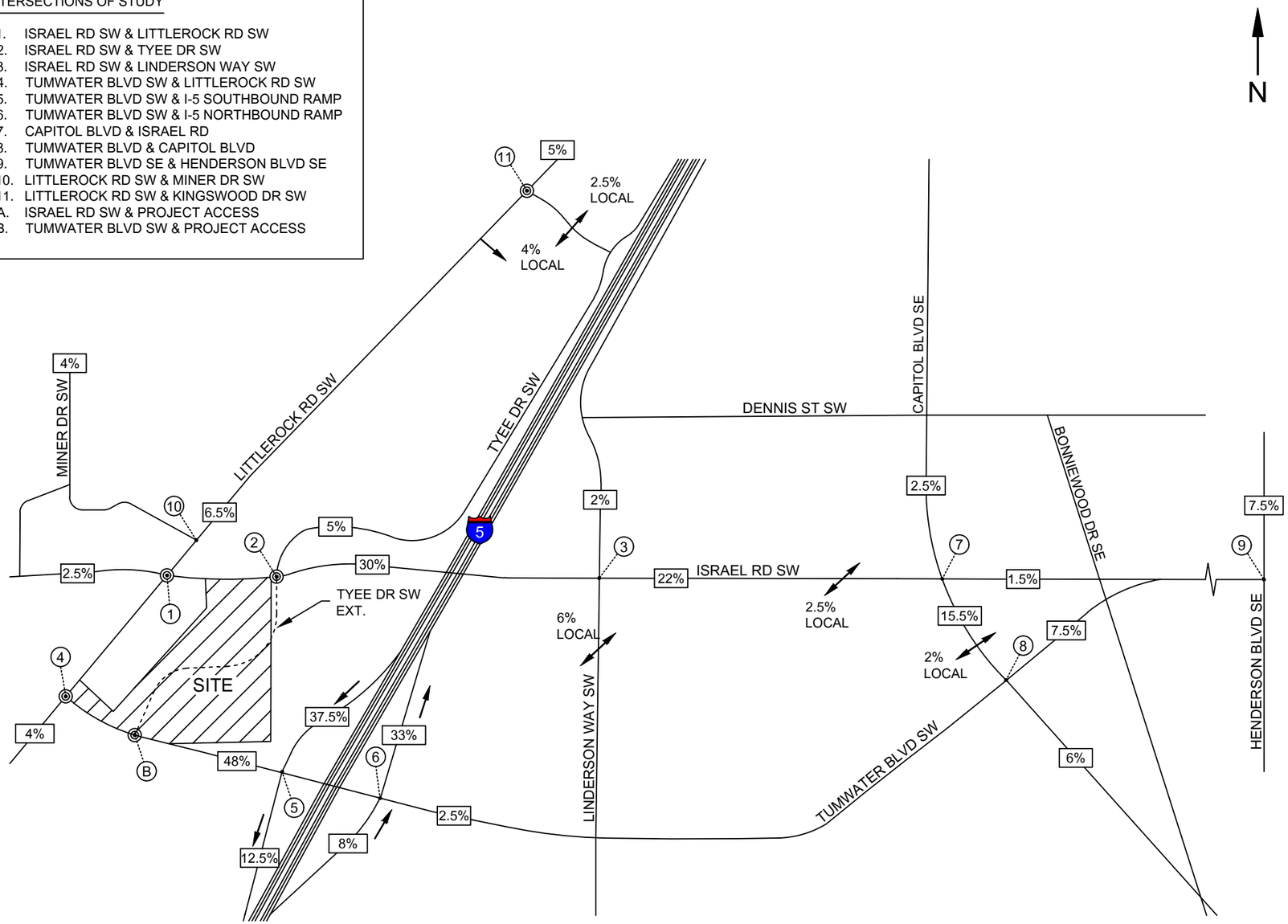
YORKSHIRE
FULL BUILD: AM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT
FIGURE 7

INTERSECTIONS OF STUDY

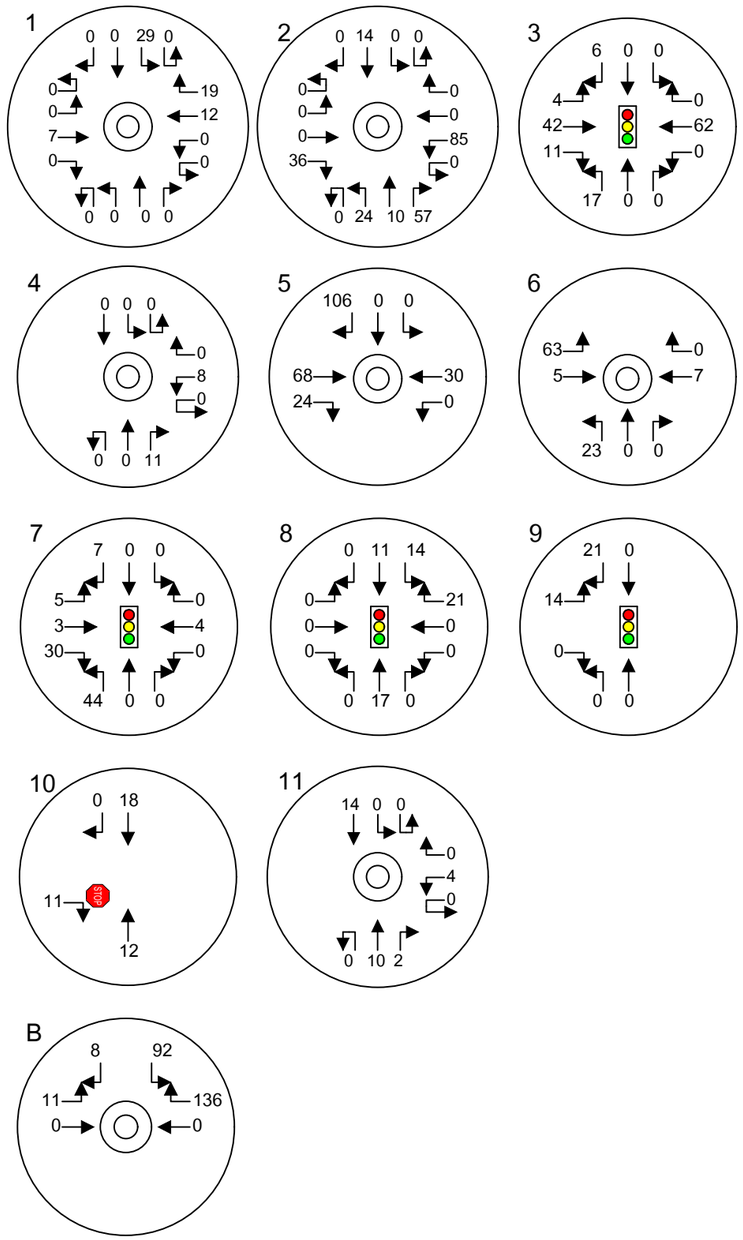
1. ISRAEL RD SW & LITTLEROCK RD SW
2. ISRAEL RD SW & TYEE DR SW
3. ISRAEL RD SW & LINDERSON WAY SW
4. TUMWATER BLVD SW & LITTLEROCK RD SW
5. TUMWATER BLVD SW & I-5 SOUTHBOUND RAMP
6. TUMWATER BLVD SW & I-5 NORTHBOUND RAMP
7. CAPITOL BLVD & ISRAEL RD
8. TUMWATER BLVD & CAPITOL BLVD
9. TUMWATER BLVD SE & HENDERSON BLVD SE
10. LITTLEROCK RD SW & MINER DR SW
11. LITTLEROCK RD SW & KINGSWOOD DR SW

A. ISRAEL RD SW & PROJECT ACCESS

B. TUMWATER BLVD SW & PROJECT ACCESS



FULL BUILDOUT
NEW PM PEAK HOUR TRIPS
INBOUND: 282 VPH
OUTBOUND: 191 VPH



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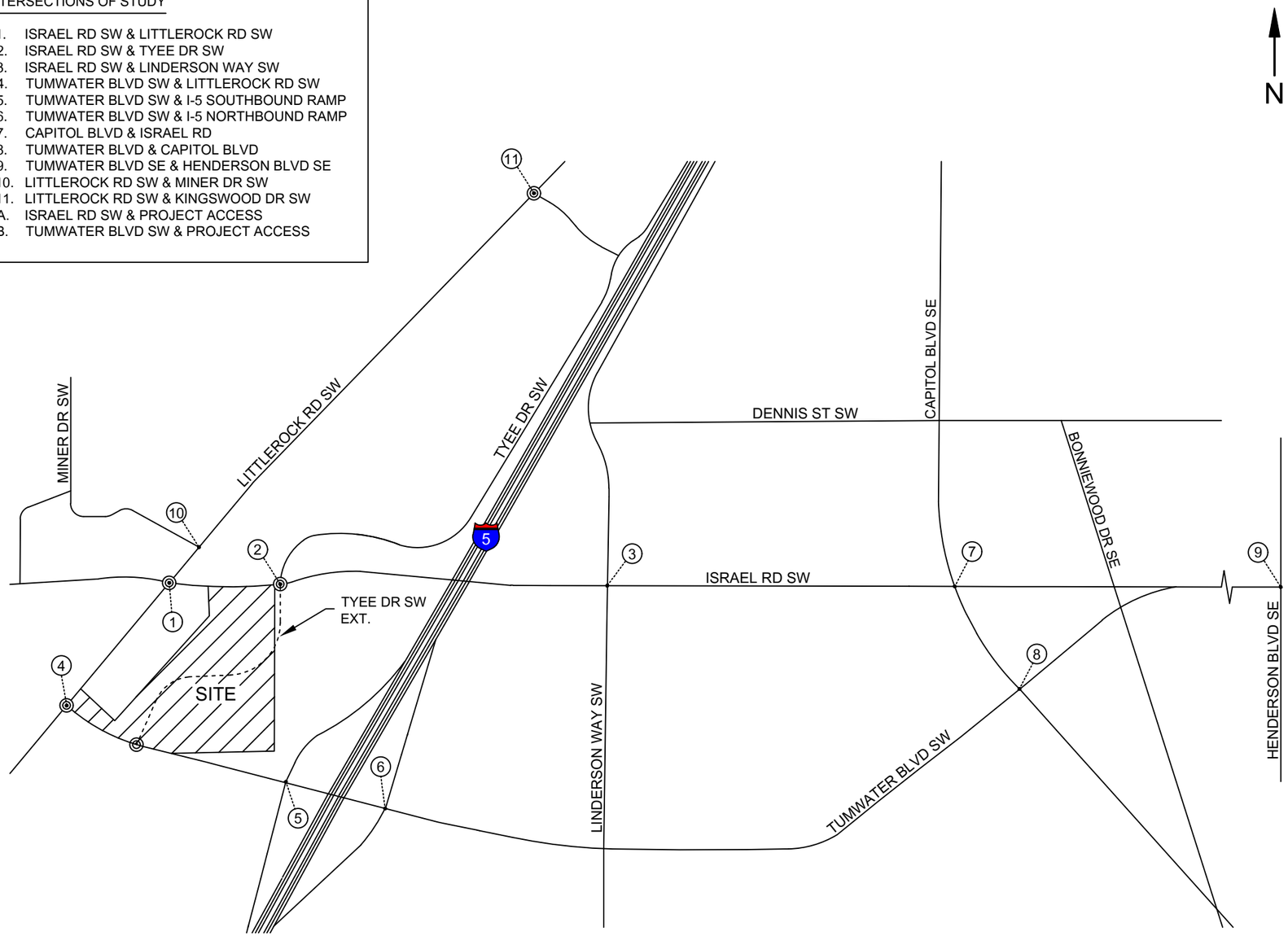
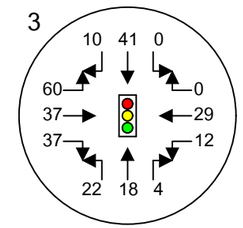
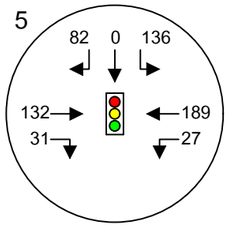
FULL BUILD: PM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT
FIGURE 8

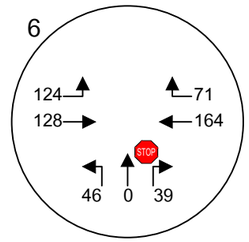
INTERSECTIONS OF STUDY

1. ISRAEL RD SW & LITTLEROCK RD SW
2. ISRAEL RD SW & TYEE DR SW
3. ISRAEL RD SW & LINDERSON WAY SW
4. TUMWATER BLVD SW & LITTLEROCK RD SW
5. TUMWATER BLVD SW & I-5 SOUTHBOUND RAMP
6. TUMWATER BLVD SW & I-5 NORTHBOUND RAMP
7. CAPITOL BLVD & ISRAEL RD
8. TUMWATER BLVD & CAPITOL BLVD
9. TUMWATER BLVD SE & HENDERSON BLVD SE
10. LITTLEROCK RD SW & MINER DR SW
11. LITTLEROCK RD SW & KINGSWOOD DR SW
A. ISRAEL RD SW & PROJECT ACCESS
B. TUMWATER BLVD SW & PROJECT ACCESS









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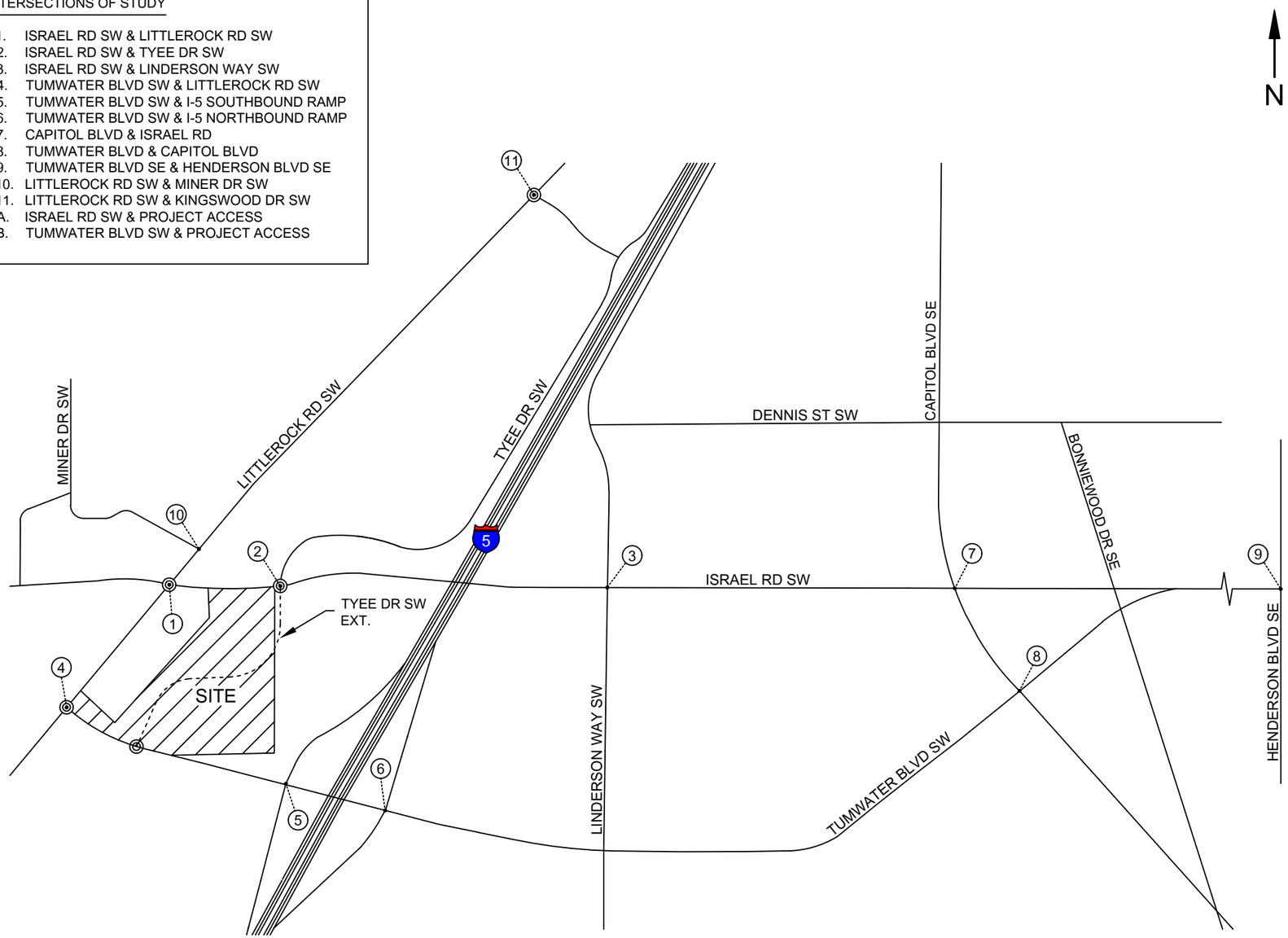
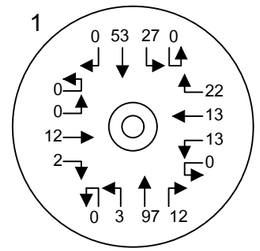
AM PEAK HOUR PIPELINE VOLUMES
FIGURE 9

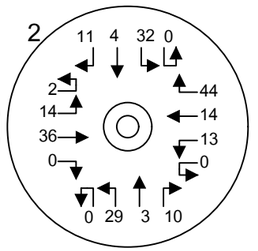
INTERSECTIONS OF STUDY

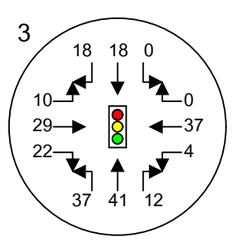
1. ISRAEL RD SW & LITTLEROCK RD SW
2. ISRAEL RD SW & TYEE DR SW
3. ISRAEL RD SW & LINDERSON WAY SW
4. TUMWATER BLVD SW & LITTLEROCK RD SW
5. TUMWATER BLVD SW & I-5 SOUTHBOUND RAMP
6. TUMWATER BLVD SW & I-5 NORTHBOUND RAMP
7. CAPITOL BLVD & ISRAEL RD
8. TUMWATER BLVD & CAPITOL BLVD
9. TUMWATER BLVD SE & HENDERSON BLVD SE
10. LITTLEROCK RD SW & MINER DR SW
11. LITTLEROCK RD SW & KINGSWOOD DR SW

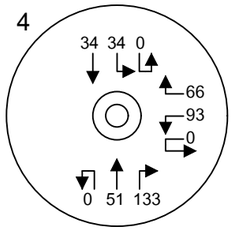
A. ISRAEL RD SW & PROJECT ACCESS
B. TUMWATER BLVD SW & PROJECT ACCESS

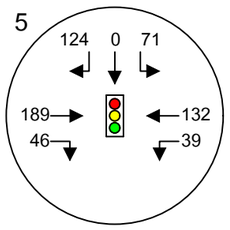


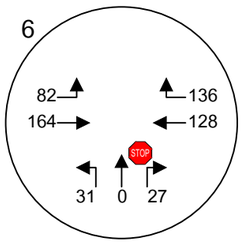


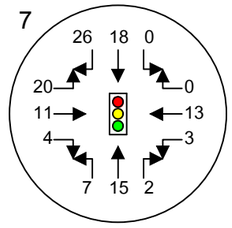


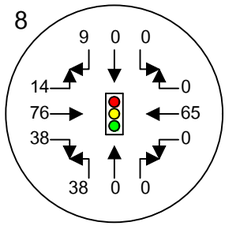


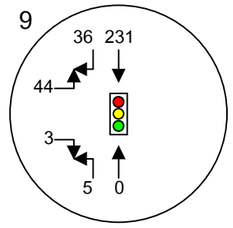


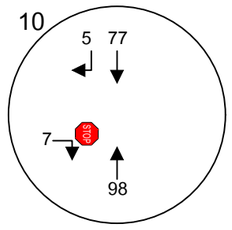


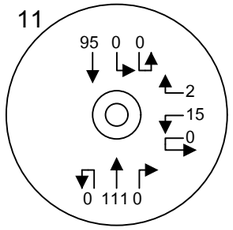












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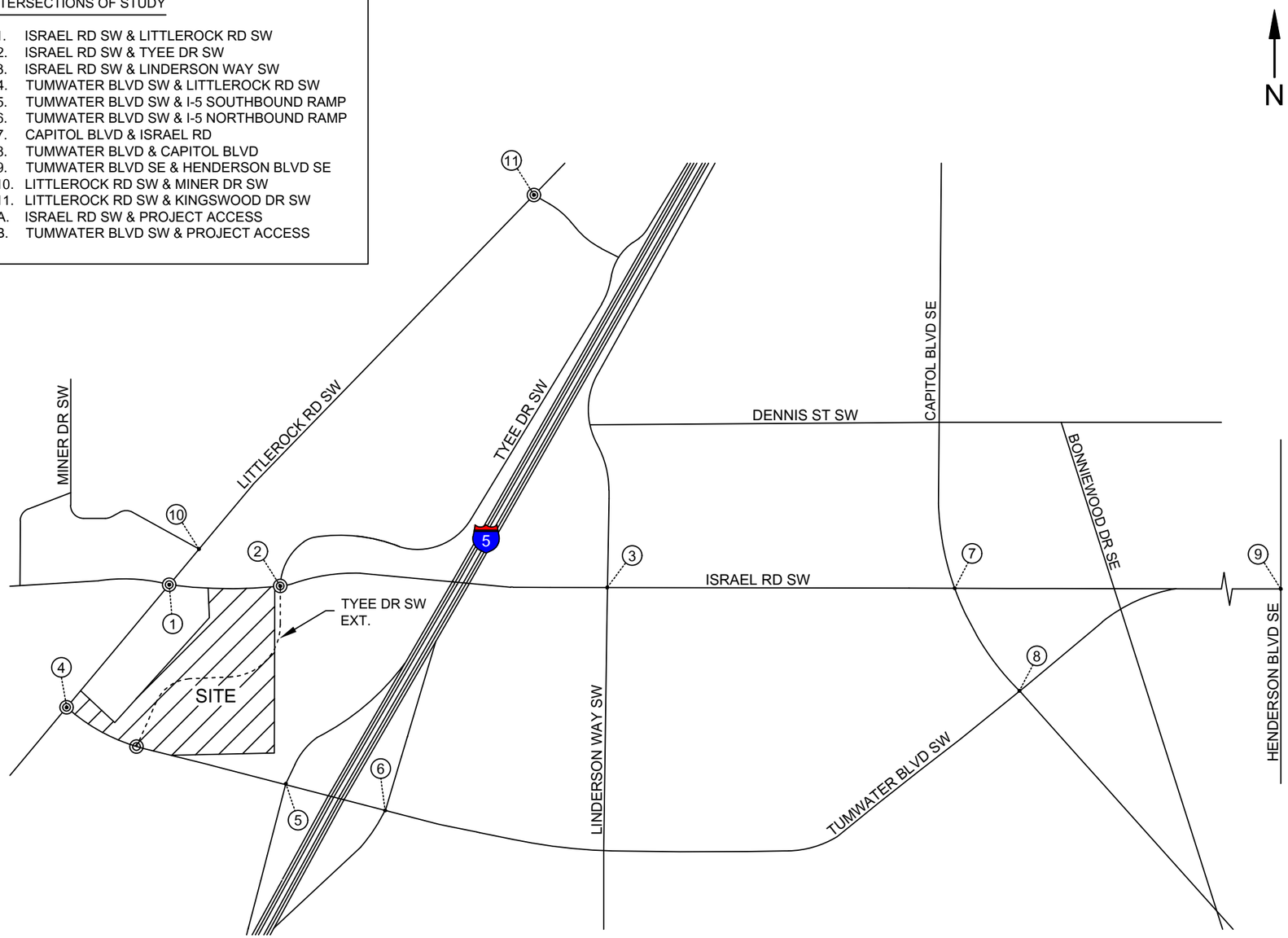
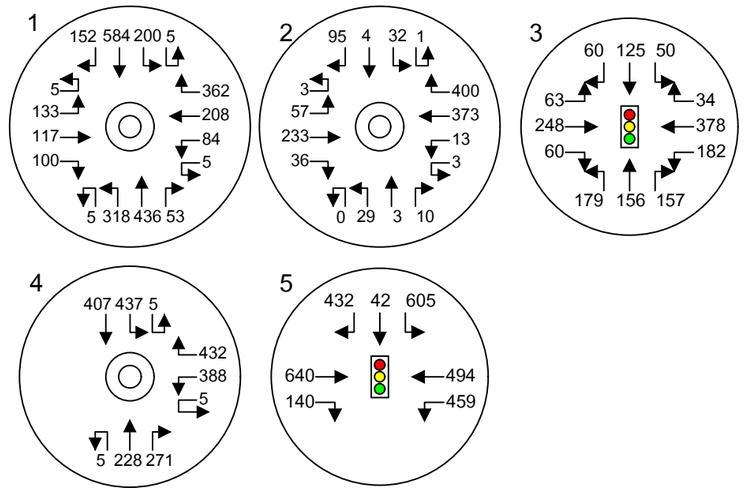
PM PEAK HOUR PIPELINE VOLUMES
FIGURE 10

INTERSECTIONS OF STUDY

1. ISRAEL RD SW & LITTLEROCK RD SW
2. ISRAEL RD SW & TYEE DR SW
3. ISRAEL RD SW & LINDERSON WAY SW
4. TUMWATER BLVD SW & LITTLEROCK RD SW
5. TUMWATER BLVD SW & I-5 SOUTHBOUND RAMP
6. TUMWATER BLVD SW & I-5 NORTHBOUND RAMP
7. CAPITOL BLVD & ISRAEL RD
8. TUMWATER BLVD & CAPITOL BLVD
9. TUMWATER BLVD SE & HENDERSON BLVD SE
10. LITTLEROCK RD SW & MINER DR SW
11. LITTLEROCK RD SW & KINGSWOOD DR SW
A. ISRAEL RD SW & PROJECT ACCESS
B. TUMWATER BLVD SW & PROJECT ACCESS





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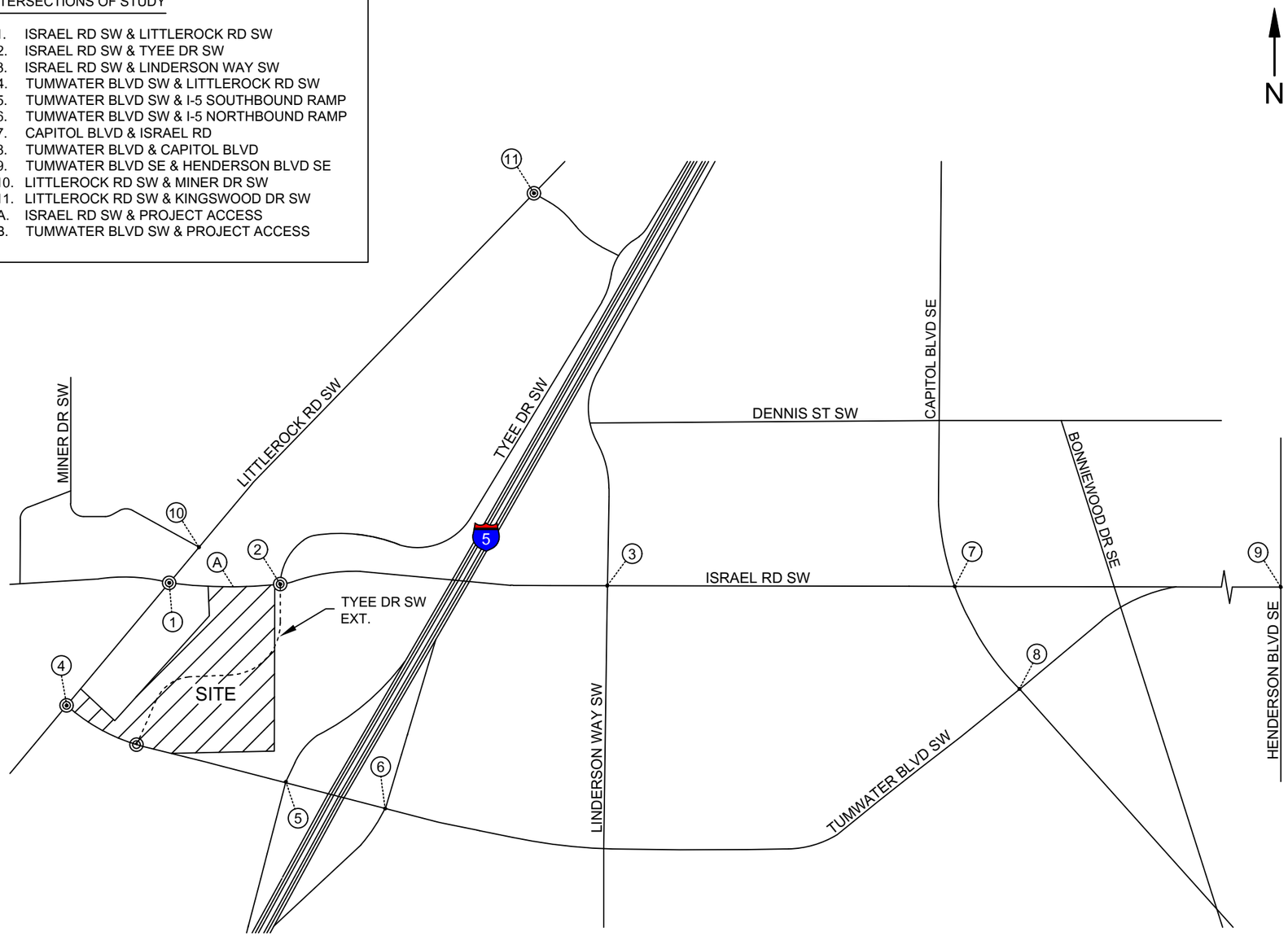
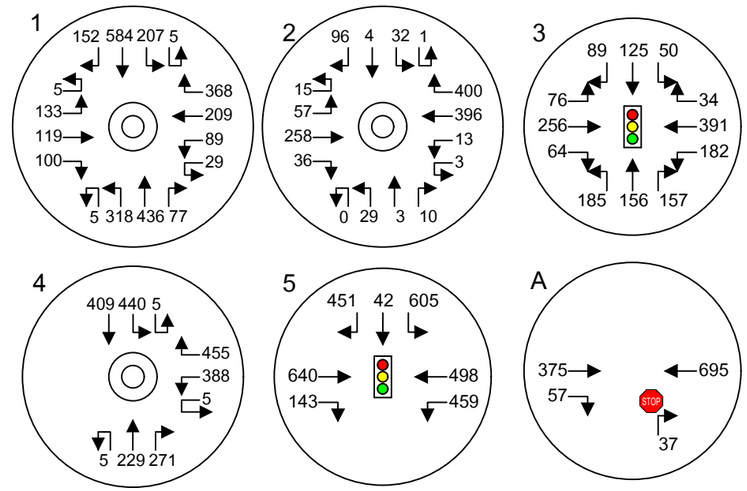
PHASE 1: FORECAST 2026 PM PEAK HOUR BACKGROUND VOLUMES
FIGURE 11

INTERSECTIONS OF STUDY

1. ISRAEL RD SW & LITTLEROCK RD SW
2. ISRAEL RD SW & TYEE DR SW
3. ISRAEL RD SW & LINDERSON WAY SW
4. TUMWATER BLVD SW & LITTLEROCK RD SW
5. TUMWATER BLVD SW & I-5 SOUTHBOUND RAMP
6. TUMWATER BLVD SW & I-5 NORTHBOUND RAMP
7. CAPITOL BLVD & ISRAEL RD
8. TUMWATER BLVD & CAPITOL BLVD
9. TUMWATER BLVD SE & HENDERSON BLVD SE
10. LITTLEROCK RD SW & MINER DR SW
11. LITTLEROCK RD SW & KINGSWOOD DR SW
A. ISRAEL RD SW & PROJECT ACCESS
B. TUMWATER BLVD SW & PROJECT ACCESS





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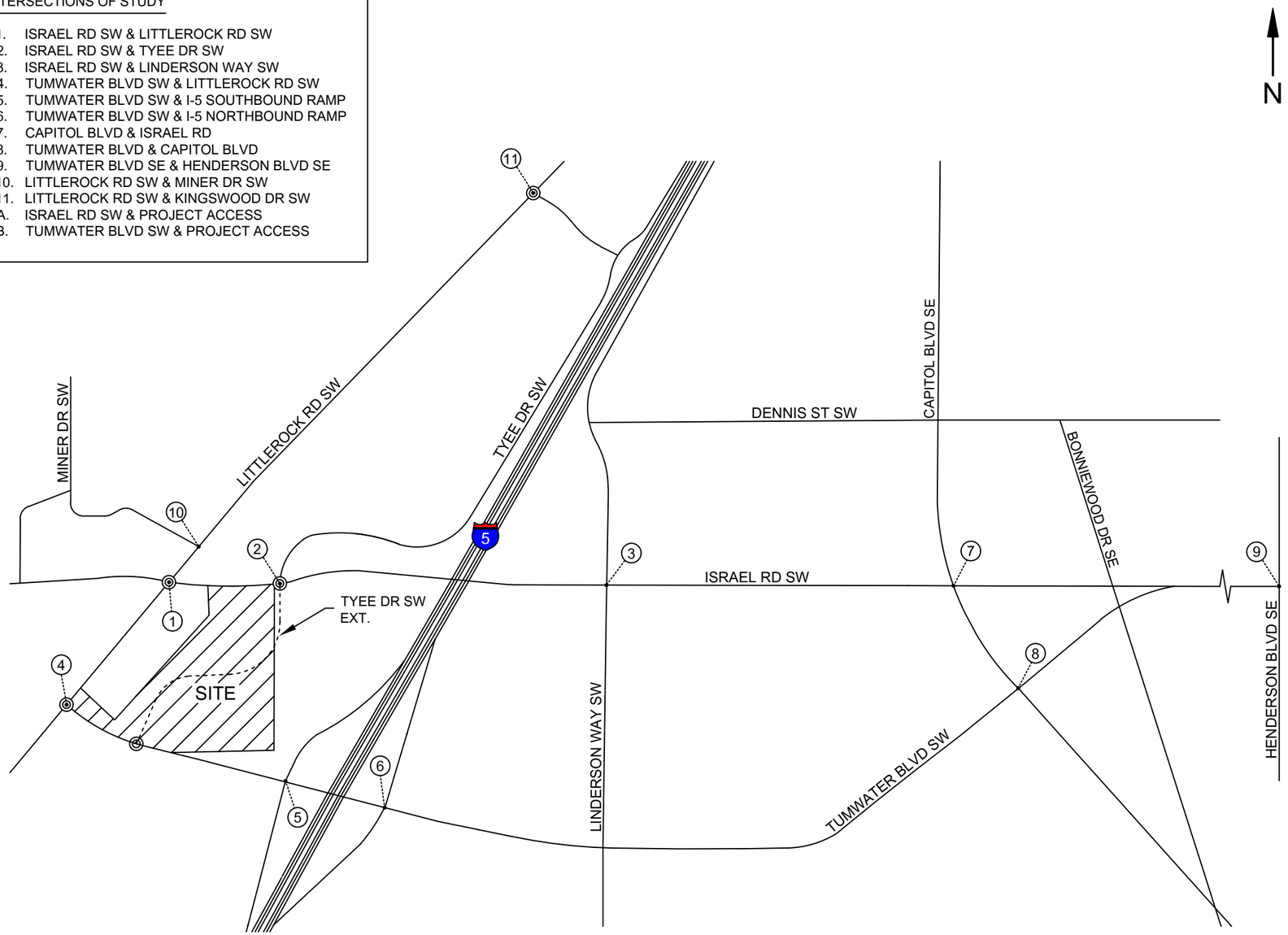
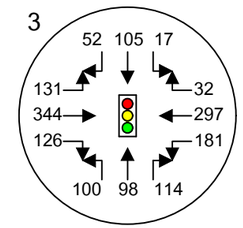
PHASE 1: FORECAST 2026 PM PEAK HOUR VOLUMES WITH PROJECT
FIGURE 12

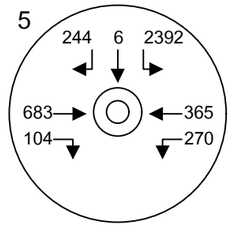
INTERSECTIONS OF STUDY

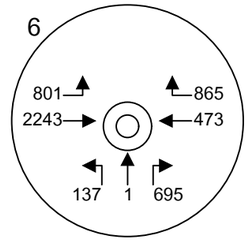
1. ISRAEL RD SW & LITTLEROCK RD SW
2. ISRAEL RD SW & TYEE DR SW
3. ISRAEL RD SW & LINDERSON WAY SW
4. TUMWATER BLVD SW & LITTLEROCK RD SW
5. TUMWATER BLVD SW & I-5 SOUTHBOUND RAMP
6. TUMWATER BLVD SW & I-5 NORTHBOUND RAMP
7. CAPITOL BLVD & ISRAEL RD
8. TUMWATER BLVD & CAPITOL BLVD
9. TUMWATER BLVD SE & HENDERSON BLVD SE
10. LITTLEROCK RD SW & MINER DR SW
11. LITTLEROCK RD SW & KINGSWOOD DR SW

A. ISRAEL RD SW & PROJECT ACCESS
B. TUMWATER BLVD SW & PROJECT ACCESS









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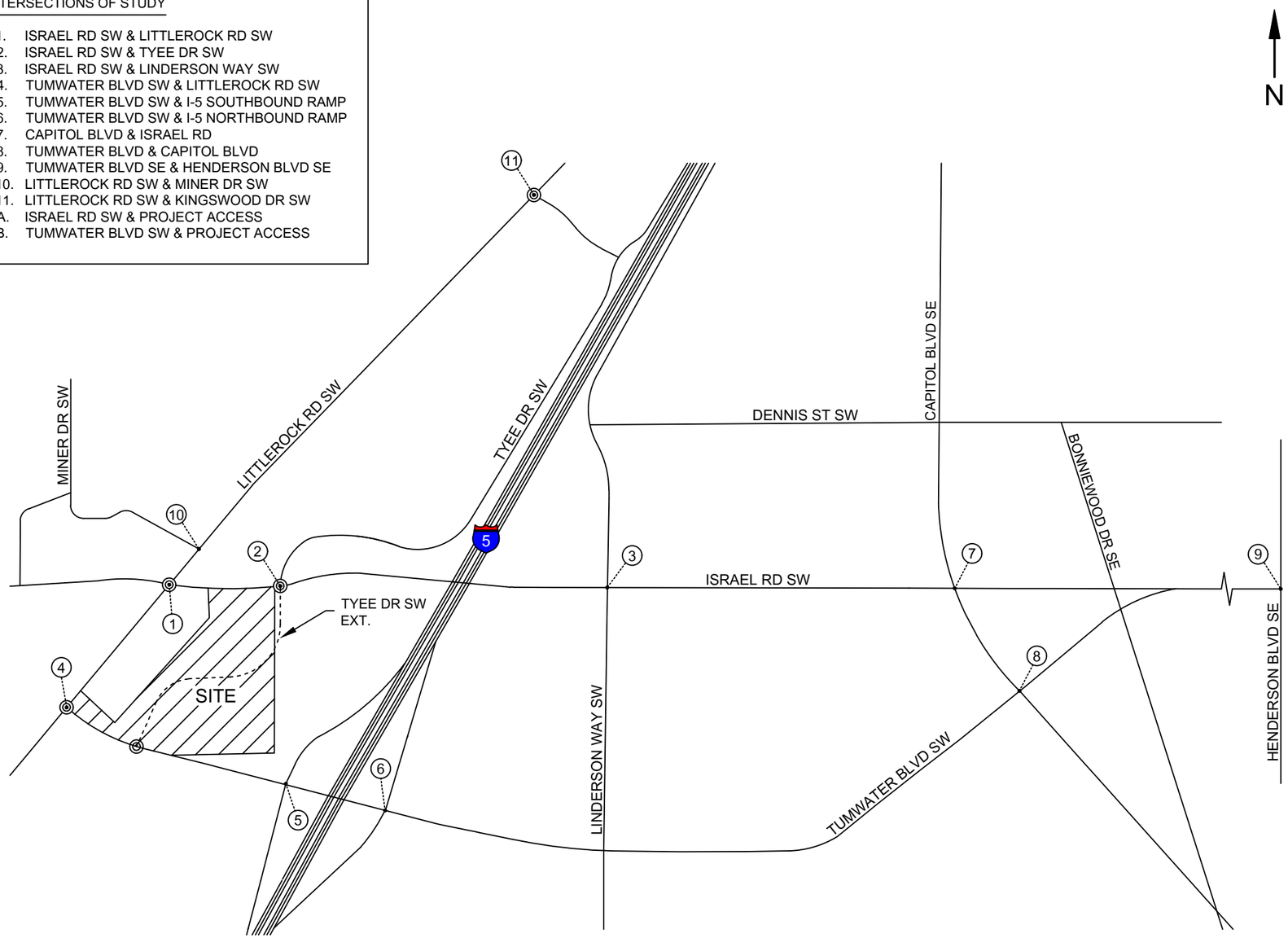
FULL BUILD: FORECAST 2031 AM PEAK HOUR BACKGROUND VOLUMES
FIGURE 13

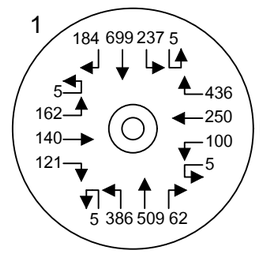
INTERSECTIONS OF STUDY

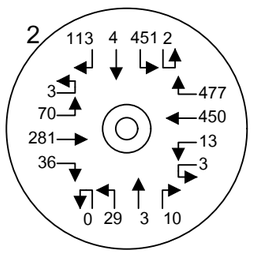
1. ISRAEL RD SW & LITTLEROCK RD SW
2. ISRAEL RD SW & TYEE DR SW
3. ISRAEL RD SW & LINDERSON WAY SW
4. TUMWATER BLVD SW & LITTLEROCK RD SW
5. TUMWATER BLVD SW & I-5 SOUTHBOUND RAMP
6. TUMWATER BLVD SW & I-5 NORTHBOUND RAMP
7. CAPITOL BLVD & ISRAEL RD
8. TUMWATER BLVD & CAPITOL BLVD
9. TUMWATER BLVD SE & HENDERSON BLVD SE
10. LITTLEROCK RD SW & MINER DR SW
11. LITTLEROCK RD SW & KINGSWOOD DR SW

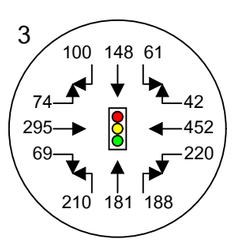
A. ISRAEL RD SW & PROJECT ACCESS

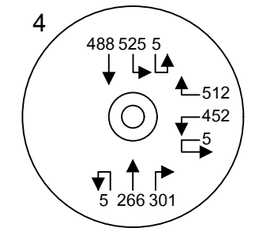
B. TUMWATER BLVD SW & PROJECT ACCESS

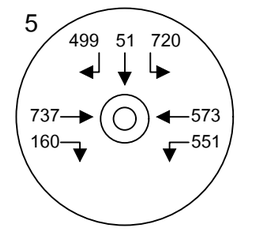


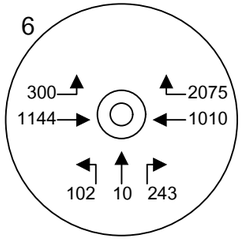


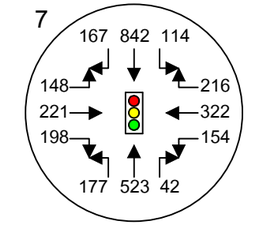


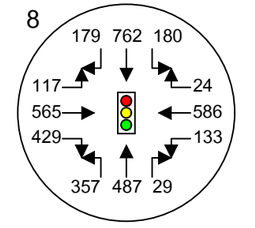


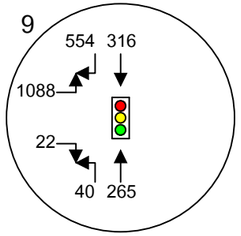


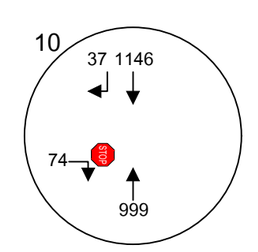


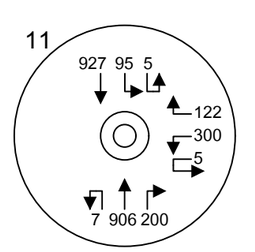












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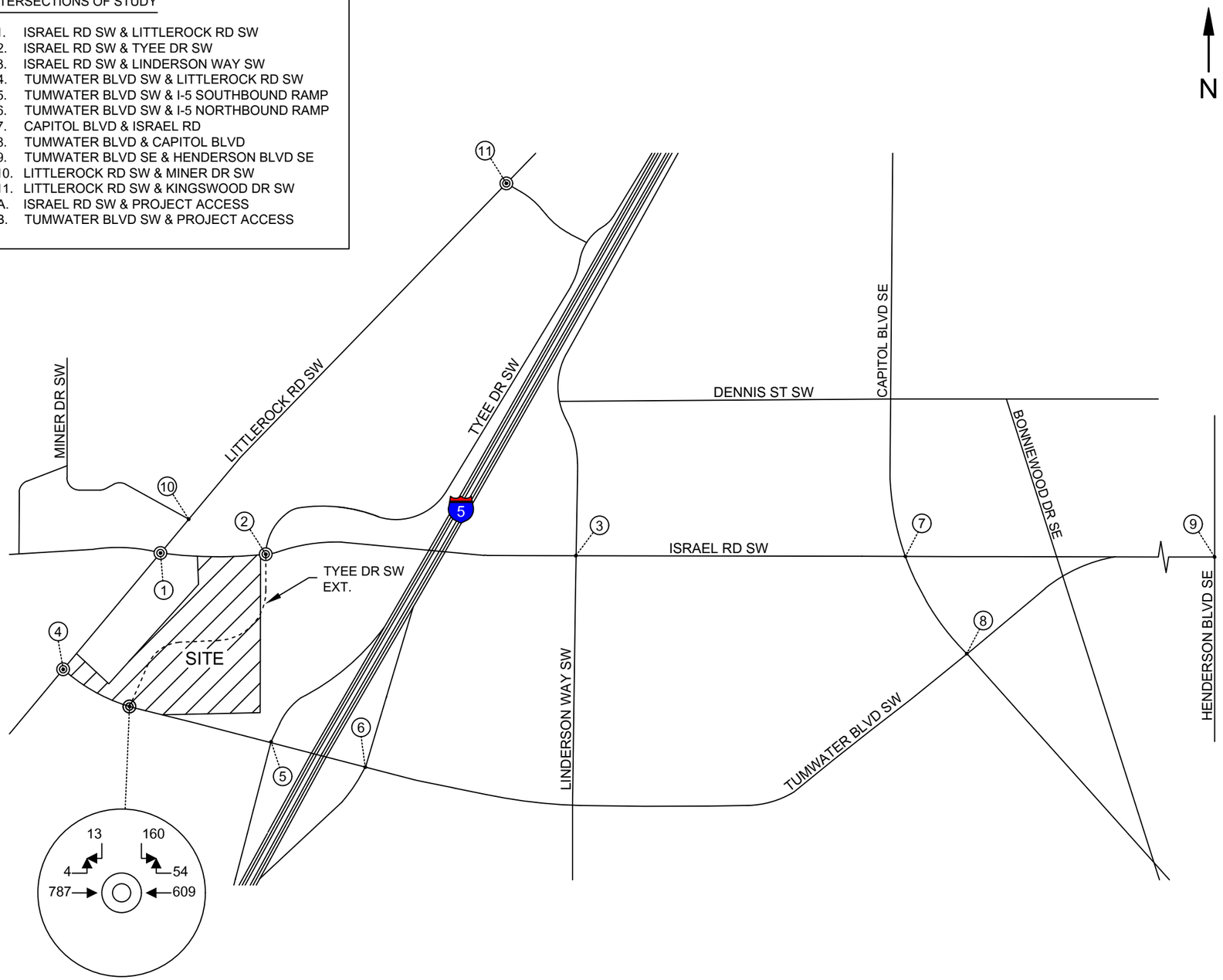
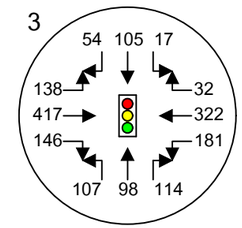
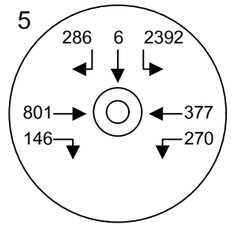
FULL BUILD: FORECAST 2031 PM PEAK HOUR BACKGROUND VOLUMES
FIGURE 14

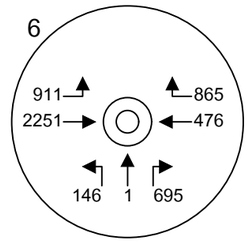
INTERSECTIONS OF STUDY

1. ISRAEL RD SW & LITTLEROCK RD SW
2. ISRAEL RD SW & TYEE DR SW
3. ISRAEL RD SW & LINDERSON WAY SW
4. TUMWATER BLVD SW & LITTLEROCK RD SW
5. TUMWATER BLVD SW & I-5 SOUTHBOUND RAMP
6. TUMWATER BLVD SW & I-5 NORTHBOUND RAMP
7. CAPITOL BLVD & ISRAEL RD
8. TUMWATER BLVD & CAPITOL BLVD
9. TUMWATER BLVD SE & HENDERSON BLVD SE
10. LITTLEROCK RD SW & MINER DR SW
11. LITTLEROCK RD SW & KINGSWOOD DR SW
A. ISRAEL RD SW & PROJECT ACCESS
B. TUMWATER BLVD SW & PROJECT ACCESS







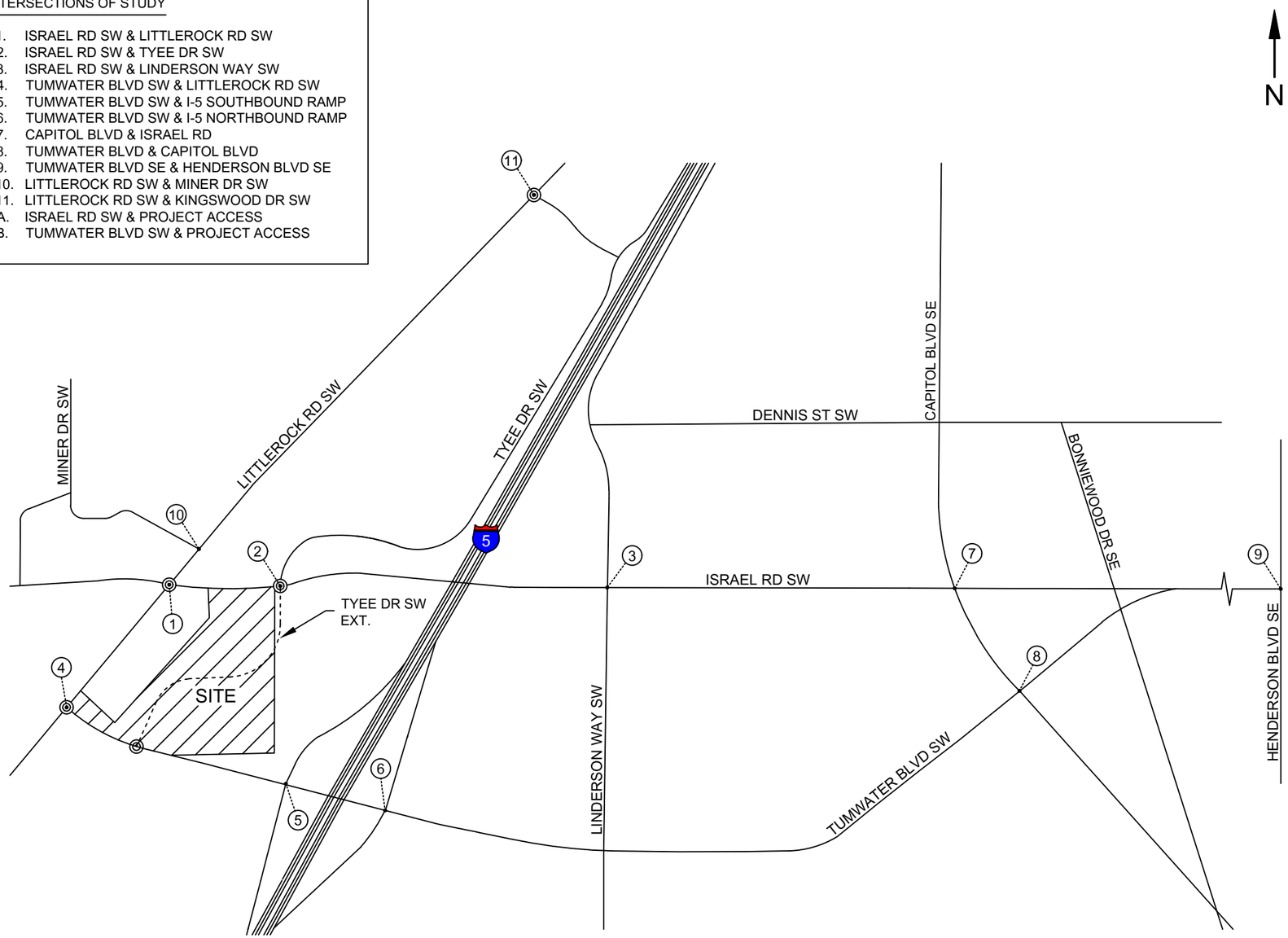


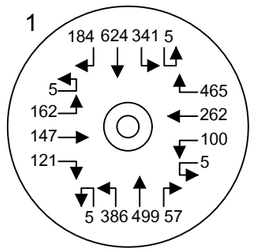
INTERSECTIONS OF STUDY

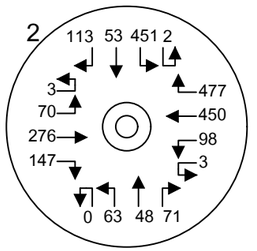
1. ISRAEL RD SW & LITTLEROCK RD SW
2. ISRAEL RD SW & TYEE DR SW
3. ISRAEL RD SW & LINDERSON WAY SW
4. TUMWATER BLVD SW & LITTLEROCK RD SW
5. TUMWATER BLVD SW & I-5 SOUTHBOUND RAMP
6. TUMWATER BLVD SW & I-5 NORTHBOUND RAMP
7. CAPITOL BLVD & ISRAEL RD
8. TUMWATER BLVD & CAPITOL BLVD
9. TUMWATER BLVD SE & HENDERSON BLVD SE
10. LITTLEROCK RD SW & MINER DR SW
11. LITTLEROCK RD SW & KINGSWOOD DR SW

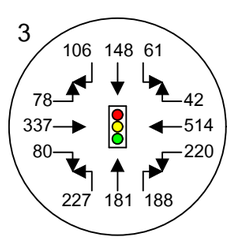
A. ISRAEL RD SW & PROJECT ACCESS

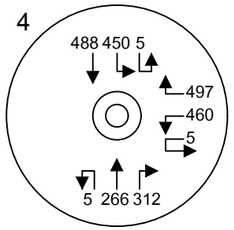
B. TUMWATER BLVD SW & PROJECT ACCESS

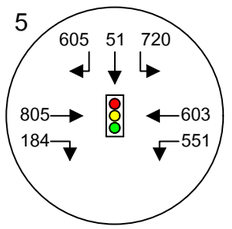


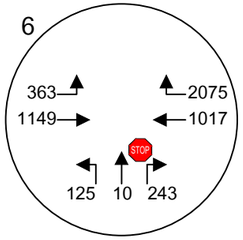


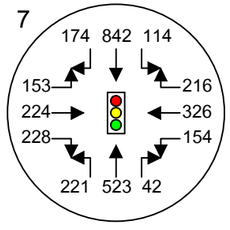


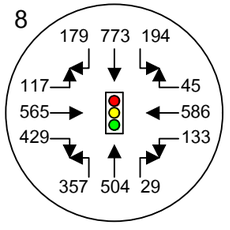


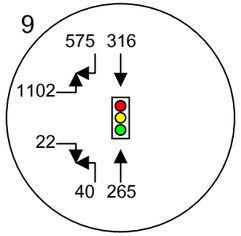


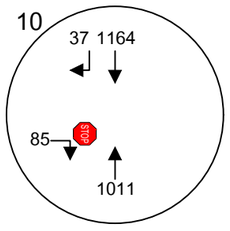


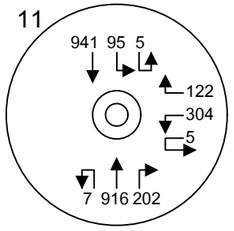


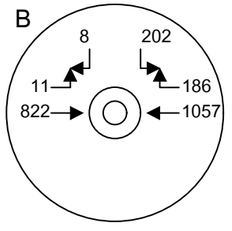












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FULL BUILD: FORECAST 2031 PM PEAK HOUR VOLUMES WITH PROJECT
FIGURE 16

4.4 Future Level of Service

A level of service analysis was made of the future 2031 AM and PM peak hour volumes without (background) and with project-generated trips. Results for intersection delay conditions were again determined using the *Synchro 12* and *SIDRA 9* analysis programs. Summaries are provided in the following sections for the Phase 1 and Full Build analyses previously outlined.

Phase 1

Phase 1 proposes construction of 240 multi-family dwelling units and access to Israel Road SW via a new right-in, right-out access. Phase 1 is anticipated to be built out by or before 2026. As overall trip generation and impacts to the surrounding roadway system are significantly lower for this phase when compared with the full build scenario, only the access has been analyzed and modeled for Phase 1. PM peak hour 2026 level of service at the proposed access onto Israel Road SW is outlined below in Table 7.

Table 7: Phase 1 - Forecast 2026 PM Peak Hour LOS With Project

Delays given in seconds per vehicle

Intersection	Control	Peak Hour	LOS	Delay
Israel Rd SW & Project Access	TWSC	PM	B	11.2

Forecast 2026 peak hour delays are projected to operate at LOS B at the proposed right-in, right-out access onto Israel Road SW. The access is shown to meet the city of Tumwater's level of service standard of LOS D or better.

Full Build

The outlying study intersections and proposed accesses were modeled under forecast 2031 conditions both without and with the addition of project-generated traffic. Forecast analysis with project entails a Tyee Drive SW extension connecting and providing access from Israel Road SW to Tumwater Boulevard SW. Forecast 2031 peak hour level of service is provided in Table 8 on the following page.

Table 8: Full Build – Forecast 2031 Weekday Peak Hour Level of Service

Delays given in seconds per vehicle

Ref. #	Intersection	Control	Peak Hour	Without Project		With Project	
				LOS	Delay	LOS	Delay
1	Israel Rd SW & Littlerock Rd SW	RAB	PM	D	36.6	D	44.7
2	Israel Rd SW & Tyee Dr SW	RAB	PM	A	9.4	C	24.7
3	Israel Rd SW & Linderson Way SW	Signal	AM PM	B C	19.2 34.9	C D	21.7 45.8
4	Tumwater Blvd SW & Littlerock Rd SW	RAB	PM	A	9.6	A	9.1
5	Tumwater Blvd SW & I-5 SB Ramp	RAB	AM PM	F B	129.4 10.7	F B	154.5 11.5
6	Tumwater Blvd SW & I-5 NB Ramp	RAB	AM PM	E E	77.5 70.3	F F	239.7 94.2
7	Capitol Blvd & Israel Rd	Signal	PM	D	45.8	D	51.4
8	Tumwater Blvd & Capitol Blvd	Signal	PM	D	53.3	D	54.1
9	Tumwater Blvd SE & Henderson Blvd SE	Signal	PM	F	152.5	F	156.4
10	Littlerock Rd SW & Miner Dr SW	TWSC	PM	D	28.6	D	31.4
11	Littlerock Rd SW & Kingswood Dr SW	RAB	PM	A	8.6	A	9.0
B	Tumwater Blvd SW & Tyee Dr Extension	RAB	AM PM	-	-	A A	5.0 5.1

RAB: Roundabout, TWSC: Two-Way Stop-Controlled

As illustrated in Table 8, the study intersections are shown to operate with LOS F or better conditions under all forecast without and with scenarios. The following study intersections were found to operate with substandard service levels:

Tumwater Boulevard SW & I-5 Ramps: were found to operate with LOS F conditions both without and with the proposed development under forecast 2031 peak hour conditions. This analysis assumed both ramps as roundabout controlled. It should be taken into consideration that significant and conservative adjustments have been applied to generate COVID-adjusted conditions. Moreover, the four percent growth rate assumes all nearby State

offices would increase year over year. Additionally, multiple pipeline projects were accounted for in conjunction with a high growth rate and COVID adjustments. Actual volumes and delays could be less. For example, the City's Transportation Master Plan expects, under 2040 conditions, the I-5 Ramps to operate at LOS A with the roundabouts.

SEPA mitigation fees are currently being collected to fund the two roundabouts at this interchange. As such, no additional mitigation on behalf of the development is recommended beyond SEPA mitigation fee payment.

Tumwater Boulevard SE & Henderson Boulevard SE: was found to operate at LOS F delays during the 2031 PM peak hour both without and with project traffic. Again, forecast volumes at this intersection may be overestimated with the adjustment factors, growth rates, and pipeline additions. The City may want to monitor this intersection in the future to determine capacity and operations. Currently the signal is operating at LOS D.

5. CONCLUSIONS & MITIGATION

The Yorkshire project proposes to construct 1150 new multi-family dwelling units, 9,000 square feet of commercial/office space and 324 self-storage units upon full build-out within the city of Tumwater. The subject site, situated on 25.52-acres of undeveloped land within tax parcel #'s: 127044-40103; -40100; -3130, is to be constructed over several phases.

Phase 1 will construct Residential Building 1 that will support 240 multi-family dwelling units. Primary access under Phase 1 is to be provided via a right-in, right-out access onto Israel Road SW, just west of the Tyee Drive SW intersection. Based on ITE data, Phase 1 is anticipated to generate 1,090 new average weekday daily trips with 89 AM peak hour trips and 94new PM peak hour trips. Refer to Figure 2 for the proposed access/roadway configuration and multi-family structure layout.

The Full Build scenario of the site was additionally analyzed. Full Build entails a new north-south Tyee Drive SW access roadway segment connecting from Israel Road SW to Tumwater Boulevard SW. Based on ITE data the project is anticipated to generate 5,409 new average weekday daily trips with 445 AM peak hour trips (112 in / 333 out) and 475 new PM peak hour trips (282 in / 191 out) at Full Build.

Baseline 2023 weekday peak hour level of service (LOS) is summarized in Table 3. With the exception of the I-5 NB and SB Ramps on Tumwater Boulevard SW, all intersections of study are shown to operate with delays in the LOS D or better range. Forecast analysis included a compound annual growth rate of 4.0 percent and the addition of pipeline volumes. A three-year horizon of 2026 was utilized for Phase 1 forecast PM peak hour analysis at the proposed access onto Israel Road SW. The access was shown to function with LOS B delays under forecast with project conditions.

An eight-year horizon of 2031 was utilized for forecast analysis upon Full Build of the Yorkshire development. Forecast 2031 AM and PM peak hour level of service without and with the addition of project-generated traffic under both noted scenarios is provided in Table 8. Except for the I-5 NB and SB Ramps on Tumwater Boulevard SW and the Tumwater Boulevard SW & Henderson Boulevard SW intersection, all intersections of study are shown to operate with LOS D or better delays during weekday peak hours without or with the addition of project-generated traffic.

As such, all but the three noted intersections are shown to meet the city of Tumwater's LOS standards. No operational deficiencies are identified at the proposed access locations for Phase 1 or Full Build. Lastly, based on capacity findings that account for 2050 growth and volumes along the Tyee Drive extension, a 3-lane cross-section between Israel Road SW and Tumwater Boulevard SW is anticipated to satisfy forecast capacity and operational demands.

Based on the analysis above, the following mitigation is required for Yorkshire project.

1. Pay Traffic Impact Fees (TIF) as required by the city of Tumwater and per SEPA mitigation fee requirements. TIF will be assessed based on Phase 1 and full buildout of the proposed Yorkshire project. A summary of the expected TIF as well as the City's SEPA Mitigation Fee for trips entering the Tumwater Blvd/I-5 Interchange at a per PM peak hour trip fee of $4,219.00 are included. Trip totals through the Tumwater Blvd/I-5 Interchange are based on the TAZ 259 model for each phase and Tyee Drive SW connection availability.

Table 9: Phase 1 & Full Build Impact Fees

Phase	Variable	TIF	Total TIF	Tumwater Blvd PM Trips	SEPA Fee	Total SEPA Fee
1	240 Multifamily units	$2,774.35 per dwelling unit	$665,844.00	26 trips	$4,219.00	$109,694.00
Full-Build (Excluding Phase 1)	910 Multifamily units	$2,774.35 per dwelling unit	$2,524,658.50	202 trips	$4,219.00	$852,238.00
	~39,500 sq. ft. Self-Storage	$1.60 per GFA	$63,200.00			
	9,000 sq. ft. Gen Office	$9.19 per GLA	$82,710.00			
	Total Transportation Impact Fee		**$3,336,412.50**		Total SEPA Fee	**$961,932.00**

2. Tyee Drive Extension: Tyee Drive (between Israel Road SE and Tumwater Blvd SW) is planned for construction as a three-lane cross-section based on the findings of the cross-section evaluation that was reference in Section 4. on page 18 of this report.

3. All new roadways and approaches shall be designed in accordance with City of Tumwater standards and shall be reviewed and approved by the City.

No other mitigation is identified at this time.

YORKSHIRE
TRAFFIC IMPACT ANALYSIS

APPENDIX: AM PEAK HOUR COUNT DATA

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

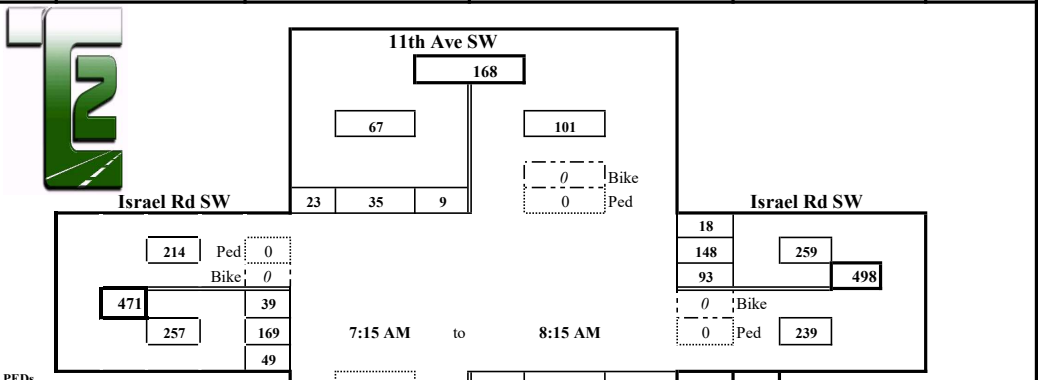
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: 11th Ave SW & Israel Rd SW **Date of Count:** Tue 07/26/2022

Location: Tumwater, Washington **Checked By:** Jen

Time Interval Ending at	From North on (SB) 11th Ave SW				From South on (NB) 11th Ave SW				From East on (WB) Israel Rd SW				From West on (EB) Israel Rd SW				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	0	2	11	2	1	10	2	11	1	17	20	2	1	6	22	11	116
7:30 A	2	1	9	4	0	5	10	20	1	22	34	7	0	9	50	7	178
7:45 A	0	2	5	6	2	14	12	20	3	30	43	3	1	6	30	14	185
8:00 A	3	2	16	4	2	12	12	16	1	30	42	3	2	18	58	21	234
8:15 A	2	4	5	9	1	12	10	5	4	11	29	5	2	6	31	7	134
8:30 A	3	3	4	7	0	4	12	10	3	12	36	3	1	11	30	7	139
8:45 A	1	4	6	6	3	7	8	7	2	14	41	3	1	5	32	11	144
9:00 A	0	1	9	6	1	9	4	13	3	13	45	5	1	8	20	9	142
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	11	19	65	44	10	73	70	102	18	149	290	31	9	69	273	87	1272
Peak Hour: 7:15 AM to 8:15 AM																	
Total	7	9	35	23	5	43	44	61	9	93	148	18	5	39	169	49	731
Approach	67				148				259				257				731
%HV	10.4%				3.4%				3.5%				1.9%				3.6%
PHF	0.76				0.80				0.85				0.66				0.78



PEDs Across:	N	S	E	W	
INT 01	0	0	1	0	1
INT 02	0	0	0	0	0
INT 03	0	0	0	0	0
INT 04	0	0	0	0	0
INT 05	0	0	0	0	0
INT 06	0	0	0	0	0
INT 07	0	0	1	0	1
INT 08	0	0	0	0	0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	2	0	2

Bicycles From:	N	S	E	W	
INT 01	0	0	0	0	0
INT 02	0	0	0	0	0
INT 03	0	0	0	0	0
INT 04	0	0	0	0	0
INT 05	0	0	0	0	0
INT 06	0	0	0	0	0
INT 07	0	0	1	0	1
INT 08	0	0	0	0	0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	1	0	1

		PHF	%HV
	EB	0.66	1.9%
Check	WB	0.85	3.5%
In: 731	NB	0.80	3.4%
Out: 731	SB	0.76	10.4%
	T Int.	0.78	3.6%

Conditions:

Special Notes

SCJ22043M_05A

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

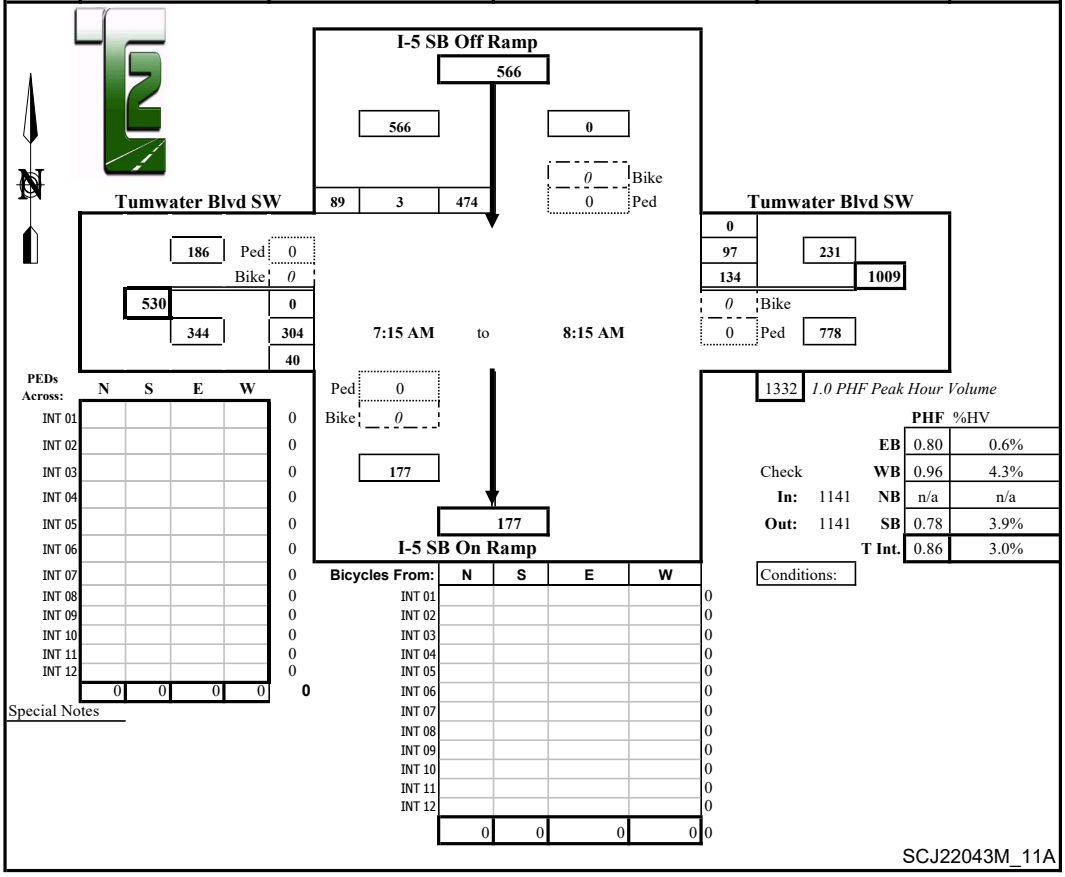
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: I-5 SB Ramps & Tumwater Blvd SW **Date of Count:** Tue 07/26/2022

Location: Tumwater, Washington **Checked By:** Jen

Time Interval Ending at	From North on (SB) I-5 SB Off Ramp				From South on (NB) I-5 SB On Ramp				From East on (WB) Tumwater Blvd SW				From West on (EB) Tumwater Blvd SW				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	1	68	1	13	0	0	0	0	2	28	14	0	1	0	60	10	194
7:30 A	5	87	1	17	0	0	0	0	3	41	17	0	0	0	60	7	230
7:45 A	5	135	1	21	0	0	0	0	3	39	20	0	1	0	95	12	323
8:00 A	7	153	0	28	0	0	0	0	2	28	32	0	0	0	80	12	333
8:15 A	5	99	1	23	0	0	0	0	2	26	28	0	1	0	69	9	255
8:30 A	6	73	0	22	0	0	0	0	2	24	30	0	0	0	51	7	207
8:45 A	11	70	1	17	0	0	0	0	1	34	25	0	1	0	59	8	214
9:00 A	5	74	0	22	0	0	0	0	3	31	39	0	1	0	65	6	237
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	45	759	5	163	0	0	0	0	18	251	205	0	5	0	539	71	1993
Peak Hour: 7:15 AM to 8:15 AM																	
Total	22	474	3	89	0	0	0	0	10	134	97	0	2	0	304	40	1141
Approach	566				0				231				344				1141
%HV	3.9%				n/a				4.3%				0.6%				3.0%
PHF	0.78				n/a				0.96				0.80				0.86



SCJ22043M_11A

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

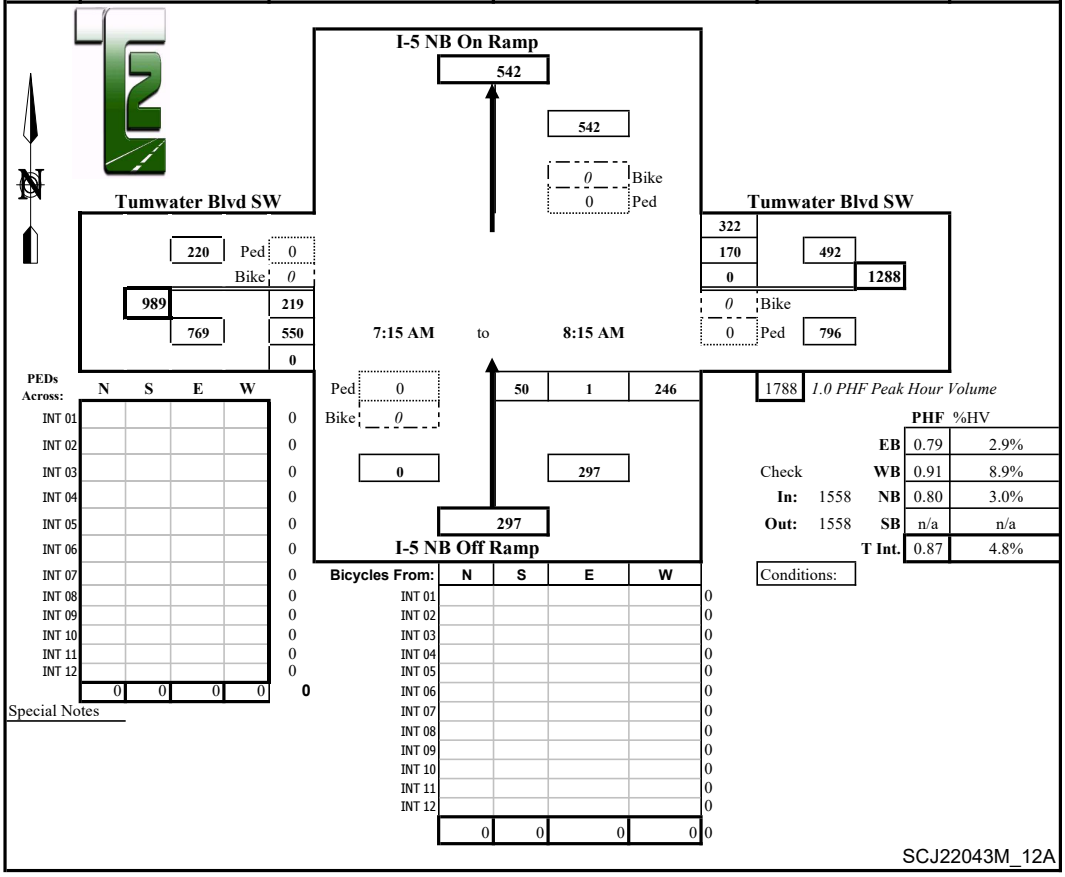
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: I-5 NB Ramps & Tumwater Blvd SW **Date of Count:** Tue 07/26/2022

Location: Tumwater, Washington **Checked By:** Jen

Time Interval	From North on (SB) I-5 NB On Ramp				From South on (NB) I-5 NB Off Ramp				From East on (WB) Tumwater Blvd SW				From West on (EB) Tumwater Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	0	0	0	0	4	10	0	33	10	0	36	67	1	44	87	0	277
7:30 A	0	0	0	0	2	12	0	81	14	0	48	81	4	49	104	0	375
7:45 A	0	0	0	0	3	11	1	60	13	0	42	93	6	66	158	0	431
8:00 A	0	0	0	0	3	12	0	69	8	0	46	78	6	60	182	0	447
8:15 A	0	0	0	0	1	15	0	36	9	0	34	70	6	44	106	0	305
8:30 A	0	0	0	0	1	13	1	36	7	0	40	68	4	43	83	0	284
8:45 A	0	0	0	0	4	11	2	24	11	0	55	61	9	41	87	0	281
9:00 A	0	0	0	0	3	16	0	27	9	0	50	80	8	51	93	0	317
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	21	100	4	366	81	0	351	598	44	398	900	0	2717
Peak Hour: 7:15 AM to 8:15 AM																	
Total	0	0	0	0	9	50	1	246	44	0	170	322	22	219	550	0	1558
Approach	0				297				492				769				1558
%HV	n/a				3.0%				8.9%				2.9%				4.8%
PHF	n/a				0.80				0.91				0.79				0.87



SCJ22043M_12A

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

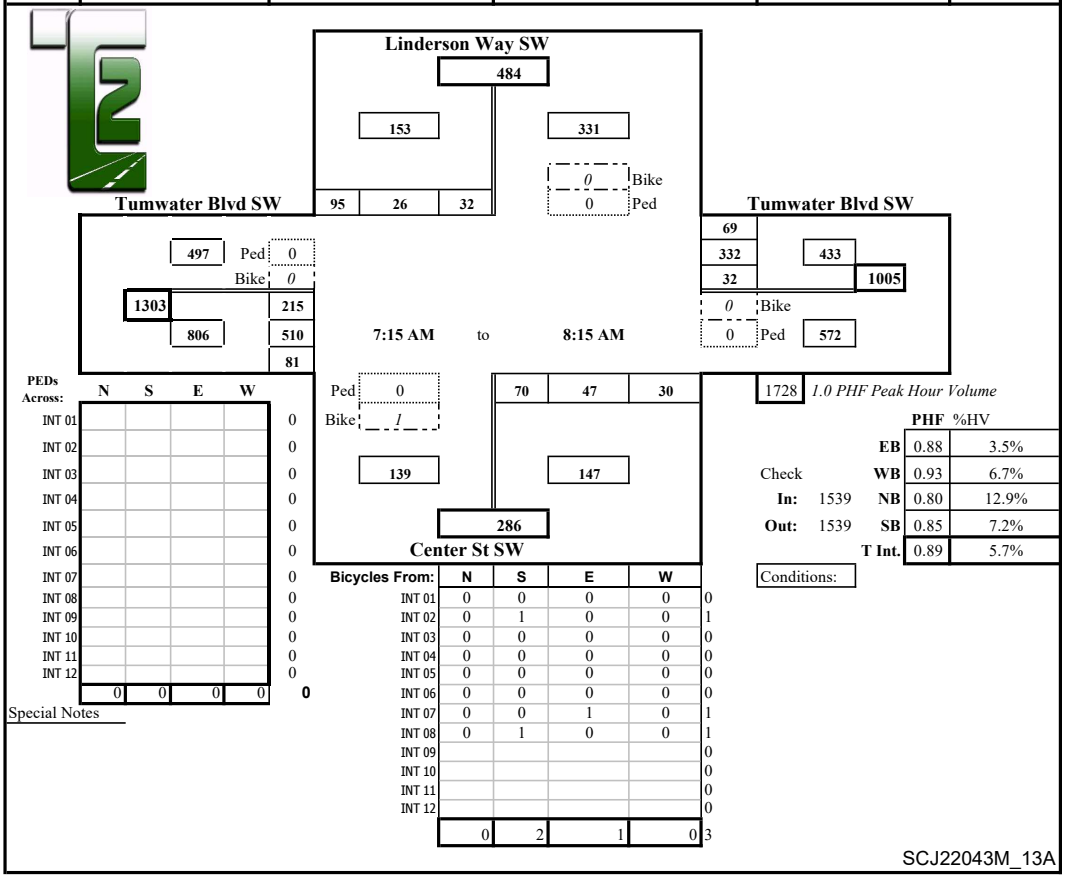
Phone: (253) 770-1407 FAX: (253) 770-1411 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Linderson Way SW/Center St SW & Tumwater Blvd SW **Date of Count:** Tue 07/26/2022

Location: Tumwater, Washington **Checked By:** Jen

Time Interval	From North on (SB) Linderson Way SW				From South on (NB) Center St SW				From East on (WB) Tumwater Blvd SW				From West on (EB) Tumwater Blvd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
7:15 A	4	4	5	17	4	17	12	6	7	3	68	8	4	26	57	18	241
7:30 A	1	6	7	23	7	22	14	10	9	10	83	17	5	55	112	20	379
7:45 A	3	9	7	29	7	19	13	10	5	9	91	15	8	72	134	24	432
8:00 A	1	10	8	25	3	15	10	7	8	9	84	23	8	56	152	21	420
8:15 A	6	7	4	18	2	14	10	3	7	4	74	14	7	32	112	16	308
8:30 A	0	5	7	17	6	22	12	13	5	10	75	8	5	28	91	12	300
8:45 A	3	13	5	15	3	18	10	5	7	8	78	5	10	22	74	14	267
9:00 A	0	6	4	24	5	22	13	11	5	9	81	4	8	19	78	19	290
9:15 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	18	60	47	168	37	149	94	65	53	62	634	94	55	310	810	144	2637
	Peak Hour: 7:15 AM to 8:15 AM																
Total	11	32	26	95	19	70	47	30	29	32	332	69	28	215	510	81	1539
Approach	153				147				433				806				1539
%HV	7.2%				12.9%				6.7%				3.5%				5.7%
PHF	0.85				0.80				0.93				0.88				0.89



Special Notes

SCJ22043M_13A

SCJ ALLIANCE
CONSULTING SERVICES

The Belmont Flats

AM Peak Hour Volumes

Covid Adjustment	30%
Growth Rate:	4%

Intersection	Movement		Existing 2022 Volumes	Covid Adjustments	Adjusted 2022 Volumes	Background 2024 Growth	Total Pipeline Volumes	Yorkshire Pipeline Volume	Baseline 2024 Volumes	Site Generated Pass-By	Site Generated Primary	Site Generated Total	Projected 2024 Volumes
		L	39	12	51	4	0	3	58	0	4	4	62
	EB	T	169	51	220	18	1	53	292	0	18	18	310
		R	49	15	64	5	10	20	99	0	16	16	115
4		L	93	28	121	10	1	0	132	0	0	0	132
11th Ave/Linderson Way	WB	T	148	44	192	15	2	18	227	0	8	8	235
Israel Rd		R	18	5	23	2	0	0	25	0	0	0	25
		L	43	13	56	4	4	7	71	0	7	7	78
TMC Date: 07/26/2022	NB	T	44	13	57	5	3	0	65	0	0	0	65
		R	61	18	79	6	1	0	86	0	0	0	86
7:15 - 8:15		L	9	3	12	1	0	0	13	0	0	0	13
PHF: 0.78	SB	T	35	11	46	4	10	0	60	0	0	0	60
		R	23	7	30	2	0	1	33	0	2	2	35
			731		950				1,160				1,215
		L	0	0	0	0	0	0	0	0	0	0	0
	EB	T	304	91	395	32	5	136	568	0	108	108	676
		R	40	12	52	4	1	40	97	0	25	25	122
10		L	134	40	174	14	5	0	193	0	0	0	193
I-5 SB Ramps	WB	T	97	29	126	10	2	18	156	0	24	24	180
Tumwater Blvd		R	0	0	0	0	0	0	0	0	0	0	0
		L	0	0	0	0	0	0	0	0	0	0	0
TMC Date: 07/26/2022	NB	T	0	0	0	0	0	0	0	0	0	0	0
		R	0	0	0	0	0	0	0	0	0	0	0
7:15 - 8:15		L	474	1,142	1,616	129	55	0	1,800	0	0	0	1,800
PHF: 0.86	SB	T	3	1	4	0	0	0	4	0	0	0	4
		R	89	27	116	9	0	42	167	0	32	32	199
			1,141		2,483				2,985				3,174
		L	219	266	485	39	0	110	634	0	74	74	708
	EB	T	550	965	1,515	121	60	26	1,722	0	34	34	1,756
		R	0	0	0	0	0	0	0	0	0	0	0
11		L	0	0	0	0	0	0	0	0	0	0	0
I-5 NB Ramps	WB	T	170	51	221	18	7	9	255	0	14	14	269
Tumwater Blvd		R	322	247	569	45	19	0	633	0	0	0	633
		L	50	15	65	5	1	9	80	0	10	10	90
TMC Date: 07/26/2022	NB	T	1	0	1	0	0	0	1	0	0	0	1
		R	246	224	470	38	15	0	523	0	0	0	523
7:15 - 8:15		L	0	0	0	0	0	0	0	0	0	0	0
PHF: 0.87	SB	T	0	0	0	0	0	0	0	0	0	0	0
		R	0	0	0	0	0	0	0	0	0	0	0
			1,558		3,325				3,847				3,979
		L	215	1,015	1,230	98	74	0	1,402	0	0	0	1,402
	EB	T	510	153	663	53	0	26	742	0	34	34	776
		R	81	24	105	8	0	0	113	0	0	0	113
12		L	32	10	42	3	0	0	45	0	0	0	45
Linderson Way/Center St	WB	T	332	100	432	35	0	9	476	0	14	14	490
Tumwater Blvd		R	69	21	90	7	34	0	131	0	0	0	131
		L	70	21	91	7	0	0	98	0	0	0	98
TMC Date: 07/26/2022	NB	T	47	14	61	5	5	0	71	0	0	0	71
		R	30	9	39	3	0	0	42	0	0	0	42
7:15 - 8:15		L	32	10	42	3	11	0	56	0	0	0	56
PHF: 0.89	SB	T	26	8	34	3	2	0	39	0	0	0	39
		R	95	29	124	10	24	0	158	0	0	0	158
			1,539		2,951				3,371				3,419

YORKSHIRE
TRAFFIC IMPACT ANALYSIS

APPENDIX: PM PEAK HOUR COUNT DATA

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

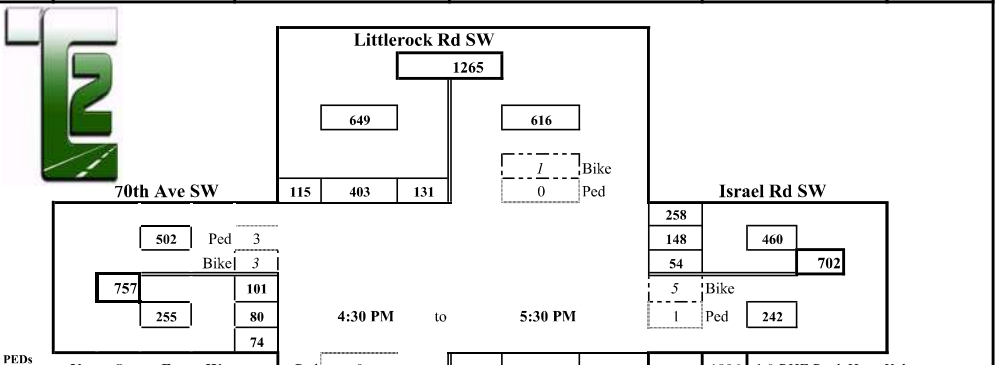
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Littlerock Rd SW & Israel Rd SW/70th Ave SW **Date of Count:** Wed 6/24/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Littlerock Rd SW				From South on (NB) Littlerock Rd SW				From East on (WB) Israel Rd SW				From West on (EB) 70th Ave SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	31	81	23	3	40	51	6	2	12	26	60	1	18	13	24	385
4:30 P	1	29	111	26	1	45	52	7	0	11	27	50	0	15	18	21	412
4:45 P	1	38	102	20	1	62	71	4	0	14	37	62	1	20	19	20	469
5:00 P	4	35	91	32	0	52	65	9	1	5	28	45	1	24	25	15	426
5:15 P	0	30	104	26	1	62	46	6	2	26	54	81	1	29	20	15	499
5:30 P	1	28	106	37	0	63	75	12	1	9	29	70	0	28	16	24	497
5:45 P	1	27	99	37	2	47	65	5	1	9	35	52	0	15	24	16	431
6:00 P	2	30	102	33	0	64	50	4	0	7	25	28	2	23	17	23	406
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	10	248	796	234	8	435	475	53	7	93	261	448	6	172	152	158	3525
Peak Hour: 4:30 PM to 5:30 PM																	
Total	6	131	403	115	2	239	257	31	4	54	148	258	3	101	80	74	1891
Approach	649				527				460				255				1891
%HV	0.9%				0.4%				0.9%				1.2%				0.8%
PHF	0.95				0.88				0.71				0.94				0.95



1996 *1.0 PHF Peak Hour Volume*

	PHF	%HV
EB	0.94	1.2%
WB	0.71	0.9%
NB	0.88	0.4%
SB	0.95	0.9%
T Int.	0.95	0.8%

Check In: 1891 Out: 1891

PEDs Across:

	N	S	E	W	
INT 01		3			3
INT 02					0
INT 03				2	2
INT 04					0
INT 05				1	1
INT 06			1		1
INT 07				1	1
INT 08	1				1
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	1	3	1	4	9

Bicycles From:

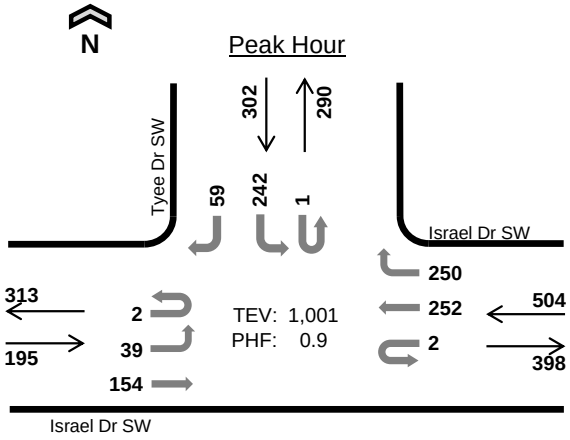
	N	S	E	W	
INT 01	2				2
INT 02	1	2	1		4
INT 03	1		1		2
INT 04		1	2	1	4
INT 05			2	1	3
INT 06				1	1
INT 07					0
INT 08		2	1		3
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	4	5	7	3	19

	N U's	S U's	E U's	W U's
	5	0		0
	2	2		0
	3	2		0
	1	1		1
	2	0		0
	1	2		0
	2	0		0
	2	1		0
	18	8	0	1

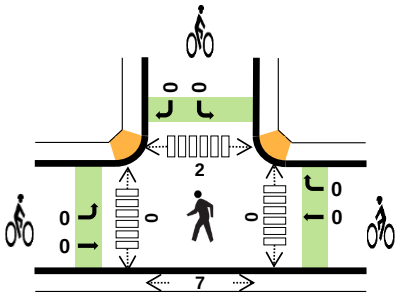
Special Notes

SCJ15075M_17p

Tyee Dr SW
Israel Dr SW



Date: 05/11/2022
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM



	HV %:	PHF
EB	2.6%	0.84
WB	0.6%	0.88
NB	-	-
SB	0.0%	0.90
TOTAL	0.8%	0.90

Two-Hour Count Summaries

Interval Start		Israel Dr SW Eastbound				Israel Dr SW Westbound				0 Northbound				Tyee Dr SW Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	7	39	0	0	0	48	53	0	0	0	0	0	62	0	28	237	0
4:15 PM		0	16	29	0	0	0	49	32	0	0	0	0	0	38	0	22	186	0
4:30 PM		**0**	**8**	**29**	**0**	**0**	**0**	**53**	**70**	**0**	**0**	**0**	**0**	**0**	**57**	**0**	**20**	**237**	0
4:45 PM		**0**	**15**	**35**	**0**	**1**	**0**	**57**	**46**	**0**	**0**	**0**	**0**	**0**	**49**	**0**	**17**	**220**	880
5:00 PM		**0**	**6**	**44**	**0**	**1**	**0**	**64**	**79**	**0**	**0**	**0**	**0**	**1**	**71**	**0**	**12**	**278**	921
5:15 PM		**2**	**10**	**46**	**0**	**0**	**0**	**78**	**55**	**0**	**0**	**0**	**0**	**0**	**65**	**0**	**10**	**266**	**1,001**
5:30 PM		0	8	46	0	0	0	50	39	0	0	0	0	0	59	0	14	216	980
5:45 PM		0	9	32	0	0	0	45	35	0	0	0	0	1	52	0	10	184	944
Count Total		2	79	300	0	2	0	444	409	0	0	0	0	2	453	0	133	1,824	0
Peak Hour	**All**	**2**	**39**	**154**	**0**	**2**	**0**	**252**	**250**	**0**	**0**	**0**	**0**	**1**	**242**	**0**	**59**	**1,001**	**0**
	HV	**0**	**0**	**5**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**
	HV%	**0%**	**0%**	**3%**	**-**	**0%**	**-**	**1%**	**0%**	**-**	**-**	**-**	**-**	**0%**	**0%**	**-**	**0%**	**1%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals EB	WB	NB	SB	Total	Bicycles EB	WB	NB	SB	Total	Pedestrians (Crossing Leg) East	West	North	South	Total
4:00 PM	2	2	0	1	*5*	0	0	0	1	*1*	0	0	0	0	*0*
4:15 PM	0	2	0	0	*2*	0	0	0	0	*0*	0	0	0	0	*0*
4:30 PM	**2**	**0**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**2**	**6**	*8*
4:45 PM	**0**	**2**	**0**	**0**	***2***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**1**	*1*
5:00 PM	**1**	**0**	**0**	**0**	***1***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
5:15 PM	**2**	**1**	**0**	**0**	***3***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	***0***
5:30 PM	0	1	0	0	*1*	0	0	0	0	*0*	0	0	0	1	*1*
5:45 PM	1	2	0	2	*5*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	8	10	0	3	*21*	0	0	0	1	*1*	0	0	2	8	*10*
Peak Hr	**5**	**3**	**0**	**0**	***8***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**2**	**7**	***9***

Two-Hour Count Summaries - Heavy Vehicles

Interval Start	Israel Dr SW				Israel Dr SW				0				Tyee Dr SW				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	1	0	0	5	0
4:15 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	0
4:30 PM	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	11
5:00 PM	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	7
5:15 PM	**0**	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**8**
5:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	7
5:45 PM	0	0	1	0	0	0	2	0	0	0	0	0	1	1	0	0	5	10
Count Total	0	0	8	0	0	0	10	0	0	0	0	0	1	2	0	0	21	0
Peak Hour	**0**	**0**	**5**	**0**	**0**	**0**	**3**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	Israel Dr SW			Israel Dr SW			0			Tyee Dr SW			15-min Total	Rolling One Hour
	Eastbound			Westbound			Northbound			Southbound				
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	1	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	1
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	1	1	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

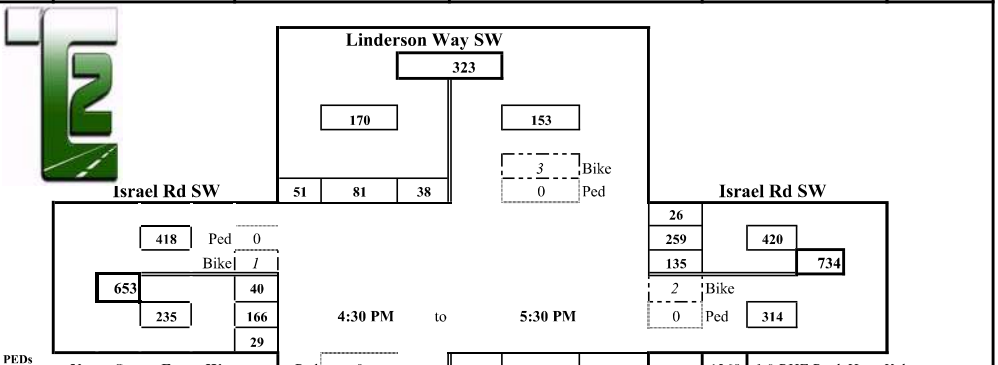
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Linderson Way SW/11th Ave SW & Israel Rd SW **Date of Count:** Wed 6/24/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Linderson Way SW				From South on (NB) 11th Ave SW				From East on (WB) Israel Rd SW				From West on (EB) Israel Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	6	27	14	0	22	13	29	3	46	79	15	0	6	32	19	308
4:30 P	0	10	18	12	1	22	13	16	1	29	62	4	0	2	40	10	238
4:45 P	1	10	22	11	0	35	27	37	2	26	65	7	1	6	46	10	302
5:00 P	0	8	14	7	0	16	21	23	1	27	49	3	2	17	43	7	235
5:15 P	0	15	27	23	1	43	22	30	2	49	79	6	0	6	38	4	342
5:30 P	0	5	18	10	0	14	17	20	1	33	66	10	0	11	39	8	251
5:45 P	0	5	15	12	0	18	21	1	2	30	63	4	1	8	35	10	222
6:00 P	0	2	11	13	0	5	15	16	1	17	50	4	0	14	28	9	184
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	1	61	152	102	2	175	149	172	13	257	513	53	4	70	301	77	2082
Peak Hour: 4:30 PM to 5:30 PM																	
Total	1	38	81	51	1	108	87	110	6	135	259	26	3	40	166	29	1130
Approach	170				305				420				235				1130
%HV	0.6%				0.3%				1.4%				1.3%				1.0%
PHF	0.65				0.77				0.78				0.88				0.83



PEDs Across:	N	S	E	W	
INT 01			1		1
INT 02				1	1
INT 03					0
INT 04					0
INT 05					0
INT 06					0
INT 07					0
INT 08	1	1	1		3
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	1	1	2	1	5

Bicycles From:	N	S	E	W	
INT 01			2		2
INT 02				1	1
INT 03	1	3	1		5
INT 04	1	1	1	1	4
INT 05		1			1
INT 06	1				1
INT 07		1	1		2
INT 08		1		1	2
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	3	7	5	3	18

1368 *1.0 PHF Peak Hour Volume*

	PHF	%HV
EB	0.88	1.3%
WB	0.78	1.4%
NB	0.77	0.3%
SB	0.65	0.6%
T Int.	0.83	1.0%

Check In: 1130 Out: 1130

Conditions:

Special Notes

SCJ15075M_10p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

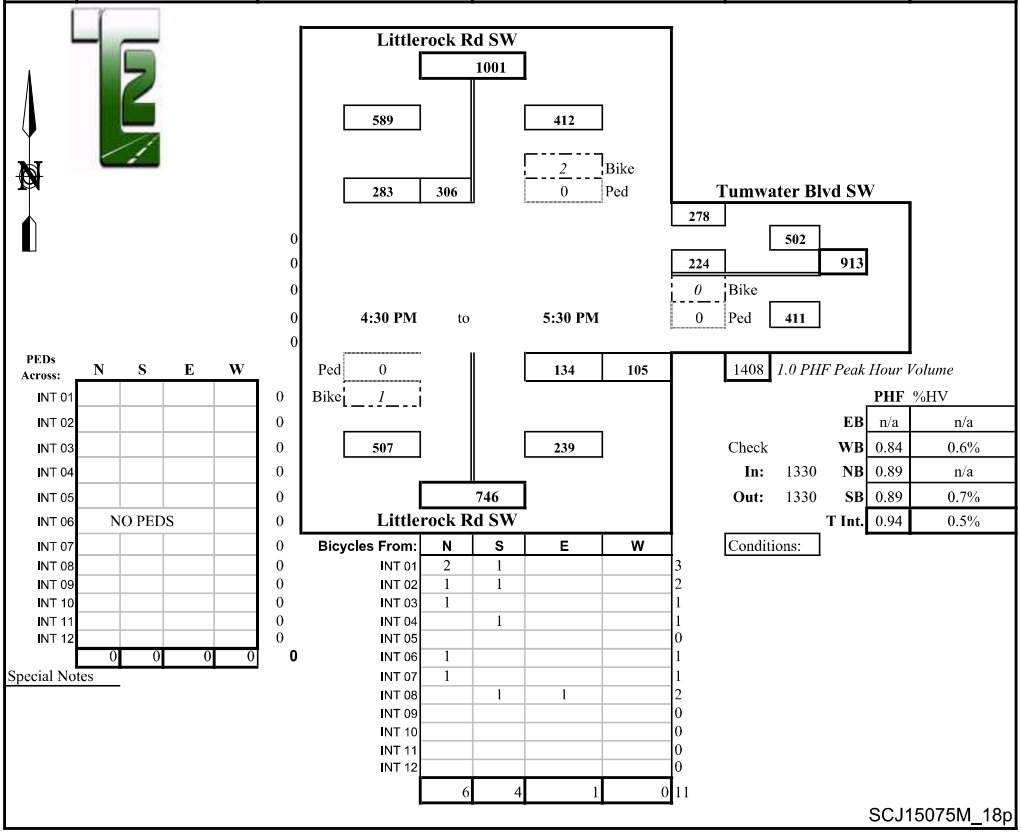
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Littlerock Rd SW & Tumwater Blvd SW **Date of Count:** Wed 6/24/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Littlerock Rd SW				From South on (NB) Littlerock Rd SW				From East on (WB) Tumwater Blvd SW				From West on (EB) 0				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	75	61	0	1	0	33	9	3	49	0	54	0	0	0	0	281
4:30 P	0	67	89	0	0	0	32	19	0	48	0	58	0	0	0	0	313
4:45 P	1	74	70	0	0	0	31	28	1	80	0	69	0	0	0	0	352
5:00 P	3	77	54	0	0	0	36	27	1	36	0	69	0	0	0	0	299
5:15 P	0	75	91	0	0	0	35	15	1	71	0	60	0	0	0	0	347
5:30 P	0	80	68	0	0	0	32	35	0	37	0	80	0	0	0	0	332
5:45 P	1	79	68	0	1	0	43	11	1	49	0	67	0	0	0	0	317
6:00 P	2	60	48	0	0	0	29	33	0	43	0	64	0	0	0	0	277
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	7	587	549	0	2	0	271	177	7	413	0	521	0	0	0	0	2518
Peak Hour: 4:30 PM to 5:30 PM																	
Total	4	306	283	0	0	0	134	105	3	224	0	278	0	0	0	0	1330
Approach		589				239				502				0			1330
%HV		0.7%				n/a				0.6%				n/a			0.5%
PHF		0.89				0.89				0.84				n/a			0.94



Special Notes

SCJ15075M_18p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

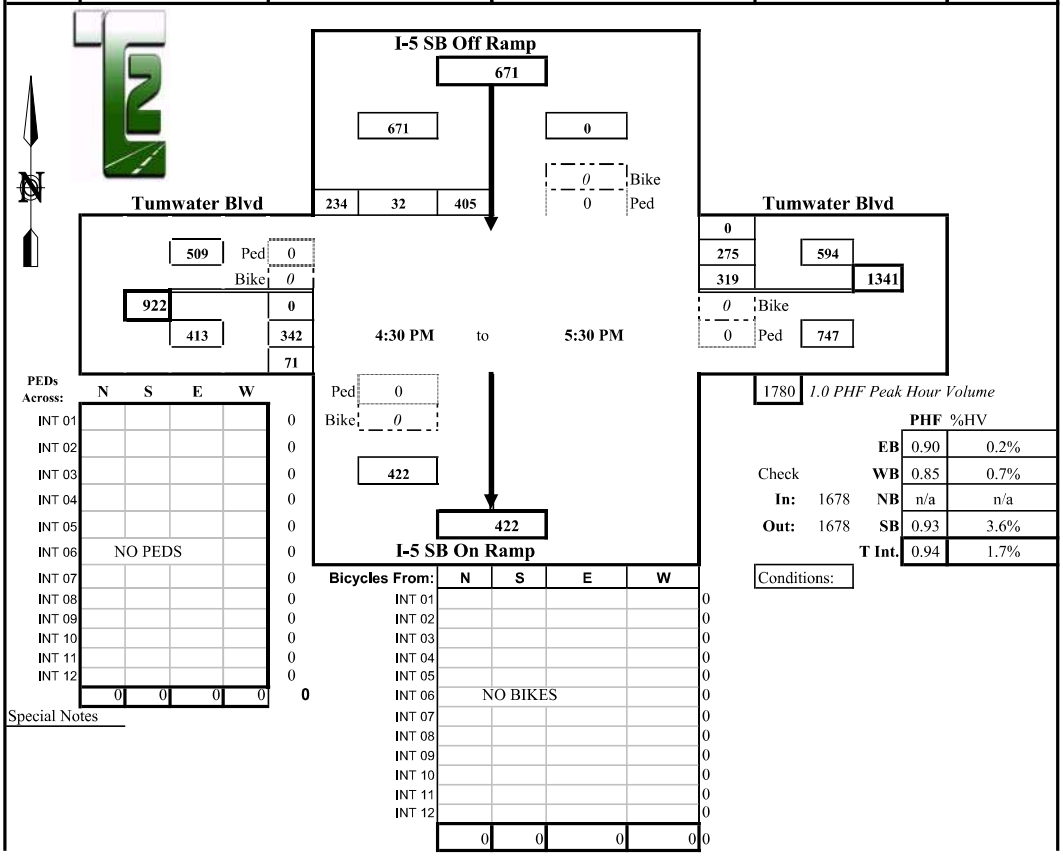
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: I-5 SB Ramps & Tumwater Blvd **Date of Count:** Wed 6/24/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval Ending at	From North (SB) I-5 SB Off Ramp				From South on (NB) I-5 SB On Ramp				From East on (WB) Tumwater Blvd				From West on (EB) Tumwater Blvd				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	5	119	9	50	0	0	0	0	1	69	53	0	1	0	60	19	379
4:30 P	5	96	6	46	0	0	0	0	0	60	60	0	0	0	79	12	359
4:45 P	3	101	6	60	0	0	0	0	2	77	89	0	0	0	92	11	436
5:00 P	8	102	10	46	0	0	0	0	0	62	58	0	1	0	90	15	383
5:15 P	7	104	8	68	0	0	0	0	0	112	63	0	0	0	64	26	445
5:30 P	6	98	8	60	0	0	0	0	2	68	65	0	0	0	96	19	414
5:45 P	3	94	3	42	0	0	0	0	0	58	66	0	0	0	70	10	343
6:00 P	7	83	9	51	0	0	0	0	0	35	56	0	2	0	85	18	337
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	44	797	59	423	0	0	0	0	5	541	510	0	4	0	636	130	3096
Peak Hour: 4:30 PM to 5:30 PM																	
Total	24	405	32	234	0	0	0	0	4	319	275	0	1	0	342	71	1678
Approach	671				0				594				413				1678
%HV	3.6%				n/a				0.7%				0.2%				1.7%
PHF	0.93				n/a				0.85				0.90				0.94



PEDs Across:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO PEDS				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

Bicycles From:

	N	S	E	W	
INT 01					0
INT 02					0
INT 03					0
INT 04					0
INT 05					0
INT 06	NO BIKES				0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	0	0	0

		PHF	%HV
	EB	0.90	0.2%
Check	WB	0.85	0.7%
In: 1678	NB	n/a	n/a
Out: 1678	SB	0.93	3.6%
	T Int.	0.94	1.7%

Conditions:

Special Notes

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

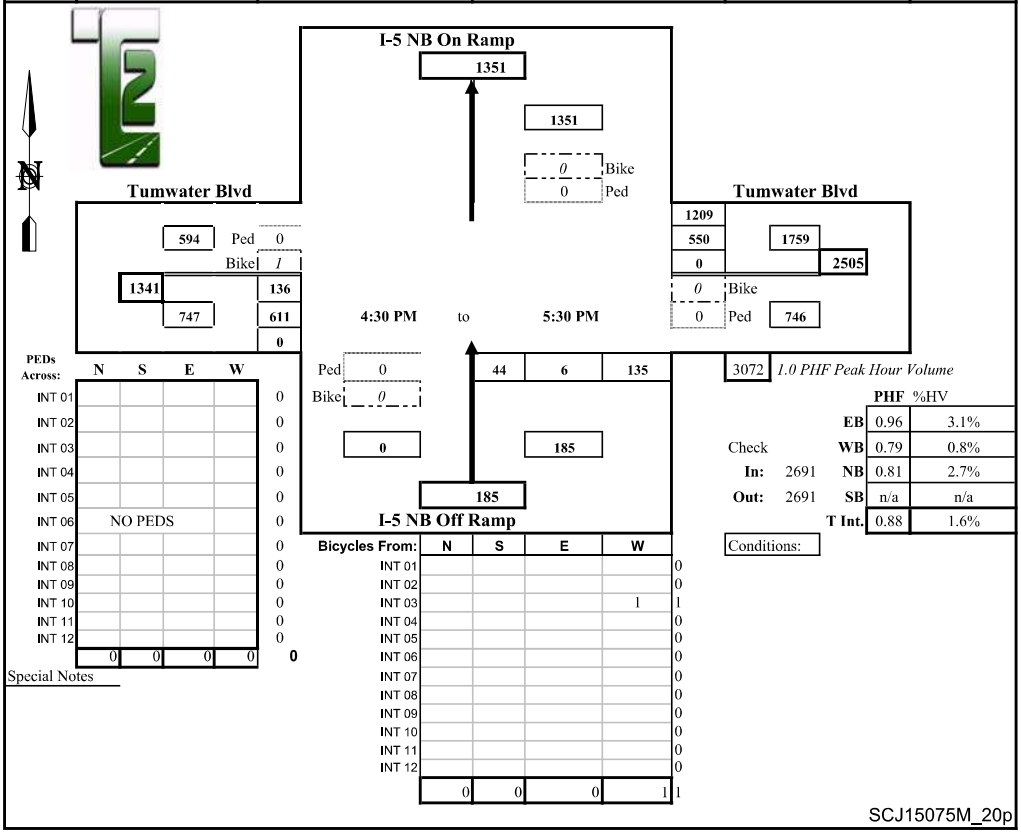
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: I-5 NB Ramps & Tumwater Blvd **Date of Count:** Wed 6/24/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) I-5 NB On Ramp				From South on (NB) I-5 NB Off Ramp				From East on (WB) Tumwater Blvd				From West on (EB) Tumwater Blvd				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	0	0	0	1	10	1	21	3	0	112	253	7	19	161	0	577
4:30 P	0	0	0	0	4	13	5	23	3	0	107	197	4	38	137	0	520
4:45 P	0	0	0	0	1	16	1	34	6	0	150	359	1	44	149	0	753
5:00 P	0	0	0	0	2	6	2	29	3	0	114	252	10	28	164	0	595
5:15 P	0	0	0	0	1	5	2	33	1	0	177	383	6	25	143	0	768
5:30 P	0	0	0	0	1	17	1	39	4	0	109	215	6	39	155	0	575
5:45 P	0	0	0	0	1	9	2	31	4	0	116	191	2	40	134	0	523
6:00 P	0	0	0	0	1	12	1	25	2	0	79	131	9	41	129	0	418
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	0	0	0	12	88	15	235	26	0	964	1981	45	274	1172	0	4729
Peak Hour: 4:30 PM to 5:30 PM																	
Total	0	0	0	0	5	44	6	135	14	0	550	1209	23	136	611	0	2691
Approach	0				185				1759				747				2691
%HV	n/a				2.7%				0.8%				3.1%				1.6%
PHF	n/a				0.81				0.79				0.96				0.88



SCJ15075M_20p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

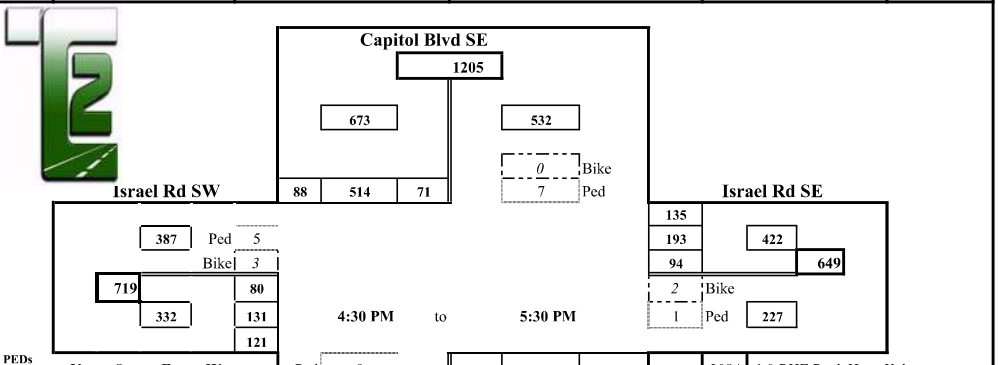
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Capitol Blvd SE & Israel Rd SE/SW **Date of Count:** Wed 6/24/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Capitol Blvd SE				From South on (NB) Capitol Blvd SE				From East on (WB) Israel Rd SE				From West on (EB) Israel Rd SW				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	20	94	13	1	34	61	12	3	14	53	25	0	35	34	35	430
4:30 P	1	15	106	29	3	19	77	7	1	12	40	25	1	24	31	25	410
4:45 P	1	21	110	22	1	20	78	8	2	30	45	41	0	15	39	28	457
5:00 P	3	17	110	17	2	23	88	11	3	20	40	40	0	21	31	21	439
5:15 P	1	20	137	21	1	32	75	3	1	30	68	34	0	22	30	49	521
5:30 P	3	13	157	28	1	31	76	3	1	14	40	20	0	22	31	23	458
5:45 P	3	13	104	18	2	24	65	4	2	14	28	20	0	29	22	16	357
6:00 P	2	10	94	21	2	23	76	1	5	22	26	9	0	21	22	57	382
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	15	129	912	169	13	206	596	49	18	156	340	214	1	189	240	254	3454
Peak Hour: 4:30 PM to 5:30 PM																	
Total	8	71	514	88	5	106	317	25	7	94	193	135	0	80	131	121	1875
Approach	673				448				422				332				1875
%HV	1.2%				1.1%				1.7%				n/a				1.1%
PHF	0.85				0.92				0.80				0.82				0.90



PEDs Across:	N	S	E	W	
INT 01	2		2		4
INT 02	1	1		1	3
INT 03	1	6		4	11
INT 04	6				6
INT 05				1	1
INT 06		2	1		3
INT 07			1		1
INT 08			1		1
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	10	9	5	6	30

Bicycles From:	N	S	E	W	
INT 01					0
INT 02		1		1	2
INT 03				1	1
INT 04			1	1	2
INT 05				1	1
INT 06			1		1
INT 07					0
INT 08		1			1
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	2	2	4	8

2084 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.82	n/a
Check	WB	0.80	1.7%
In: 1875	NB	0.92	1.1%
Out: 1875	SB	0.85	1.2%
	T Int.	0.90	1.1%

Conditions:

Special Notes

SCJ15075M_06p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

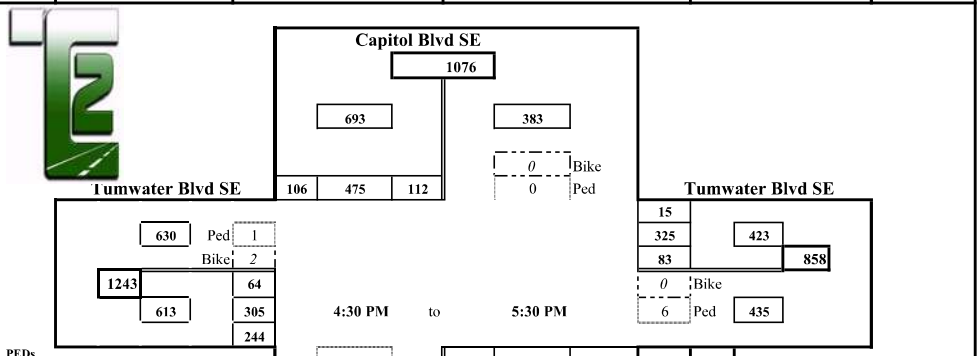
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Capitol Blvd SE & Tumwater Blvd SE **Date of Count:** Wed 6/24/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval Ending at	From North on (SB) Capitol Blvd SE				From South on (NB) Capitol Blvd SE				From East on (WB) Tumwater Blvd SE				From West on (EB) Tumwater Blvd SE				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	2	16	118	19	0	54	85	3	2	12	58	1	7	19	63	59	507
4:30 P	1	11	121	23	2	54	67	4	1	12	53	3	3	24	54	42	468
4:45 P	0	37	94	33	0	52	76	5	0	24	72	1	7	17	82	78	571
5:00 P	4	16	106	19	1	47	72	3	0	14	70	5	5	20	81	62	515
5:15 P	0	33	141	36	4	53	83	4	1	28	104	4	4	13	78	50	627
5:30 P	3	26	134	18	1	47	73	6	1	17	79	5	5	14	64	54	537
5:45 P	3	23	105	28	2	67	69	1	4	14	57	2	3	10	61	52	489
6:00 P	7	20	85	14	1	50	75	3	1	10	45	8	3	7	39	43	399
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	20	182	904	190	11	424	600	29	10	131	538	29	37	124	522	440	4113
Peak Hour: 4:30 PM to 5:30 PM																	
Total	7	112	475	106	6	199	304	18	2	83	325	15	21	64	305	244	2250
Approach	693				521				423				613				2250
%HV	1.0%				1.2%				0.5%				3.4%				1.6%
PHF	0.83				0.93				0.78				0.87				0.90



PEDs Across:

	N	S	E	W	
INT 01			2		2
INT 02			9		9
INT 03			6		6
INT 04				1	1
INT 05					0
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	0	17	1	18

Bicycles From:

	N	S	E	W	
INT 01					0
INT 02		1	1		2
INT 03				1	1
INT 04		1		1	2
INT 05					0
INT 06					0
INT 07					0
INT 08					0
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	0	2	1	2	5

2508 *1.0 PHF Peak Hour Volume*

		PHF	%HV
	EB	0.87	3.4%
Check	WB	0.78	0.5%
In: 2250	NB	0.93	1.2%
Out: 2250	SB	0.83	1.0%
	T Int.	0.90	1.6%

Conditions:

Special Notes

SCJ15075M_07p

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

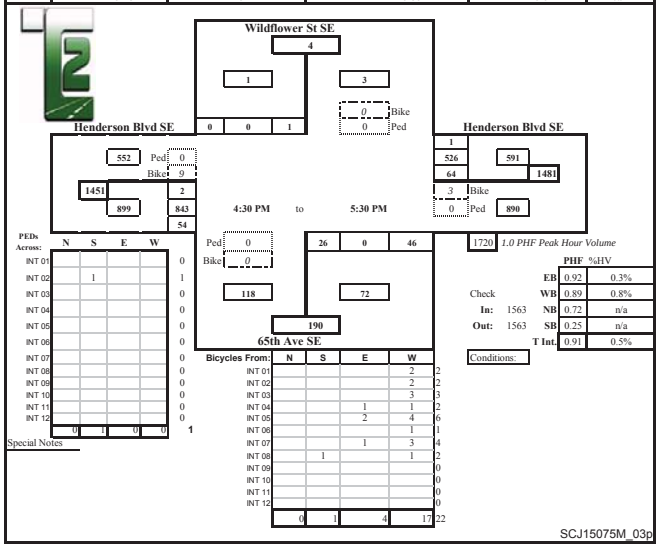
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Wildflower St SE/65th Ave SE & Henderson Blvd SE **Date of Count:** Wed 7/01/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval Ending at	From North on (SB) Wildflower St SE				From South on (NB) 65th Ave SE				From East on (WB) Henderson Blvd SE				From West on (EB) Henderson Blvd SE				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	0	2	0	1	0	5	0	6	1	10	97	2	0	0	146	10	279
4:30 P	0	0	0	0	0	10	0	6	1	16	105	0	1	0	157	14	308
4:45 P	0	0	0	0	0	4	0	13	0	14	111	0	0	1	205	12	360
5:00 P	0	0	0	0	0	9	0	7	2	12	126	1	0	1	184	14	354
5:15 P	0	1	0	0	0	3	0	11	3	17	149	0	1	0	222	16	419
5:30 P	0	0	0	0	0	10	0	15	0	21	140	0	2	0	232	12	430
5:45 P	0	0	0	0	0	13	0	7	1	17	129	0	2	1	178	10	355
6:00 P	0	0	0	0	0	6	0	17	4	18	139	0	0	0	131	13	324
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	0	3	0	1	0	60	0	82	12	125	996	3	6	3	1455	101	2829
Peak Hour: 4:30 PM to 5:30 PM																	
Total	0	1	0	0	0	26	0	46	5	64	526	1	3	2	843	54	1563
Approach	1				72				591				899				1563
%HV	n/a				n/a				0.8%				0.3%				0.5%
PHF	0.25				0.72				0.89				0.92				0.91



SCJ15075M_03p

Prepared for: **City of Tumwater**

Traffic Count Consultants, Inc.

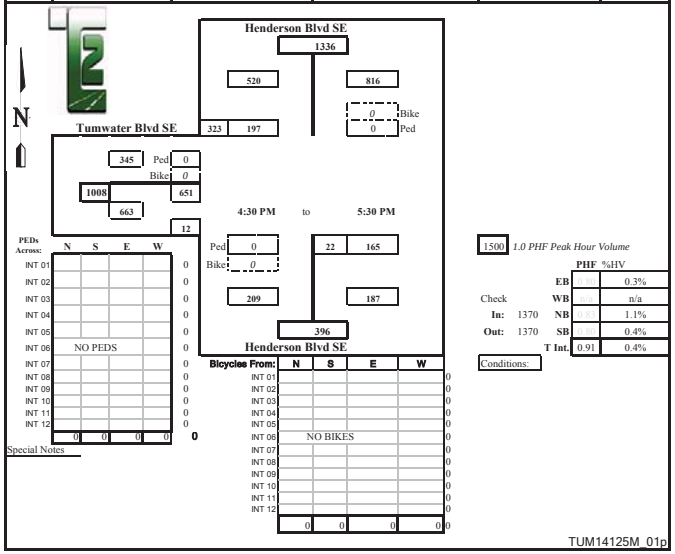
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Henderson Blvd SE & Tumwater Blvd SE **Date of Count:** Thurs 11/13/2014

Location: Tumwater, Washington **Checked By:** Jess

Time Interval Ending at	From North on (SB) Henderson Blvd SE				From South on (NB) Henderson Blvd SE				From East on (WB) 0				From West on (EB) Tumwater Blvd SE				Interval Total
	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	2	0	39	57	0	4	34	0	0	0	0	0	0	155	0	7	296
4:30 P	3	0	35	66	0	7	35	0	0	0	0	0	0	124	0	0	267
4:45 P	2	0	46	90	0	8	36	0	0	0	0	0	1	169	0	1	350
5:00 P	0	0	37	72	2	6	38	0	0	0	0	0	1	142	0	2	297
5:15 P	0	0	40	72	0	4	52	0	0	0	0	0	0	201	0	6	375
5:30 P	0	0	74	89	0	4	39	0	0	0	0	0	0	139	0	3	348
5:45 P	1	0	56	61	0	7	29	0	0	0	0	0	0	130	0	3	286
6:00 P	0	0	36	42	0	5	25	0	0	0	0	0	0	93	0	3	204
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	8	0	363	549	2	45	288	0	0	0	0	0	2	1153	0	25	2423
Peak Hour: 4:30 PM to 5:30 PM																	
Total	2	0	197	323	2	22	165	0	0	0	0	0	2	651	0	12	1370
Approach	520				187				0				663				1370
%HV	0.4%				1.1%				n/a				0.3%				0.4%
PHF	0.80				0.83				n/a				0.80				0.91

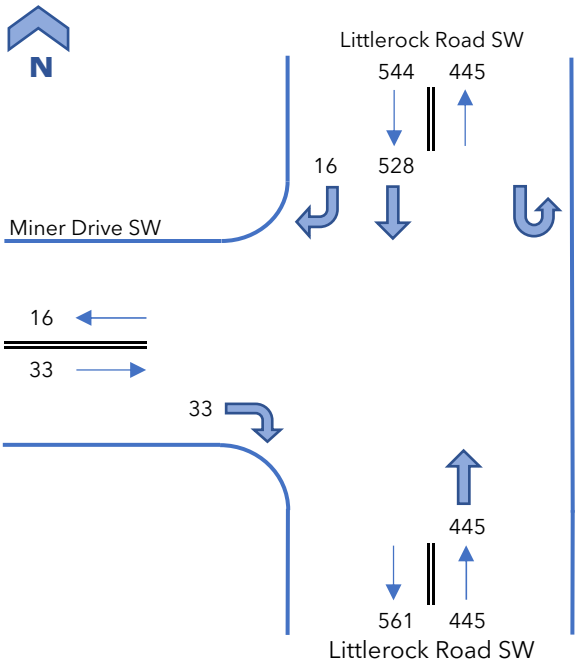


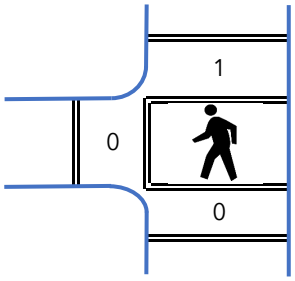
TUM14125M_01p

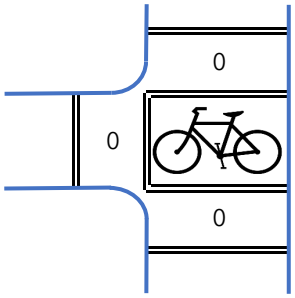
HEATH&ASSOCIATES
Transportation Planning & Engineering

Date Collected: 8/17/2023
Day of the Week: Thursday
Time Period: 4:00 PM to 6:00 PM
Peak Hour: 4:30 PM to 5:30 PM

Littlerock Road SW & Miner Drive SW







Interval Start Time	Miner Drive SW Eastbound					Westbound			Littlerock Road SW Northbound				Littlerock Road SW Southbound				15 Minute Totals	Hourly Totals
	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT		
4:00 PM	0	0	0	3	0	0	0	0	0	0	102	0	0	0	132	3	240	
4:15 PM	0	0	0	8	0	0	0	0	0	0	118	0	0	0	122	1	249	
4:30 PM	0	0	0	5	0	0	0	0	0	0	110	0	0	0	131	2	248	
4:45 PM	0	0	0	9	0	0	0	0	0	0	119	0	0	0	117	4	249	986
5:00 PM	0	0	0	9	0	0	0	0	0	0	114	0	0	0	133	5	261	1007
5:15 PM	0	0	0	10	0	0	0	0	0	0	102	0	0	0	147	5	264	1022
5:30 PM	0	0	0	5	0	0	0	0	0	0	105	0	0	0	134	1	245	1019
5:45 PM	0	0	0	5	0	0	0	0	0	0	79	0	0	0	106	5	195	965
Count Total	0	0	0	54	0	0	0	0	0	0	849	0	0	0	1022	26	1951	--
Peak Hour Total	0	0	0	33	0	0	0	0	0	0	445	0	0	0	528	16	1022	--
PHF	0.83				0.00				0.93				0.89				0.97	--
Heavy Vehicles	0	0	0	0	0	0	0	0	0	0	4	0	0	0	6	0	10	--
HV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.9%	0.0%	0.0%	0.0%	1.1%	0.0%	1.0%	--

Interval Start Time	Heavy Vehicles				
	EB	WB	NB	SB	Total
4:00 PM	0	0	0	1	1
4:15 PM	1	0	2	1	4
4:30 PM	0	0	0	2	2
4:45 PM	0	0	2	1	3
5:00 PM	0	0	1	3	4
5:15 PM	0	0	1	0	1
5:30 PM	1	0	0	1	2
5:45 PM	0	0	1	0	1
Count Total	2	0	7	9	18
Peak Hour Total	0	0	4	6	10
Peak Hour HV%	0.0%	0.0%	0.9%	1.1%	1.0%

Pedestrians (Leg)				
E	W	N	S	Total
0	0	0	0	0
0	0	1	0	1
0	0	0	0	0
0	0	0	0	0
0	0	1	0	1
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	1	2	0	3
0	0	1	0	1

Bicycles (Leg)				
E	W	N	S	Total
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	1	0	1
0	0	0	0	0
0	0	1	0	1
0	0	0	0	0

Prepared for: **SCJ Alliance**

Traffic Count Consultants, Inc.

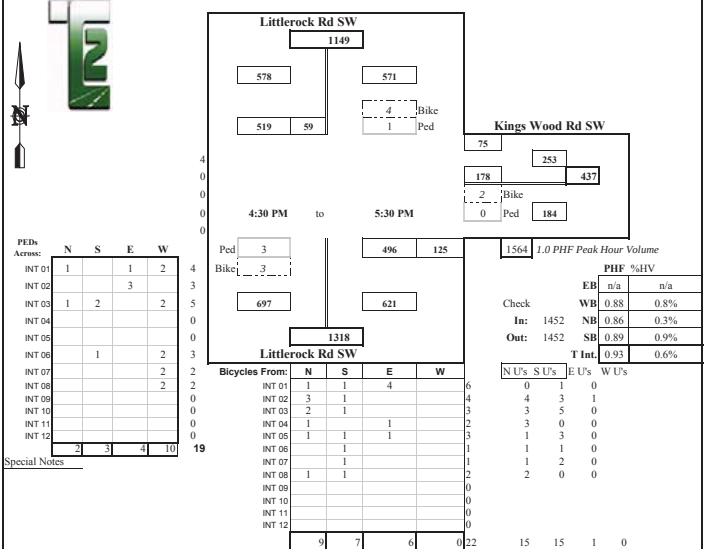
Phone: (253) 926-6009 FAX: (253) 922-7211 E-Mail: Team@TC2inc.com

WBE/DBE

Intersection: Littlerock Rd SW & Kings Wood Dr SW **Date of Count:** Wed 6/24/2015

Location: Tumwater, Washington **Checked By:** Jess

Time Interval	From North on (SB) Littlerock Rd SW				From South on (NB) Littlerock Rd SW				From East on (WB) Kings Wood Rd SW				From West on (EB) 0				Interval Total
Ending at	T	L	S	R	T	L	S	R	T	L	S	R	T	L	S	R	
4:15 P	1	12	129	0	2	0	99	37	0	41	0	22	0	0	0	0	340
4:30 P	2	16	137	0	1	0	103	30	0	28	0	18	0	0	0	0	332
4:45 P	1	20	119	0	0	0	124	33	0	47	0	25	0	0	0	0	368
5:00 P	3	21	118	0	1	0	108	30	1	49	0	14	0	0	0	0	340
5:15 P	0	9	128	0	0	0	114	32	1	48	0	22	0	0	0	0	353
5:30 P	1	9	154	0	1	0	150	30	0	34	0	14	0	0	0	0	391
5:45 P	0	12	138	0	0	0	98	39	0	52	0	14	0	0	0	0	353
6:00 P	2	12	116	0	2	0	76	22	0	50	0	17	0	0	0	0	293
6:15 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:30 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Survey	10	111	1039	0	7	0	872	253	2	349	0	146	0	0	0	0	2770
Peak Hour:	4:30 PM				to	5:30 PM											
Total	5	59	519	0	2	0	496	125	2	178	0	75	0	0	0	0	1452
Approach	578				621				253				0				1452
%HV	0.9%				0.3%				0.8%				n/a				0.6%
PHF	0.89				0.86				0.88				n/a				0.93



PEDs Across:	N	S	E	W	
INT 01	1		1	2	4
INT 02			3		3
INT 03	1	2		2	5
INT 04					0
INT 05					0
INT 06		1		2	3
INT 07				2	2
INT 08				2	2
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	2	3	4	10	19

Special Notes

Bicycles From:	N	S	E	W	
INT 01	1	1	4		6
INT 02	3	1			4
INT 03	2	1			3
INT 04	1		1		2
INT 05	1	1	1		3
INT 06		1			1
INT 07		1			1
INT 08	1	1			2
INT 09					0
INT 10					0
INT 11					0
INT 12					0
	9	7	6	0	22

	PHF	%HV
EB	n/a	n/a
WB	0.88	0.8%
NB	0.86	0.3%
SB	0.89	0.9%
T Int.	0.93	0.6%

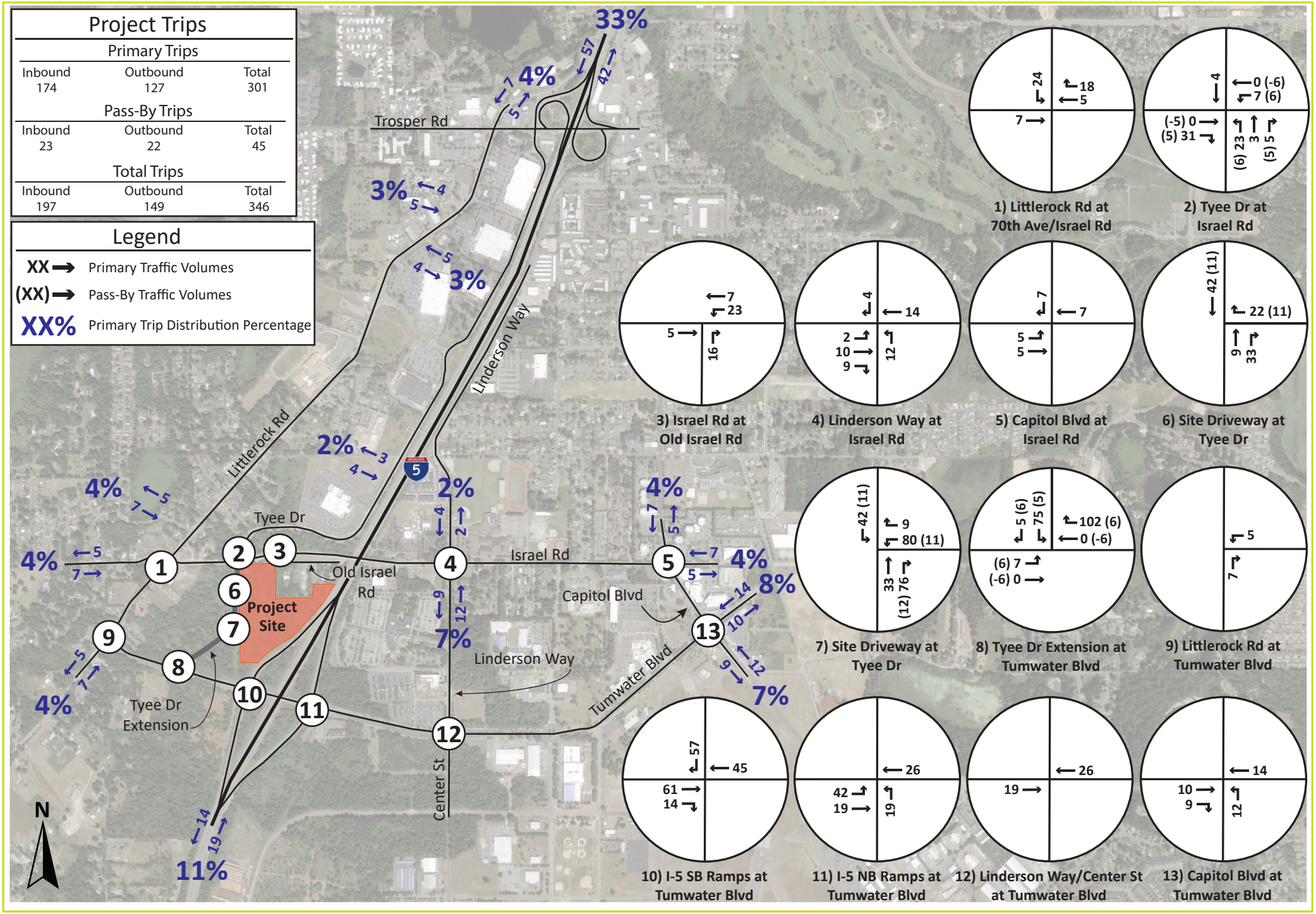
Check In: 1452 Out: 1452

N U's	S U's	E U's	W U's
0	1	0	
4	3	1	
3	5	0	
3	0	0	
1	3	0	
1	1	0	
1	2	0	
2	0	0	
15	15	1	0

SCJ15075M_15p

YORKSHIRE
TRAFFIC IMPACT ANALYSIS

APPENDIX: PIPELINE DATA



SCJ ALLIANCE
ENGINEERING AND PLANNING SERVICES

The Belmont Flats
Tumwater, Washington
Traffic Impact Analysis

Figure 5
Site-Generated Traffic Volumes
PM Peak Hour

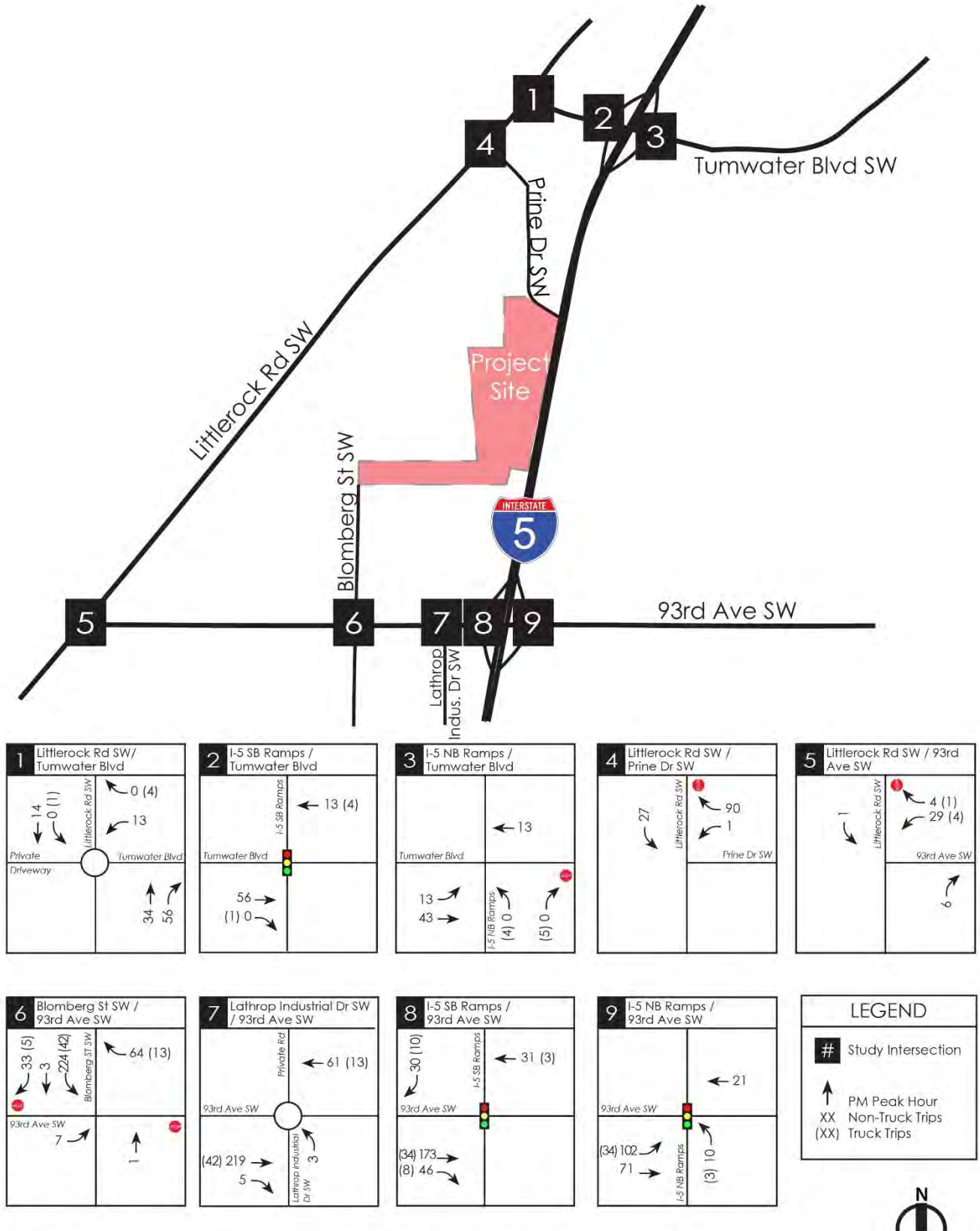
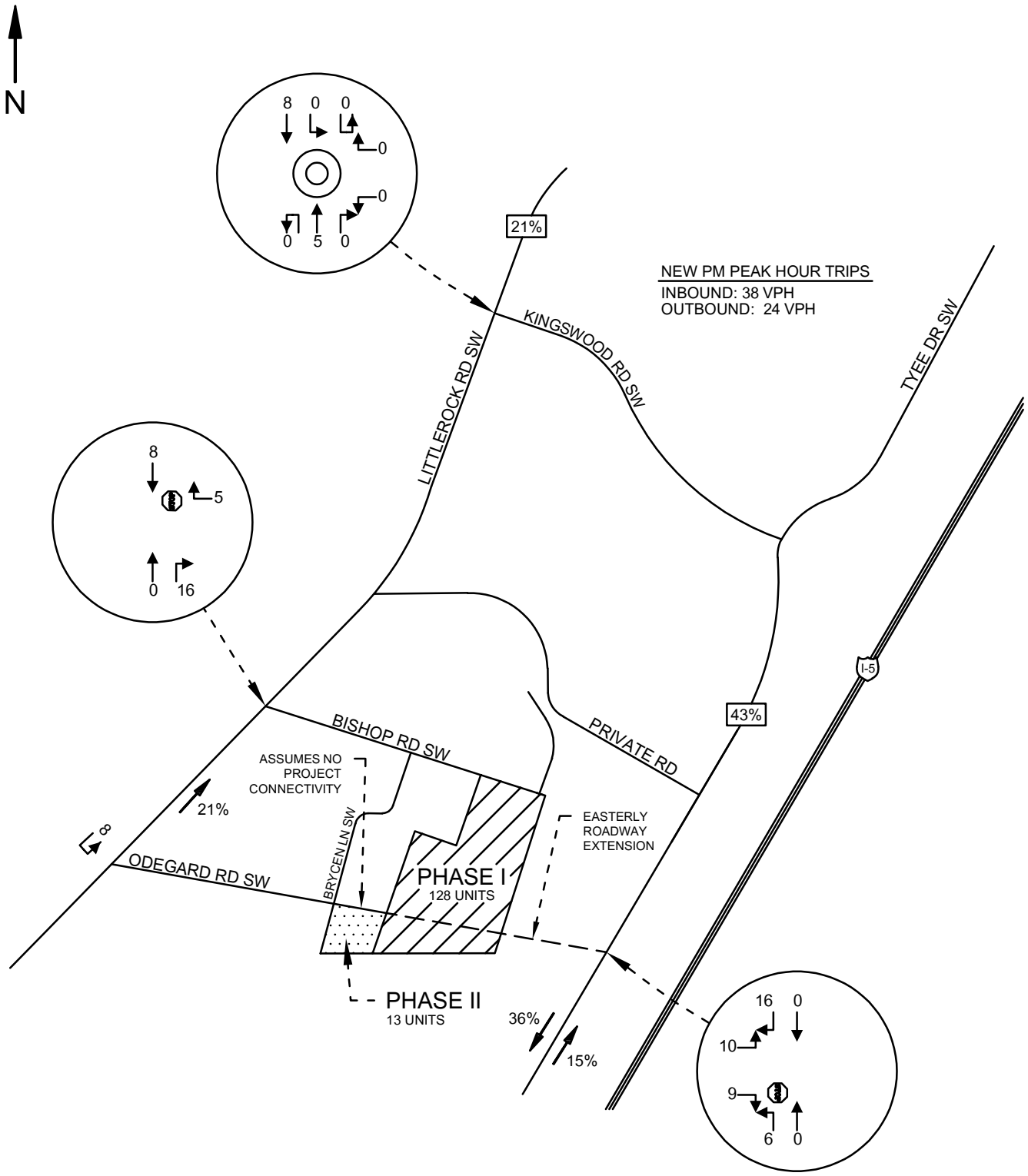


Figure 6: Weekday PM Peak Hour Project Trip Assignment

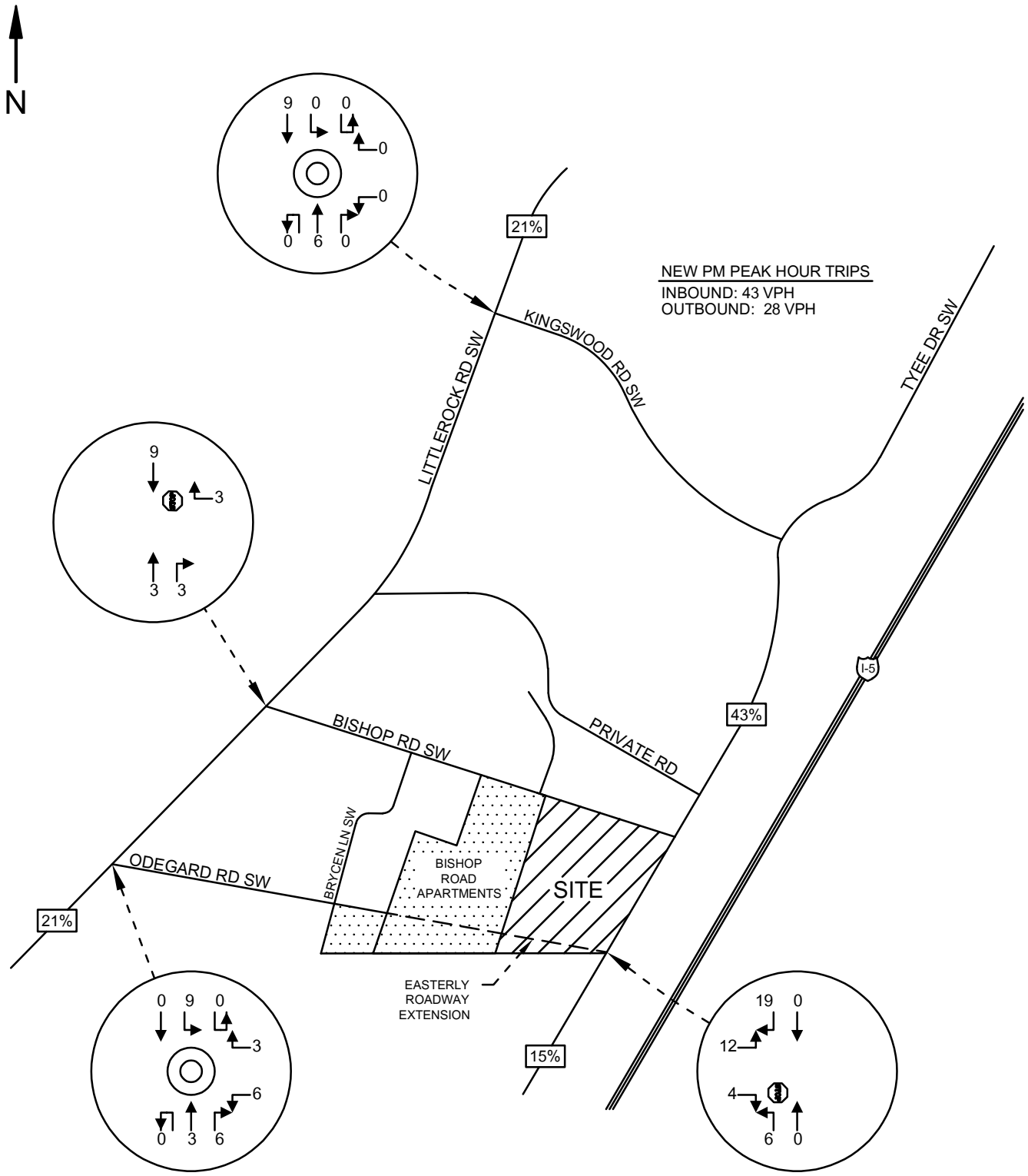


HEATH & ASSOCIATES

TRAFFIC AND CIVIL ENGINEERING

BISHOP ROAD APARTMENTS

PM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT
FIGURE 2.1

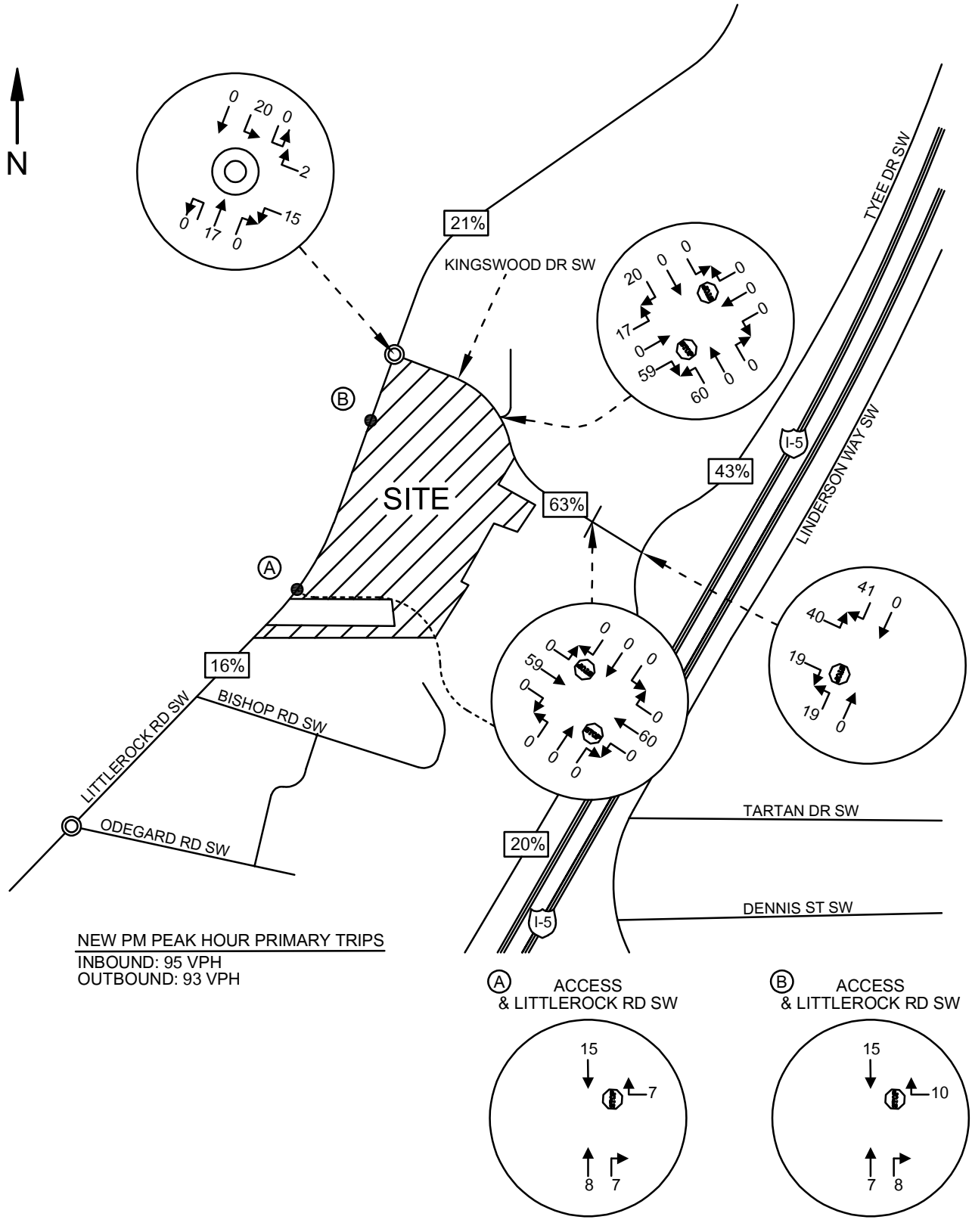


HEATH & ASSOCIATES

TRANSPORTATION PLANNING & ENGINEERING

KINGSWOOD APARTMENTS

PM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT
FIGURE 3.2

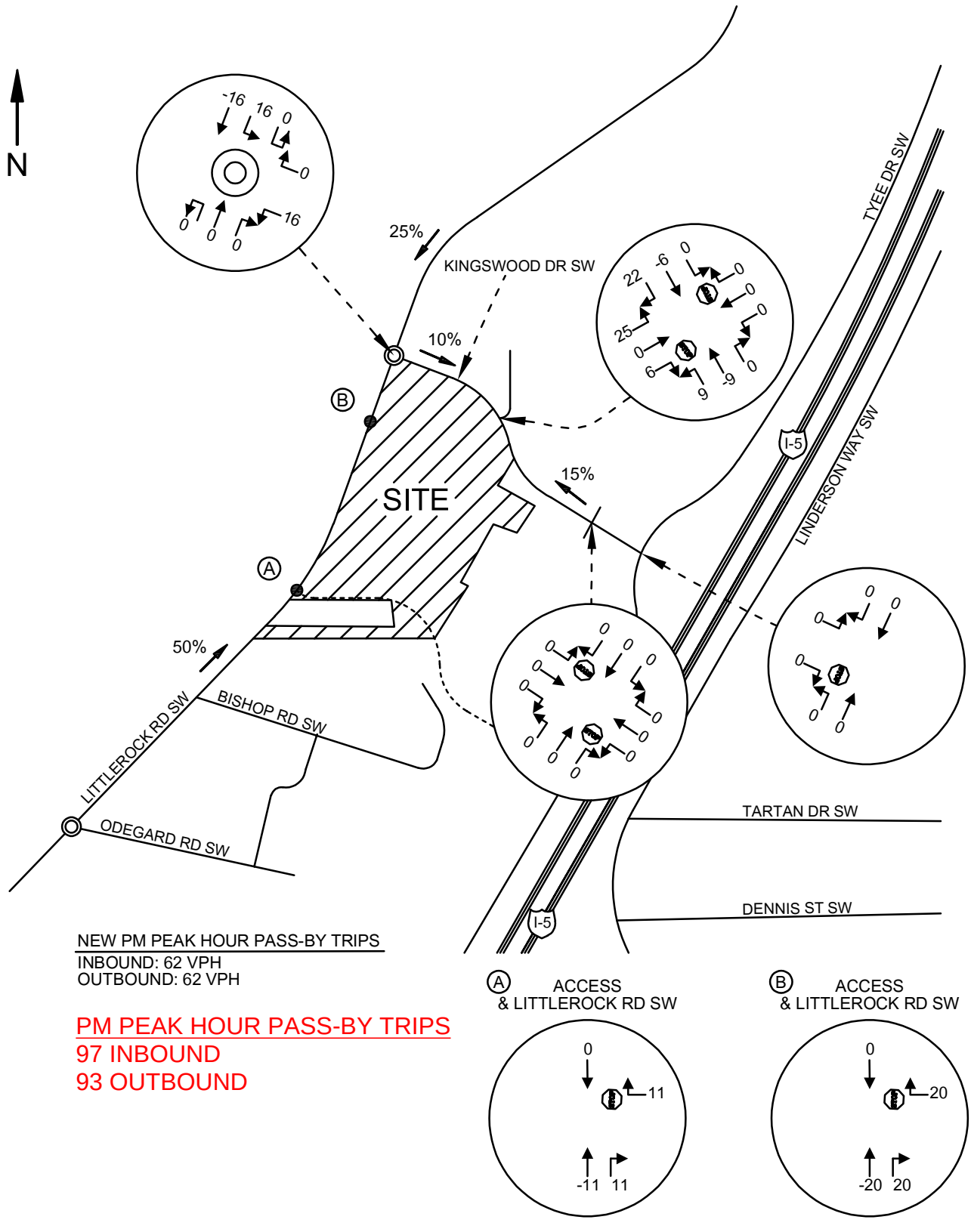


HEATH & ASSOCIATES

TRAFFIC AND CIVIL ENGINEERING

KINGSWOOD COMMERCIAL

PM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT (PRIMARY TRIPS)
FIGURE 4.1

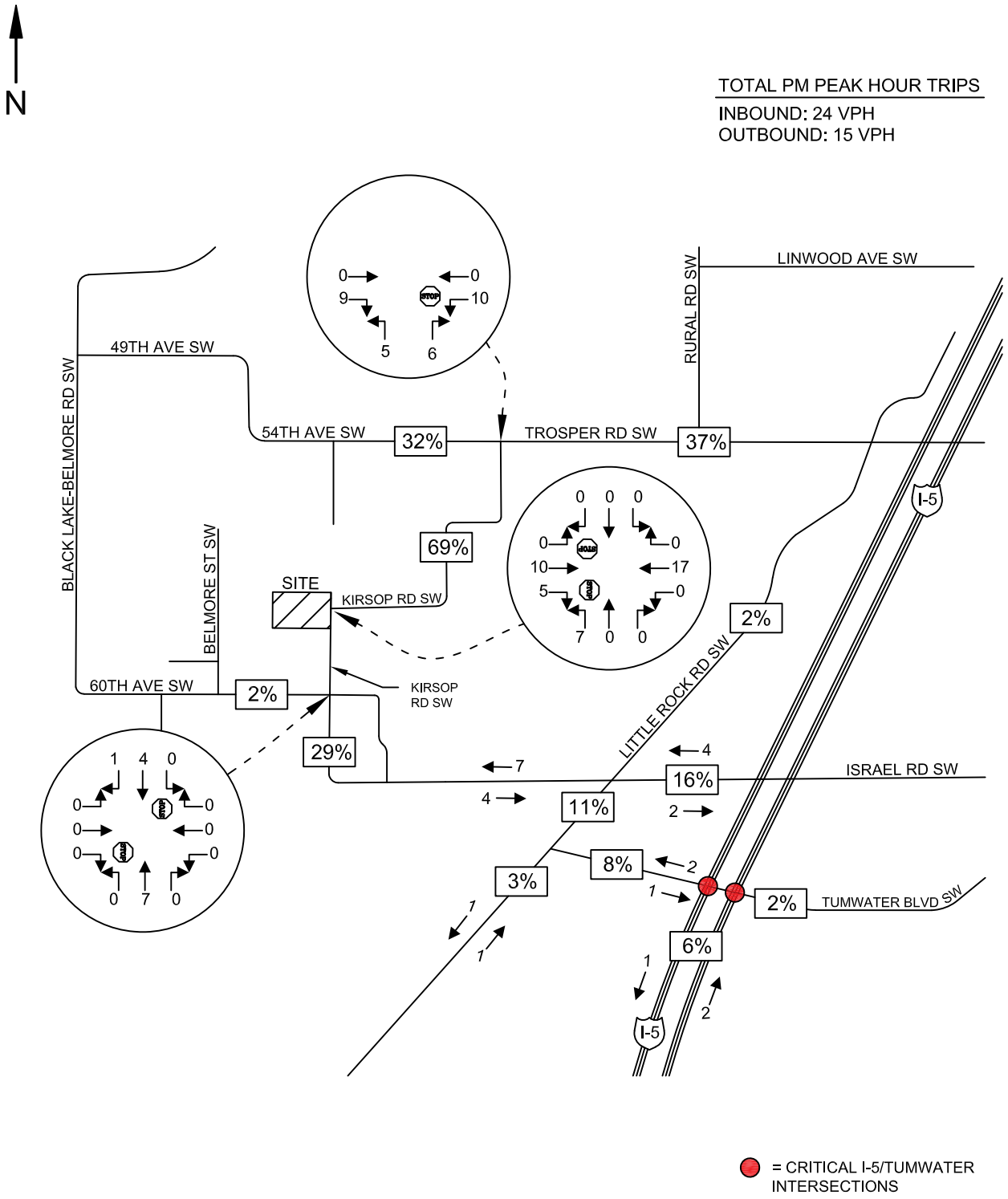


HEATH & ASSOCIATES

TRAFFIC AND CIVIL ENGINEERING

KINGSWOOD COMMERCIAL

PM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT (PASS-BY TRIPS)
FIGURE 4.2



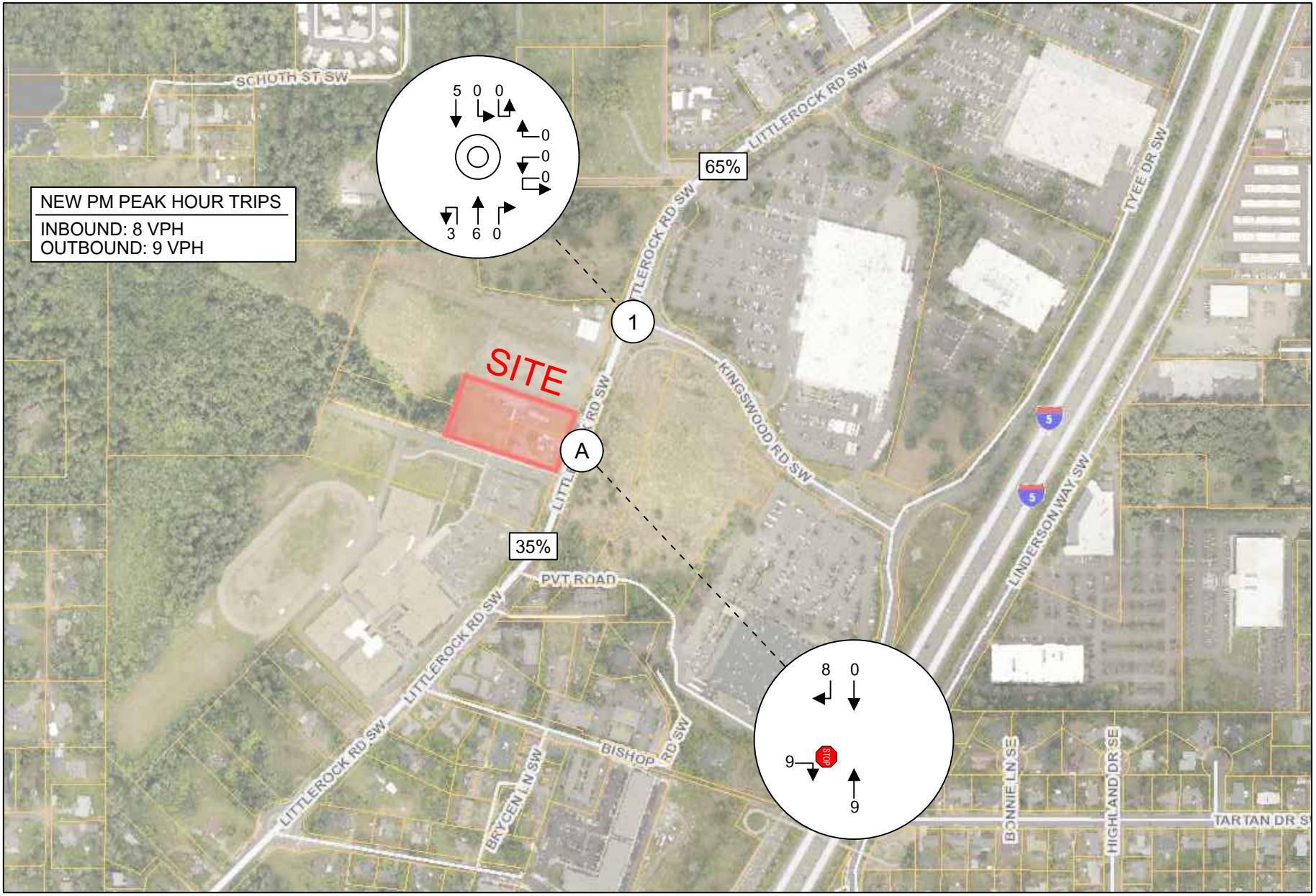
HEATH & ASSOCIATES

TRAFFIC AND CIVIL ENGINEERING

KIRSOP CROSSING

PM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT

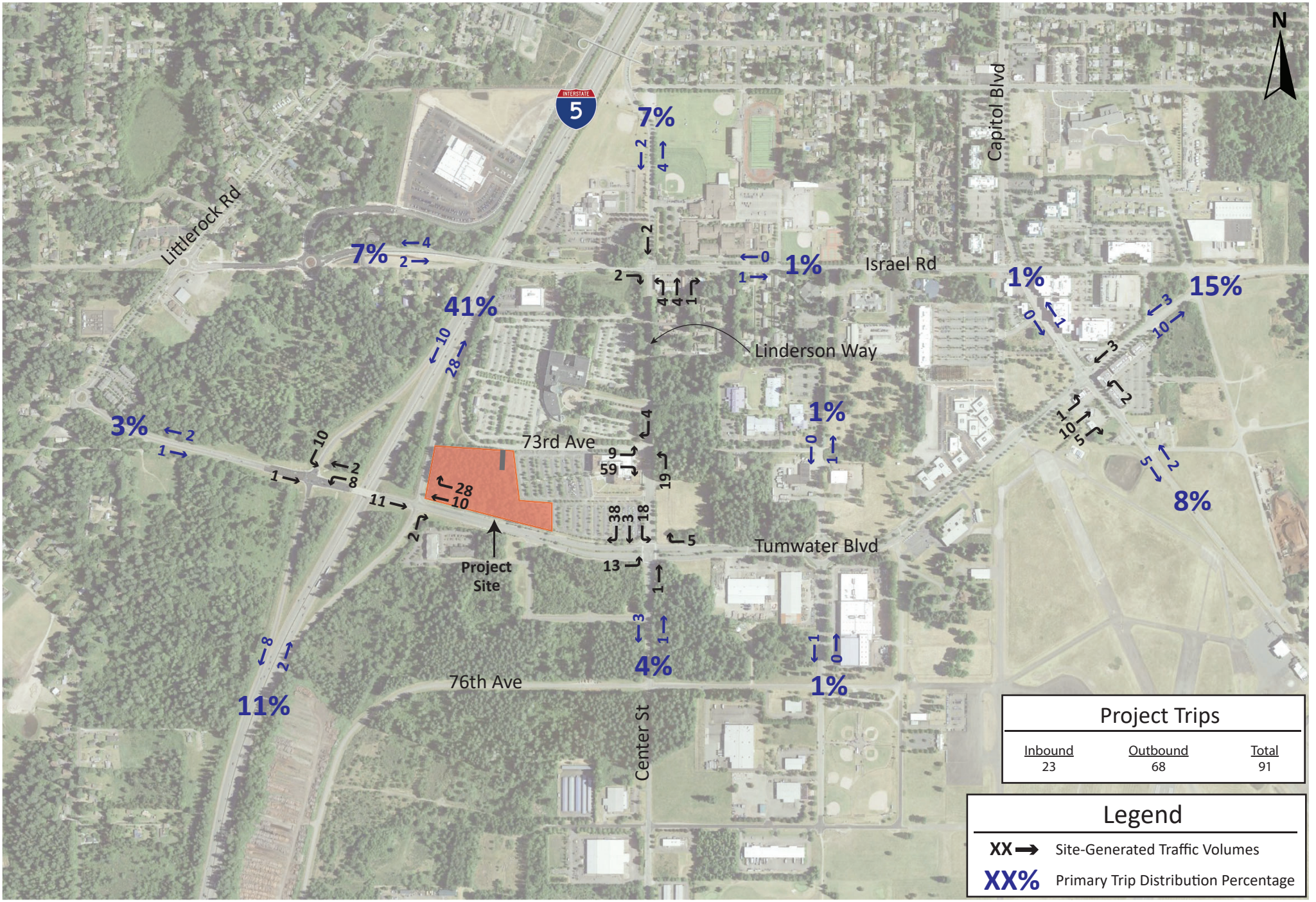
FIGURE 4



HEATH&ASSOCIATES
Transportation Planning & Engineering

LITTLEROCK STORAGE

PM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT
FIGURE 4



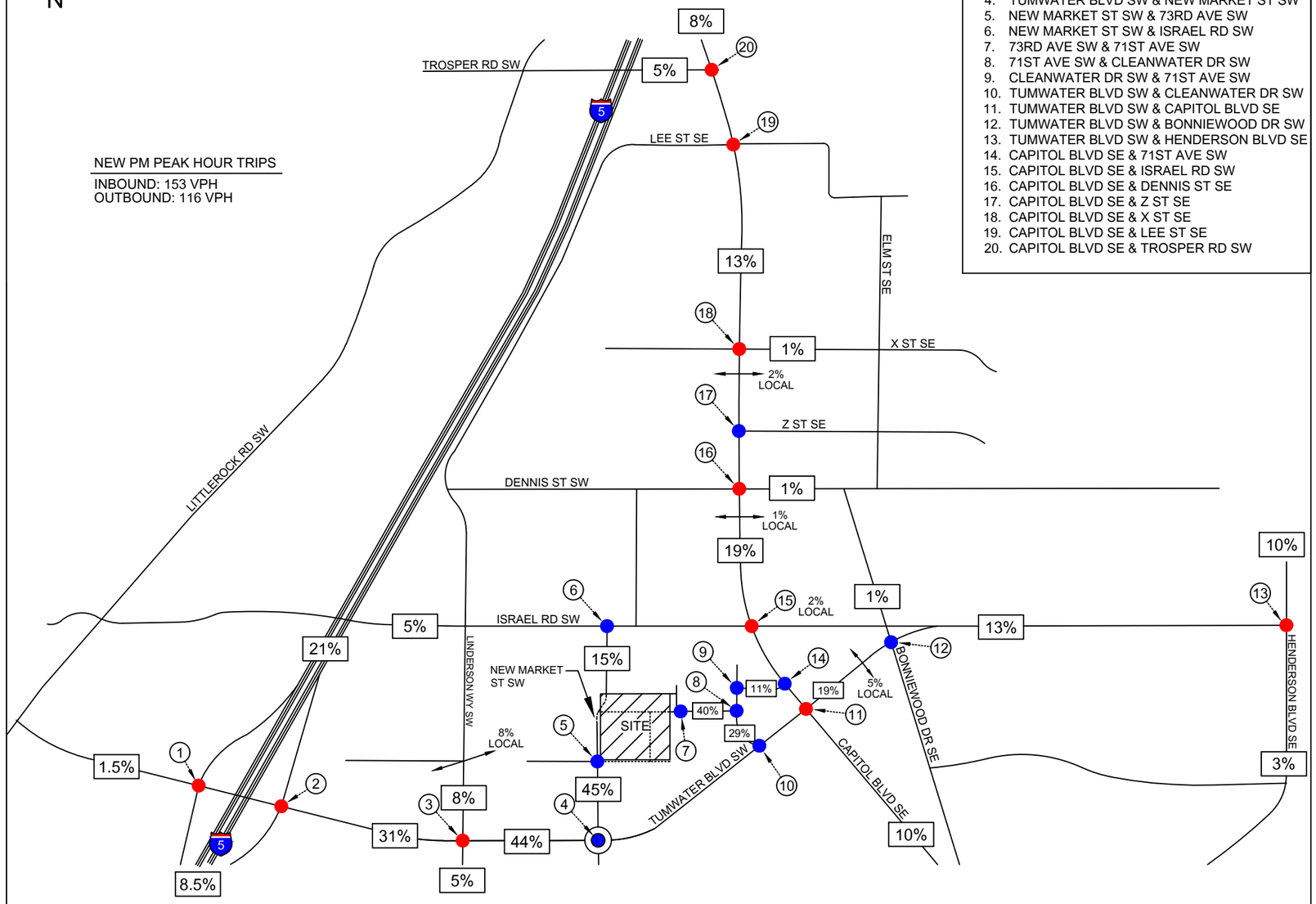
L&I/WSDA Safety & Health Lab and Training Center
Tumwater, Washinton
Traffic Impact Analysis

Figure 7
Site-Generated Traffic Volumes
PM Peak Hour

N

NEW PM PEAK HOUR TRIPS

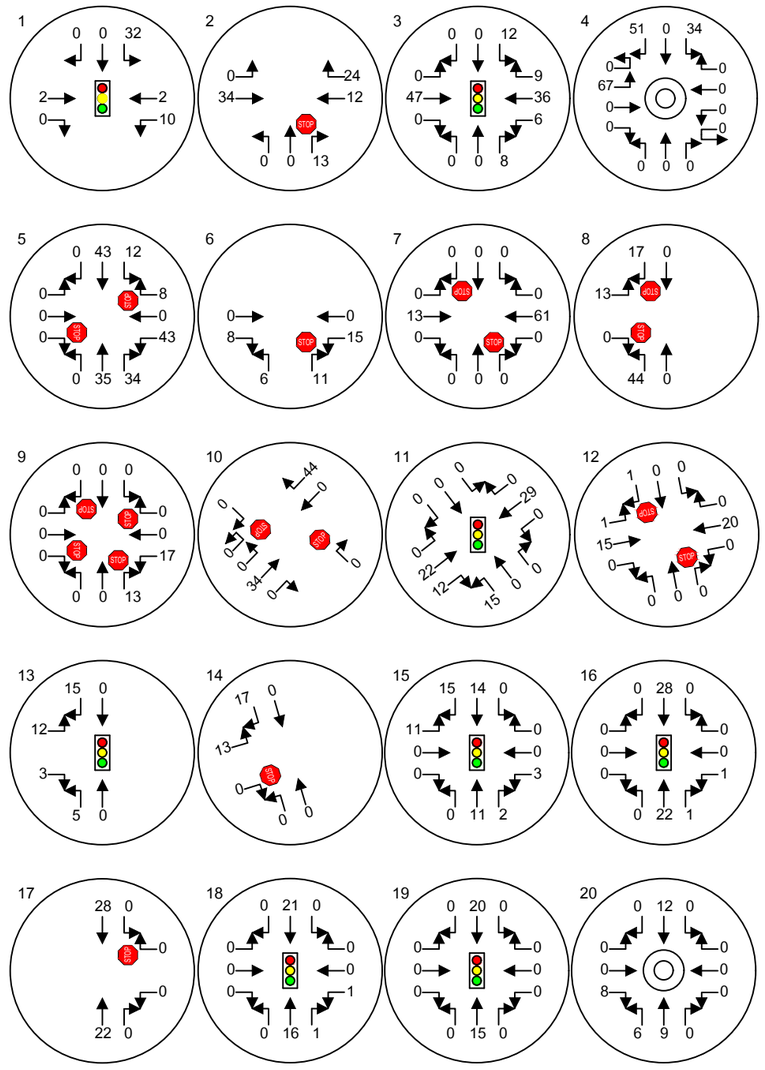
INBOUND: 153 VPH
OUTBOUND: 116 VPH



OUTLYING INTERSECTIONS OF STUDY

1. TUMWATER BLVD SW & SB I-5 RAMPS
2. TUMWATER BLVD SW & NB I-5 RAMPS
3. TUMWATER BLVD SW & LINDERSON WY SW
4. TUMWATER BLVD SW & NEW MARKET ST SW
5. NEW MARKET ST SW & 73RD AVE SW
6. NEW MARKET ST SW & ISRAEL RD SW
7. 73RD AVE SW & 71ST AVE SW
8. 71ST AVE SW & CLEANWATER DR SW
9. CLEANWATER DR SW & 71ST AVE SW
10. TUMWATER BLVD SW & CLEANWATER DR SW
11. TUMWATER BLVD SW & CAPITOL BLVD SE
12. TUMWATER BLVD SW & BONNIEWOOD DR SW
13. TUMWATER BLVD SW & HENDERSON BLVD SE
14. CAPITOL BLVD SE & 71ST AVE SW
15. CAPITOL BLVD SE & ISRAEL RD SW
16. CAPITOL BLVD SE & DENNIS ST SE
17. CAPITOL BLVD SE & Z ST SE
18. CAPITOL BLVD SE & X ST SE
19. CAPITOL BLVD SE & LEE ST SE
20. CAPITOL BLVD SE & TROSPER RD SW

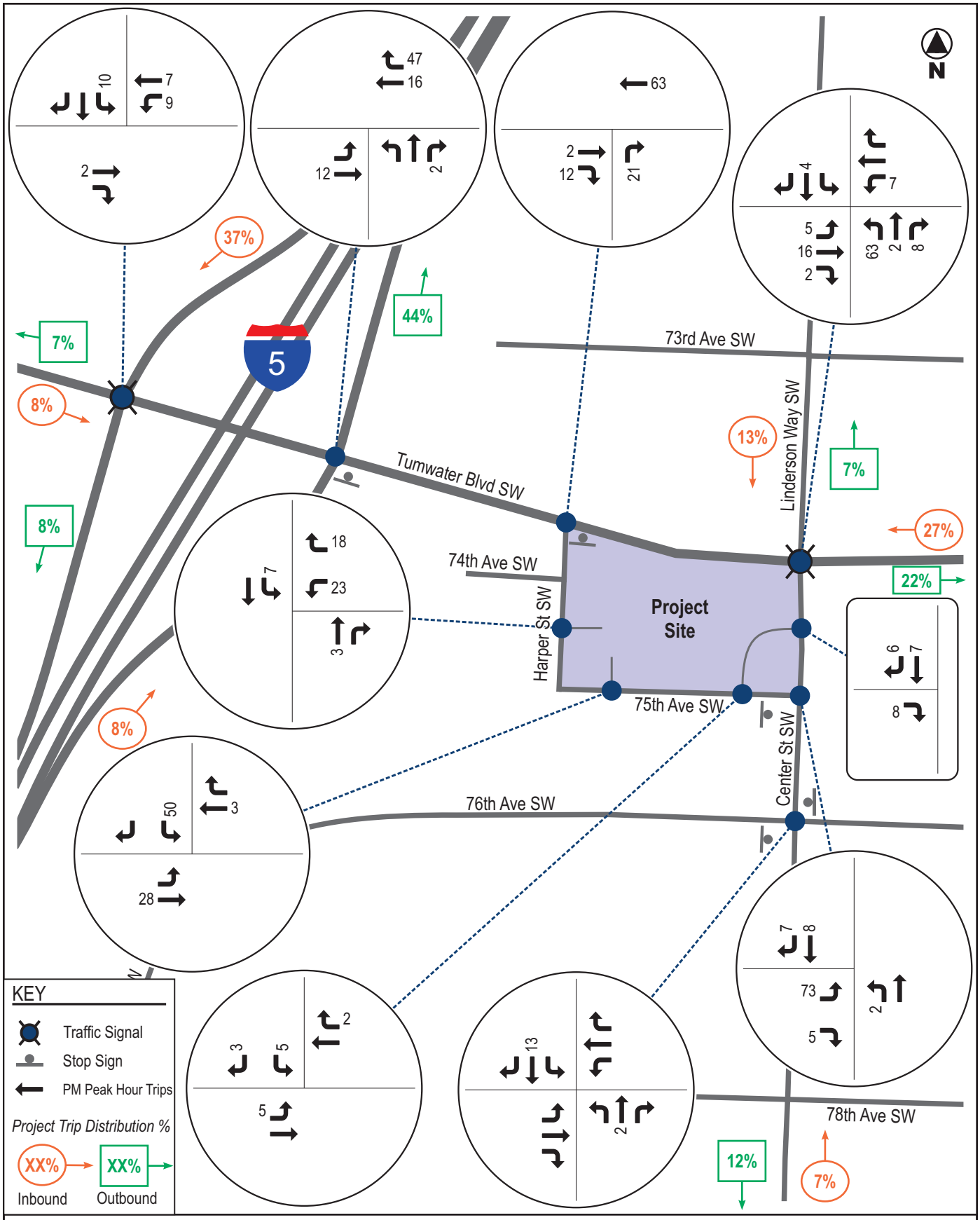
OUTLYING STUDY INTERSECTIONS



HEATH&ASSOCIATES
Transportation Planning & Engineering

NEW MARKET APARTMENTS

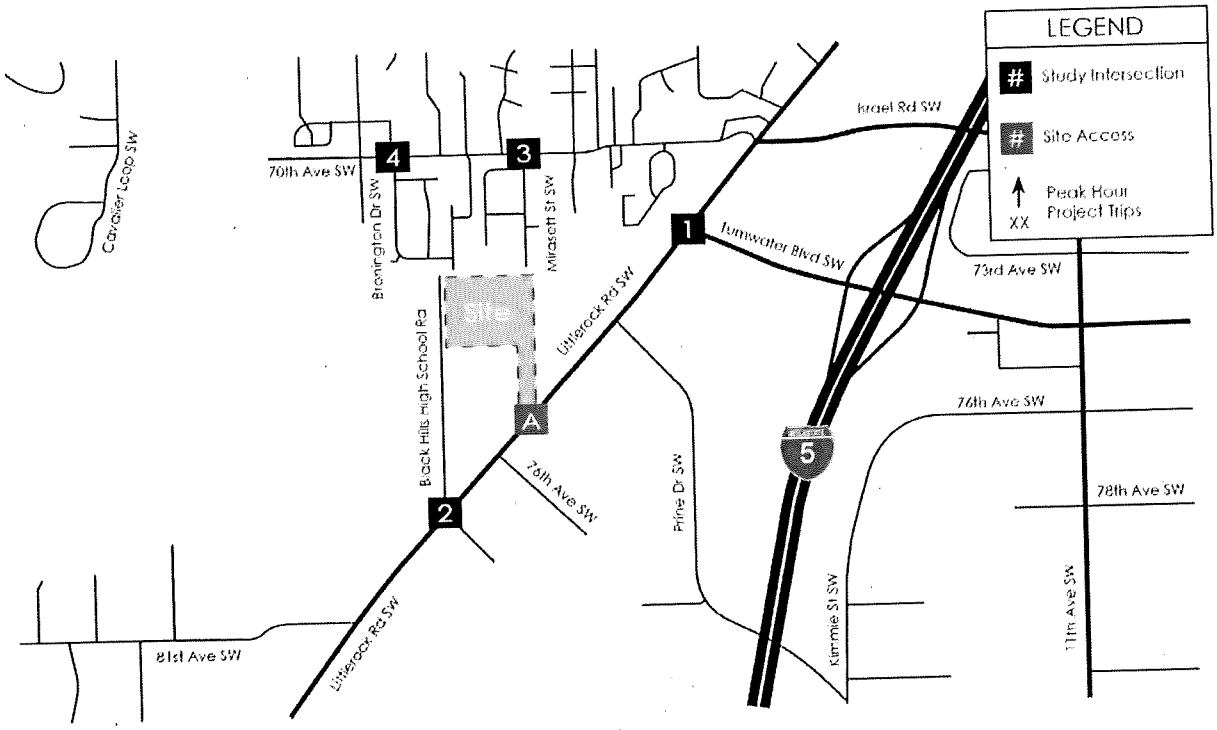
PM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT
FIGURE 6



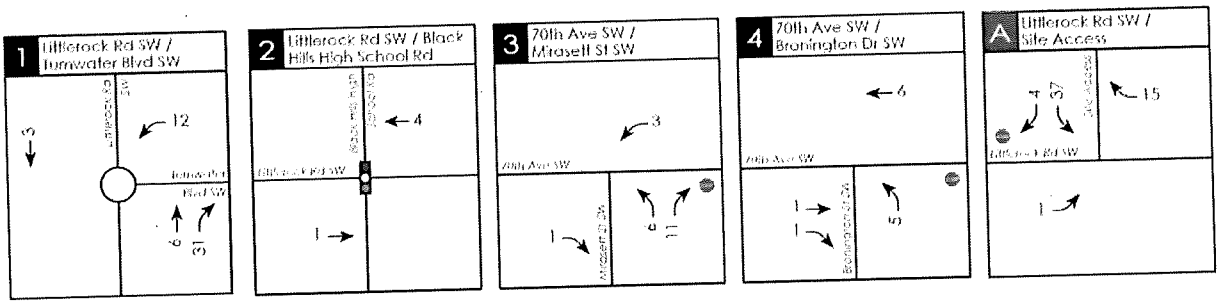
OSOS — LAB

Figure 5
Project Trip Distribution and Assignment
PM Peak Hour Traffic Volumes

heffron transportation inc



AM Peak Hour:



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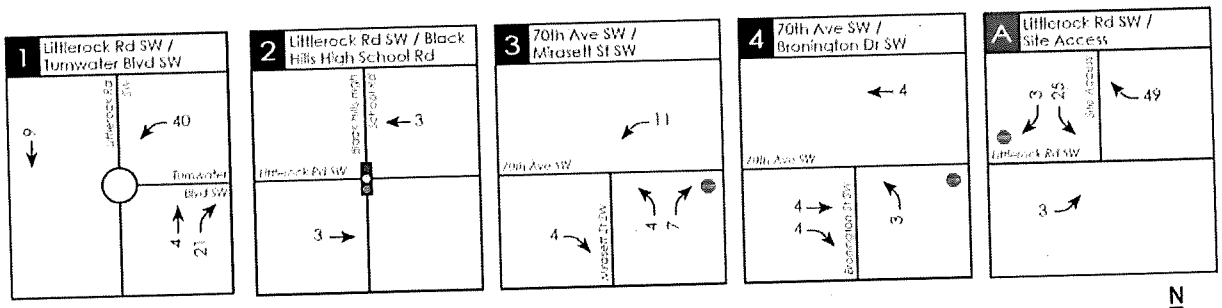


Figure 4: Peak Hour Project Trip Assignment

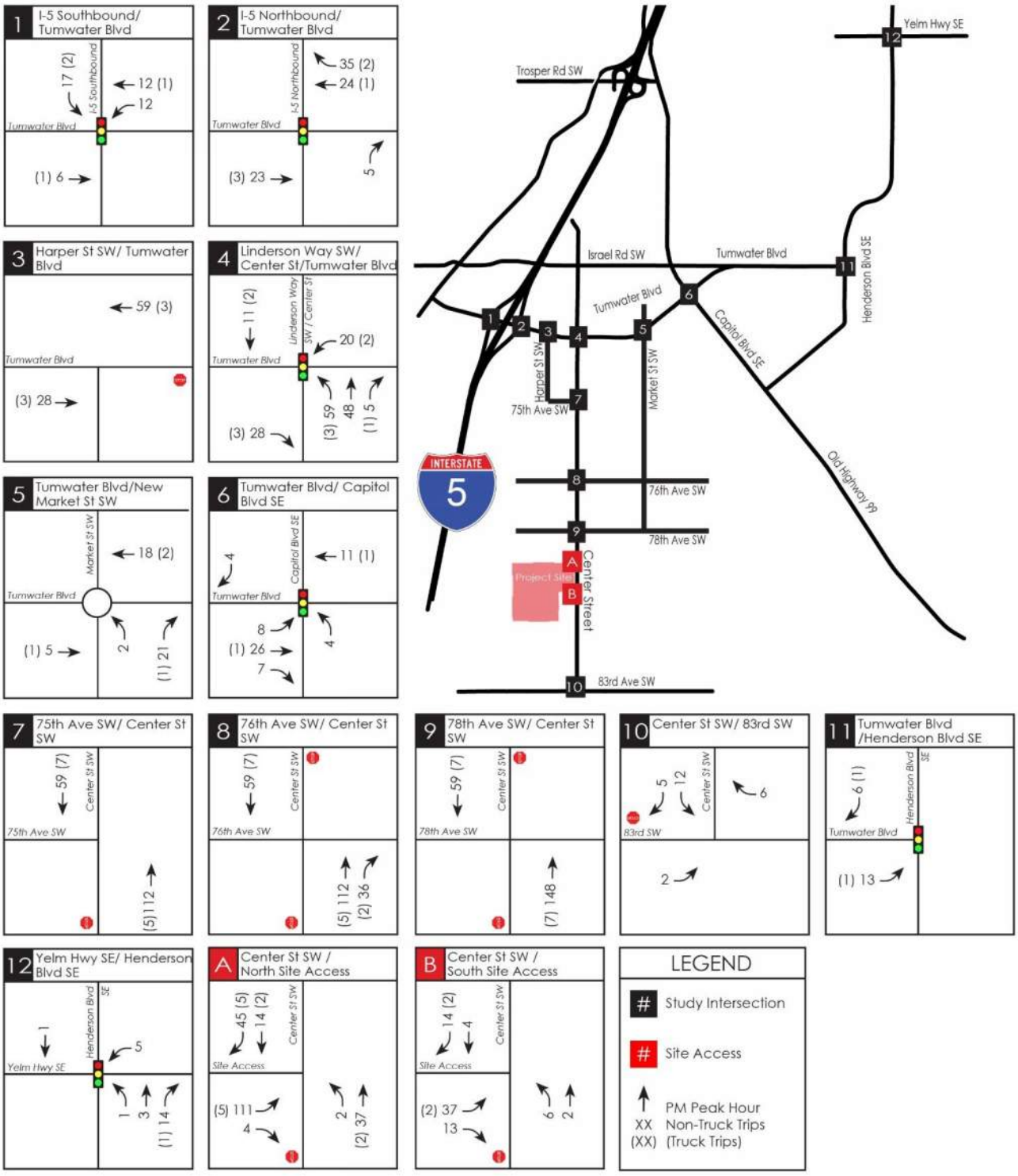
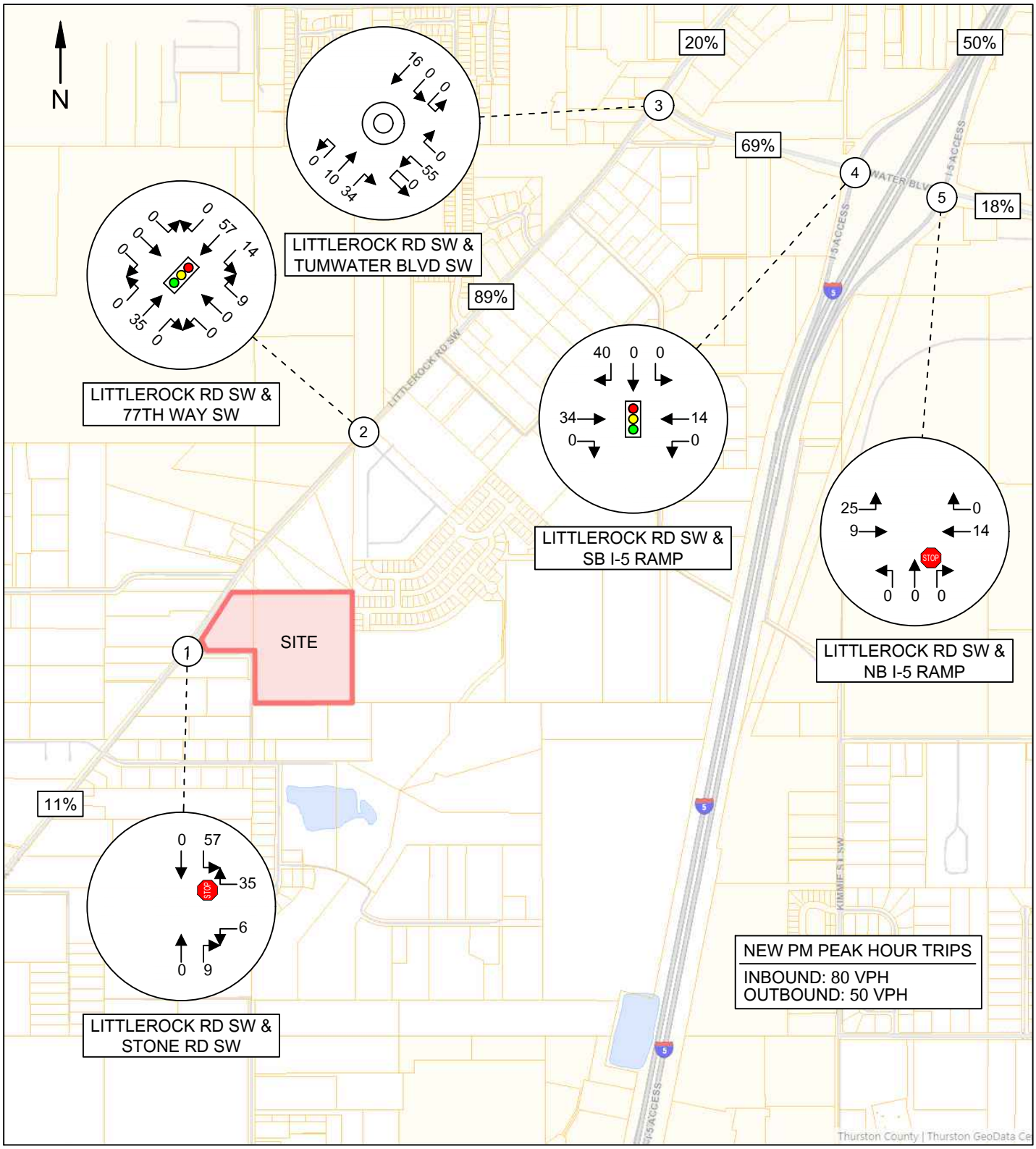
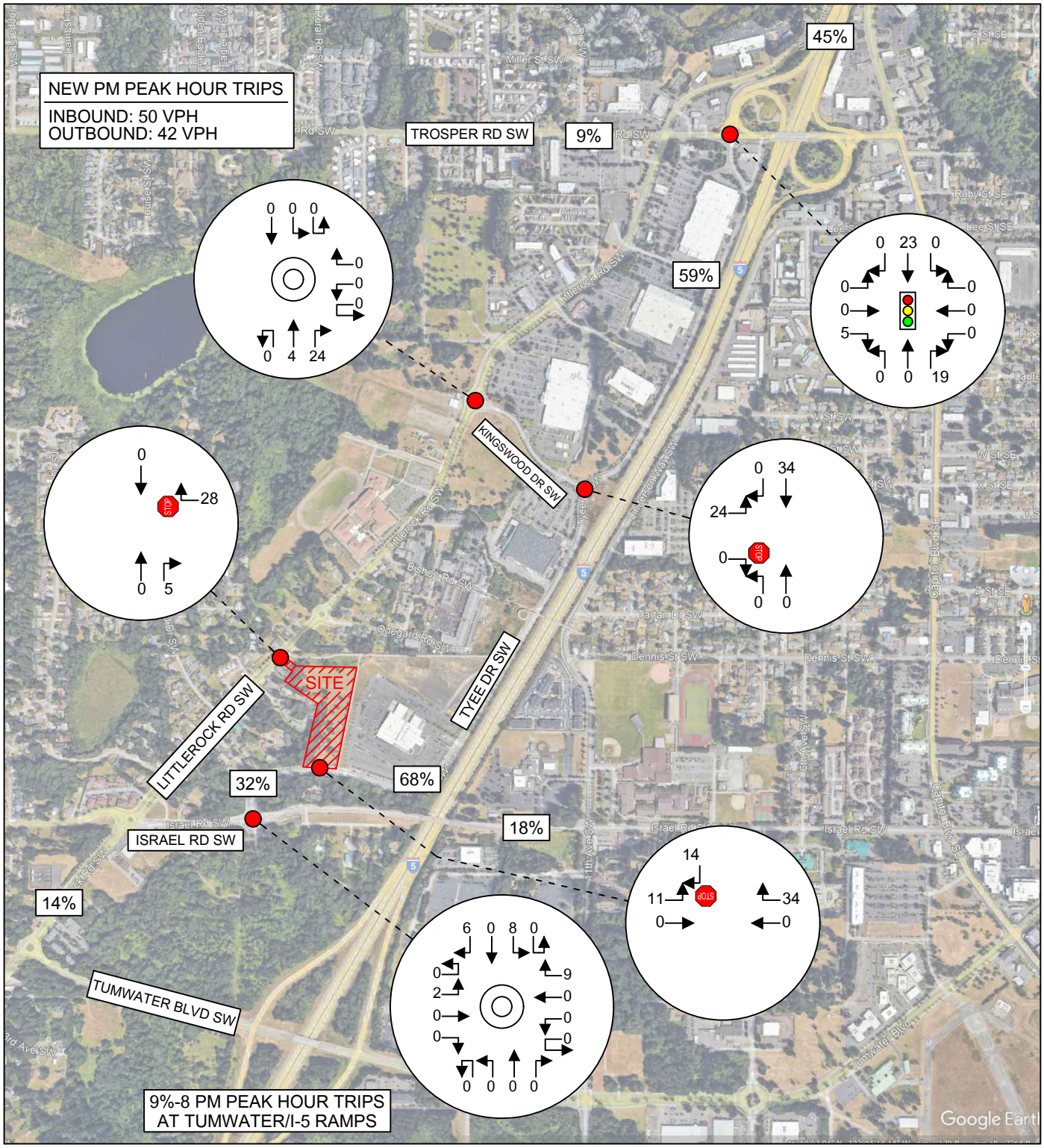


Figure 6: Weekday PM Peak Hour Project Trip Assignment



HEATH&ASSOCIATES
Transportation Planning & Engineering

TRESTLEWOOD
PM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT
FIGURE 3



HEATH&ASSOCIATES
Transportation Planning & Engineering

TYEE LANDING APARTMENTS

PM PEAK HOUR TRIP DISTRIBUTION & ASSIGNMENT
FIGURE 3

1. Israel Road SW & Littlerock Road SW

PM Peak Hour

	Pipeline Projects												
1.	Belmont Flats	0	0	24	18	5	0	0	0	0	0	7	0
2.	Bertch Thurston County	0	13	0	0	0	2	7	31	0	0	0	0
3.	Bishop Road Apartments	0	0	0	0	0	0	0	16	0	0	0	0
4.	Kingswood Apartments	0	6	0	0	0	0	0	9	0	0	0	0
5.	Kingswood Commercial	0	15	0	0	0	0	0	15	0	0	0	0
6.	Kirsop Crossing	0	0	0	0	4	0	0	0	3	2	2	0
7.	Littlerock Storage	0	2	2	2	0	0	0	2	0	0	0	0
8.	L&I Training Center	0	0	1	2	2	0	0	0	0	0	1	0
9.	New Market Apartments	0	0	0	0	2	0	0	0	0	0	2	0
10.	OSOS Library Arhive Building	0	5	0	0	0	0	0	1	0	0	0	0
11.	Skyview Estates	0	2	0	0	0	0	0	5	0	0	0	0
12.	South Sound Commerce Center	0	5	0	0	0	0	0	10	0	0	0	0
13.	Trestlewood	0	5	0	0	0	5	3	3	0	0	0	0
14.	Tyee Landing Apartments	0	0	0	0	0	6	2	5	0	0	0	0
	Total	0	53	27	22	13	13	12	97	3	2	12	0

2. Israel Road SW & Tyee Drive SW

PM Peak Hour

	Pipeline Projects												
1.	Belmont Flats	0	4	0	0	-6	13	10	3	29	36	-5	0
2.	Bertch Thurston County	0	0	0	0	2	0	0	0	0	0	7	0
3.	Bishop Road Apartments	5	0	4	9	0	0	0	0	0	0	0	0
4.	Kingswood Apartments	0	0	4	6	0	0	0	0	0	0	0	0
5.	Kingswood Commercial	0	0	15	15	0	0	0	0	0	0	0	0
6.	Kirsop Crossing	0	0	0	0	4	0	0	0	0	0	2	0
7.	Littlerock Storage	0	0	0	0	2	0	0	0	0	0	2	0
8.	L&I Training Center	0	0	0	0	4	0	0	0	0	0	2	0
9.	New Market Apartments	0	0	0	0	2	0	0	0	0	0	2	0
10.	OSOS Library Arhive Building	0	0	0	0	0	0	0	0	0	0	0	0
11.	Skyview Estates	0	0	0	0	1	0	0	0	0	0	1	0
12.	South Sound Commerce Center	0	0	1	5	0	0	0	0	0	0	0	0
13.	Trestlewood	0	0	0	0	5	0	0	0	0	0	3	0
14.	Tyee Landing Apartments	6	0	8	9	0	0	0	0	0	0	0	2
	Total	11	4	32	44	14	13	10	3	29	36	14	2

3. Israel Road SW & Linderson Way SW

PM Peak Hour

	Pipeline Projects												
1.	Belmont Flats	4	0	0	0	14	0	0	0	12	9	10	2
2.	Bertch Thurston County	0	0	0	0	0	0	0	0	0	1	1	1
3.	Bishop Road Apartments	1	0	0	0	1	0	0	0	1	1	1	1
4.	Kingswood Apartments	1	0	0	0	1	0	0	0	1	1	1	1
5.	Kingswood Commercial	3	0	0	0	3	0	0	0	3	3	3	3
6.	Kirsop Crossing	0	0	0	0	1	0	0	0	0	0	1	0
7.	Littlerock Storage	0	0	0	0	1	0	0	0	0	0	1	0
8.	L&I Training Center	0	2	0	0	0	0	1	4	4	2	0	0
9.	New Market Apartments	0	0	0	0	6	0	0	0	0	0	8	0
10.	OSOS Library Arhive Building	0	7	0	0	0	2	2	3	2	2	0	0
11.	Skyview Estates	0	0	0	0	0	0	0	0	0	0	0	0
12.	South Sound Commerce Center	0	9	0	0	0	2	9	34	5	1	0	0
13.	Trestlewood	0	0	0	0	1	0	0	0	0	0	1	0
14.	Tyee Landing Apartments	9	0	0	0	9	0	0	0	9	2	2	2
	Total	18	18	0	0	37	4	12	41	37	22	29	10

4. Tumwater Boulevard SW & Littlerock Road SW

PM Peak Hour

	Pipeline Projects												
1.	Belmont Flats	0	0	0	0	0	5	7	0	0	0	0	0
2.	Bertch Thurston County	0	14	1	4	0	13	56	34	0	0	0	0
3.	Bishop Road Apartments	0	0	0	16	0	0	0	0	0	0	0	0
4.	Kingswood Apartments	0	0	6	9	0	0	0	0	0	0	0	0
5.	Kingswood Commercial	0	0	15	15	0	0	0	0	0	0	0	0
6.	Kirsop Crossing	0	1	1	2	0	0	0	1	0	0	0	0
7.	Littlerock Storage	0	0	1	1	0	0	0	0	0	0	0	0
8.	L&I Training Center	0	0	0	0	0	2	1	0	0	0	0	0
9.	New Market Apartments	0	0	0	0	0	1	1	0	0	0	0	0
10.	OSOS Library Arhive Building	0	0	1	5	0	2	1	0	0	0	0	0
11.	Skyview Estates	0	3	0	0	0	12	31	6	0	0	0	0
12.	South Sound Commerce Center	0	0	5	10	0	3	2	0	0	0	0	0
13.	Trestlewood	0	16	0	0	0	55	34	10	0	0	0	0
14.	Tyee Landing Apartments	0	0	4	4	0	0	0	0	0	0	0	0
	Total	0	34	34	66	0	93	133	51	0	0	0	0

5. Tumwater Boulevard SW & Southbound I-5 Ramp

PM Peak Hour

	Pipeline Projects												
1.	Belmont Flats	57	0	0	0	45	0	0	0	0	14	61	0
2.	Bertch Thurston County	0	0	0	0	17	0	0	0	0	1	56	0
3.	Bishop Road Apartments	8	0	0	0	8	0	0	0	0	0	0	0
4.	Kingswood Apartments	5	0	0	0	4	0	0	0	0	3	3	0
5.	Kingswood Commercial	8	0	0	0	7	0	0	0	0	7	8	0
6.	Kirsop Crossing	0	0	0	0	2	0	0	0	0	1	0	0
7.	Littlerock Storage	0	0	0	0	1	0	0	0	0	1	0	0
8.	L&I Training Center	0	0	10	0	2	8	0	0	0	0	1	0
9.	New Market Apartments	0	0	32	0	2	10	0	0	0	0	2	0
10.	OSOS Library Arhive Building	0	0	10	0	7	9	0	0	0	0	2	0
11.	Skyview Estates	6	0	0	0	6	0	0	0	0	15	15	0
12.	South Sound Commerce Center	0	0	19	0	13	12	0	0	0	0	7	0
13.	Trestlewood	40	0	0	0	14	0	0	0	0	0	34	0
14.	Tyee Landing Apartments	0	0	0	0	4	0	0	0	0	4	0	0
	Total	124	0	71	0	132	39	0	0	0	46	189	0

6. Tumwater Boulevard SW & Northbound I-5 Ramp

PM Peak Hour

	Pipeline Projects												
1.	Belmont Flats	0	0	0	0	26	0	0	0	19	0	19	42
2.	Bertch Thurston County	0	0	0	0	13	0	5	0	4	0	43	13
3.	Bishop Road Apartments	0	0	0	0	3	0	0	0	0	0	3	0
4.	Kingswood Apartments	0	0	0	0	1	0	0	0	0	0	1	0
5.	Kingswood Commercial	0	0	0	0	2	0	0	0	2	0	2	2
6.	Kirsop Crossing	0	0	0	0	0	0	0	0	2	0	0	0
7.	Littlerock Storage	0	0	0	0	0	0	0	0	0	0	0	0
8.	L&I Training Center	0	0	0	28	10	0	2	0	0	0	11	0
9.	New Market Apartments	0	0	0	24	12	0	13	0	0	0	34	0
10.	OSOS Library Arhive Building	0	0	0	47	16	0	2	0	0	0	12	0
11.	Skyview Estates	0	0	0	0	4	0	0	0	4	0	2	0
12.	South Sound Commerce Center	0	0	0	37	25	0	5	0	0	0	26	0
13.	Trestlewood	0	0	0	0	14	0	0	0	0	0	9	25
14.	Tyee Landing Apartments	0	0	0	0	2	0	0	0	0	0	2	0
	Total	0	0	0	136	128	0	27	0	31	0	164	82

7. Capitol Boulevard & Israel Road

PM Peak Hour

	Pipeline Projects												
1.	Belmont Flats	7	0	0	0	7	0	0	0	0	0	5	5
2.	Bertch Thurston County	1	0	0	0	1	0	0	0	1	1	1	1
3.	Bishop Road Apartments	1	0	0	0	1	0	0	0	1	1	1	1
4.	Kingswood Apartments	0	0	0	0	1	0	0	0	0	0	1	0
5.	Kingswood Commercial	1	0	0	0	1	0	0	0	1	1	1	1
6.	Kirsop Crossing	0	0	0	0	0	0	0	0	0	0	0	0
7.	Littlerock Storage	0	0	0	0	0	0	0	0	0	0	0	0
8.	L&I Training Center	0	0	0	0	0	0	0	1	0	0	0	0
9.	New Market Apartments	15	14	0	0	0	3	2	11	0	0	0	11
10.	OSOS Library Arhive Building	1	0	0	0	1	0	0	0	1	1	1	1
11.	Skyview Estates	0	4	0	0	0	0	0	3	3	0	0	0
12.	South Sound Commerce Center	0	0	0	0	0	0	0	0	0	0	0	0
13.	Trestlewood	0	0	0	0	0	0	0	0	0	0	0	0
14.	Tyee Landing Apartments	0	0	0	0	1	0	0	0	0	0	1	0
	Total	26	18	0	0	13	3	2	15	7	4	11	20

8. Tumwater Boulevard & Capitol Boulevard

PM Peak Hour

	Pipeline Projects												
1.	Belmont Flats	0	0	0	0	14	0	0	0	12	9	10	0
2.	Bertch Thurston County	3	0	0	0	3	0	0	0	3	3	3	3
3.	Bishop Road Apartments	0	0	0	0	0	0	0	0	0	0	0	0
4.	Kingswood Apartments	0	0	0	0	0	0	0	0	0	0	0	0
5.	Kingswood Commercial	0	0	0	0	1	0	0	0	0	0	1	0
6.	Kirsop Crossing	0	0	0	0	0	0	0	0	0	0	0	0
7.	Littlerock Storage	0	0	0	0	0	0	0	0	0	0	0	0
8.	L&I Training Center	0	0	0	0	3	0	0	0	2	5	10	1
9.	New Market Apartments	0	0	0	0	29	0	0	0	15	12	22	0
10.	OSOS Library Arhive Building	1	0	0	0	1	0	0	0	1	1	1	1
11.	Skyview Estates	0	0	0	0	0	0	0	0	0	0	0	0
12.	South Sound Commerce Center	4	0	0	0	12	0	0	0	4	7	27	8
13.	Trestlewood	1	0	0	0	1	0	0	0	1	1	1	1
14.	Tyee Landing Apartments	0	0	0	0	1	0	0	0	0	0	1	0
	Total	9	0	0	0	65	0	0	0	38	38	76	14

9. Tumwater Boulevard SE & Henderson Boulevard SE

PM Peak Hour

	Pipeline Projects												
1.	Belmont Flats	11	0	0	0	0	0	0	0	0	0	0	9
2.	Bertch Thurston County	1	0	0	0	0	0	0	0	0	0	0	1
3.	Bishop Road Apartments	0	0	0	0	0	0	0	0	0	0	0	0
4.	Kingswood Apartments	0	0	0	0	0	0	0	0	0	0	0	0
5.	Kingswood Commercial	0	0	0	0	0	0	0	0	0	0	0	0
6.	Kirsop Crossing	0	0	0	0	0	0	0	0	0	0	0	0
7.	Littlerock Storage	0	0	0	0	0	0	0	0	0	0	0	0
8.	L&I Training Center	2	0	0	0	0	0	0	0	0	0	0	8
9.	New Market Apartments	15	0	0	0	0	0	0	0	5	3	0	12
10.	OSOS Library Arhive Building	0	0	0	0	0	0	0	0	0	0	0	0
11.	Skyview Estates	0	0	0	0	0	0	0	0	0	0	0	0
12.	South Sound Commerce Center	7	0	0	0	0	0	0	0	0	0	0	14
13.	Trestlewood	0	0	0	0	0	0	0	0	0	0	0	0
14.	Tyee Landing Apartments	0	0	0	0	0	0	0	0	0	0	0	0
	Total	36	0	0	0	0	0	0	0	5	3	0	44

10. Littlerock Road SW & Miner Drive SW

PM Peak Hour

	Pipeline Projects												
1.	Belmont Flats	5	0	0	0	0	0	0	0	0	7	0	0
2.	Bertch Thurston County	0	15	0	0	0	0	0	38	0	0	0	0
3.	Bishop Road Apartments	0	8	0	0	0	0	0	5	0	0	0	0
4.	Kingswood Apartments	0	9	0	0	0	0	0	6	0	0	0	0
5.	Kingswood Commercial	0	15	0	0	0	0	0	17	0	0	0	0
6.	Kirsop Crossing	0	1	0	0	0	0	0	1	0	0	0	0
7.	Littlerock Storage	0	9	0	0	0	0	0	9	0	0	0	0
8.	L&I Training Center	0	0	0	0	0	0	0	0	0	0	0	0
9.	New Market Apartments	0	0	0	0	0	0	0	0	0	0	0	0
10.	OSOS Library Arhive Building	0	1	0	0	0	0	0	1	0	0	0	0
11.	Skyview Estates	0	3	0	0	0	0	0	6	0	0	0	0
12.	South Sound Commerce Center	0	0	0	0	0	0	0	0	0	0	0	0
13.	Trestlewood	0	16	0	0	0	0	0	10	0	0	0	0
14.	Tyee Landing Apartments	0	0	0	0	0	0	0	5	0	0	0	0
	Total	5	77	0	0	0	0	0	98	0	7	0	0

11. Littlerock Road SW & Kingswood Drive SW

PM Peak Hour

	Pipeline Projects												
1.	Belmont Flats	0	17	0	0	0	0	0	13	0	0	0	0
2.	Bertch Thurston County	0	15	0	0	0	0	0	38	0	0	0	0
3.	Bishop Road Apartments	0	8	0	0	0	0	0	5	0	0	0	0
4.	Kingswood Apartments	0	9	0	0	0	0	0	6	0	0	0	0
5.	Kingswood Commercial	0	20	0	2	0	15	0	17	0	0	0	0
6.	Kirsop Crossing	0	1	0	0	0	0	0	1	0	0	0	0
7.	Littlerock Storage	0	5	0	0	0	0	0	9	0	0	0	0
8.	L&I Training Center	0	0	0	0	0	0	0	0	0	0	0	0
9.	New Market Apartments	0	0	0	0	0	0	0	0	0	0	0	0
10.	OSOS Library Arhive Building	0	1	0	0	0	0	0	1	0	0	0	0
11.	Skyview Estates	0	3	0	0	0	0	0	6	0	0	0	0
12.	South Sound Commerce Center	0	0	0	0	0	0	0	0	0	0	0	0
13.	Trestlewood	0	16	0	0	0	0	0	10	0	0	0	0
14.	Tyee Landing Apartments	0	0	0	0	0	0	0	5	0	0	0	0
	Total	0	95	0	2	0	15	0	111	0	0	0	0

YORKSHIRE
TRAFFIC IMPACT ANALYSIS

APPENDIX: ITE TRIP GENERATION DATA

Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

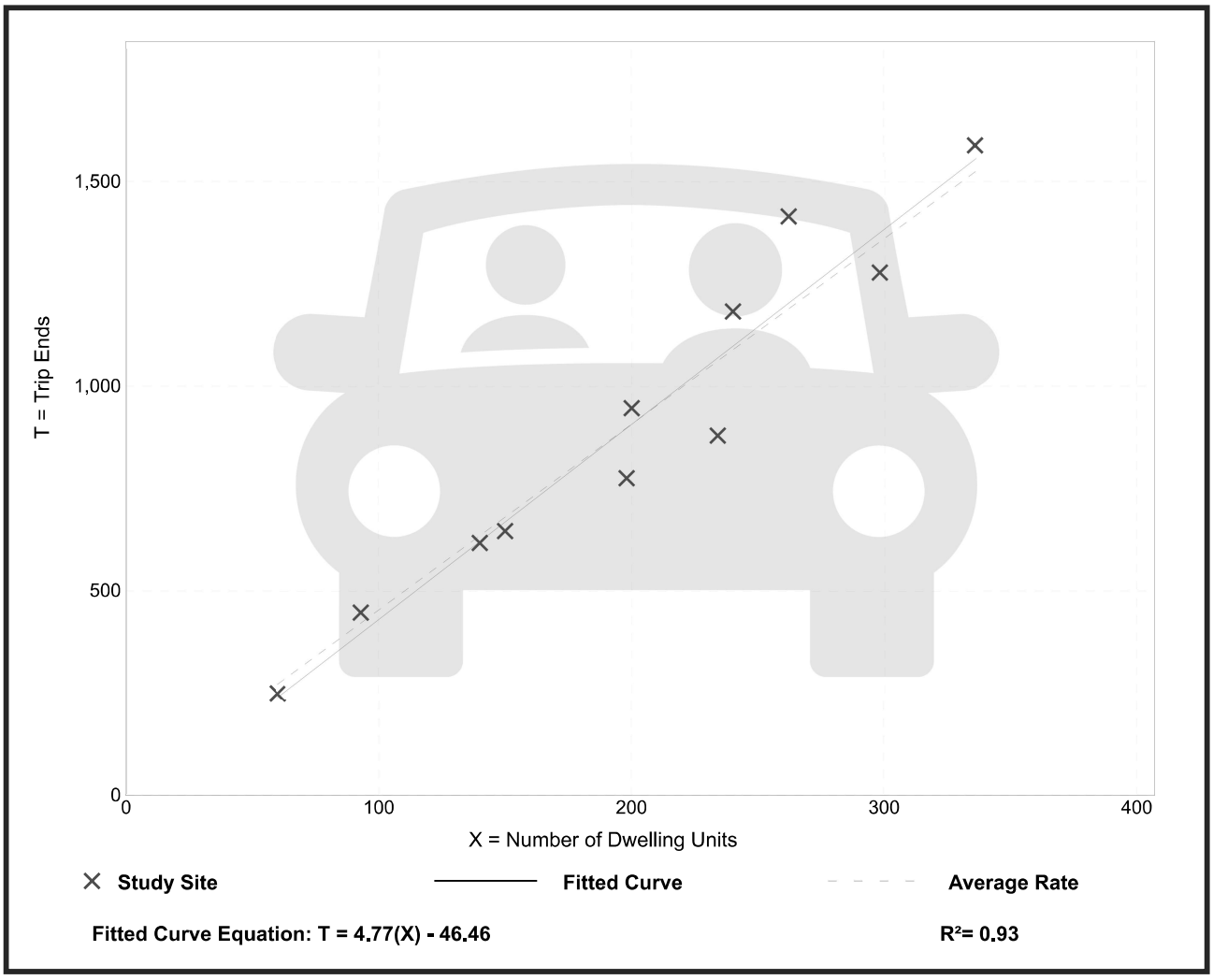
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 11
Avg. Num. of Dwelling Units: 201
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
4.54	3.76 - 5.40	0.51

Data Plot and Equation



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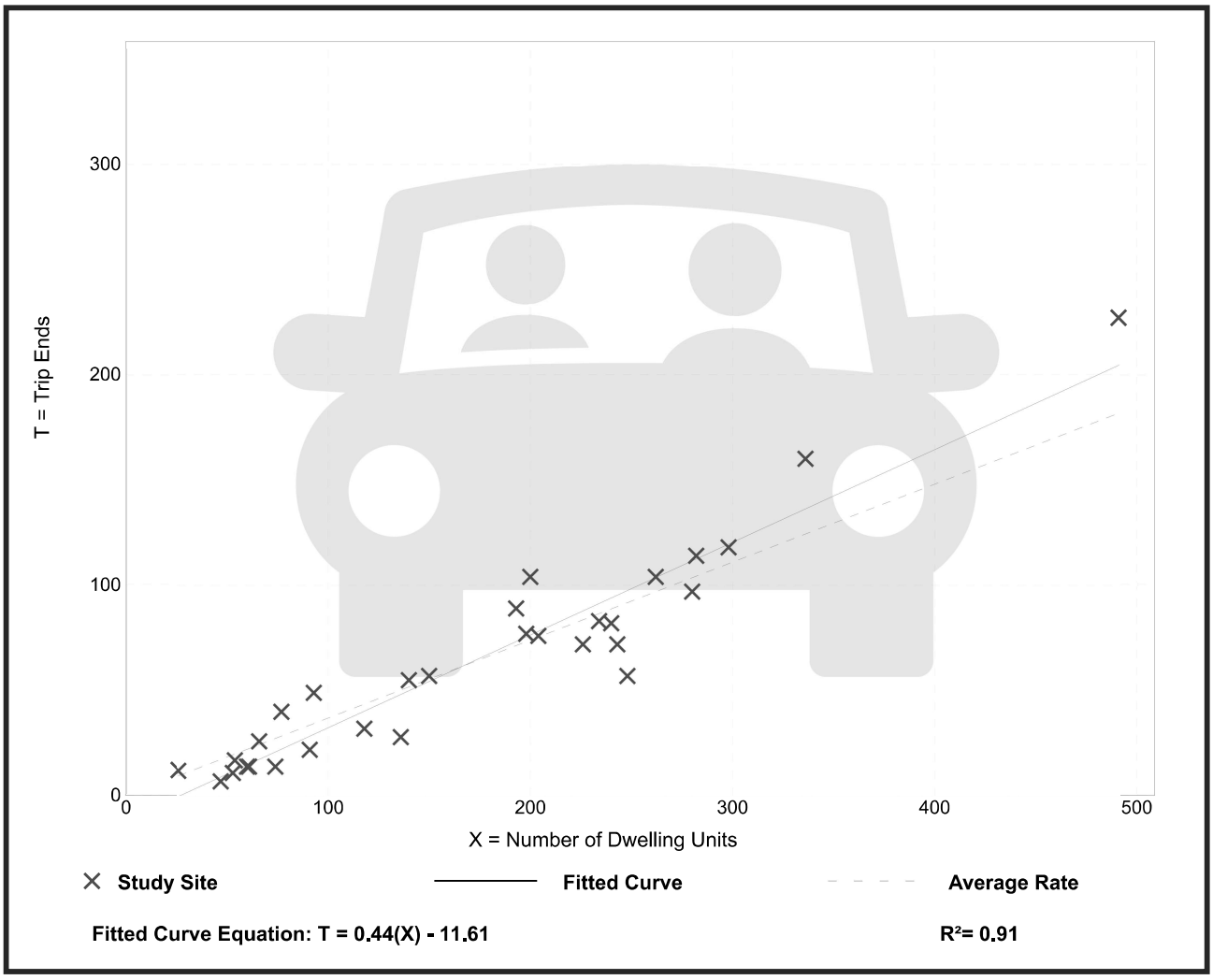
Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 30
Avg. Num. of Dwelling Units: 173
Directional Distribution: 23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.37	0.15 - 0.53	0.09

Data Plot and Equation



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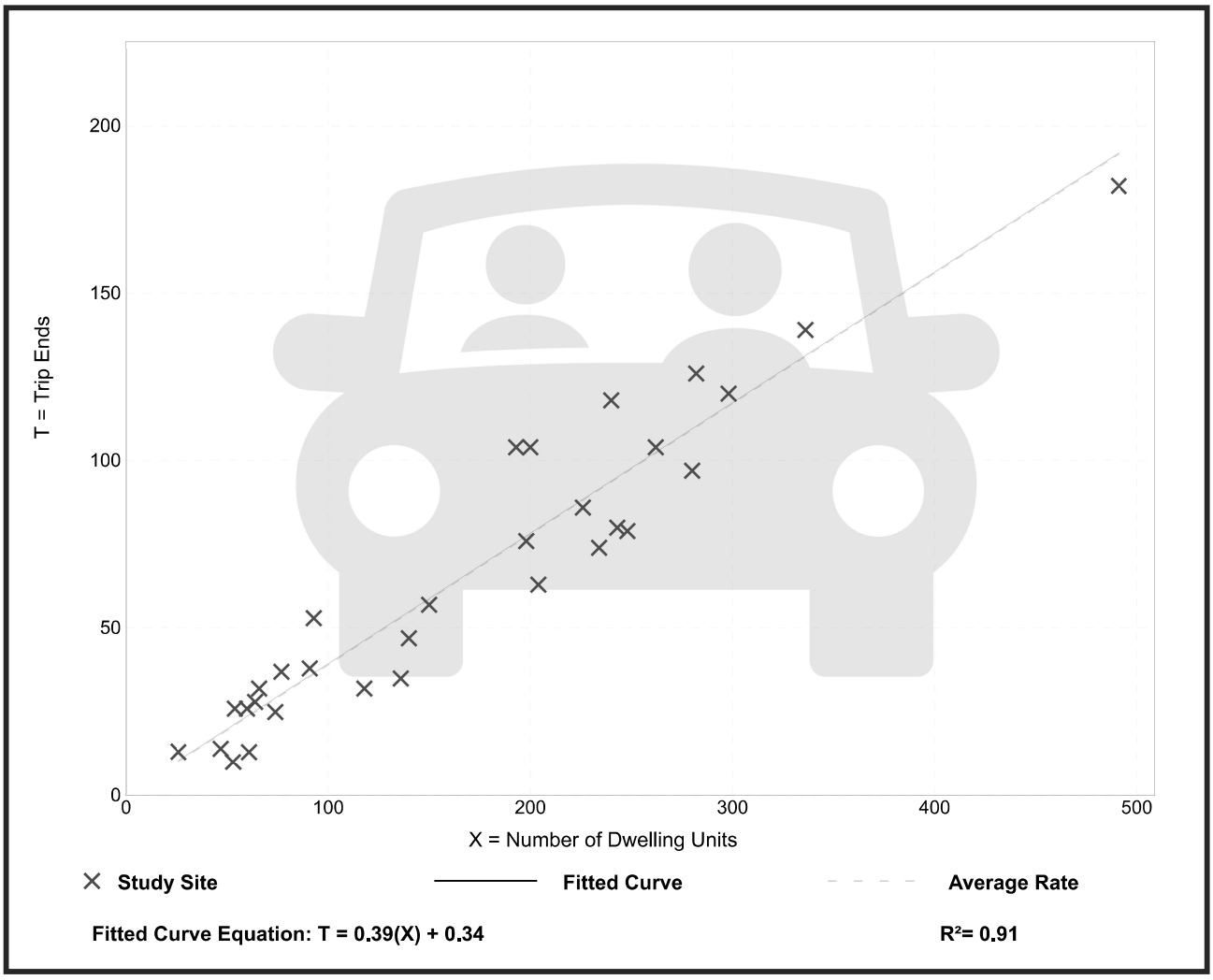
Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 31
Avg. Num. of Dwelling Units: 169
Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.39	0.19 - 0.57	0.08

Data Plot and Equation



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Mini-Warehouse
(151)

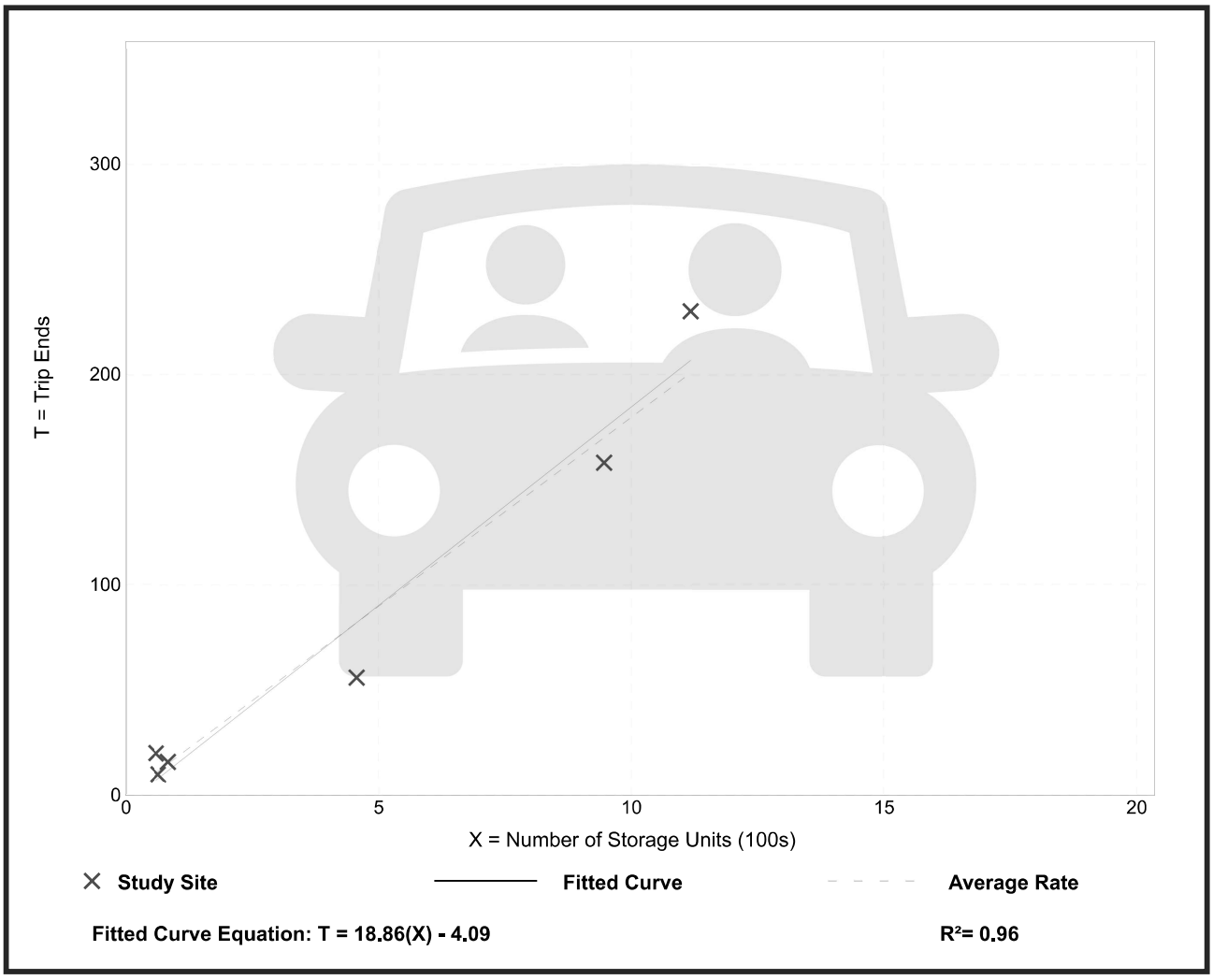
Vehicle Trip Ends vs: **Storage Units (100s)**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 6
Avg. Num. of Storage Units (100s): 5
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Storage Unit (100s)

Average Rate	Range of Rates	Standard Deviation
17.96	12.25 - 33.33	4.13

Data Plot and Equation



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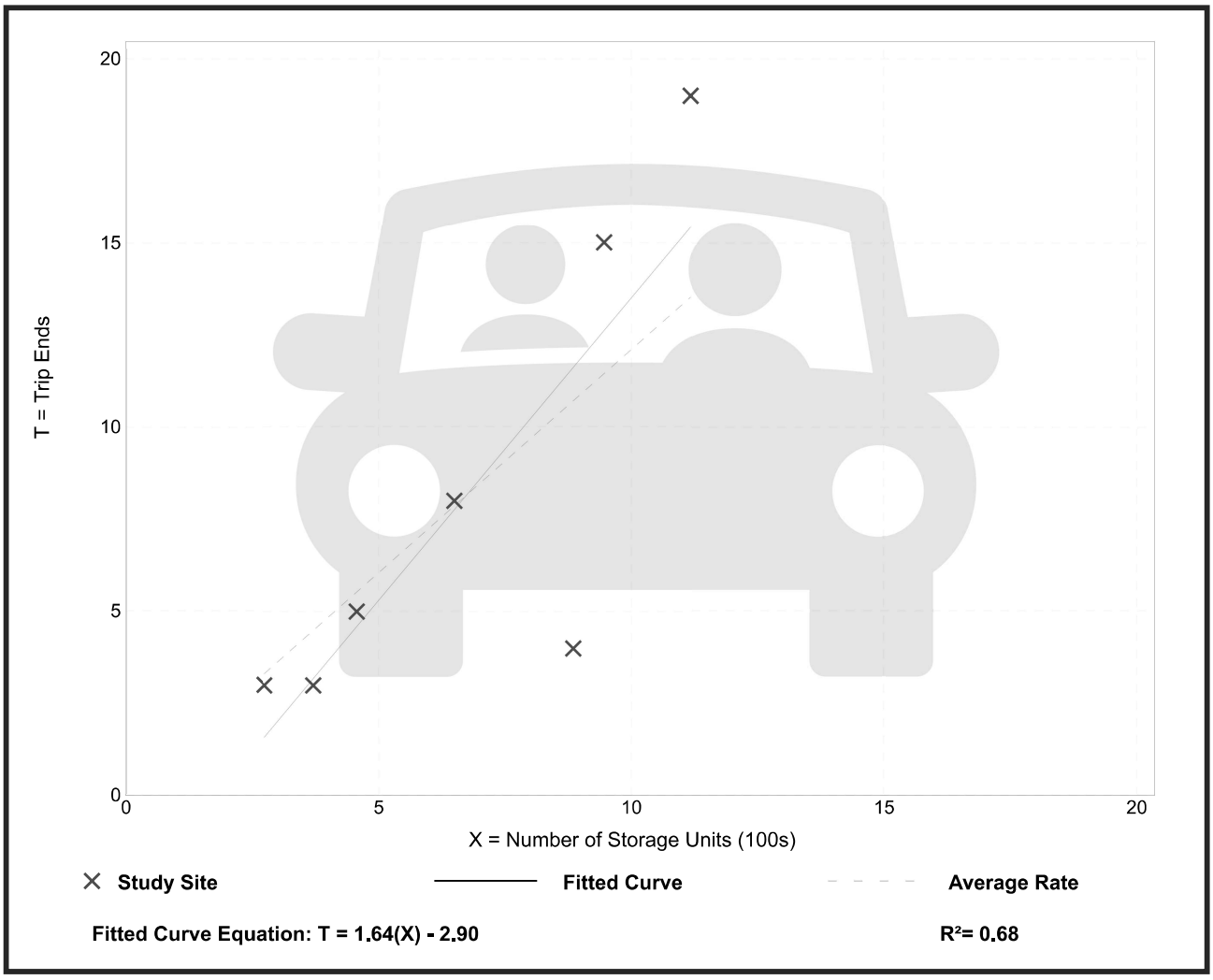
Mini-Warehouse
(151)

Vehicle Trip Ends vs: **Storage Units (100s)**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 7
Avg. Num. of Storage Units (100s): 7
Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per Storage Unit (100s)

Average Rate	Range of Rates	Standard Deviation
1.21	0.45 - 1.70	0.49

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

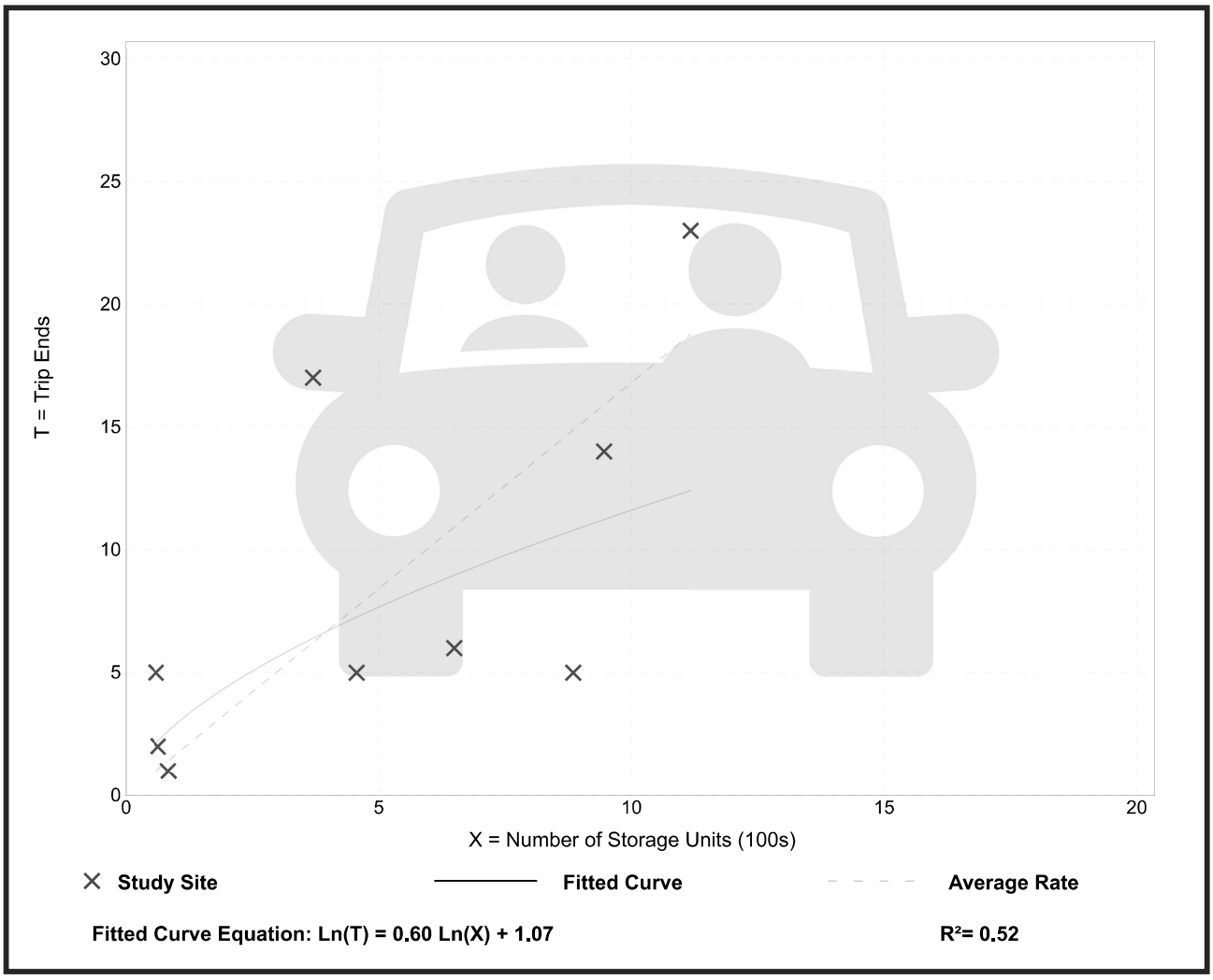
Mini-Warehouse
(151)

Vehicle Trip Ends vs:	**Storage Units (100s)**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	9
Avg. Num. of Storage Units (100s):	5
Directional Distribution:	50% entering, 50% exiting

Vehicle Trip Generation per Storage Unit (100s)

Average Rate	Range of Rates	Standard Deviation
1.68	0.56 - 8.33	1.37

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Small Office Building
(712)

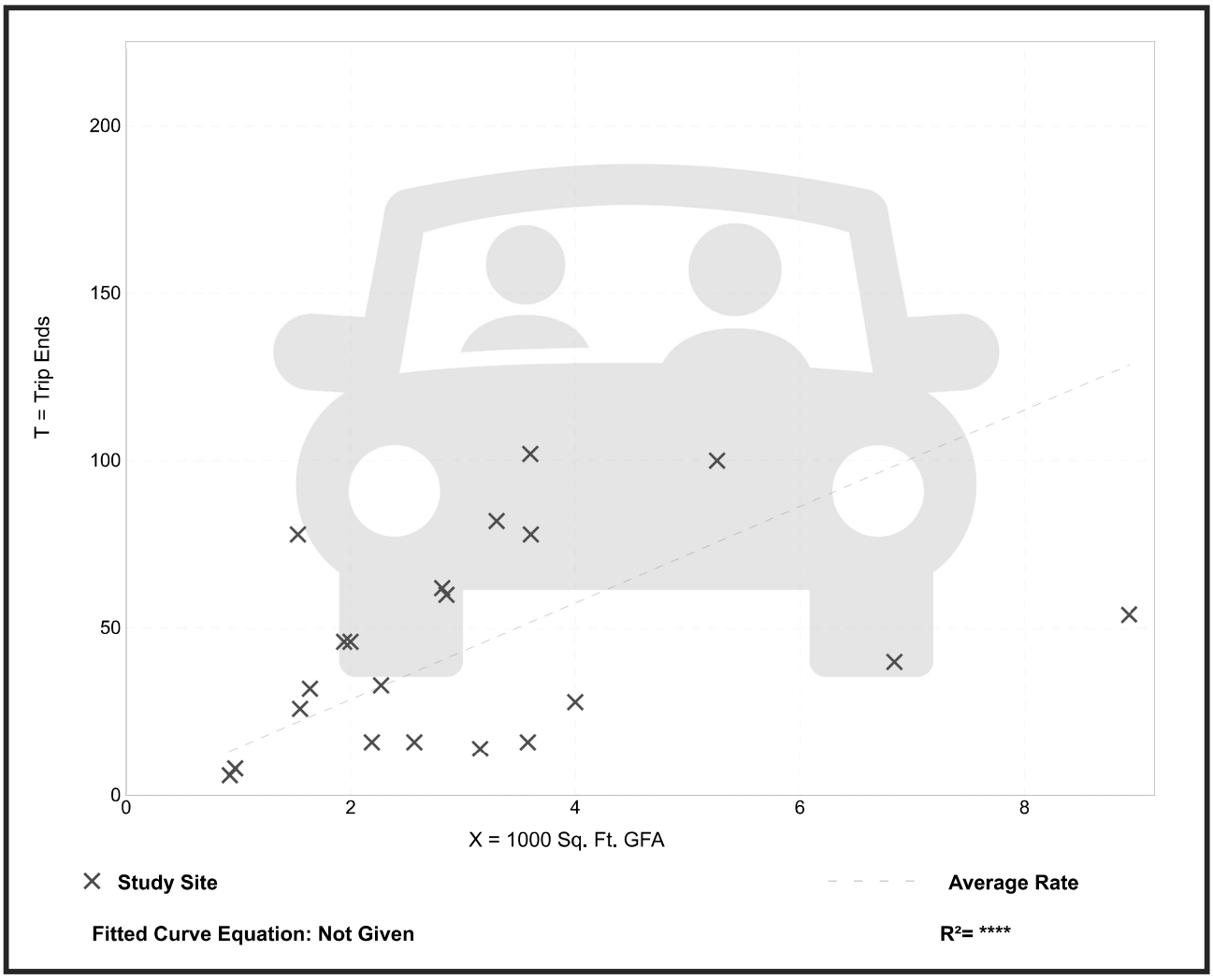
Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 21
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
14.39	4.44 - 50.91	10.16

Data Plot and Equation



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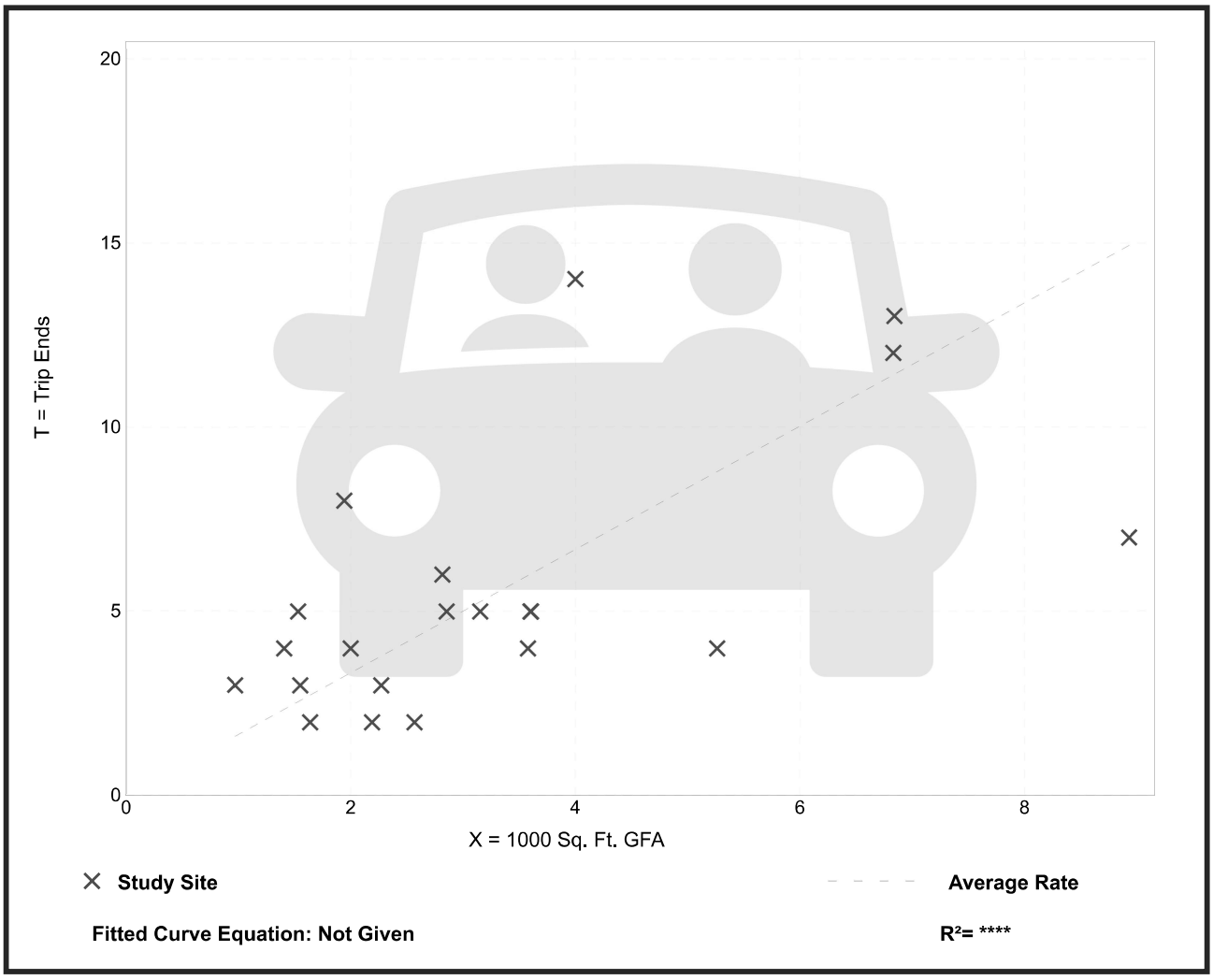
Small Office Building
(712)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 21
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 82% entering, 18% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.67	0.76 - 4.12	0.88

Data Plot and Equation



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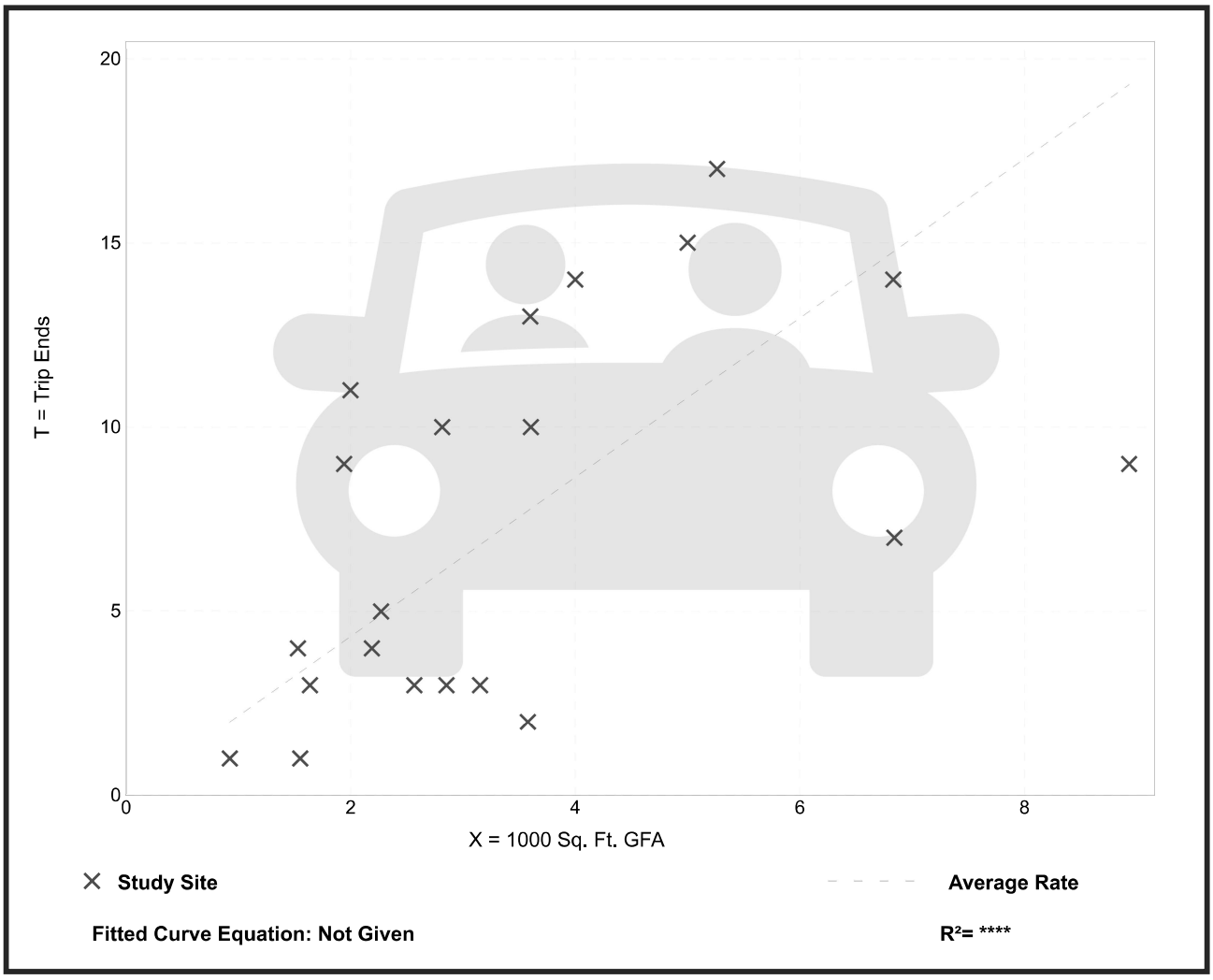
Small Office Building
(712)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 21
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 34% entering, 66% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.16	0.56 - 5.50	1.26

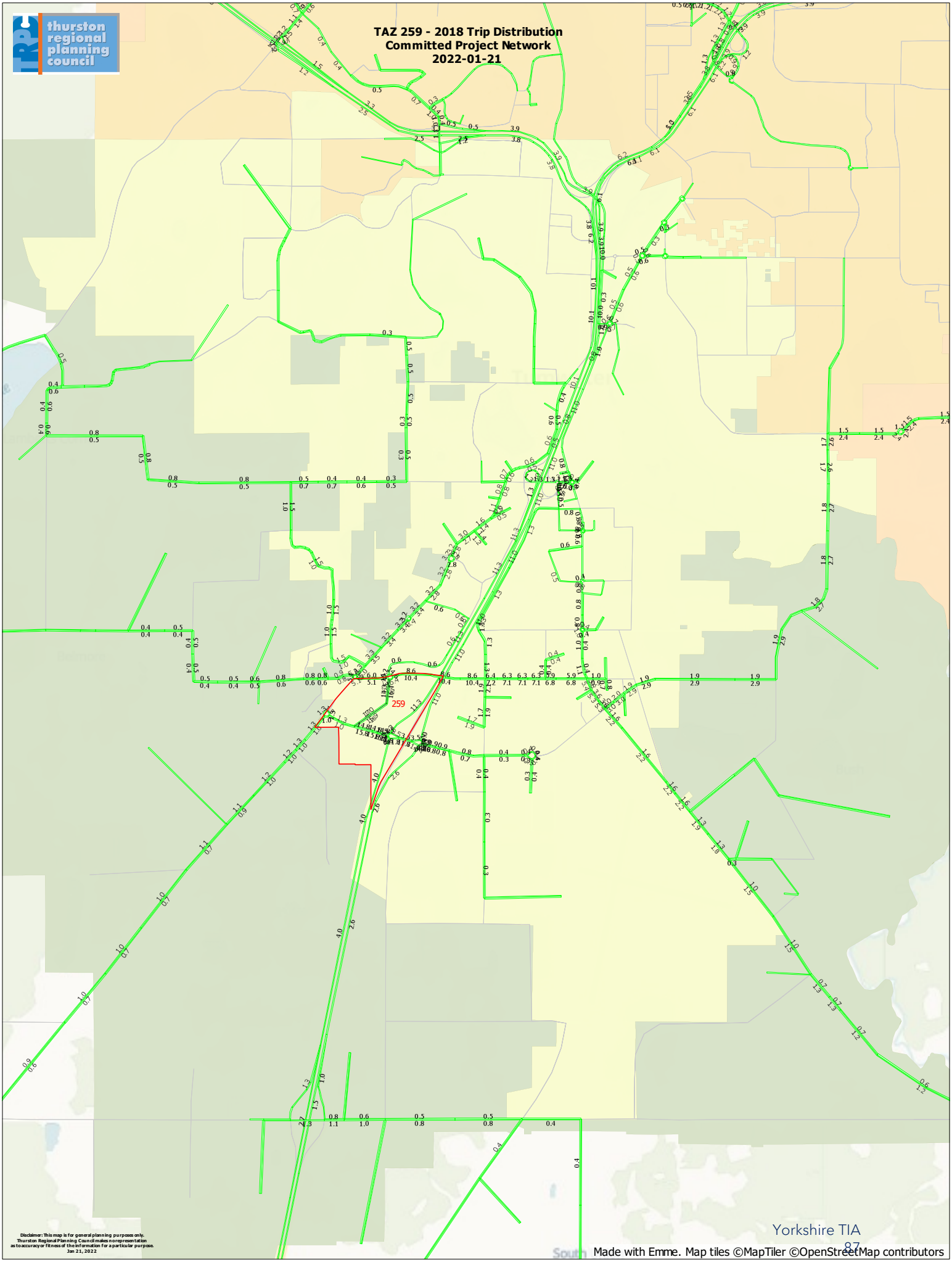
Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

YORKSHIRE
TRAFFIC IMPACT ANALYSIS

APPENDIX: TRPC TAZ 259 MODELING


TAZ 259 - 2018 Trip Distribution
Committed Project Network
2022-01-21
259
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as to accuracy or fitness of the information for a particular purpose.
Jan 21, 2022
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TAZ 259 - 2018 Trip Distribution
Committed Project Network
2021-09-14

259

259

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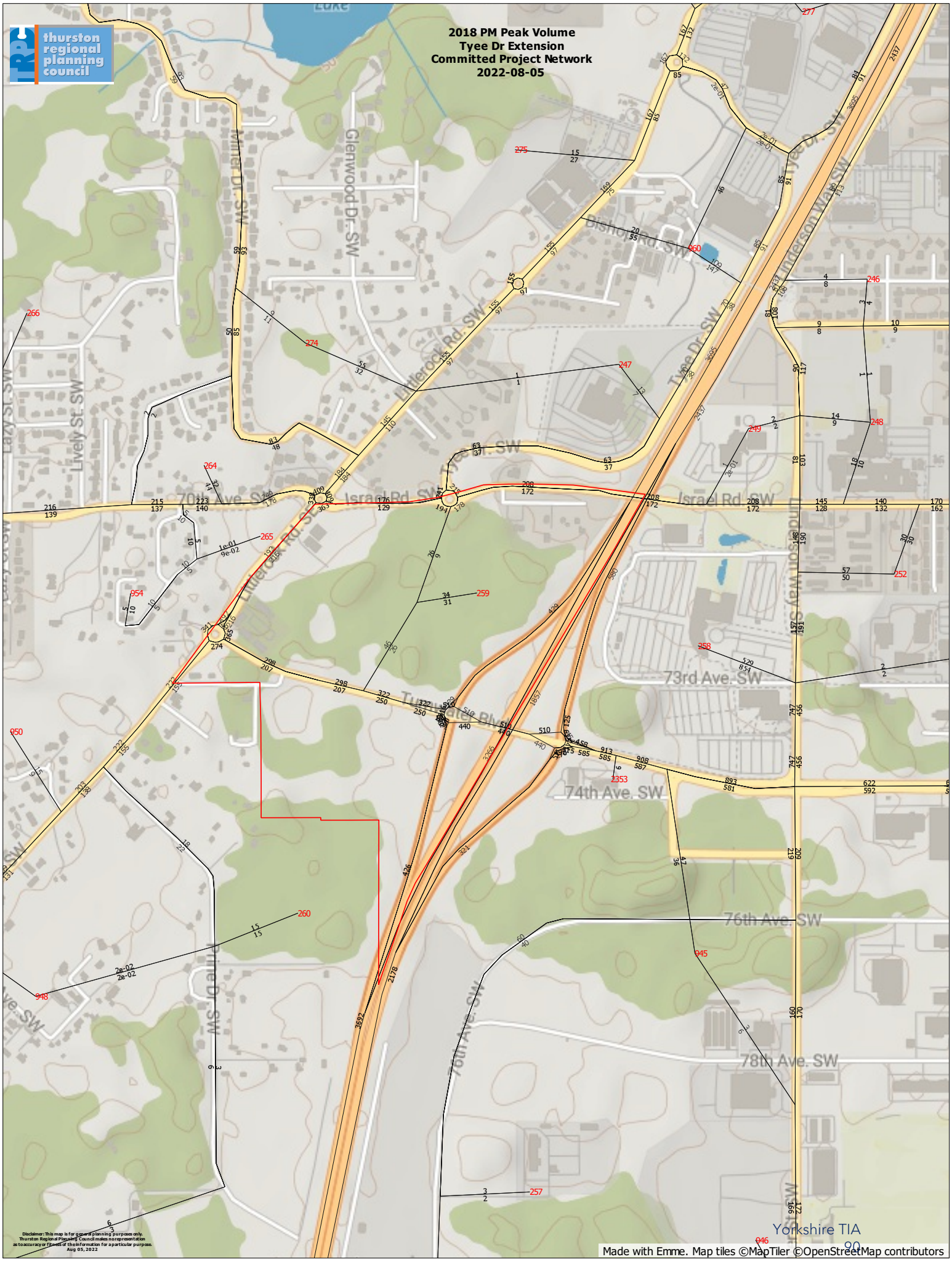
Sep 14, 2021

YORKSHIRE
TRAFFIC IMPACT ANALYSIS

APPENDIX: TRPC TYEE DR SW REROUTE MODELING & VOLUMES


2018 PM Peak Volume
Tyee Dr Extension
Committed Project Network
2022-08-05
thurston regional planning council
Glenwood Dr. SW
Littlerock Rd. SW
Tyee Dr. SW
Anderson Way SW
Bishop Rd. SW
Israel Rd. SW
70th Ave. SW
73rd Ave. SW
74th Ave. SW
76th Ave. SW
78th Ave. SW
Tumwater Blvd.
Lazy St. SW
Lively St. SW
Yorkshire TIA
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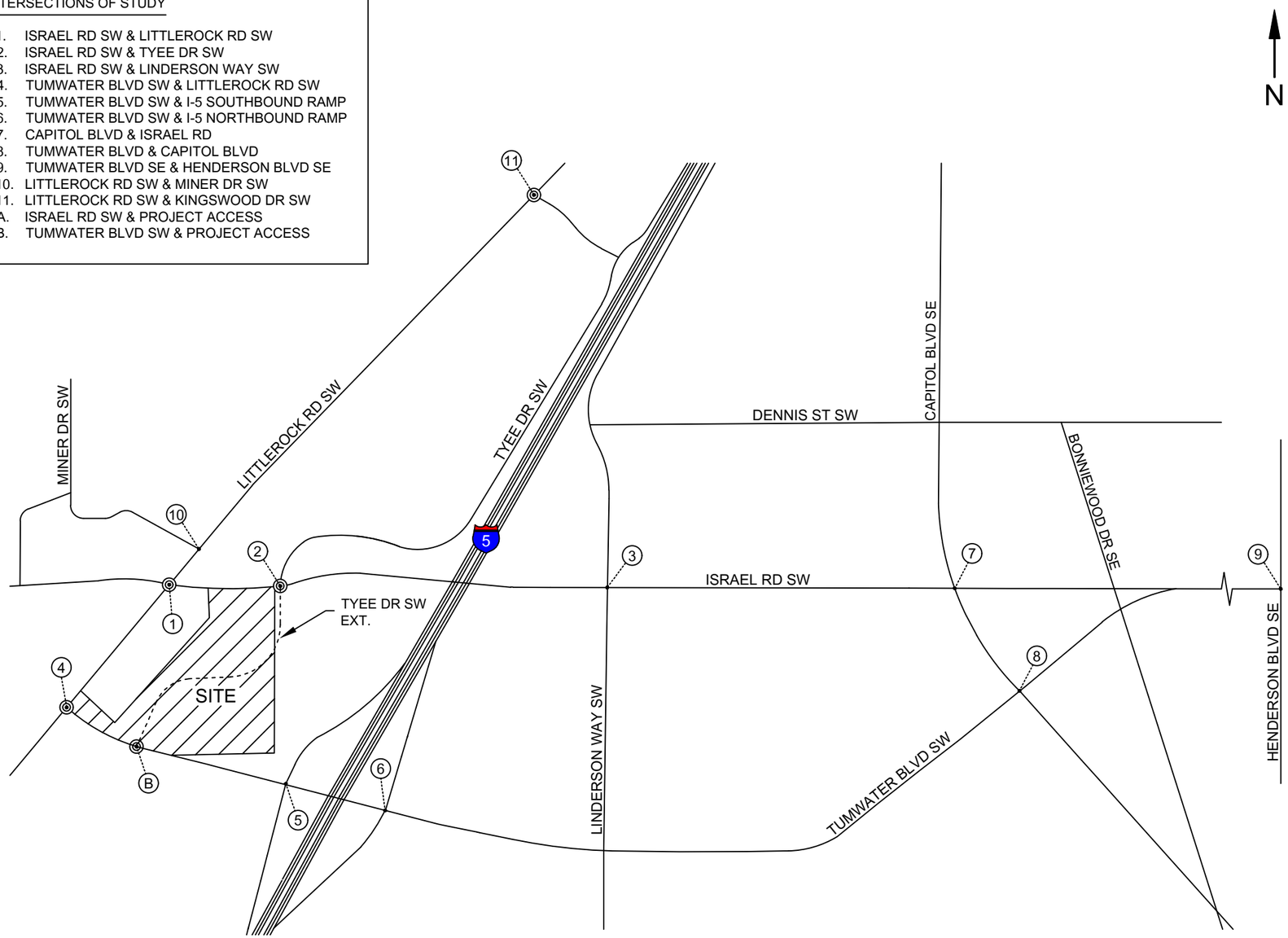
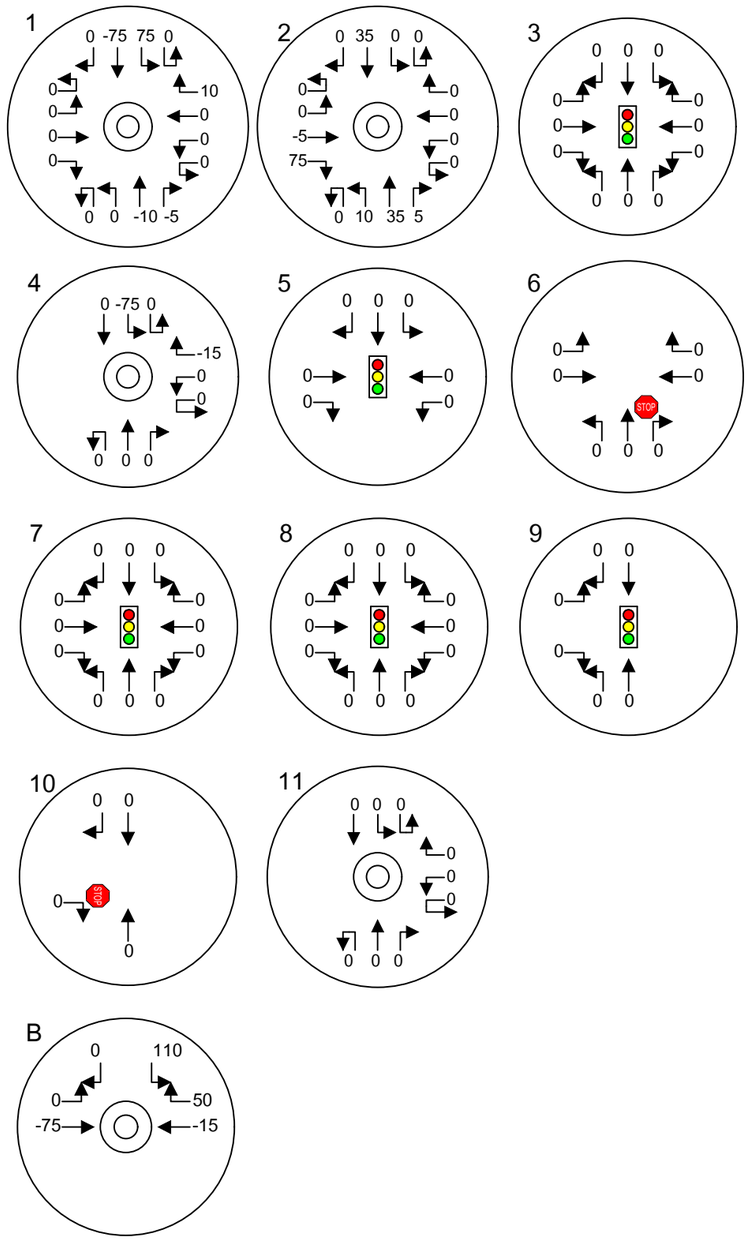
INTERSECTIONS OF STUDY

1. ISRAEL RD SW & LITTLEROCK RD SW
2. ISRAEL RD SW & TYEE DR SW
3. ISRAEL RD SW & LINDERSON WAY SW
4. TUMWATER BLVD SW & LITTLEROCK RD SW
5. TUMWATER BLVD SW & I-5 SOUTHBOUND RAMP
6. TUMWATER BLVD SW & I-5 NORTHBOUND RAMP
7. CAPITOL BLVD & ISRAEL RD
8. TUMWATER BLVD & CAPITOL BLVD
9. TUMWATER BLVD SE & HENDERSON BLVD SE
10. LITTLEROCK RD SW & MINER DR SW
11. LITTLEROCK RD SW & KINGSWOOD DR SW
A. ISRAEL RD SW & PROJECT ACCESS
B. TUMWATER BLVD SW & PROJECT ACCESS





HEATH&ASSOCIATES
Transportation Planning & Engineering

YORKSHIRE

PM PEAK HOUR REROUTING DUE TO TYEE DRIVE SW EXTENSION
FIGURE A

YORKSHIRE
TRAFFIC IMPACT ANALYSIS

APPENDIX: TYEE DRIVE SW CROSS-SECTION MEMO

Date: April 13, 2023

To: Mary Heather Ames, PE
Transportation Manager
City of Tumwater

From: Aaron Van Aken, PE, PTOE

Subject: Yorkshire – Tyee Drive SW Extension: Cross-Section Evaluation Memo Update

The intent of this memo is to provide and summarize the findings with respect to the Tyee Drive cross-section evaluation. The city's Comprehensive Plan and *Littlerock Road Subarea Plan* identified Tyee Drive as a planned 4- to 5-lane road between Israel Road and Tumwater Blvd. The city, however, provided the option of conducting an in-depth analysis to determine if growth models and capacity evaluation could support a reduced cross-section (three lanes). This analysis, therefore, summarizes the in-depth analysis and key findings.

Per the recent findings from the January 10, 2023 meeting with Thurston Regional Planning Council (TRPC), and subsequent volume increase adjustments of Area 18 (see Attachment 8) per City direction, the modeling with respect to the forecast 2050 growth along Tyee Drive was shown to support a Tyee Drive three-lane section. Summarized below are the projected PM peak hour directional travel volumes and the respective volume-to-capacity (v/c) ratios.

Northern Half
NB: 255 – v/c: 0.46
SB: 385 – v/c: 0.70
Total: 640 vehicles

Southern Half
NB: 285 – v/c: 0.51
SB: 275 – v/c: 0.50
Total: 560 vehicles

The projected volumes and v/c ratios are reflective of a three-lane section with Yorkshire development traffic, background traffic and other in-process/future pipeline. The v/c ratios are shown to meet the City's mobility standards. This also accounts for a fully extended Tyee Drive (i.e., extending south from Tumwater Blvd and connecting to Littlerock Road and beyond). Supporting Attachments are as follows:

Attachment 1: Speed and Lanes Yorkshire Belmont
This identifies the number of lanes and speeds as shown in the model results.

Attachment 2: Yorkshire Select Zone Area Wide
This shows only the trips related to the Yorkshire development zoomed out to a large area.

Attachment 3: Yorkshire Select Zone Zoom
This shows only the trips related to the Yorkshire development zoomed in to a smaller area.

Attachment 4: 2050 PM Yorkshire Plus Background Growth
This map identifies the estimated number of north/south PM peak hour volumes along Tyee Drive with the Yorkshire development and all background traffic under 2050 conditions.

Attachment 5: Yorkshire Belmont Zoom
Zoomed in version of Attachment 4

Attachment 6: Tyee Drive V/C Ratios
This identified the volume-to-capacity ratios for Tyee Drive between Israel Road SW and Tumwater Blvd SE under 2050 PM peak hour conditions.

Attachment 7: Pipeline and Future Volume Analysis
Provides methodologies and derivations for future traffic volume assumptions for 20 targeted areas within the city.

Conclusion

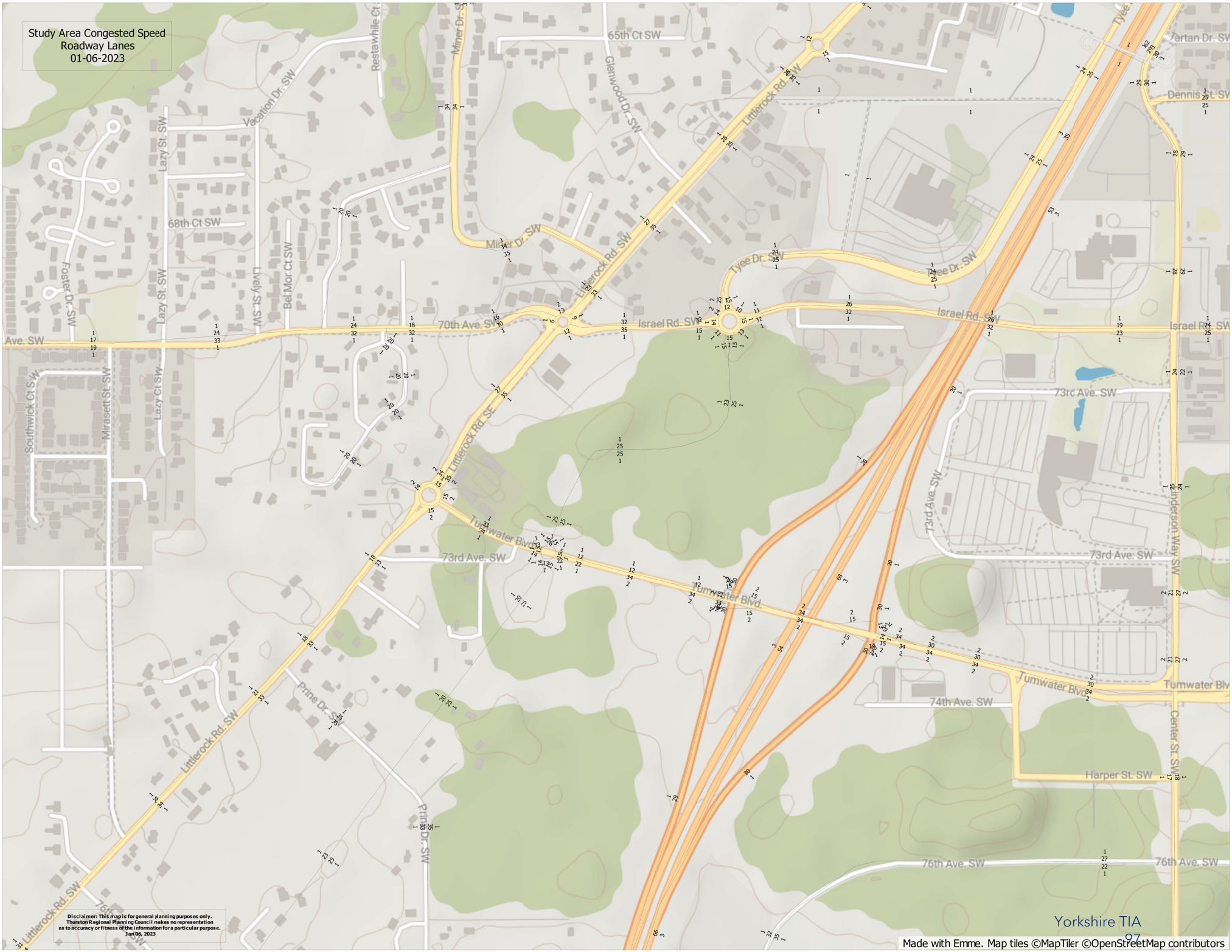
After an in-depth analysis and TRPC modeling, a three-lane section was determined to adequately support the projected 2050 peak hour demands and volumes of the Tyee Drive roadway. It is therefore recommended to allow the Yorkshire development to design and construct a three-lane Tyee Drive cross-section.

Please feel free to contact me should you have any questions.
Aaron Van Aken, P.E., PTOE

YORKSHIRE
CROSS-SECTION EVALUATION
MEMO

ATTACHMENT 1: SPEED AND
LANES YORKSHIRE BELMONT

APPENDIX


Study Area Congested Speed
Roadway Lanes
01-06-2023
Littlerock Rd. SW
Littlerock Rd SE
Tumwater Blvd.
Israel Rd. SW
70th Ave. SW
73rd Ave. SW
74th Ave. SW
76th Ave. SW
65th Ct SW
68th Ct SW
Miner Dr. SW
Glenwood Dr. SW
Vacation Dr. SW
Restawhile Ct
Lazy St. SW
Foster Dr. SW
Bel Mor Ct SW
Tyee Dr. SW
Tartan Dr. SW
Dennis St. SW
Southwick Ct SW
Mirasett St. SW
Lazy Ct SW
Prine Dr. SW
Anderson Way SW
Center St. SW
Harper St. SW
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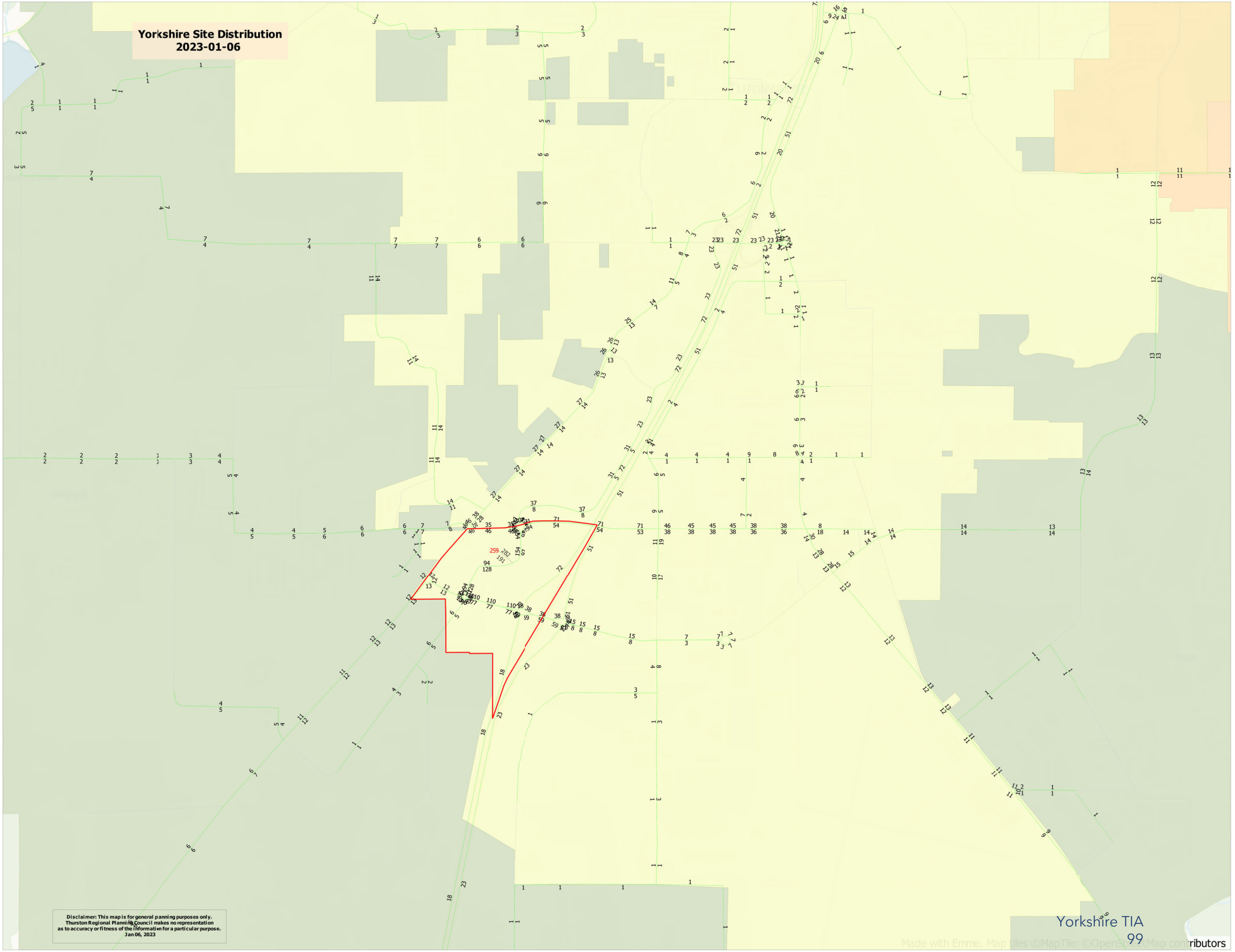
YORKSHIRE
CROSS-SECTION EVALUATION
MEMO

ATTACHMENT 2: YORKSHIRE
SELECT ZONE AREA WIDE

APPENDIX


Yorkshire Site Distribution
2023-01-06
Disclaimer: This map is for general panning purposes only.
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Jan 06, 2023
Yorkshire TIA
99
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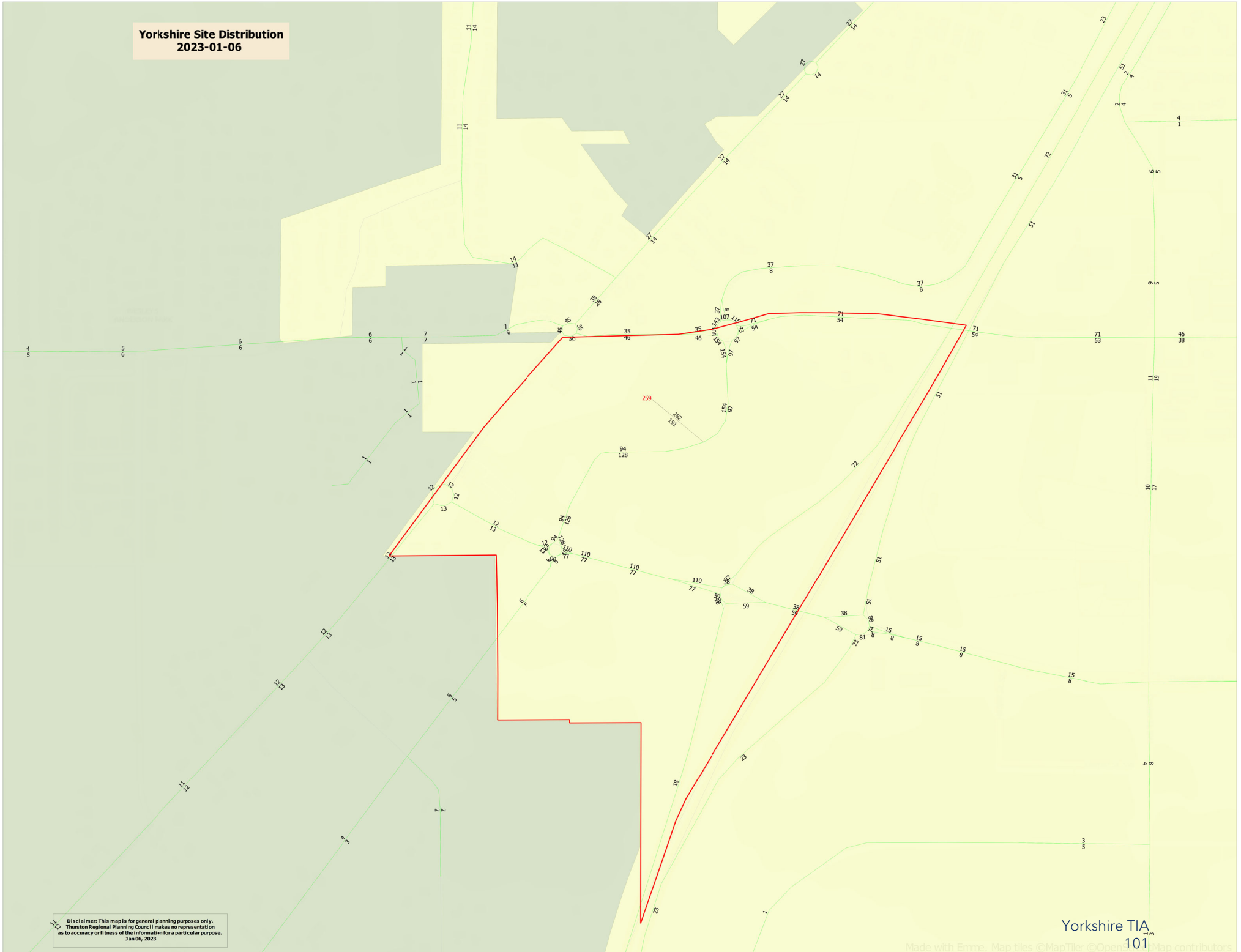
YORKSHIRE
CROSS-SECTION EVALUATION
MEMO

ATTACHMENT 3: YORKSHIRE
SELECT ZONE ZOOM

APPENDIX


Yorkshire Site Distribution
2023-01-06
Disclaimer: This map is for general panning purposes only.
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as to accuracy or fitness of the informatin for a particular purpose.
Jan 06, 2023
Yorkshire TIA
101
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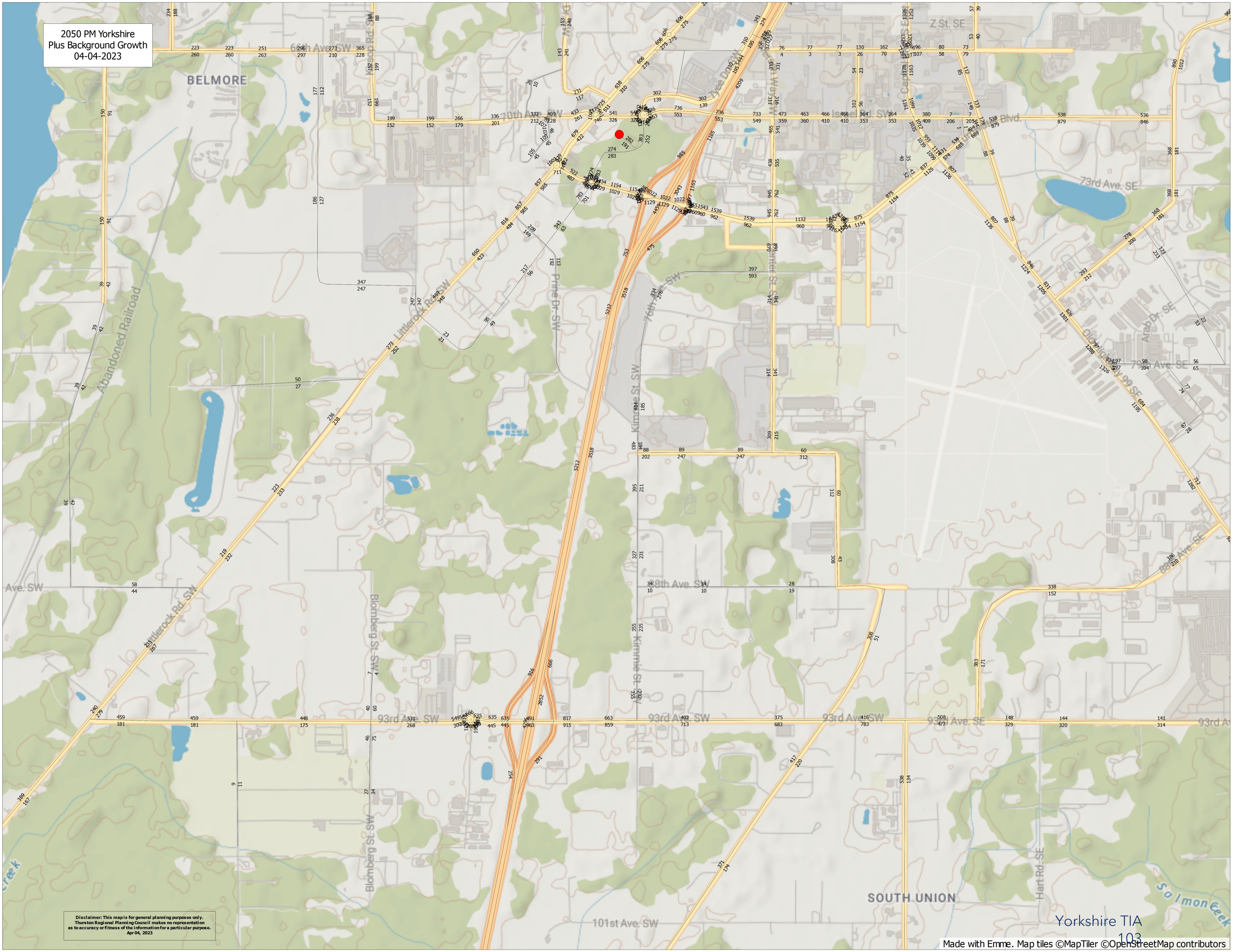
YORKSHIRE
CROSS-SECTION EVALUATION
MEMO

ATTACHMENT 4: 2050 PM
YORKSHIRE PLUS
BACKGROUND GROWTH

APPENDIX


2050 PM Yorkshire
Plus Background Growth
04-04-2023
BELMORE
SOUTH UNION
Z St. SE
66th Ave. SW
70th Ave. SW
73rd Ave. SE
88th Ave. SW
93rd Ave. SW
93rd Ave. SE
101st Ave. SW
Littlerock Rd. SW
Abandoned Railroad
Prine Dr. SW
Blomberg St. SW
Kimmie St. SW
Kimmie St.
76th Ave. SW
Arab Dr. SE
Old Hwy 99 SE
Hart Rd. SE
Salmon Creek
Disclaimer: This map is for general planning purposes only. Thurston Regional Planning Council makes no representation as to accuracy or fitness of the information for a particular purpose. Apr 04, 2023
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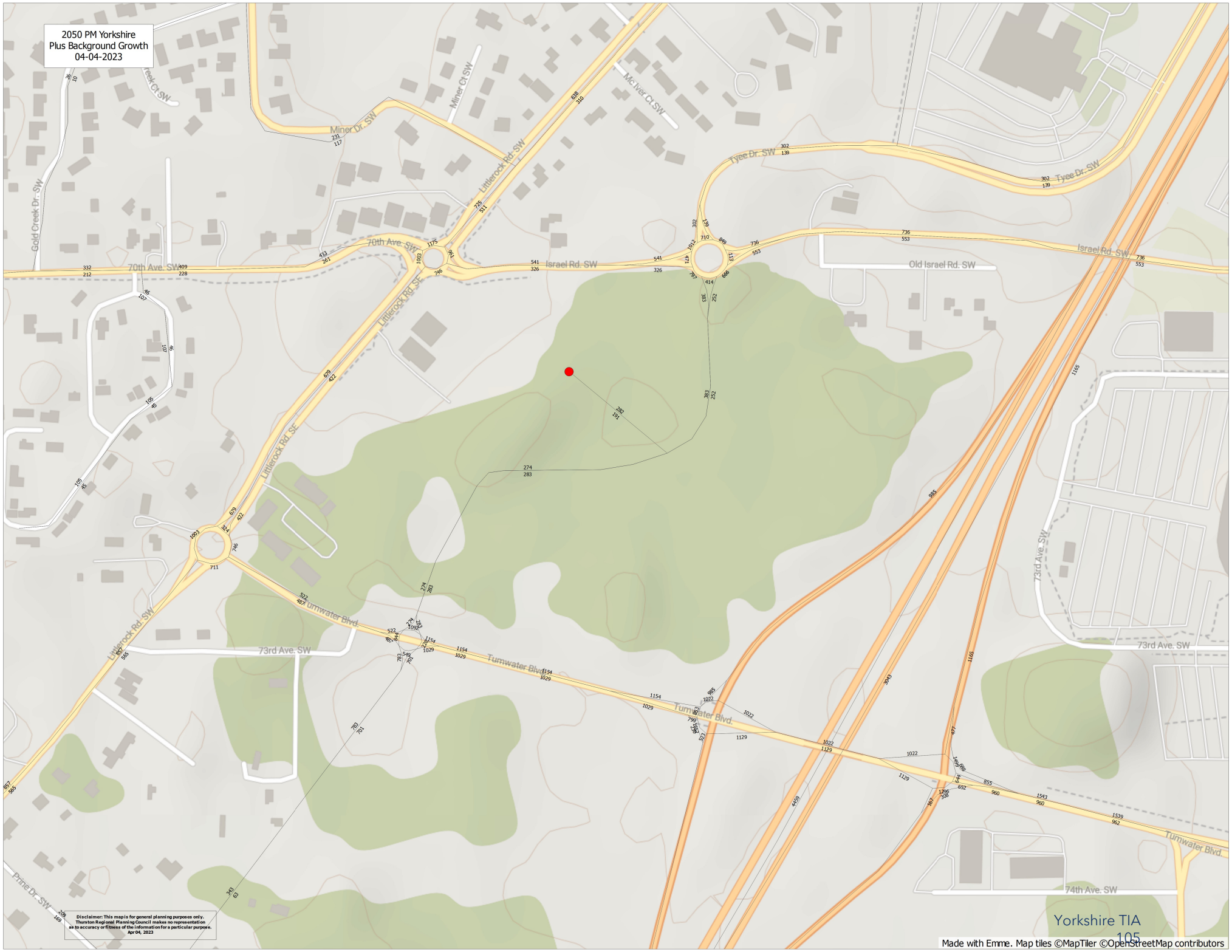
YORKSHIRE
CROSS-SECTION EVALUATION
MEMO

ATTACHMENT 5: 2050 PM
YORKSHIRE PLUS
BACKGROUND GROWTH
ZOOM
APPENDIX


2050 PM Yorkshire
Plus Background Growth
04-04-2023
Littlerock Rd. SW
Littlerock Rd. SE
70th Ave. SW
Israel Rd. SW
Old Israel Rd. SW
Tyee Dr. SW
Miner Dr. SW
Miner Ct SW
McIver Ct SW
Gold Creek Dr. SW
Turnwater Blvd.
73rd Ave. SW
74th Ave. SW
Prime Dr. SW
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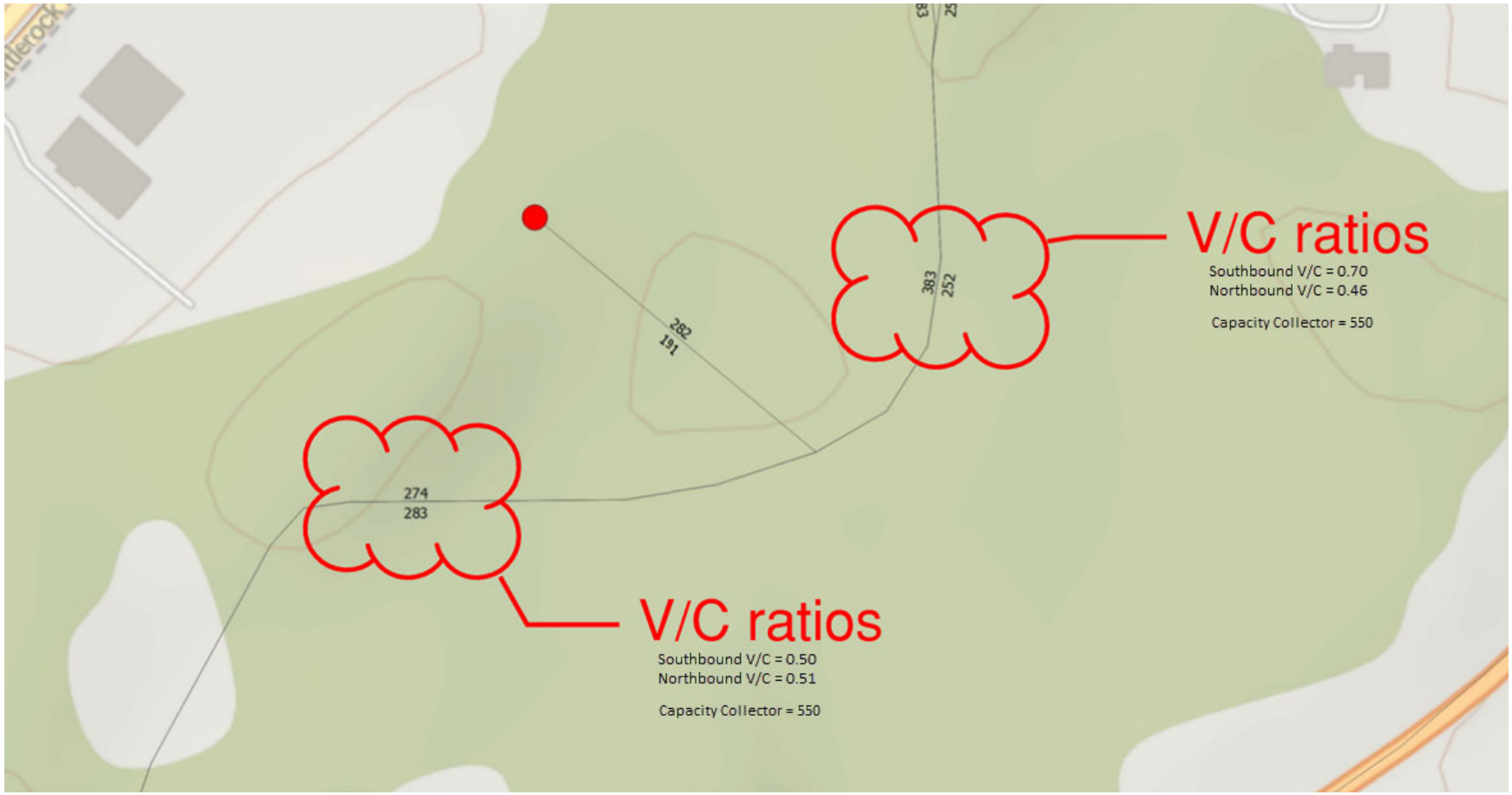
Apr 04, 2023
Yorkshire TIA
105
Made with Emme. Map tiles ©MapTiler ©OpenStreetMap contributors

YORKSHIRE
CROSS-SECTION EVALUATION
MEMO

ATTACHMENT 6: TYEE DRIVE
V/C RATIOS

APPENDIX

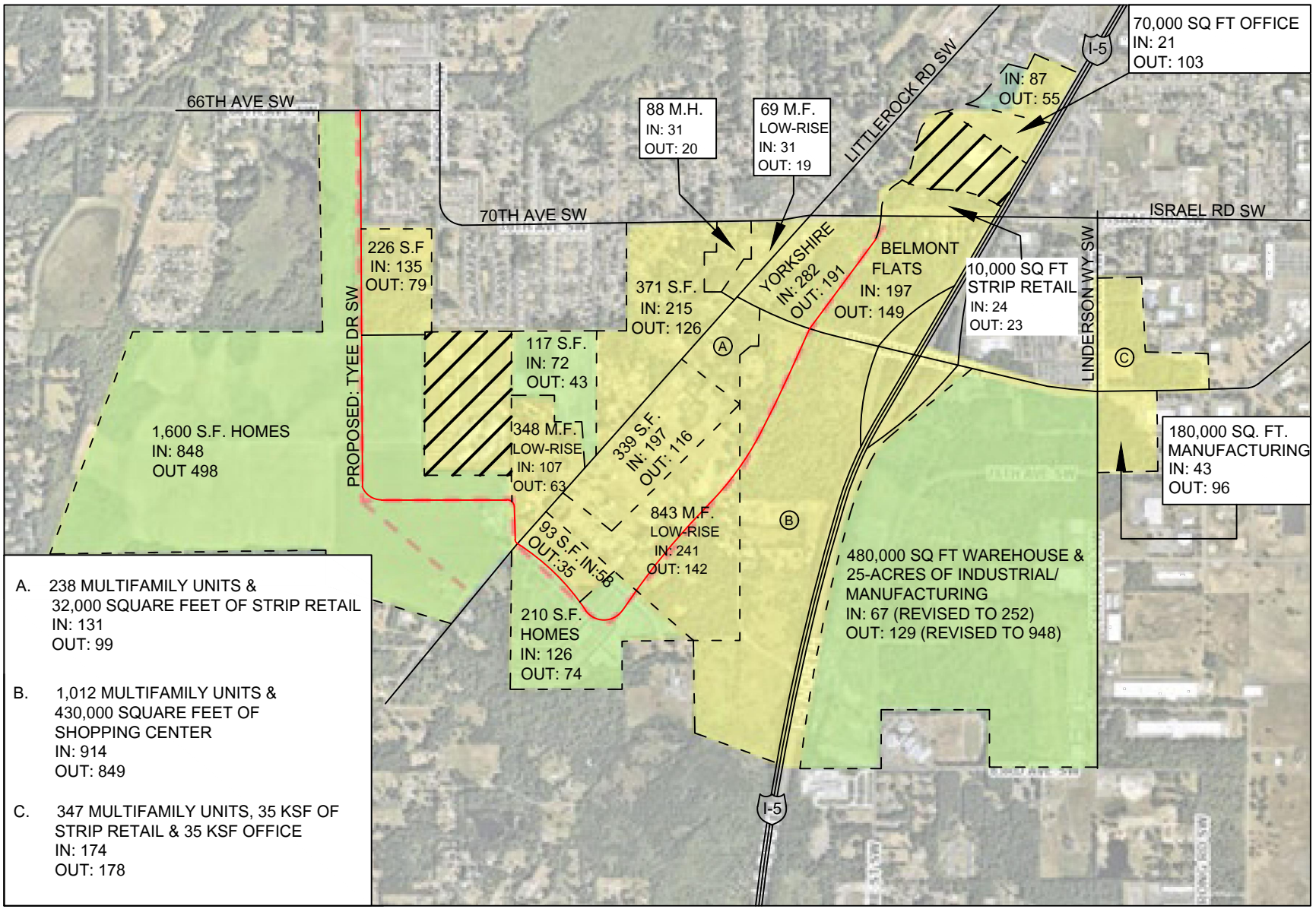
Tyee Dr Cross-section V/C Ratios



YORKSHIRE
CROSS-SECTION EVALUATION
MEMO

ATTACHMENT 7: PIPELINE AND
FUTURE VOLUMES ANALYSIS

APPENDIX



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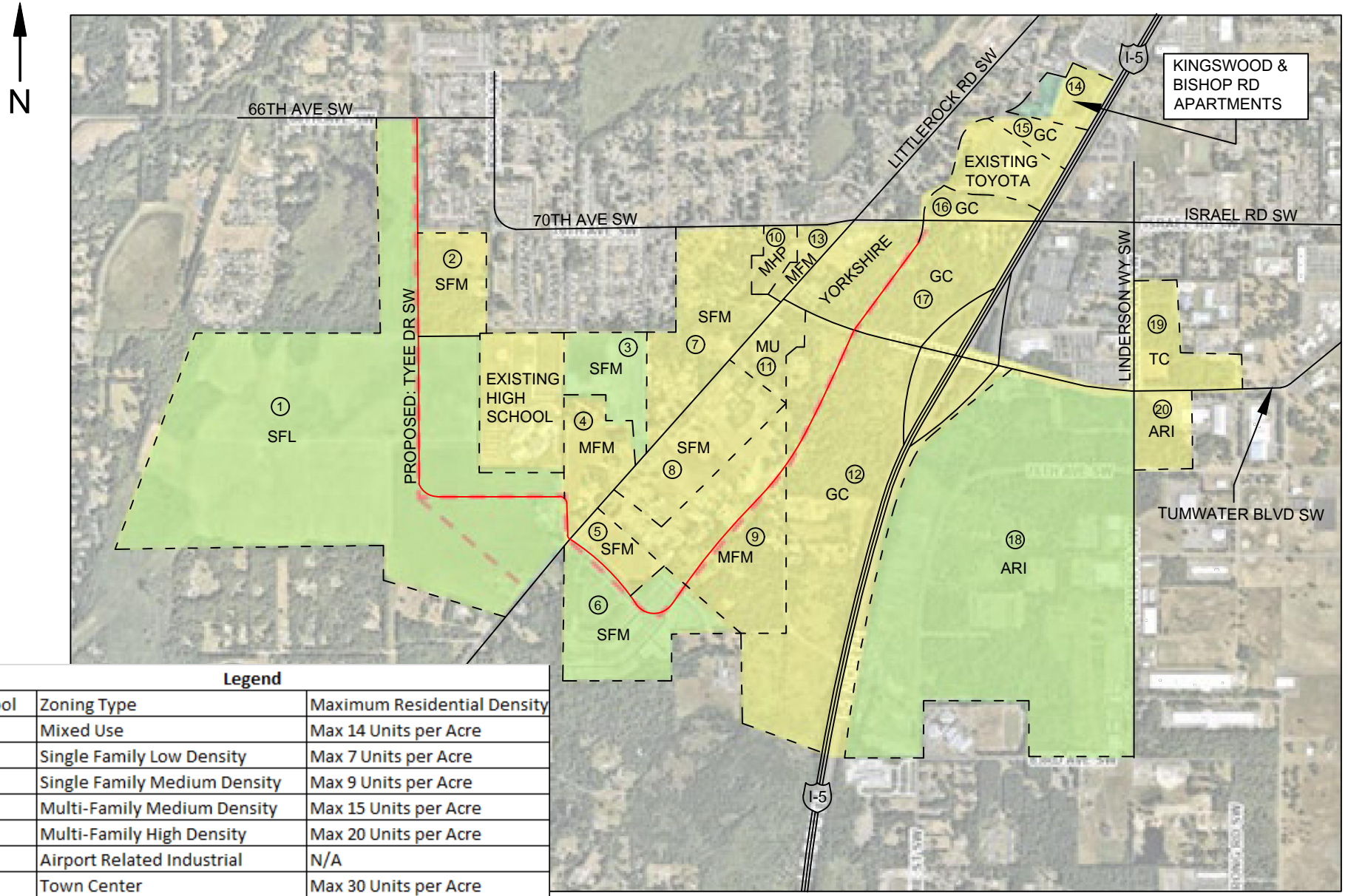
TRANSPORTATION PLANNING & ENGINEERING

YORKSHIRE

ESTIMATED PRIMARY PM PEAK HOUR TRIPS PER CITY ZONING
FIGURE A



Legend		
Symbol	Zoning Type	Maximum Residential Density
MU	Mixed Use	Max 14 Units per Acre
SFL	Single Family Low Density	Max 7 Units per Acre
SFM	Single Family Medium Density	Max 9 Units per Acre
MFM	Multi-Family Medium Density	Max 15 Units per Acre
MFH	Multi-Family High Density	Max 20 Units per Acre
AR1	Airport Related Industrial	N/A
TC	Town Center	Max 30 Units per Acre
GC	General Commercial	Max 14 Units per Acre
MHP	Manufactured Home Park	Max 9 Units per Acre

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YORKSHIRE

ZONING MAP
FIGURE B

Area 1
Acreage
City has directed 1,600 single family homes for area 1

ITE Trip Generation 11th Ed.
1,600 Single-Family Homes
Dwelling Units as Input Variable
ITE Equations - LUC 210 - Single-Family Housing
PM Peak Hour Trips: 1346
Inbound: 848
Outbound: 498

Area 2
Zoning - SFM
Acreage - 25.06~
Density - Max 9 per acre
25.06 x 9 = 226 Single Family Homes

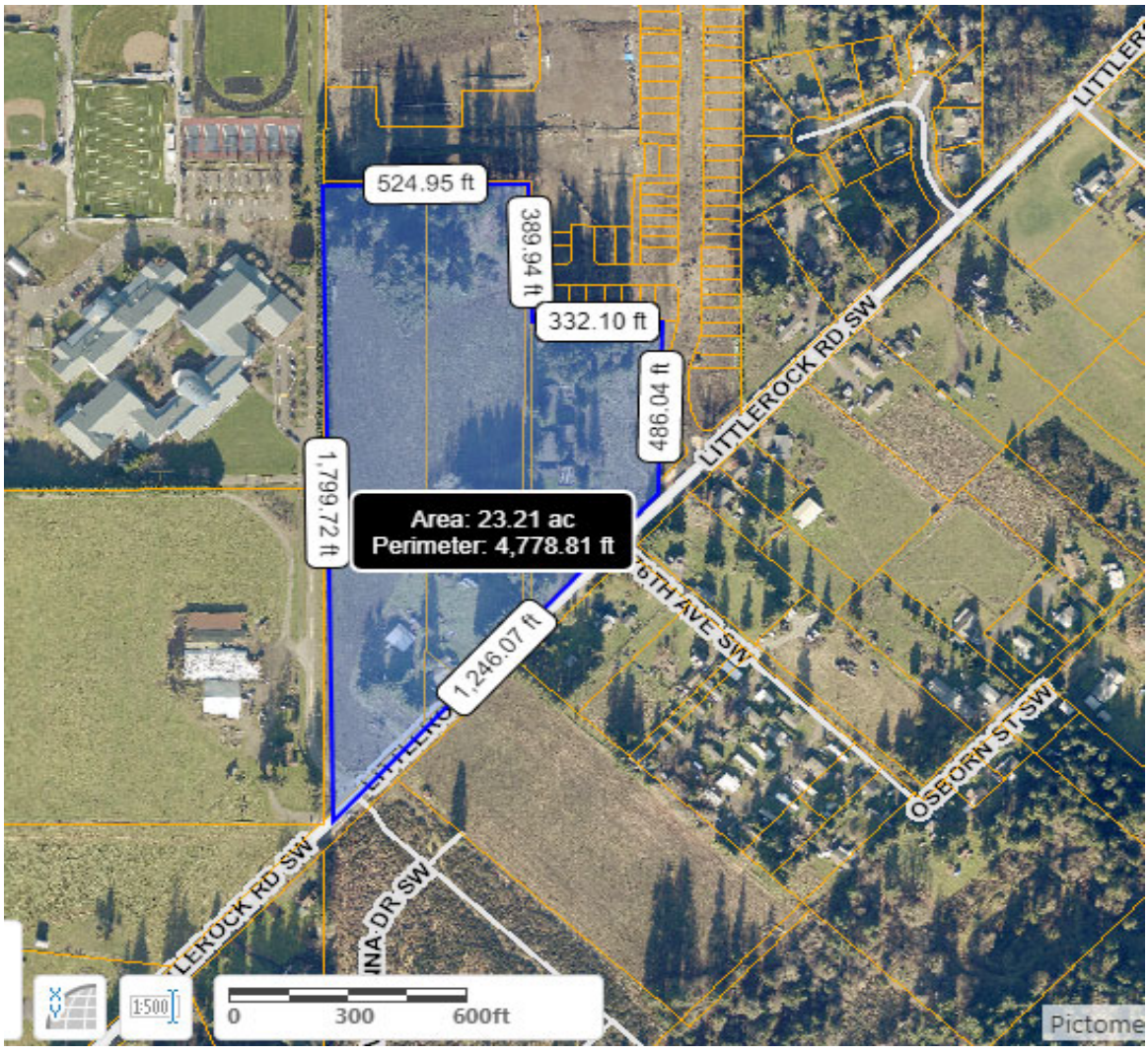
ITE Trip Generation 11th Ed.
226 Single-Family Homes
Dwelling Units as Input Variable
ITE Equations LUC 210 - Single-Family Housing
PM Peak Hour Trips: 214
Inbound: 135
Outbound: 79

Area 3
Zoning - SFM
Acreage - 26.67~
City has directed 117 Single Family Units

ITE Trip Generation 11th Ed.
117 Single-Family Homes
Dwelling Units as Input Variable
ITE Equations - LUC 210 - Single-Family Housing
PM Peak Hour Trips: 115
Inbound: 72
Outbound: 43

Area 4
Zoning - MFM
Acreage - 23.21~
Density - Max 15 per acre
23.21 x 15 = 348 Multi-Family Units

ITE Trip Generation 11th Ed.
348 Multi-Family Units
Dwelling Units as Input Variable
ITE Equations LUC 220 - Multifamily Housing (Low-Rise)
PM Peak Hour Trips: 170
Inbound: 107
Outbound: 63

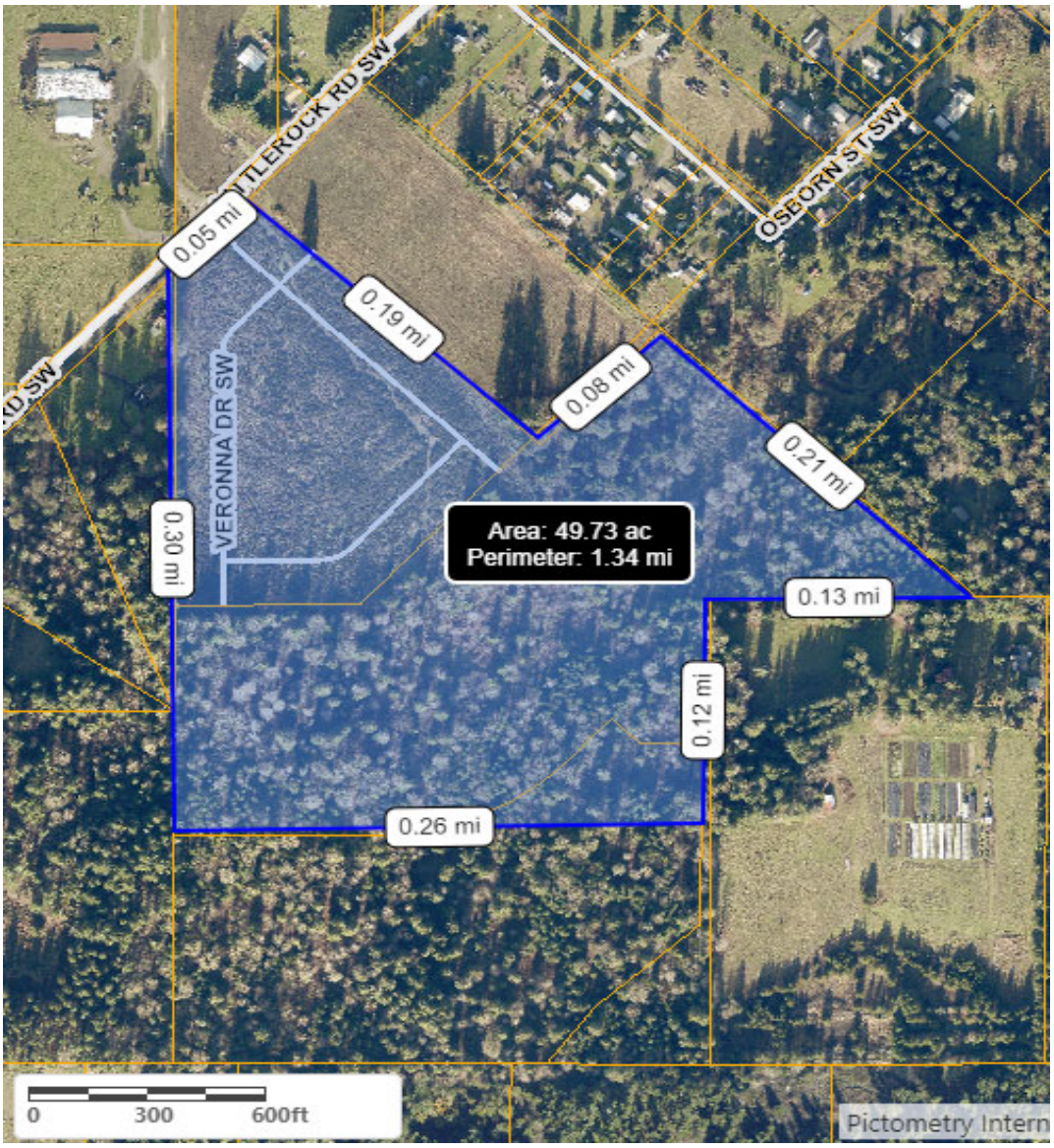


Area 5
Zoning - SFM
Acreage - 10.28~
Density - Max 9 per acre
10.28 x 9 = 93 Single Family Homes

ITE Trip Generation 11th Ed.
93 Single-Family Homes
Dwelling Units as Input Variable
ITE Equations - LUC 210 Sinlge-Family Housing
PM Peak Hour Trips: 93
Inbound: 58
Outbound: 35

Area 6
Acreage - 49.73~
City has directed 210 single family homes for area 6

ITE Trip Generation 11th Ed.
210 Single-Family Homes
Dwelling Units as Input Variable
ITE Equations - LUC 210 - Sinlge-Family Housing
PM Peak Hour Trips: 200
Inbound: 126
Outbound: 74

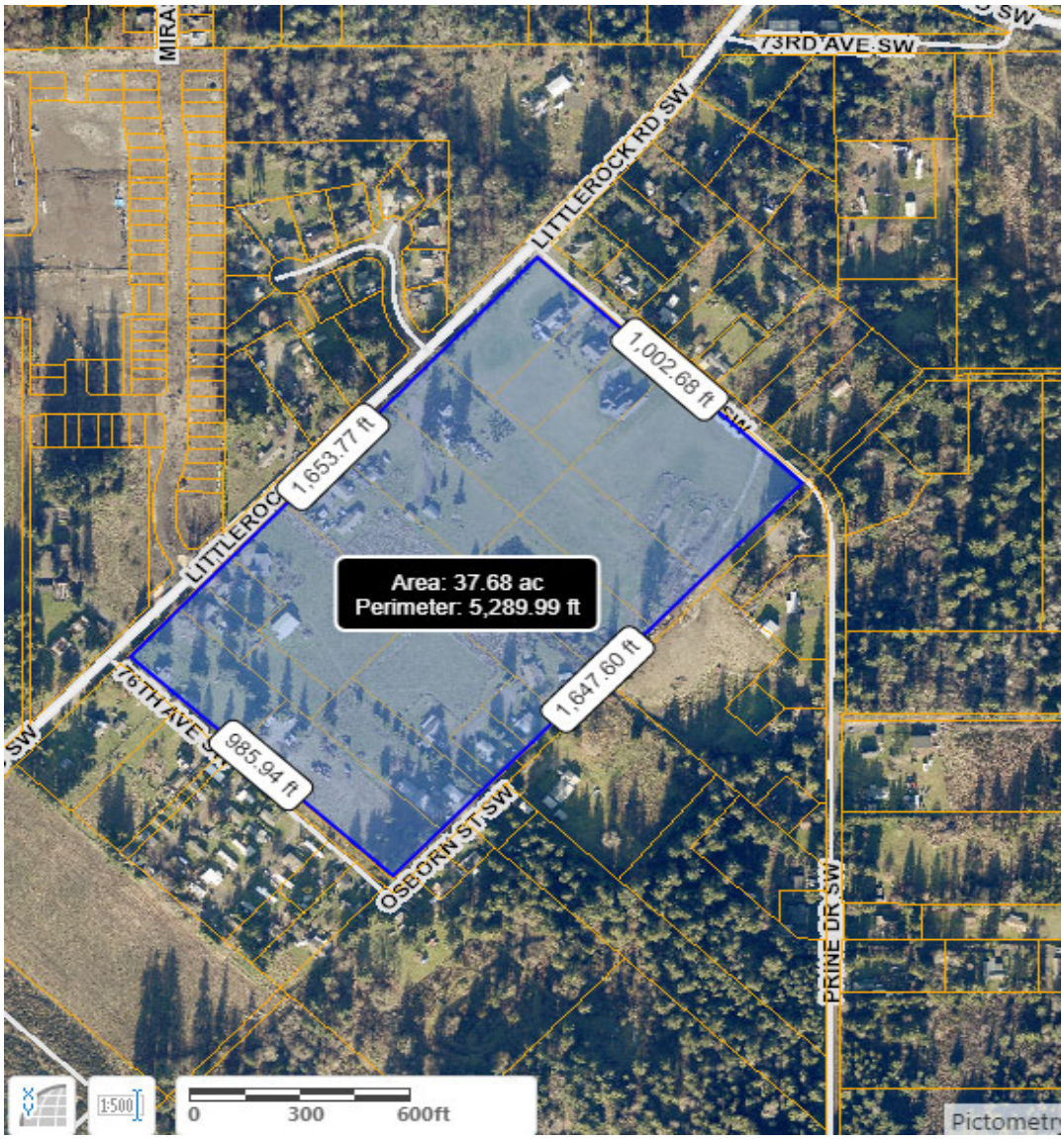


Area 7
Zoning - SFM
Acreage - 41.23~
Density - Max 9 per acre
41.23 x 9 = 371 Single Family Homes

ITE Trip Generation 11th Ed.
371 Single-Family Homes
Dwelling Units as Input Variable
ITE Equations - LUC 210 - Single-Family Housing
PM Peak Hour Trips: 341
Inbound: 215
Outbound: 126

Area 8
Zoning - SFM
Acreage - 37.68~
Density - Max 9 per acre
37.68 x 9 = 339 Single Family Homes

ITE Trip Generation 11th Ed.
339 Single-Family Homes
Dwelling Units as Input Variable
ITE Equations - LUC 210 - Single-Family Housing
PM Peak Hour Trips: 313
Inbound: 197
Outbound: 116



Area 9
Zoning - MFM
Acreage - 56.17~
Density - Max 15 per acre
56.17 x 15 = 843 Multi-Family Homes

ITE Trip Generation 11th Ed.
843 Single-Family Homes
Dwelling Units as Input Variable
ITE Equations - LUC 220 - Multifamily Housing (Low-Rise)
PM Peak Hour Trips: 383
Inbound: 241
Outbound: 142

Area 10
Zoning - MHP
Acreage - 12.21~
Density - Max 9 per acre
(12.21 x 9 = 110 Multi-Family Homes) X .80* = 88 Mobile Homes

* = 20% reduction due existing mobile home park

ITE Trip Generation 11th Ed.
88 Mobile Homes
Dwelling Units as Input Variable
ITE Equations - LUC 240 - Mobile Home Park
PM Peak Hour Trips: 51
Inbound: 31
Outbound: 20

Area 11
Zoning - MU
Acreage - 21.32~
Resideintial Density - Max 14 multifamily units per acre

Assumptions: 80% Residential (~17-acres)
20% Commercial (4.32-Acres)

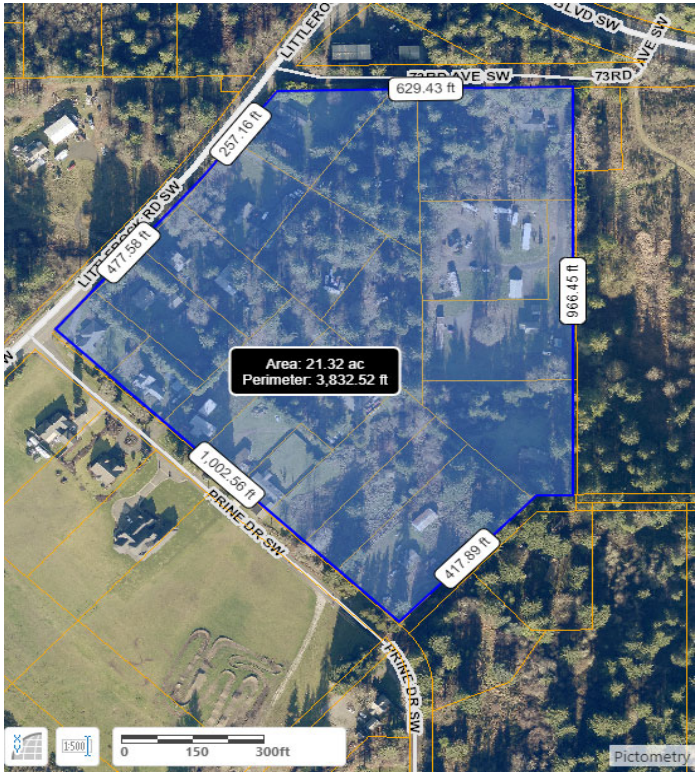
17-acres X 14 units per acres = 238 Units
LUC - 220 Multifamily Housing (Low-Rise)
Input Variable: Dwelling Units
ITE Equations
PM Peak Hour Trips: 123
Inbound: 77
Outbound: 46

Total Site Primary Trips
Inbound: 131
Outbound: 99

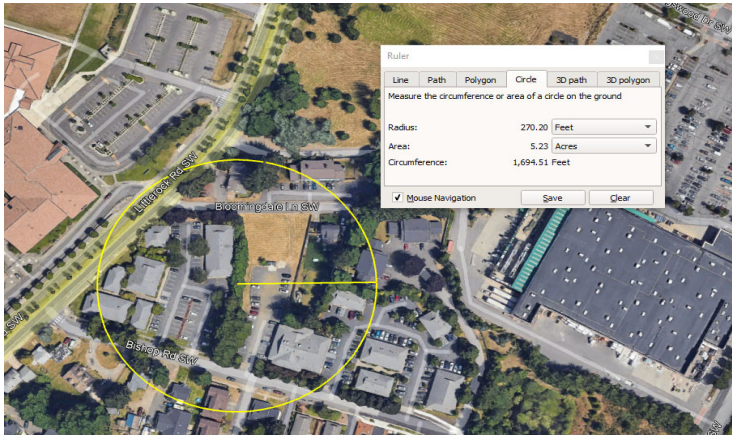
According to an existing mixed used development within the city,
The assumption is to add ~32,000 square feet of shopping center.
LUC - 822 - Strip Retail Plaza (>40K)
Input Variable: 1,000 square feet
ITE Equations
PM Peak Hour Trips: 178
Inbound: 89
Outbound: 89

40% Pass-By Trips (LUC - 821) no Pass-By data for LUC-822 was available
Primary PM Trips: 107
Inbound: 54
Outbound: 53

Site Acreage



City Comparision Figure



Total Building area within circle: 31,695 square feet

Area 12
Zoning - GC
Acreage - 120.5~
Residential Density - 14 units per acre

Assumptions: 60% Residential (~72.3-acres)
40% Commercial (~48.2-Acres)

72.3-acres X 14 units per acres = 1,012 Units
LUC - 220 Multifamily Housing (Low-Rise)
Input Variable: Dwelling Units
ITE Equations
PM Peak Hour Trips: 456
Inbound: 287
Outbound: 169

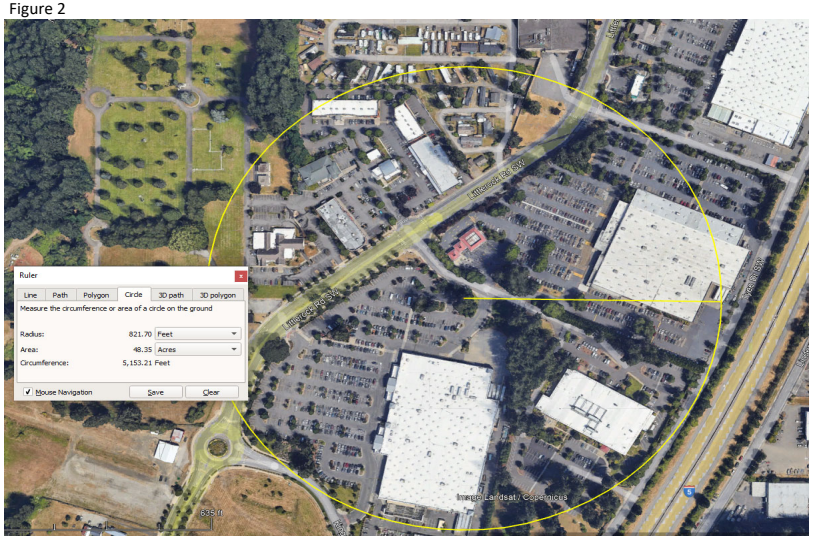
Total Site Primary Trips
Inbound: 914
Outbound: 849

According to an existing General Commercial development within the city,
The assumption is to add ~430,000 square feet of shopping center.
LUC - 820 - Shopping Center (>150K)
Input Variable: 1,000 square feet
ITE Equations
PM Peak Hour Trips: 1613
Inbound: 774
Outbound: 839

19% Pass-By Trips
PM Peak Hour Pass-By Trips: 1,307
Inbound:627
Outbound: 680

Figure 1

Figure 2



Total Building area within circle: 430,032 square feet

Area 13
Zoning - MFM * = 50% reduction due to existing PSE facility
Acreage - 9.22~
Density - Max 15 per acre
(9.22 x 15 = 138 Multi-Family Units) x .50% = 69 units

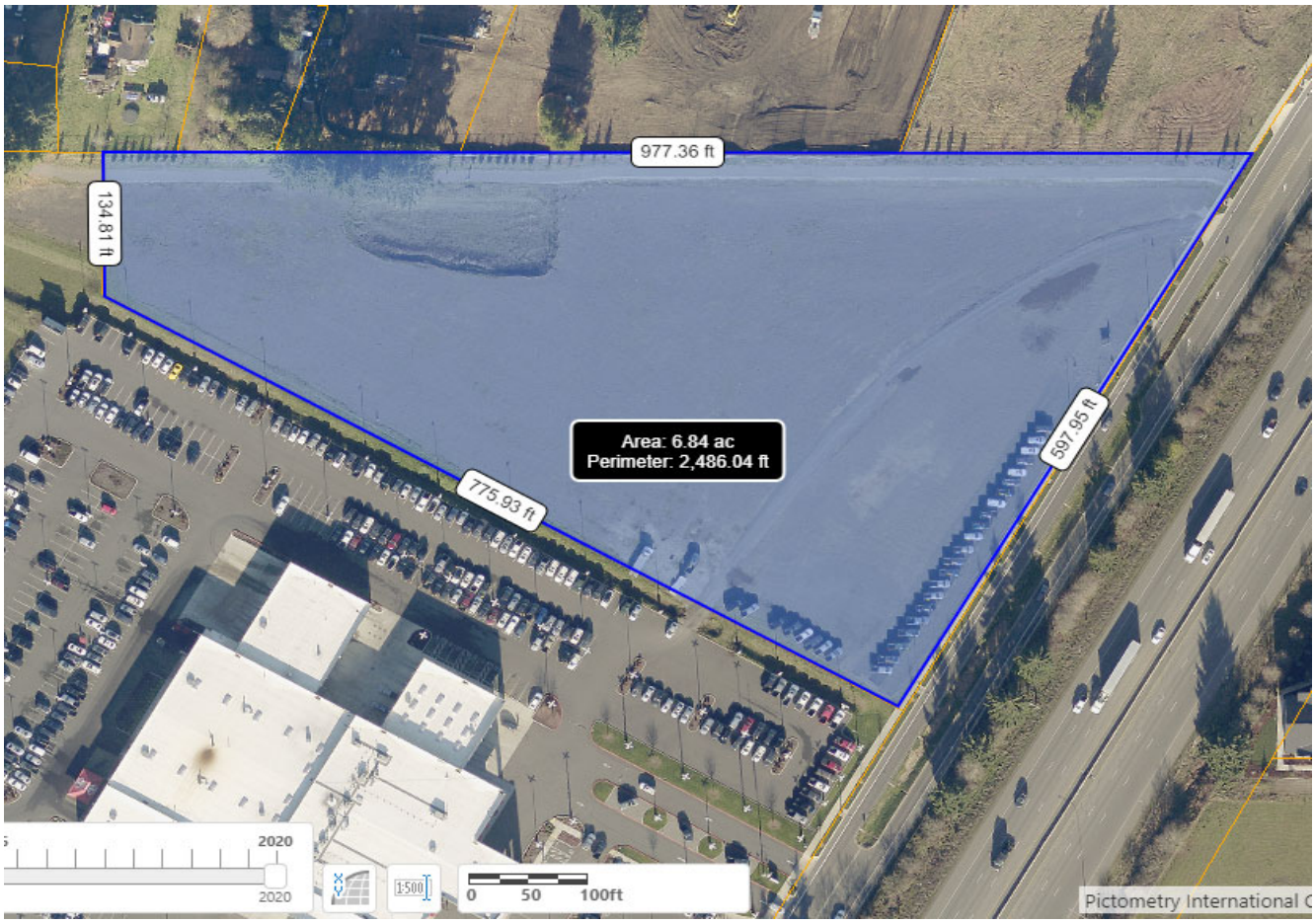
ITE Trip Generation 11th Ed.
69 multifamily units
Dwelling Units as Input Variable
ITE Equations - LUC 220 - Multifamily Housing (Low-Rise)
PM Peak Hour Trips: 50
Inbound: 31
Outbound: 19

Area 14
Acreage - 6.57~
Bishop Rd Apartments & Kingswood Apartments

According to latest verisions of the TIA's
PM Peak Hour Trips: 142
Inbound : 87
Outbound: 55

Area 15
General Commercial Space (GC)
Acreage - 6.84~
Assumption = 70 ksf Office

ITE Trip Generation 11th Ed.
70 ksf office
Square Footage as Input Variable
ITE Equations - LUC 710 - General Office Building
PM Peak Hour Trips: 124
Inbound: 21
Outbound: 103



Area 16
General Commercial Space (GC)
Acreage - 5.34~
Assumption = 10 ksf of Strip Retail

ITE Trip Generation 11th Ed.
10 ksf of strip retail
Square Footage as Input Variable
ITE Equations - LUC 822 - Strip Retail
PM Peak Hour Trips: 78
Inbound: 39
Outbound: 39

40% Pass-By Trips (LUC - 821) no Pass-By data for LUC-822 was available
Primary PM Trips: 47
Inbound: 24
Outbound: 23

Area 17
The Belmont Flats
Estimated Trip Generation
Total PM Peak Hour Trips: 346
Inbound: 197
Outbound: 149

Area 18
Zoning - ARI
Acreage - 286.58
City directed 480 ksf of warehousing & 25-acres of Manufactuing on Area 18

480 ksf Warehousing
LUC - 150 Warehousing
Input Variable: Square Footage
ITE Equations
PM Peak Hour Trips: 84
Inbound: 23
Outbound: 61

25-acres of Manufacturing
LUC - 140- Manufacuting
Input Variable: 1-acre
ITE Equations
PM Peak Hour Trips: 112
Inbound: 44
Outbound: 68

TOTAL SITE TRIPS
Inbound: 67
Outbound: 129

Table 1
Trip Generation Summary

Time Period	New Trips Generated (PASSENGER VEHICLES ONLY) In	Out	Total	New Trips Generated (TRUCKS ONLY) In	Out	Total	Total New Trips Generated (ALL VEHICLES) In	Out	Total
Daily	1,897	1,897	3,794	855	855	1,710	2,752	2,752	5,504
AM Peak Hour	918	162	1,080	54	66	120	972	228	1,200
PM Peak Hour	206	874	1,080	46	74	120	252	948	1,200

Per City direction, Area 18 has been updated to reflect the full-build scenario at identified in the table above from TENW's *Panattoni Port of Olympia* Traffic Scoping Memo (August 27, 2021)

Area 19
Zoning - TC
Acreage - 23.03~

Assumptions: 50% Multifamily (11.55-acres)
50% Commercial (11.5-acres)

11.55-acres X 30 units per acres = ~347 Units
LUC - 220 Multifamily Housing (Low-Rise)
Input Variable: Dwelling Units
ITE Equations
PM Peak Hour Trips: 170
Inbound: 107
Outbound: 63

TOTAL SITE TRIPS
Inbound: 174
Outbound: 178

According to existing development within the city,
The assumption is to add ~35,000 square feet of strip retail and ~35,000 square feet of office

LUC - 822 - Strip Retail (<40K)
Input Variable: 1,000 square feet
ITE Equations
PM Peak Hour Trips: 189
Inbound: 94
Outbound: 95

LUC - 710 - General Office Building
Input Variable: 1,000 square feet
ITE Equations
PM Peak Hour Trips: 69
Inbound: 11
Outbound: 58

40% Pass-By Trips (LUC - 821) no Pass-By data for LUC-822 was available
Primary PM Trips: 113
Inbound: 56
Outbound: 57

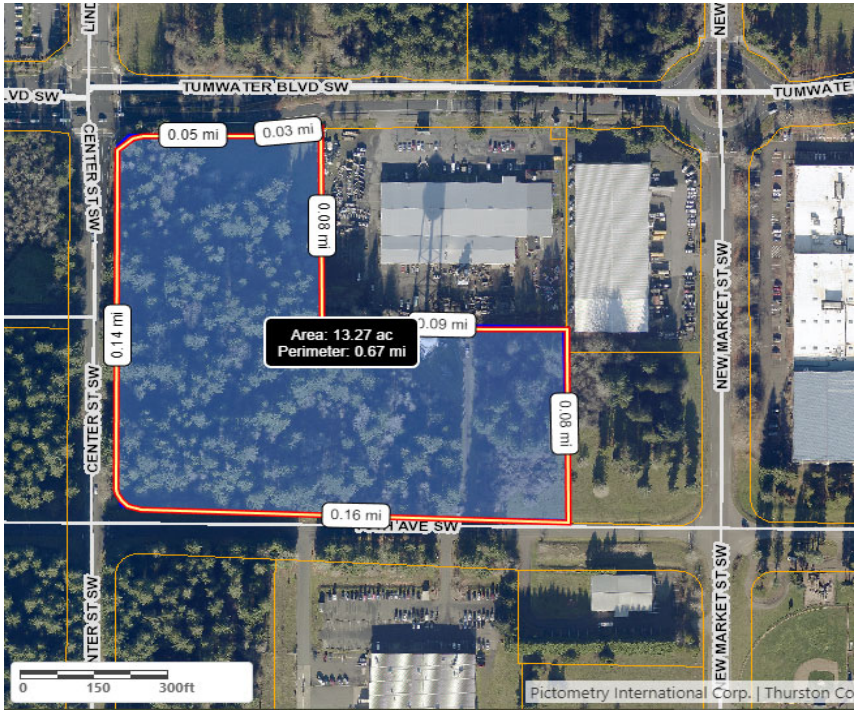
Acreage of Site

Similar development

Total building Area: 68,928 Square Feet

Area 20
Zoning - ARI
Acreage - 13.27 acres of Manufacturing
Assumed 3-60,000 square foot buildings = 180,000 total square feet

ITE Trip Generation 11th Ed.
180 ksf of Manufacturing
Square Footage as Input Variable
ITE Equations - LUC - 140 - Manufacturing
PM Peak Hour Trips: 139
Inbound: 43
Outbound: 96

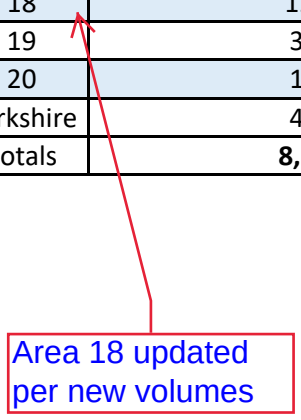


Existing manufactuing/Industrial buildings in zoning ARI

Existing Buildings = ~60,000 square feet each

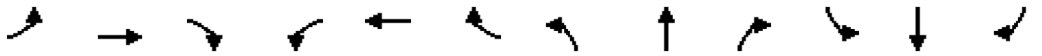
Project Site - Yorkshire
Estimated Trip Generation
Total PM Peak Hour Trips: 473
Inbound: 282
Outbound: 191

Primary Trip Generation Summary			
Area #	**Total PM Peak Hour Trips**	**Inbound**	**Outbound**
1	1,346	848	498
2	214	135	79
3	115	72	43
4	170	107	63
5	93	58	35
6	200	126	74
7	341	215	126
8	313	197	116
9	383	241	142
10	51	31	20
11	230	131	99
12	1,763	914	849
13	50	31	19
14	142	87	55
15	124	21	103
16	47	24	23
17	346	197	149
18	1200	252	9848
19	352	174	178
20	139	43	96
Yorkshire	473	282	191
Totals	**8,576**	**4,421**	**4,155**



YORKSHIRE
TRAFFIC IMPACT ANALYSIS

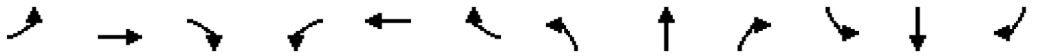
APPENDIX: AM PEAK HOUR LEVEL OF SERVICE



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	224	65	123	196	23	57	58	81	12	47	31
Future Volume (veh/h)	52	224	65	123	196	23	57	58	81	12	47	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1744	1758	1758	1758	1660	1660	1660
Adj Flow Rate, veh/h	67	287	83	158	251	29	73	74	104	15	60	40
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	10	10	10
Cap, veh/h	474	386	112	422	520	60	350	114	161	266	124	83
Arrive On Green	0.05	0.29	0.29	0.10	0.34	0.34	0.05	0.17	0.17	0.02	0.13	0.13
Sat Flow, veh/h	1688	1321	382	1661	1535	177	1674	661	929	1581	929	619
Grp Volume(v), veh/h	67	0	370	158	0	280	73	0	178	15	0	100
Grp Sat Flow(s),veh/h/ln	1688	0	1703	1661	0	1712	1674	0	1591	1581	0	1548
Q Serve(g_s), s	1.2	0.0	8.4	2.7	0.0	5.5	1.6	0.0	4.4	0.3	0.0	2.6
Cycle Q Clear(g_c), s	1.2	0.0	8.4	2.7	0.0	5.5	1.6	0.0	4.4	0.3	0.0	2.6
Prop In Lane	1.00		0.22	1.00		0.10	1.00		0.58	1.00		0.40
Lane Grp Cap(c), veh/h	474	0	498	422	0	580	350	0	275	266	0	207
V/C Ratio(X)	0.14	0.00	0.74	0.37	0.00	0.48	0.21	0.00	0.65	0.06	0.00	0.48
Avail Cap(c_a), veh/h	604	0	1018	668	0	1223	522	0	1174	409	0	1063
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.7	0.0	13.6	9.8	0.0	11.2	14.8	0.0	16.4	15.7	0.0	17.1
Incr Delay (d2), s/veh	0.1	0.0	2.2	0.6	0.0	0.6	0.3	0.0	2.6	0.1	0.0	1.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	3.0	0.9	0.0	1.8	0.5	0.0	1.6	0.1	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	9.9	0.0	15.9	10.3	0.0	11.8	15.1	0.0	19.0	15.8	0.0	18.9
LnGrp LOS	A		B	B		B	B		B	B		B
Approach Vol, veh/h		437			438			251			115	
Approach Delay, s/veh		14.9			11.2			17.9			18.5	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.2	11.9	8.7	17.0	6.8	10.2	6.7	19.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.5	31.5	10.5	25.5	6.7	29.3	5.5	30.5
Max Q Clear Time (g_c+I1), s	2.3	6.4	4.7	10.4	3.6	4.6	3.2	7.5
Green Ext Time (p_c), s	0.0	1.0	0.2	2.1	0.0	0.5	0.0	1.7

Intersection Summary	
HCM 7th Control Delay, s/veh	14.6
HCM 7th LOS	B



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	403	53	177	129	0	0	0	0	1648	4	118
Future Volume (veh/h)	0	403	53	177	129	0	0	0	0	1648	4	118
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1786	1786	1744	1744	0				1744	1744	1744
Adj Flow Rate, veh/h	0	469	62	206	150	0				1916	5	137
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86				0.86	0.86	0.86
Percent Heavy Veh, %	0	1	1	4	4	0				4	4	4
Cap, veh/h	0	628	83	247	714	0				807	25	696
Arrive On Green	0.00	0.21	0.21	0.15	0.41	0.00				0.49	0.49	0.49
Sat Flow, veh/h	0	3104	397	1661	1744	0				1661	52	1433
Grp Volume(v), veh/h	0	263	268	206	150	0				1916	0	142
Grp Sat Flow(s),veh/h/ln	0	1697	1715	1661	1744	0				1661	0	1486
Q Serve(g_s), s	0.0	12.5	12.6	10.3	4.8	0.0				41.7	0.0	4.7
Cycle Q Clear(g_c), s	0.0	12.5	12.6	10.3	4.8	0.0				41.7	0.0	4.7
Prop In Lane	0.00		0.23	1.00		0.00				1.00		0.96
Lane Grp Cap(c), veh/h	0	353	357	247	714	0				807	0	722
V/C Ratio(X)	0.00	0.74	0.75	0.83	0.21	0.00				2.37	0.00	0.20
Avail Cap(c_a), veh/h	0	868	877	598	1611	0				807	0	722
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	31.8	31.9	35.5	16.4	0.0				22.1	0.0	12.5
Incr Delay (d2), s/veh	0.0	3.1	3.2	7.2	0.1	0.0				622.5	0.0	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.2	5.3	4.5	1.8	0.0				154.2	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	35.0	35.1	42.7	16.5	0.0				644.6	0.0	12.7
LnGrp LOS		C	D	D	B					F		B
Approach Vol, veh/h		531			356						2058	
Approach Delay, s/veh		35.0			31.7						601.0	
Approach LOS		D			C						F	

Timer - Assigned Phs		3	4		6		8					
Phs Duration (G+Y+Rc), s		17.3	22.4		46.2		39.6					
Change Period (Y+Rc), s		4.5	4.5		4.5		4.5					
Max Green Setting (Gmax), s		30.9	43.9		41.7		79.3					
Max Q Clear Time (g_c+I1), s		12.3	14.6		43.7		6.8					
Green Ext Time (p_c), s		0.5	3.3		0.0		0.9					

Intersection Summary	
HCM 7th Control Delay, s/veh	430.1
HCM 7th LOS	F

Intersection	
Int Delay, s/veh	255.6

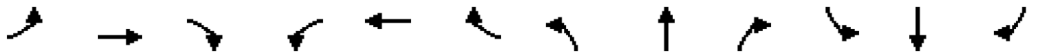
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	495	1545	0	0	225	580	66	1	479	0	0	0
Future Vol, veh/h	495	1545	0	0	225	580	66	1	479	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	300	-	-	-	-	0	-	-	600	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	87	87	87	87	87	87	87	87	87
Heavy Vehicles, %	3	3	3	9	9	9	3	3	3	2	2	2
Mvmt Flow	569	1776	0	0	259	667	76	1	551	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	259	0	-	-	-	0	3172	3172	888
Stage 1	-	-	-	-	-	-	2914	2914	-
Stage 2	-	-	-	-	-	-	259	259	-
Critical Hdwy	4.145	-	-	-	-	-	6.645	6.545	6.945
Critical Hdwy Stg 1	-	-	-	-	-	-	5.845	5.545	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.445	5.545	-
Follow-up Hdwy	2.2285	-	-	-	-	-	3.5285	4.0285	3.3285
Pot Cap-1 Maneuver	1298	-	0	0	-	0	~ 10	10	~ 286
Stage 1	-	-	0	0	-	0	~ 27	34	-
Stage 2	-	-	0	0	-	0	781	691	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	1298	-	-	-	-	-	~ 5	0	~ 286
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 5	0	-
Stage 1	-	-	-	-	-	-	~ 15	0	-
Stage 2	-	-	-	-	-	-	781	0	-

Approach	EB	WB	NB
HCM Control Delay, s/v	2.41	0	$ 1307.14
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT
Capacity (veh/h)	5	286	1298	-	-
HCM Lane V/C Ratio	14.421	1.926	0.438	-	-
HCM Control Delay (s/veh)	$ 7372.1	$ 458.8	9.9	-	-
HCM Lane LOS	F	F	A	-	-
HCM 95th %tile Q(veh)	11.5	38.4	2.3	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	131	344	126	181	297	32	100	98	114	17	105	52
Future Volume (veh/h)	131	344	126	181	297	32	100	98	114	17	105	52
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1744	1758	1758	1758	1660	1660	1660
Adj Flow Rate, veh/h	142	374	137	197	323	35	109	107	124	18	114	57
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
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	10	10	10
Cap, veh/h	474	446	163	367	599	65	301	155	179	227	160	80
Arrive On Green	0.08	0.36	0.36	0.10	0.39	0.39	0.07	0.21	0.21	0.02	0.15	0.15
Sat Flow, veh/h	1688	1237	453	1661	1546	168	1674	743	860	1581	1044	522
Grp Volume(v), veh/h	142	0	511	197	0	358	109	0	231	18	0	171
Grp Sat Flow(s),veh/h/ln	1688	0	1690	1661	0	1714	1674	0	1603	1581	0	1566
Q Serve(g_s), s	3.0	0.0	16.1	4.2	0.0	9.4	3.1	0.0	7.8	0.6	0.0	6.0
Cycle Q Clear(g_c), s	3.0	0.0	16.1	4.2	0.0	9.4	3.1	0.0	7.8	0.6	0.0	6.0
Prop In Lane	1.00		0.27	1.00		0.10	1.00		0.54	1.00		0.33
Lane Grp Cap(c), veh/h	474	0	609	367	0	663	301	0	334	227	0	240
V/C Ratio(X)	0.30	0.00	0.84	0.54	0.00	0.54	0.36	0.00	0.69	0.08	0.00	0.71
Avail Cap(c_a), veh/h	536	0	888	467	0	986	304	0	765	309	0	739
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.6	0.0	17.1	12.4	0.0	13.8	18.5	0.0	21.3	20.4	0.0	23.4
Incr Delay (d2), s/veh	0.4	0.0	4.8	1.2	0.0	0.7	0.7	0.0	2.6	0.1	0.0	3.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	6.4	1.5	0.0	3.4	1.2	0.0	2.9	0.2	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	11.0	0.0	21.9	13.6	0.0	14.5	19.3	0.0	23.9	20.6	0.0	27.4
LnGrp LOS	B		C	B		B	B		C	C		C
Approach Vol, veh/h		653			555			340			189	
Approach Delay, s/veh		19.5			14.2			22.4			26.7	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.5	16.6	10.6	25.5	8.7	13.4	9.1	27.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	27.8	9.6	30.6	4.3	27.5	6.7	33.5
Max Q Clear Time (g_c+I1), s	2.6	9.8	6.2	18.1	5.1	8.0	5.0	11.4
Green Ext Time (p_c), s	0.0	1.3	0.2	2.9	0.0	0.9	0.1	2.3

Intersection Summary	
HCM 7th Control Delay, s/veh	19.2
HCM 7th LOS	B

MOVEMENT SUMMARY

Site: 101 [Forecast 2031 AM Peak Hour Background Volumes (Site Folder: 5)]

Tumwater Blvd SW & Southbound I-5 Ramp
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: Tumwater Blvd SW														
1	L2	270	4.0	270	4.0	0.190	9.7	LOS A	0.0	0.0	0.00	0.67	0.00	34.8
6	T1	365	4.0	365	4.0	0.223	3.6	LOS A	0.0	0.0	0.00	0.37	0.00	38.3
Approach		635	4.0	635	4.0	0.223	6.2	LOS A	0.0	0.0	0.00	0.50	0.00	36.7
North: SB I-5 Ramp														
7	L2	2392	4.0	2392	4.0	1.312	156.7	LOS F	119.4	3079.5	1.00	4.53	10.30	10.8
4	T1	6	4.0	6	4.0	1.312	150.1	LOS F	119.4	3079.5	1.00	4.68	10.51	10.8
14	R2	244	4.0	244	4.0	1.312	150.5	LOS F	119.4	3079.5	1.00	4.68	10.51	10.7
Approach		2642	4.0	2642	4.0	1.312	156.2	LOS F	119.4	3079.5	1.00	4.54	10.32	10.8
West: Tumwater Blvd SW														
2	T1	683	1.0	683	1.0	1.237	139.3	LOS F	39.5	996.1	1.00	2.33	5.29	11.5
12	R2	104	1.0	104	1.0	1.237	137.5	LOS F	39.5	996.1	1.00	2.49	5.64	11.5
Approach		787	1.0	787	1.0	1.237	139.0	LOS F	39.5	996.1	1.00	2.35	5.34	11.5
All Vehicles		4064	3.4	4064	3.4	1.312	129.4	LOS F	119.4	3079.5	0.84	3.49	7.74	12.3

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.

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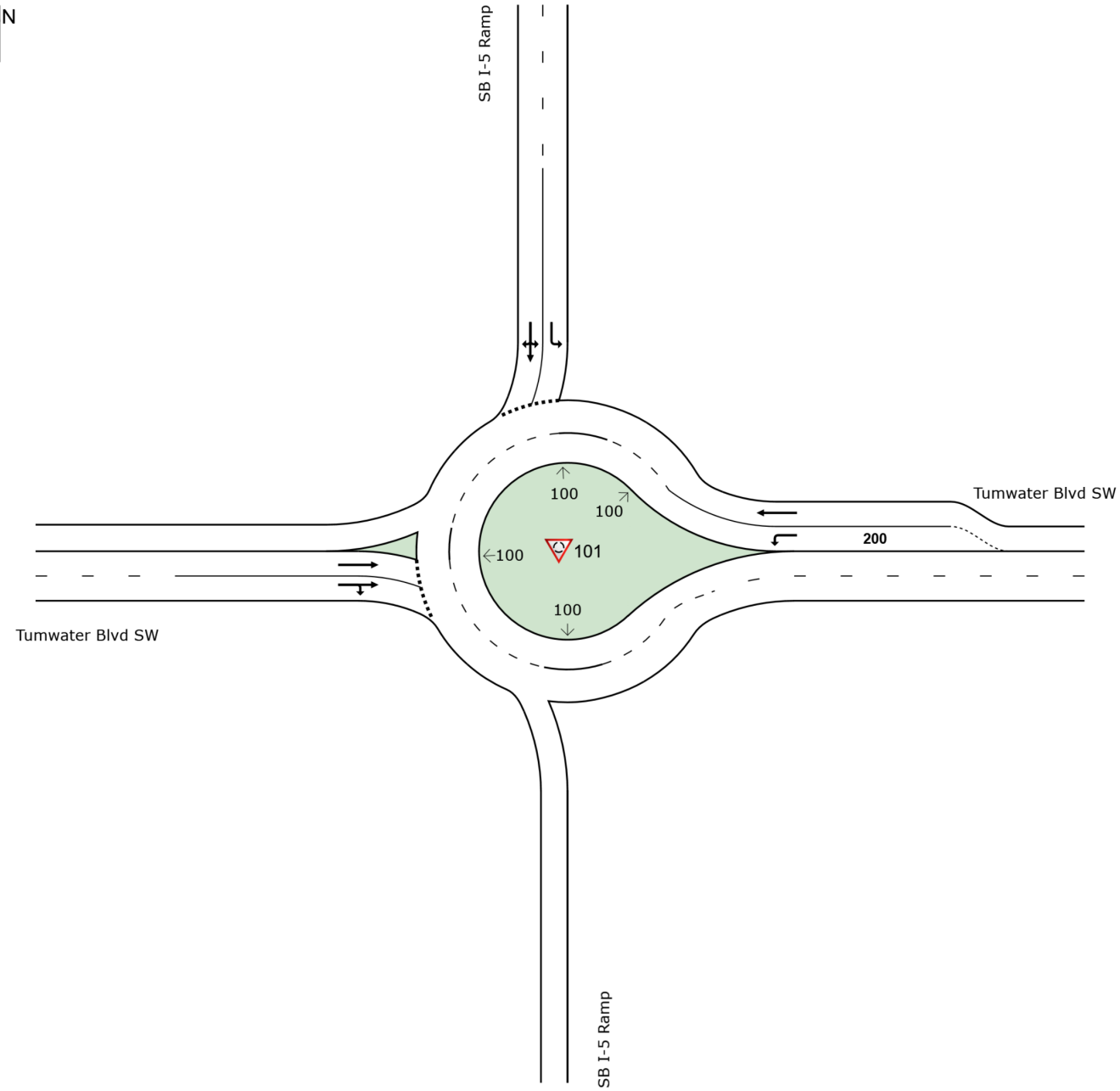
SITE LAYOUT

Site: 101 [Forecast 2031 AM Peak Hour Background Volumes (Site Folder: 5)]

Tumwater Blvd SW & Southbound I-5 Ramp
Site Category: (None)
Roundabout

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



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MOVEMENT SUMMARY

Site: [Forecast 2031 AM Peak Hour Background Volumes (Site Folder: 6)]

Tumwater Blvd SW & Northbound I-5 Ramp
Site Category: -
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: Northbound I-5 Ramp														
3	L2	137	3.0	137	3.0	0.893	105.7	LOS F	5.4	139.2	0.99	1.42	2.69	14.3
8	T1	1	3.0	1	3.0	0.893	120.4	LOS F	5.4	139.2	0.99	1.42	2.69	14.3
18	R2	695	3.0	695	3.0	2.037	498.5	LOS F	125.1	3203.6	1.00	4.45	12.37	3.9
Approach		833	3.0	833	3.0	2.037	433.4	LOS F	125.1	3203.6	1.00	3.95	10.77	4.5
East: Tumwater Blvd SW														
6	T1	473	9.0	473	9.0	0.587	15.2	LOS B	6.4	170.4	0.95	1.09	1.32	32.0
16	R2	865	9.0	865	9.0	0.563	3.9	LOS A	0.0	0.0	0.00	0.45	0.00	36.7
Approach		1338	9.0	1338	9.0	0.587	7.9	LOS A	6.4	170.4	0.34	0.67	0.47	34.8
West: Tumwater Blvd SW														
5	L2	801	3.0	801	3.0	0.976	30.5	LOS E	0.0	0.0	0.00	0.58	0.00	36.3
2	T1	2243	3.0	2243	3.0	0.976	3.6	LOS E	0.0	0.0	0.00	0.43	0.00	37.7
Approach		3044	3.0	3044	3.0	0.976	10.7	LOS B	0.0	0.0	0.00	0.47	0.00	37.3
All Vehicles		5215	4.5	5215	4.5	2.037	77.5	LOS E	125.1	3203.6	0.25	1.08	1.84	17.2

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.

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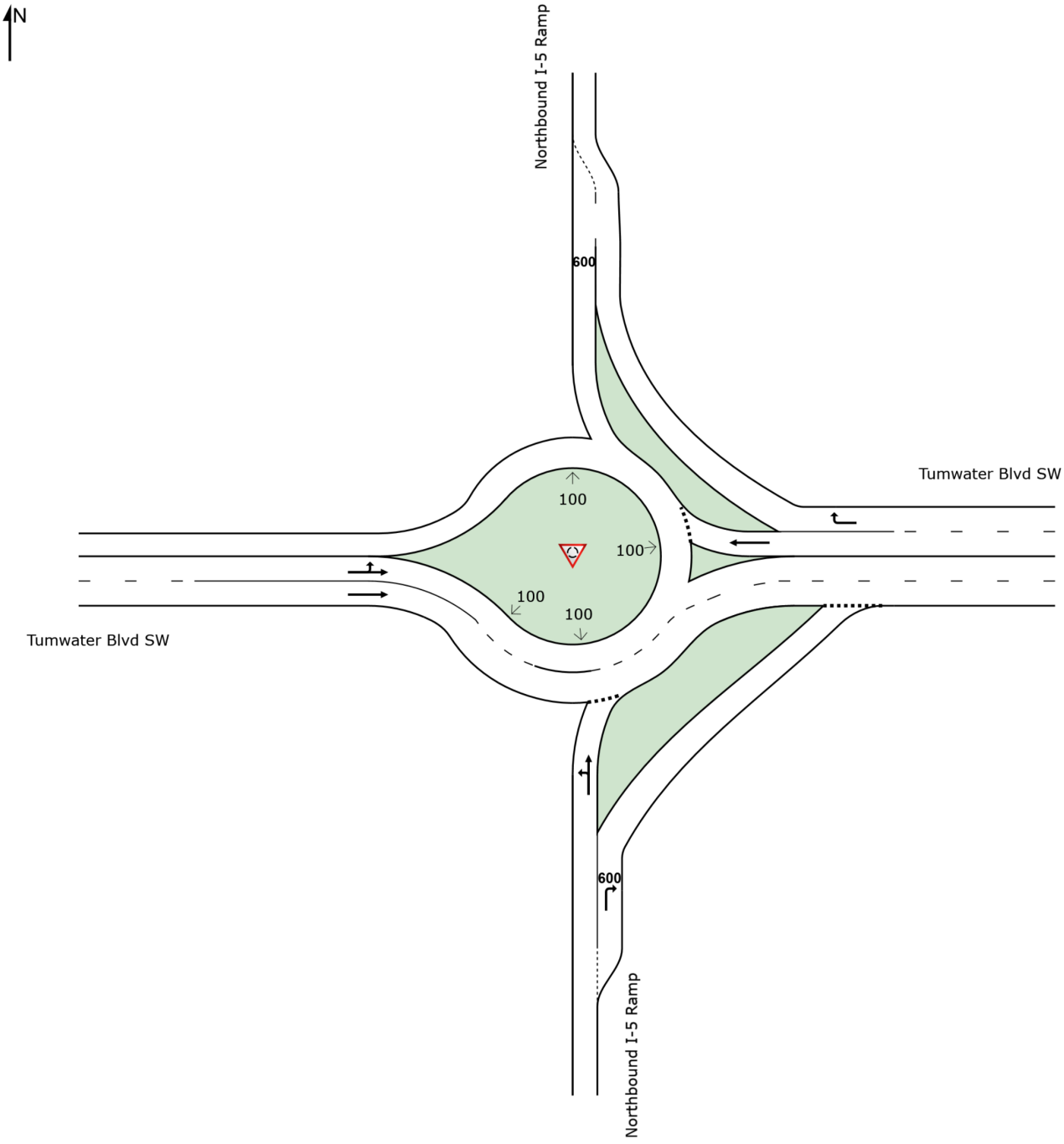
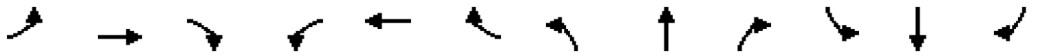
SITE LAYOUT

Site: [Forecast 2031 AM Peak Hour Background Volumes (Site Folder: 6)]

Tumwater Blvd SW & Northbound I-5 Ramp
Site Category: -
Roundabout

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





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	138	417	146	181	322	32	107	98	114	17	105	54
Future Volume (veh/h)	138	417	146	181	322	32	107	98	114	17	105	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1744	1744	1744	1758	1758	1758	1660	1660	1660
Adj Flow Rate, veh/h	150	453	159	197	350	35	116	107	124	18	114	59
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
Percent Heavy Veh, %	2	2	2	4	4	4	3	3	3	10	10	10
Cap, veh/h	492	515	181	329	670	67	268	145	169	201	155	80
Arrive On Green	0.08	0.41	0.41	0.10	0.43	0.43	0.06	0.20	0.20	0.02	0.15	0.15
Sat Flow, veh/h	1688	1253	440	1661	1560	156	1674	743	860	1581	1030	533
Grp Volume(v), veh/h	150	0	612	197	0	385	116	0	231	18	0	173
Grp Sat Flow(s),veh/h/ln	1688	0	1693	1661	0	1716	1674	0	1603	1581	0	1564
Q Serve(g_s), s	3.2	0.0	21.4	4.3	0.0	10.6	3.7	0.0	8.7	0.6	0.0	6.8
Cycle Q Clear(g_c), s	3.2	0.0	21.4	4.3	0.0	10.6	3.7	0.0	8.7	0.6	0.0	6.8
Prop In Lane	1.00		0.26	1.00		0.09	1.00		0.54	1.00		0.34
Lane Grp Cap(c), veh/h	492	0	695	329	0	737	268	0	314	201	0	235
V/C Ratio(X)	0.30	0.00	0.88	0.60	0.00	0.52	0.43	0.00	0.74	0.09	0.00	0.73
Avail Cap(c_a), veh/h	560	0	857	365	0	869	268	0	700	272	0	682
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.1	0.0	17.4	13.5	0.0	13.4	21.5	0.0	24.2	22.7	0.0	26.0
Incr Delay (d2), s/veh	0.3	0.0	9.0	2.2	0.0	0.6	1.1	0.0	3.4	0.2	0.0	4.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	9.3	1.6	0.0	3.8	1.5	0.0	3.4	0.2	0.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	10.4	0.0	26.4	15.8	0.0	14.0	22.6	0.0	27.6	22.9	0.0	30.4
LnGrp LOS	B		C	B		B	C		C	C		C
Approach Vol, veh/h		762			582			347			191	
Approach Delay, s/veh		23.3			14.6			25.9			29.7	
Approach LOS		C			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.6	17.1	10.6	30.9	8.5	14.2	9.4	32.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.0	28.0	7.5	32.5	4.0	28.0	7.5	32.5
Max Q Clear Time (g_c+I1), s	2.6	10.7	6.3	23.4	5.7	8.8	5.2	12.6
Green Ext Time (p_c), s	0.0	1.2	0.1	3.0	0.0	0.9	0.1	2.4

Intersection Summary	
HCM 7th Control Delay, s/veh	21.7
HCM 7th LOS	C

MOVEMENT SUMMARY

Site: 101 [Forecast 2031 AM Peak Hour Volumes With Project (Site Folder: 5)]

Tumwater Blvd SW & Southbound I-5 Ramp
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: Tumwater Blvd SW														
1	L2	270	4.0	270	4.0	0.191	9.7	LOS A	0.0	0.0	0.00	0.67	0.00	34.8
6	T1	377	4.0	377	4.0	0.230	3.6	LOS A	0.0	0.0	0.00	0.37	0.00	38.3
Approach		647	4.0	647	4.0	0.230	6.2	LOS A	0.0	0.0	0.00	0.49	0.00	36.7
North: SB I-5 Ramp														
7	L2	2392	4.0	2392	4.0	1.339	168.9	LOS F	128.0	3303.1	1.00	4.75	10.92	10.2
4	T1	6	4.0	6	4.0	1.339	162.2	LOS F	128.0	3303.1	1.00	4.91	11.15	10.3
14	R2	286	4.0	286	4.0	1.339	162.7	LOS F	128.0	3303.1	1.00	4.91	11.15	10.2
Approach		2684	4.0	2684	4.0	1.339	168.2	LOS F	128.0	3303.1	1.00	4.76	10.94	10.2
West: Tumwater Blvd SW														
2	T1	801	1.0	801	1.0	1.430	216.9	LOS F	64.5	1625.5	1.00	2.95	7.32	8.2
12	R2	146	1.0	146	1.0	1.430	215.7	LOS F	64.5	1625.5	1.00	3.20	7.87	8.2
Approach		947	1.0	947	1.0	1.430	216.7	LOS F	64.5	1625.5	1.00	2.99	7.41	8.2
All Vehicles		4278	3.3	4278	3.3	1.430	154.5	LOS F	128.0	3303.1	0.85	3.73	8.50	10.8

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.

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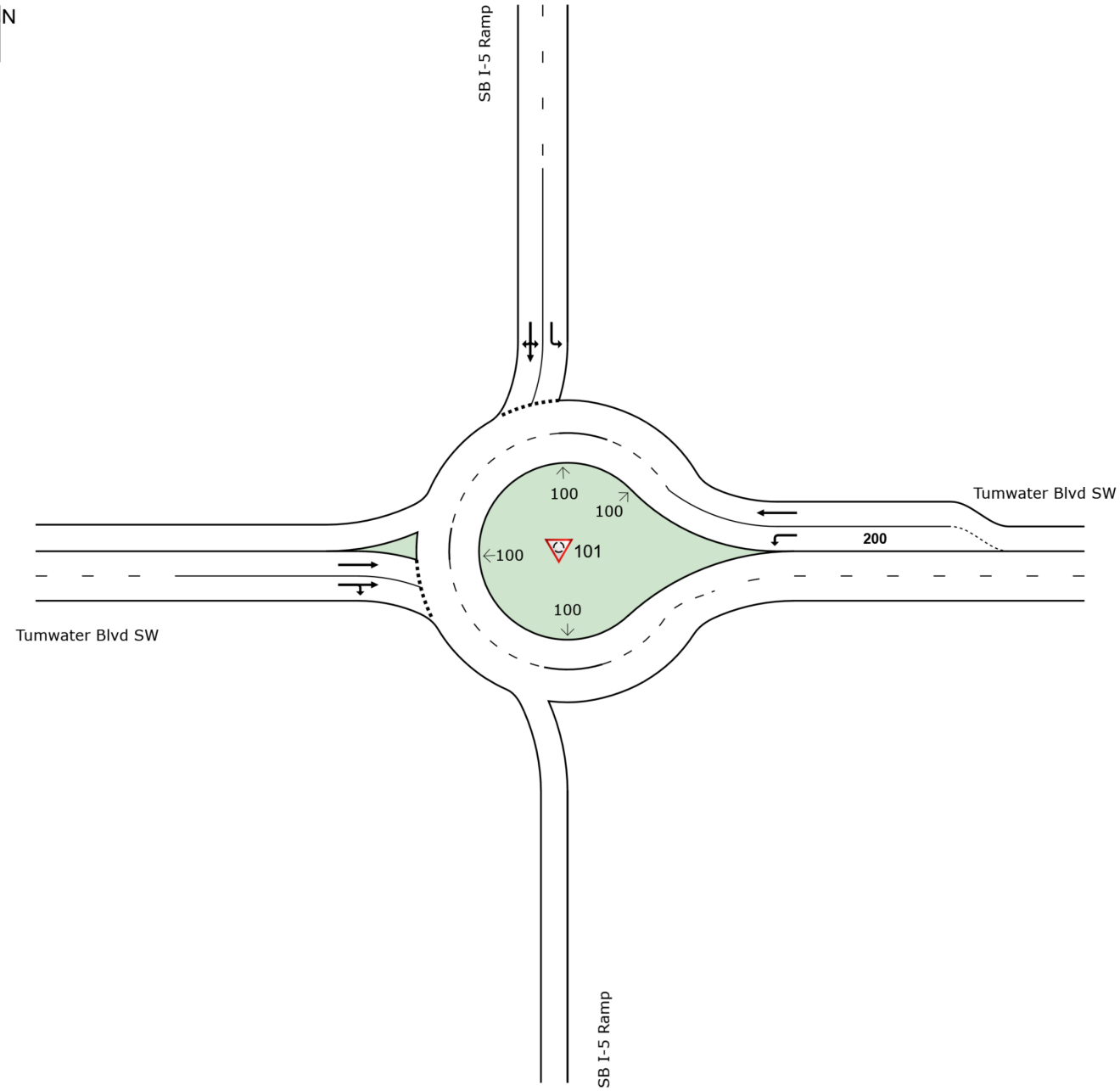
SITE LAYOUT

Site: 101 [Forecast 2031 AM Peak Hour Volumes With Project (Site Folder: 5)]

Tumwater Blvd SW & Southbound I-5 Ramp
Site Category: (None)
Roundabout

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



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MOVEMENT SUMMARY

Site: [Forecast 2031 AM Peak Hour Volumes With Project (Site Folder: 6)]

Tumwater Blvd SW & Northbound I-5 Ramp
Site Category: -
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: Northbound I-5 Ramp														
3	L2	146	3.0	146	3.0	0.999	115.6	LOS F	6.6	169.7	1.00	1.52	3.26	13.5
8	T1	1	3.0	1	3.0	0.999	186.5	LOS F	6.6	169.7	1.00	1.52	3.26	13.5
18	R2	695	3.0	695	3.0	4.607	1644.0	LOS F	195.6	5007.5	1.00	3.35	8.93	1.3
Approach		842	3.0	842	3.0	4.607	1377.3	LOS F	195.6	5007.5	1.00	3.03	7.94	1.5
East: Tumwater Blvd SW														
6	T1	476	9.0	476	9.0	0.962	58.1	LOS E	22.4	601.0	1.00	1.68	2.71	19.9
16	R2	865	9.0	865	9.0	0.563	3.9	LOS A	0.0	0.0	0.00	0.45	0.00	36.7
Approach		1341	9.0	1341	9.0	0.962	23.1	LOS C	22.4	601.0	0.35	0.89	0.96	28.1
West: Tumwater Blvd SW														
5	L2	911	3.0	911	3.0	1.014	74.6	LOS F	6.4	163.6	1.00	0.04	1.00	32.8
2	T1	2251	3.0	2251	3.0	1.014	9.9	LOS F	7.2	184.9	1.00	0.04	1.00	34.1
Approach		3162	3.0	3162	3.0	1.014	28.6	LOS C	7.2	184.9	1.00	0.04	1.00	33.7
All Vehicles		5345	4.5	5345	4.5	4.607	239.7	LOS F	195.6	5007.5	0.84	0.72	2.08	7.9

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: [Forecast 2031 AM Peak Hour Volumes With Project (Site Folder: 6)]

Tumwater Blvd SW & Northbound I-5 Ramp
Site Category: -
Roundabout

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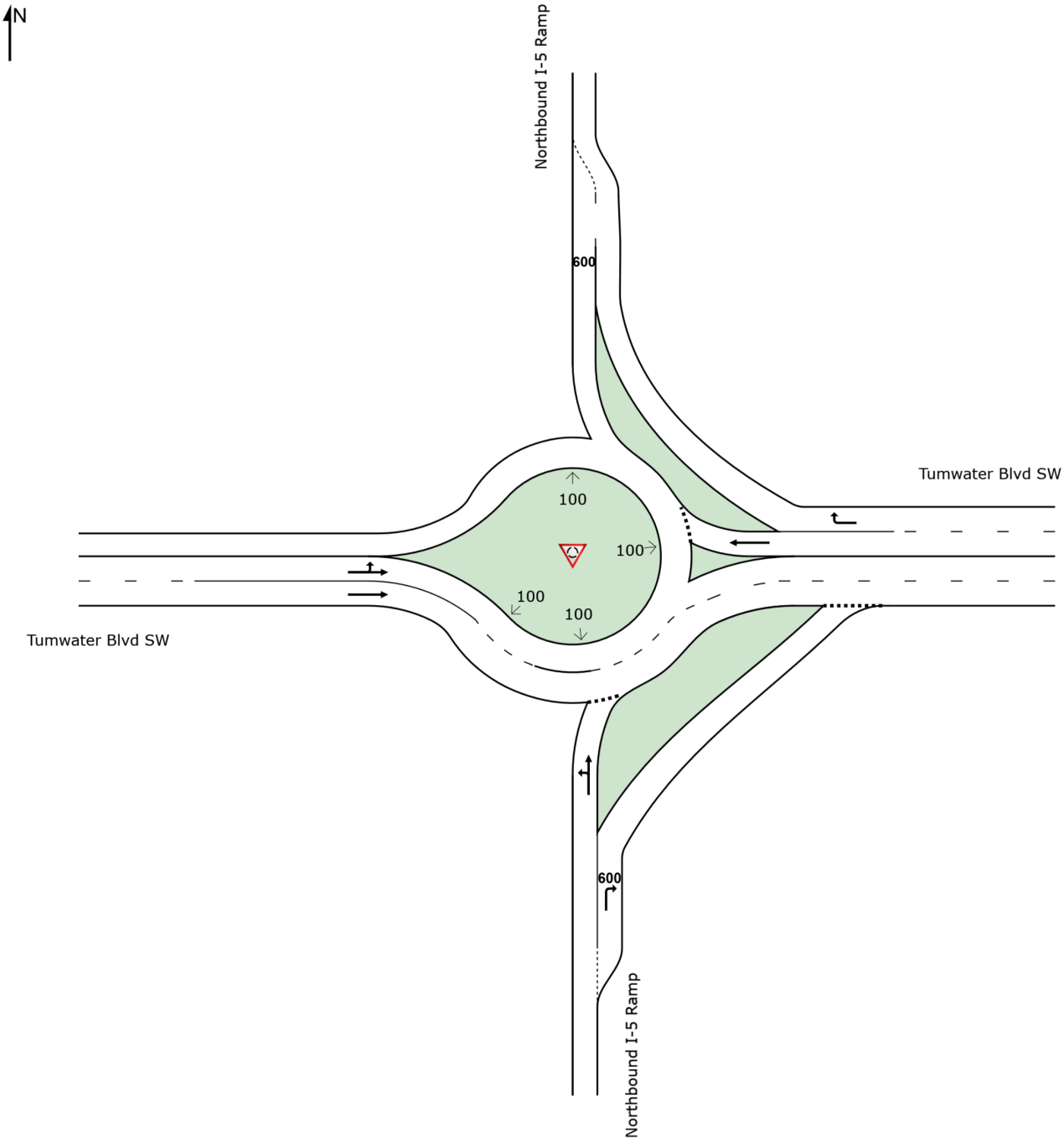

MOVEMENT SUMMARY

Site: [Forecast 2031 AM Peak Hour Volumes With Project (Site Folder: B)]

Tumwater Blvd SW & Tyee Dr Extension
Site Category: -
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: Tumwater Blvd SW														
1u	U	5	2.0	5	2.0	0.230	12.2	LOS B	1.3	33.2	0.09	0.37	0.09	38.9
6	T1	609	2.0	609	2.0	0.230	3.7	LOS A	1.3	33.2	0.09	0.37	0.09	37.9
16	R2	54	2.0	54	2.0	0.230	4.1	LOS A	1.3	33.2	0.09	0.37	0.09	36.6
Approach		668	2.0	668	2.0	0.230	3.8	LOS A	1.3	33.2	0.09	0.37	0.09	37.8
North: Tyee Drive Extension														
7u	U	5	2.0	5	2.0	0.218	14.3	LOS B	0.7	18.7	0.46	0.80	0.46	34.7
7	L2	160	2.0	160	2.0	0.218	11.9	LOS B	0.7	18.7	0.46	0.80	0.46	34.0
14	R2	13	2.0	13	2.0	0.218	6.0	LOS A	0.7	18.7	0.46	0.80	0.46	33.0
Approach		178	2.0	178	2.0	0.218	11.5	LOS B	0.7	18.7	0.46	0.80	0.46	33.9
West: Tumwater Blvd SW														
5u	U	5	2.0	5	2.0	0.314	13.1	LOS B	2.0	50.1	0.41	0.48	0.41	37.6
5	L2	4	2.0	4	2.0	0.314	10.7	LOS B	2.0	50.1	0.41	0.48	0.41	36.7
2	T1	787	2.0	787	2.0	0.314	4.5	LOS A	2.0	50.8	0.41	0.47	0.41	36.7
Approach		796	2.0	796	2.0	0.314	4.6	LOS A	2.0	50.8	0.41	0.47	0.41	36.8
All Vehicles		1642	2.0	1642	2.0	0.314	5.0	LOS A	2.0	50.8	0.28	0.46	0.28	36.8

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.

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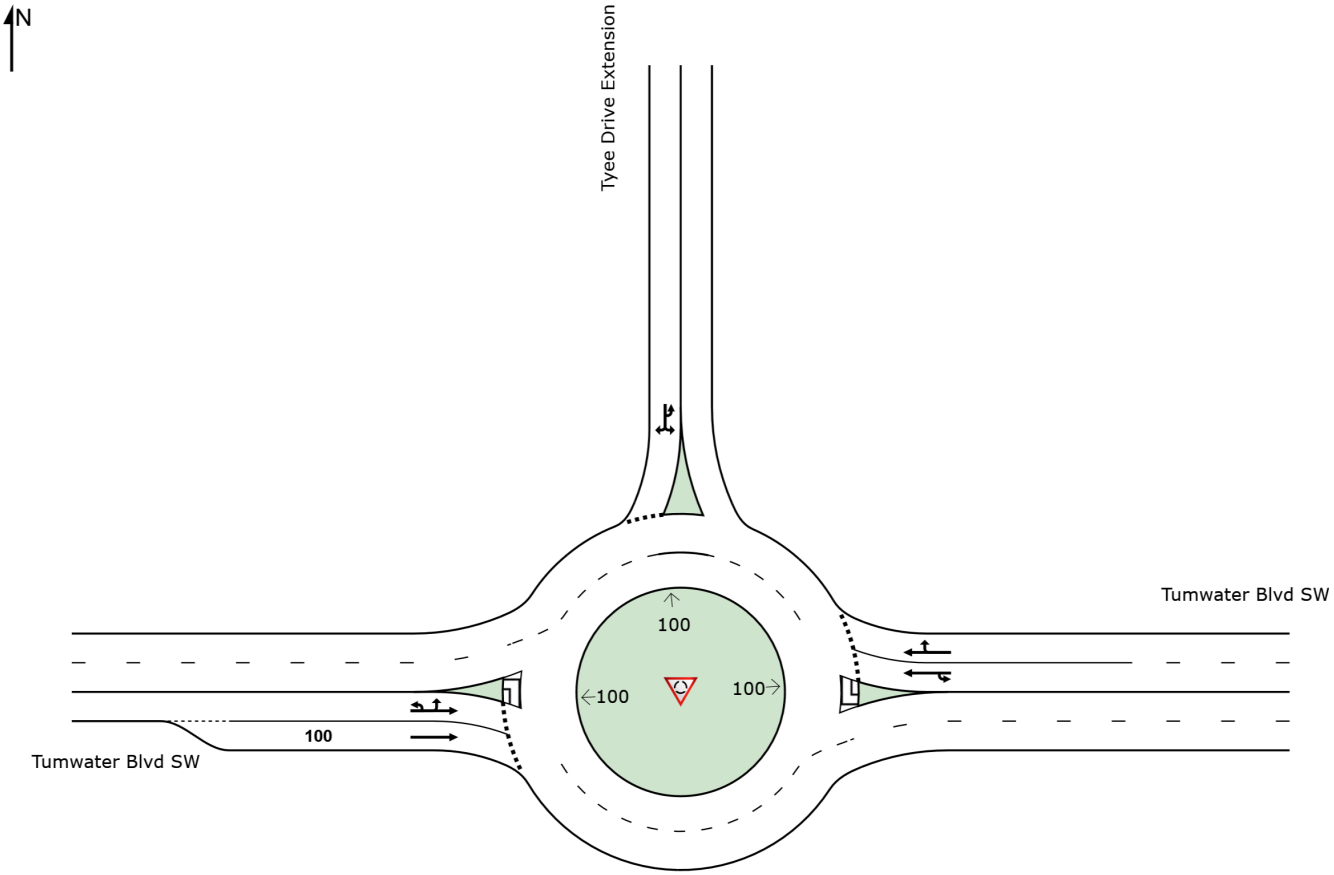
SITE LAYOUT

Site: [Forecast 2031 AM Peak Hour Volumes With Project (Site Folder: B)]

Tumwater Blvd SW & Tyee Dr Extension
Site Category: -
Roundabout

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



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YORKSHIRE
TRAFFIC IMPACT ANALYSIS

APPENDIX: PM PEAK HOUR LEVEL OF SERVICE

MOVEMENT SUMMARY

Site: [Baseline 2023 PM Peak Hour Volumes (Site Folder: 1)]

Israel Rd SW & Littlerock Rd SW
Site Category: -
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: Littlerock Rd SW														
3u	U	5	1.0	5	1.0	0.594	15.4	LOS B	5.1	128.7	0.71	0.78	0.78	35.4
3	L2	280	1.0	295	1.0	0.594	13.0	LOS B	5.1	128.7	0.71	0.78	0.78	34.6
8	T1	301	1.0	317	1.0	0.594	7.0	LOS A	5.1	128.7	0.71	0.78	0.78	34.5
18	R2	36	1.0	38	1.0	0.594	7.1	LOS A	5.1	128.7	0.71	0.78	0.78	33.6
Approach		622	1.0	655	1.0	0.594	9.8	LOS A	5.1	128.7	0.71	0.78	0.78	34.5
East: Israel Rd SW														
1u	U	5	1.0	5	1.0	0.364	16.6	LOS B	2.3	57.6	0.78	0.85	0.78	35.5
1	L2	63	1.0	66	1.0	0.364	14.1	LOS B	2.3	57.6	0.78	0.85	0.78	34.6
6	T1	173	1.0	182	1.0	0.364	8.1	LOS A	2.3	57.6	0.78	0.85	0.78	34.6
16	R2	302	1.0	318	1.0	0.389	8.0	LOS A	2.7	67.2	0.80	0.83	0.80	34.4
Approach		543	1.0	572	1.0	0.389	8.8	LOS A	2.7	67.2	0.79	0.84	0.79	34.5
North: Littlerock Rd SW														
7u	U	5	1.0	5	1.0	0.378	15.4	LOS B	2.5	63.3	0.71	0.77	0.71	35.3
7	L2	153	1.0	161	1.0	0.378	13.0	LOS B	2.5	63.3	0.71	0.77	0.71	34.5
4	T1	472	1.0	497	1.0	0.378	6.5	LOS A	2.7	69.1	0.70	0.70	0.70	35.3
14	R2	135	1.0	142	1.0	0.378	6.6	LOS A	2.7	69.1	0.70	0.66	0.70	34.7
Approach		765	1.0	805	1.0	0.378	7.9	LOS A	2.7	69.1	0.70	0.71	0.70	35.0
West: Israel Rd SW														
5u	U	5	1.0	5	1.0	0.236	13.9	LOS B	1.1	27.5	0.59	0.72	0.59	35.7
5	L2	118	1.0	124	1.0	0.236	11.5	LOS B	1.1	27.5	0.59	0.72	0.59	34.8
2	T1	94	1.0	99	1.0	0.236	5.5	LOS A	1.1	27.5	0.59	0.72	0.59	34.8
12	R2	87	1.0	92	1.0	0.131	6.6	LOS A	0.5	13.2	0.57	0.75	0.57	35.2
Approach		304	1.0	320	1.0	0.236	8.3	LOS A	1.1	27.5	0.58	0.73	0.58	34.9
All Vehicles		2234	1.0	2352	1.0	0.594	8.7	LOS A	5.1	128.7	0.71	0.76	0.73	34.7

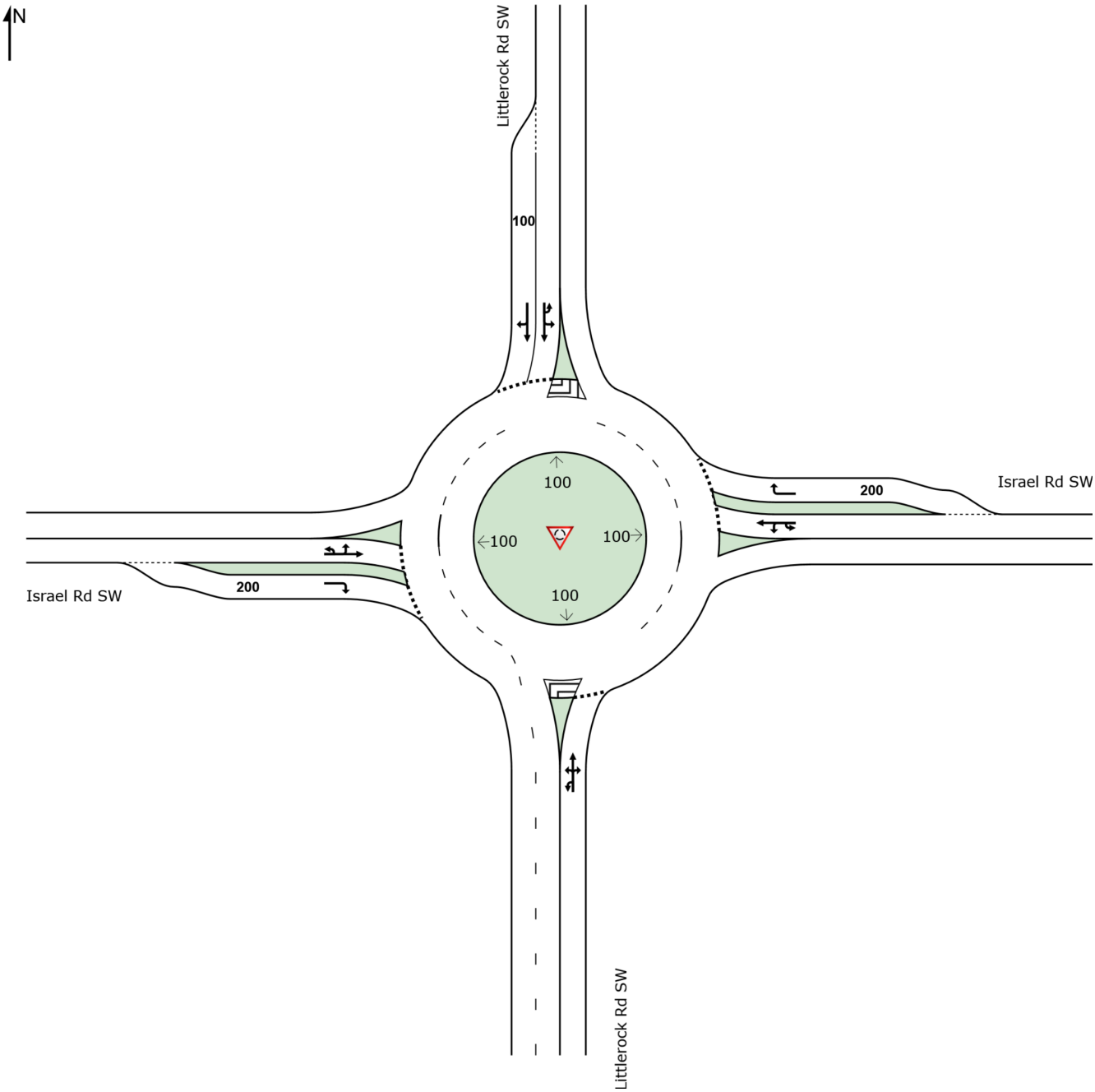
Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per 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: [Baseline 2023 PM Peak Hour Volumes (Site Folder: 1)]

Israel Rd SW & Littlerock Rd SW
Site Category: -
Roundabout

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



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MOVEMENT SUMMARY

Site: [Baseline 2023 PM Peak Hour Volumes (Site Folder: 2)]

Israel Rd SW & Tyee Dr SW
Site Category: -
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: Israel Rd SW														
1u	U	3	1.0	3	1.0	0.510	12.6	LOS B	4.1	103.9	0.29	0.43	0.29	38.3
6	T1	319	1.0	354	1.0	0.510	4.2	LOS A	4.1	103.9	0.29	0.43	0.29	37.2
16	R2	316	1.0	351	1.0	0.510	4.2	LOS A	4.1	103.9	0.29	0.43	0.29	36.0
Approach		638	1.0	709	1.0	0.510	4.3	LOS A	4.1	103.9	0.29	0.43	0.29	36.6
North: Tyee Dr SW														
7u	U	1	1.0	1	1.0	0.247	13.5	LOS B	1.5	38.0	0.50	0.68	0.50	34.6
7	L2	306	1.0	340	1.0	0.247	11.1	LOS B	1.5	38.0	0.50	0.68	0.50	33.8
14	R2	75	1.0	83	1.0	0.088	5.9	LOS A	0.4	11.1	0.48	0.59	0.48	35.5
Approach		382	1.0	424	1.0	0.247	10.1	LOS B	1.5	38.0	0.50	0.66	0.50	34.1
West: Israel Rd SW														
5u	U	3	2.6	3	2.6	0.247	13.7	LOS B	1.4	36.1	0.51	0.58	0.51	36.7
5	L2	49	2.6	54	2.6	0.247	11.3	LOS B	1.4	36.1	0.51	0.58	0.51	35.8
2	T1	195	2.6	217	2.6	0.247	5.3	LOS A	1.4	36.1	0.51	0.58	0.51	35.8
Approach		247	2.6	274	2.6	0.247	6.6	LOS A	1.4	36.1	0.51	0.58	0.51	35.8
All Vehicles		1267	1.3	1408	1.3	0.510	6.5	LOS A	4.1	103.9	0.40	0.53	0.40	35.6

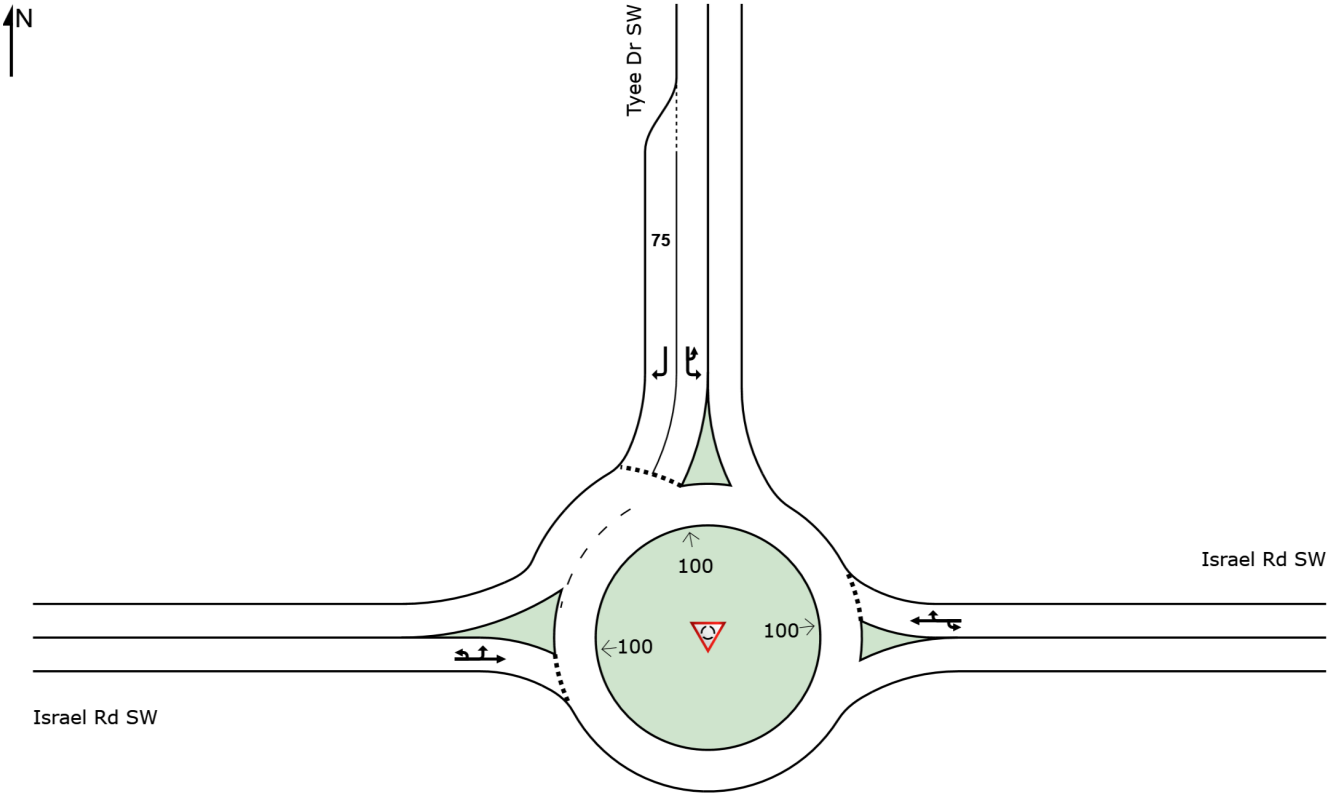
Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per 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: [Baseline 2023 PM Peak Hour Volumes (Site Folder: 2)]

Israel Rd SW & Tyee Dr SW
Site Category: -
Roundabout

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



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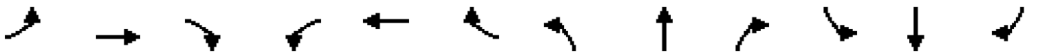

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	195	34	158	303	30	127	102	129	45	95	60
Future Volume (veh/h)	47	195	34	158	303	30	127	102	129	45	95	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1786	1786	1786	1786	1786	1786	1786	1786	1786	1786	1786	1786
Adj Flow Rate, veh/h	57	235	41	190	365	36	153	123	155	54	114	72
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	314	339	59	436	481	47	406	169	213	305	183	116
Arrive On Green	0.04	0.23	0.23	0.12	0.30	0.30	0.10	0.24	0.24	0.04	0.18	0.18
Sat Flow, veh/h	1701	1481	258	1701	1600	158	1701	718	905	1701	1023	646
Grp Volume(v), veh/h	57	0	276	190	0	401	153	0	278	54	0	186
Grp Sat Flow(s),veh/h/ln	1701	0	1739	1701	0	1758	1701	0	1623	1701	0	1670
Q Serve(g_s), s	1.2	0.0	6.9	3.8	0.0	9.9	3.4	0.0	7.6	1.2	0.0	4.9
Cycle Q Clear(g_c), s	1.2	0.0	6.9	3.8	0.0	9.9	3.4	0.0	7.6	1.2	0.0	4.9
Prop In Lane	1.00		0.15	1.00		0.09	1.00		0.56	1.00		0.39
Lane Grp Cap(c), veh/h	314	0	398	436	0	528	406	0	382	305	0	299
V/C Ratio(X)	0.18	0.00	0.69	0.44	0.00	0.76	0.38	0.00	0.73	0.18	0.00	0.62
Avail Cap(c_a), veh/h	435	0	928	613	0	1122	477	0	1070	392	0	1024
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.5	0.0	16.9	11.7	0.0	15.1	13.8	0.0	16.9	15.2	0.0	18.1
Incr Delay (d2), s/veh	0.3	0.0	2.2	0.7	0.0	2.3	0.6	0.0	2.7	0.3	0.0	2.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	2.7	1.3	0.0	3.8	1.2	0.0	2.7	0.4	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	13.8	0.0	19.0	12.3	0.0	17.4	14.4	0.0	19.5	15.5	0.0	20.2
LnGrp LOS	B		B	B		B	B		B	B		C
Approach Vol, veh/h		333			591			431			240	
Approach Delay, s/veh		18.1			15.8			17.7			19.1	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.5	15.7	10.0	15.4	9.2	13.1	6.6	18.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.5	31.5	10.5	25.5	6.7	29.3	5.5	30.5
Max Q Clear Time (g_c+I1), s	3.2	9.6	5.8	8.9	5.4	6.9	3.2	11.9
Green Ext Time (p_c), s	0.0	1.7	0.2	1.5	0.0	1.0	0.0	2.5

Intersection Summary	
HCM 7th Control Delay, s/veh	17.3
HCM 7th LOS	B

MOVEMENT SUMMARY

Site: [Baseline 2023 PM Peak Hour Volumes (Site Folder: 4)]

Tumwater Blvd SW & Littlerock Rd SW
Site Category: -
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: Littlerock Rd SW														
3u	U	5	1.0	5	1.0	0.131	13.4	LOS B	0.8	20.0	0.51	0.52	0.51	37.2
8	T1	157	1.0	167	1.0	0.131	5.1	LOS A	0.8	20.0	0.51	0.52	0.51	36.2
18	R2	123	1.0	131	1.0	0.124	5.8	LOS A	0.7	17.5	0.53	0.60	0.53	35.3
Approach		285	1.0	303	1.0	0.131	5.6	LOS A	0.8	20.0	0.52	0.56	0.52	35.8
East: Tumwater Blvd SW														
1u	U	5	1.0	5	1.0	0.241	12.8	LOS B	1.2	30.1	0.34	0.65	0.34	34.9
1	L2	262	1.0	279	1.0	0.241	10.4	LOS B	1.2	30.1	0.34	0.65	0.34	34.1
16	R2	326	1.0	347	1.0	0.270	5.1	LOS A	1.4	35.4	0.34	0.53	0.34	35.8
Approach		593	1.0	631	1.0	0.270	7.5	LOS A	1.4	35.4	0.34	0.58	0.34	35.0
North: Littlerock Rd SW														
7u	U	5	1.0	5	1.0	0.423	13.4	LOS B	3.0	75.4	0.53	0.64	0.53	35.7
7	L2	359	1.0	382	1.0	0.423	11.0	LOS B	3.0	75.4	0.53	0.64	0.53	34.9
4	T1	332	1.0	353	1.0	0.423	5.3	LOS A	3.0	75.4	0.50	0.59	0.50	35.6
Approach		696	1.0	740	1.0	0.423	8.3	LOS A	3.0	75.4	0.51	0.61	0.51	35.2
All Vehicles		1574	1.0	1674	1.0	0.423	7.5	LOS A	3.0	75.4	0.45	0.59	0.45	35.2

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.

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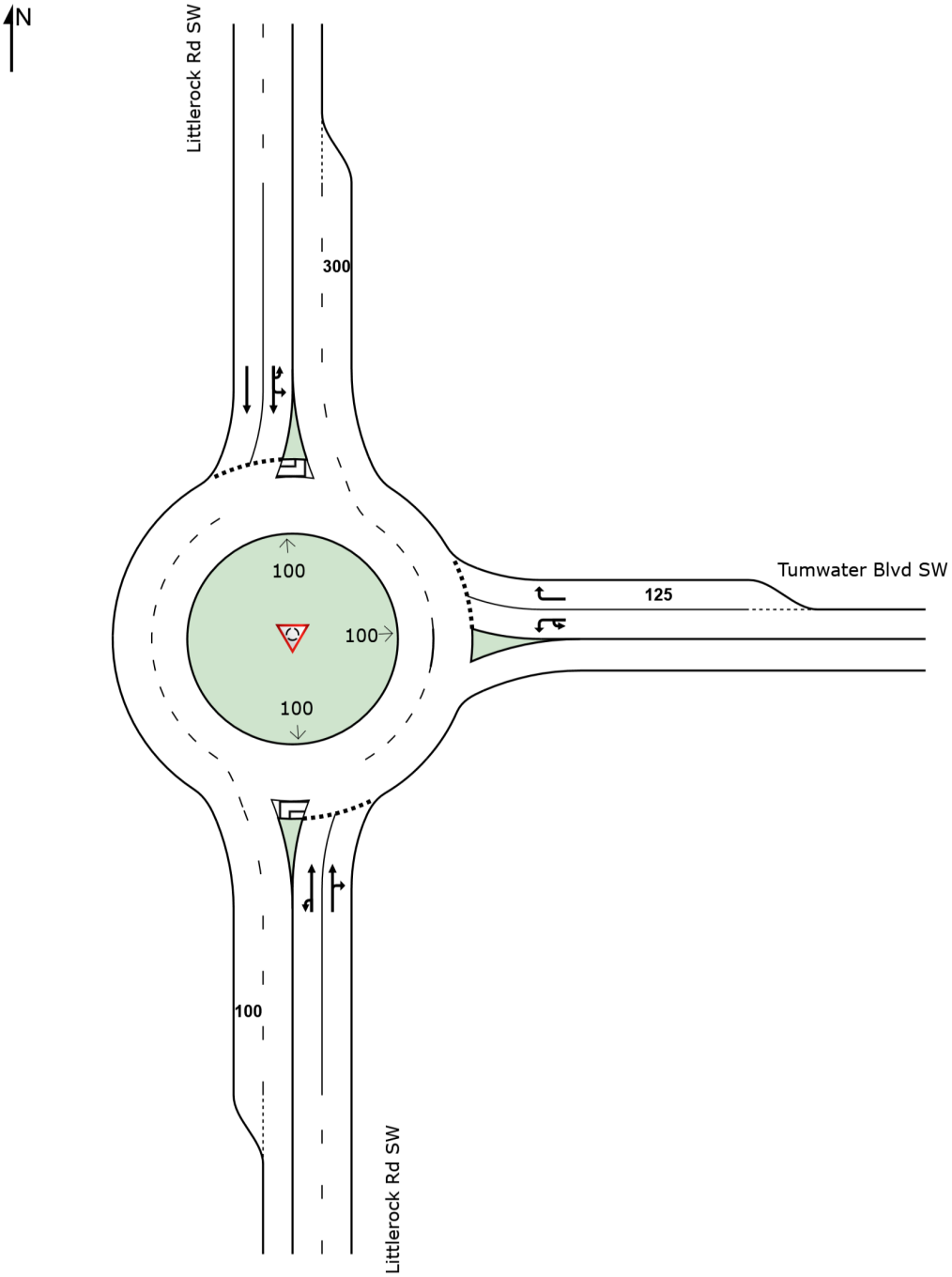
SITE LAYOUT

Site: [Baseline 2023 PM Peak Hour Volumes (Site Folder: 4)]

Tumwater Blvd SW & Littlerock Rd SW
Site Category: -
Roundabout

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



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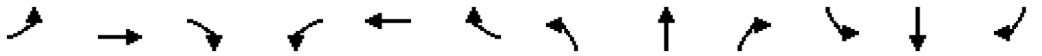


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	401	83	374	322	0	0	0	0	475	37	274
Future Volume (veh/h)	0	401	83	374	322	0	0	0	0	475	37	274
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1786	1786	1786	1786	0				1744	1744	1744
Adj Flow Rate, veh/h	0	427	88	398	343	0				505	39	291
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				0.94	0.94	0.94
Percent Heavy Veh, %	0	1	1	1	1	0				4	4	4
Cap, veh/h	0	588	120	447	947	0				590	63	471
Arrive On Green	0.00	0.21	0.21	0.26	0.53	0.00				0.36	0.36	0.36
Sat Flow, veh/h	0	2895	574	1701	1786	0				1661	178	1327
Grp Volume(v), veh/h	0	257	258	398	343	0				505	0	330
Grp Sat Flow(s),veh/h/ln	0	1697	1683	1701	1786	0				1661	0	1505
Q Serve(g_s), s	0.0	11.1	11.2	17.6	8.8	0.0				22.1	0.0	14.2
Cycle Q Clear(g_c), s	0.0	11.1	11.2	17.6	8.8	0.0				22.1	0.0	14.2
Prop In Lane	0.00		0.34	1.00		0.00				1.00		0.88
Lane Grp Cap(c), veh/h	0	356	353	447	947	0				590	0	534
V/C Ratio(X)	0.00	0.72	0.73	0.89	0.36	0.00				0.86	0.00	0.62
Avail Cap(c_a), veh/h	0	950	943	671	1807	0				884	0	801
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	28.8	28.9	27.8	10.7	0.0				23.4	0.0	20.9
Incr Delay (d2), s/veh	0.0	2.8	2.9	9.8	0.2	0.0				5.5	0.0	1.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.5	4.6	7.9	3.1	0.0				9.0	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	0.0	31.6	31.8	37.6	10.9	0.0				28.9	0.0	22.0
LnGrp LOS		C	C	D	B					C		C
Approach Vol, veh/h		515			741						835	
Approach Delay, s/veh		31.7			25.3						26.2	
Approach LOS		C			C						C	

Timer - Assigned Phs		3	4		6		8					
Phs Duration (G+Y+Rc), s		25.1	20.9		32.3		46.0					
Change Period (Y+Rc), s		4.5	4.5		4.5		4.5					
Max Green Setting (Gmax), s		30.9	43.9		41.7		79.3					
Max Q Clear Time (g_c+I1), s		19.6	13.2		24.1		10.8					
Green Ext Time (p_c), s		1.0	3.2		3.7		2.2					

Intersection Summary	
HCM 7th Control Delay, s/veh	27.2
HCM 7th LOS	C

Intersection	
Int Delay, s/veh	13.7

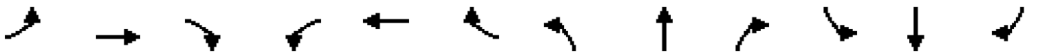
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	159	716	0	0	644	1417	52	7	158	0	0	0
Future Vol, veh/h	159	716	0	0	644	1417	52	7	158	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	Free	-	-	None	-	-	None
Storage Length	300	-	-	-	-	0	-	-	600	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	1	1	1	3	3	3	2	2	2
Mvmt Flow	181	814	0	0	732	1610	59	8	180	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	732	0	-	814	-	0	1907	1907	407
Stage 1	-	-	-	-	-	-	1175	1175	-
Stage 2	-	-	-	-	-	-	732	732	-
Critical Hdwy	4.145	-	-	-	-	-	6.645	6.545	6.945
Critical Hdwy Stg 1	-	-	-	-	-	-	5.845	5.545	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.445	5.545	-
Follow-up Hdwy	2.2285	-	-	-	-	-	3.5285	4.0285	3.3285
Pot Cap-1 Maneuver	865	-	0	0	-	0	67	68	592
Stage 1	-	-	0	0	-	0	255	263	-
Stage 2	-	-	0	0	-	0	473	424	-
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	865	-	-	-	-	-	~ 53	0	592
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 53	0	-
Stage 1	-	-	-	-	-	-	202	0	-
Stage 2	-	-	-	-	-	-	473	0	-

Approach	EB	WB	NB
HCM Control Delay, s/v	1.86	0	102.48
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT
Capacity (veh/h)	53	592	865	-	-
HCM Lane V/C Ratio	1.269	0.303	0.209	-	-
HCM Control Delay (s/veh)	$ 340.2	13.7	10.3	-	-
HCM Lane LOS	F	B	B	-	-
HCM 95th %tile Q(veh)	6	1.3	0.8	-	-

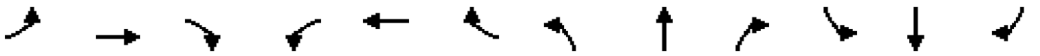
Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	153	142	110	226	158	124	371	29	83	602	103
Future Volume (veh/h)	94	153	142	110	226	158	124	371	29	83	602	103
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	104	170	158	122	251	176	138	412	32	92	669	114
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
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	288	264	245	364	308	216	314	1062	82	422	910	155
Arrive On Green	0.06	0.29	0.29	0.07	0.30	0.30	0.08	0.32	0.32	0.06	0.30	0.30
Sat Flow, veh/h	1795	899	836	1781	1024	718	1795	3369	261	1795	3061	521
Grp Volume(v), veh/h	104	0	328	122	0	427	138	218	226	92	391	392
Grp Sat Flow(s),veh/h/ln	1795	0	1735	1781	0	1741	1795	1791	1838	1795	1791	1791
Q Serve(g_s), s	2.7	0.0	11.3	3.2	0.0	15.6	3.6	6.5	6.6	2.4	13.5	13.5
Cycle Q Clear(g_c), s	2.7	0.0	11.3	3.2	0.0	15.6	3.6	6.5	6.6	2.4	13.5	13.5
Prop In Lane	1.00		0.48	1.00		0.41	1.00		0.14	1.00		0.29
Lane Grp Cap(c), veh/h	288	0	509	364	0	523	314	564	579	422	533	533
V/C Ratio(X)	0.36	0.00	0.64	0.33	0.00	0.82	0.44	0.39	0.39	0.22	0.73	0.74
Avail Cap(c_a), veh/h	418	0	1041	486	0	1050	527	1153	1183	494	981	981
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.0	0.0	21.2	16.0	0.0	22.3	16.2	18.4	18.4	15.2	21.7	21.7
Incr Delay (d2), s/veh	0.8	0.0	1.4	0.5	0.0	3.2	1.0	0.4	0.4	0.3	2.0	2.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	4.6	1.3	0.0	6.5	1.4	2.5	2.6	0.9	5.5	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	17.8	0.0	22.6	16.6	0.0	25.5	17.2	18.8	18.8	15.5	23.7	23.7
LnGrp LOS	B		C	B		C	B	B	B	B	C	C
Approach Vol, veh/h		432			549			582			875	
Approach Delay, s/veh		21.4			23.5			18.4			22.9	
Approach LOS		C			C			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.6	26.2	9.3	24.7	9.9	25.0	8.8	25.2
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.9	44.3	9.5	41.3	13.5	37.7	9.3	41.5
Max Q Clear Time (g_c+I1), s	4.4	8.6	5.2	13.3	5.6	15.5	4.7	17.6
Green Ext Time (p_c), s	0.0	2.7	0.1	2.3	0.2	4.9	0.1	3.0

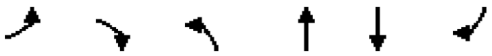
Intersection Summary	
HCM 7th Control Delay, s/veh	21.7
HCM 7th LOS	C



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	357	286	97	381	18	233	356	21	131	557	124
Future Volume (veh/h)	75	357	286	97	381	18	233	356	21	131	557	124
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	83	397	318	108	423	20	259	396	23	146	619	138
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
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	2	2	2
Cap, veh/h	108	523	443	142	562	476	384	900	52	190	922	411
Arrive On Green	0.06	0.28	0.28	0.08	0.30	0.30	0.11	0.26	0.26	0.11	0.26	0.26
Sat Flow, veh/h	1767	1856	1572	1781	1870	1585	3456	3414	198	1781	3554	1585
Grp Volume(v), veh/h	83	397	318	108	423	20	259	205	214	146	619	138
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1781	1870	1585	1728	1777	1835	1781	1777	1585
Q Serve(g_s), s	3.1	13.1	12.2	4.0	13.7	0.6	4.8	6.5	6.5	5.4	10.5	4.7
Cycle Q Clear(g_c), s	3.1	13.1	12.2	4.0	13.7	0.6	4.8	6.5	6.5	5.4	10.5	4.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	108	523	443	142	562	476	384	469	484	190	922	411
V/C Ratio(X)	0.77	0.76	0.72	0.76	0.75	0.04	0.67	0.44	0.44	0.77	0.67	0.34
Avail Cap(c_a), veh/h	408	1423	1206	517	1546	1310	1004	992	1025	623	2197	980
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.0	22.0	21.7	30.3	21.2	16.6	28.7	20.6	20.6	29.2	22.3	20.2
Incr Delay (d2), s/veh	10.8	2.3	2.2	8.1	2.1	0.0	2.1	0.6	0.6	6.4	0.9	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	5.5	4.4	1.9	5.8	0.2	2.0	2.6	2.7	2.5	4.1	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	41.8	24.3	23.9	38.3	23.3	16.7	30.7	21.2	21.2	35.6	23.2	20.6
LnGrp LOS	D	C	C	D	C	B	C	C	C	D	C	C
Approach Vol, veh/h		798			551			678			903	
Approach Delay, s/veh		26.0			26.0			24.9			24.8	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.7	22.2	9.9	23.4	12.0	21.9	8.6	24.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	23.5	37.5	19.5	51.5	19.5	41.5	15.5	55.5
Max Q Clear Time (g_c+I1), s	7.4	8.5	6.0	15.1	6.8	12.5	5.1	15.7
Green Ext Time (p_c), s	0.3	2.5	0.2	3.8	0.7	4.9	0.1	2.8

Intersection Summary	
HCM 7th Control Delay, s/veh	25.4
HCM 7th LOS	C



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	763	14	26	193	231	378
Future Volume (vph)	763	14	26	193	231	378
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			100
Storage Lanes	1	0	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.998					0.850
Flt Protected	0.953			0.994		
Satd. Flow (prot)	1789	0	0	1870	1881	1599
Flt Permitted	0.953			0.994		
Satd. Flow (perm)	1789	0	0	1870	1881	1599
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	1					410
Link Speed (mph)	35			35	35	
Link Distance (ft)	1155			1066	1144	
Travel Time (s)	22.5			20.8	22.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	829	15	28	210	251	411
Shared Lane Traffic (%)						
Lane Group Flow (vph)	844	0	0	238	251	411
Turn Type	Prot		Split	NA	NA	custom
Protected Phases	4		6	6	2	
Permitted Phases						6
Detector Phase	4		6	6	2	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	44.0		22.6	22.6	23.4	22.6
Total Split (%)	48.9%		25.1%	25.1%	26.0%	25.1%
Maximum Green (s)	39.5		18.1	18.1	18.9	18.1
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Min	Min	Min	Min
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	39.8			15.3	15.5	15.3
Actuated g/C Ratio	0.47			0.18	0.18	0.18
v/c Ratio	1.00			0.70	0.73	0.66
Control Delay (s/veh)	56.0			44.6	45.6	9.1
Queue Delay	0.0			0.0	0.0	0.0

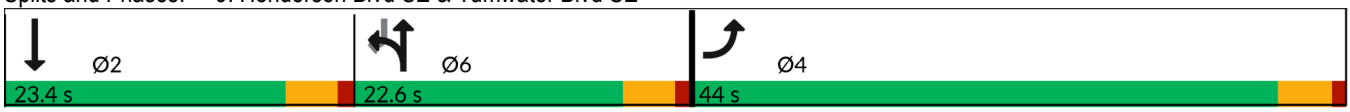
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay (s/veh)	56.0			44.6	45.6	9.1
LOS	E			D	D	A
Approach Delay (s/veh)	56.0			44.6	22.9	
Approach LOS	E			D	C	
Queue Length 50th (ft)	~502			121	129	0
Queue Length 95th (ft)	#769			203	211	79
Internal Link Dist (ft)	1075			986	1064	
Turn Bay Length (ft)						100
Base Capacity (vph)	846			405	426	668
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	1.00			0.59	0.59	0.62

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 84.1			
Natural Cycle: 90			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.00			
Intersection Signal Delay (s/veh): 41.9		Intersection LOS: D	
Intersection Capacity Utilization 78.1%		ICU Level of Service D	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: Henderson Blvd SE & Tumwater Blvd SE



Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	49	0	659	781	24
Future Vol, veh/h	0	49	0	659	781	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	0	51	0	679	805	25

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	818	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	379	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	379	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	15.95	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	379	-	-
HCM Lane V/C Ratio	-	0.133	-	-
HCM Control Delay (s/veh)	-	15.9	-	-
HCM Lane LOS	-	C	-	-
HCM 95th %tile Q(veh)	-	0.5	-	-

MOVEMENT SUMMARY

Site: [Baseline 2023 PM Peak Hour Volumes (Site Folder: 11)]

Littlerock Rd SW & Kingswood Dr SW
Site Category: -
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: Littlerock Rd SW														
3u	U	5	1.0	5	1.0	0.576	12.8	LOS B	4.9	124.2	0.38	0.44	0.38	37.9
8	T1	581	1.0	625	1.0	0.576	4.4	LOS A	4.9	124.2	0.38	0.44	0.38	36.8
18	R2	146	1.0	157	1.0	0.576	4.5	LOS A	4.9	124.2	0.38	0.44	0.38	35.7
Approach		732	1.0	787	1.0	0.576	4.5	LOS A	4.9	124.2	0.38	0.44	0.38	36.6
East: Kingswood Dr SW														
1u	U	5	1.0	5	1.0	0.203	14.8	LOS B	1.4	34.4	0.68	0.75	0.68	34.1
1	L2	209	1.0	225	1.0	0.203	12.4	LOS B	1.4	34.4	0.68	0.75	0.68	33.3
16	R2	88	1.0	95	1.0	0.113	7.4	LOS A	0.6	16.4	0.66	0.69	0.66	34.8
Approach		302	1.0	325	1.0	0.203	11.0	LOS B	1.4	34.4	0.67	0.73	0.67	33.8
North: Littlerock Rd SW														
7u	U	5	1.0	5	1.0	0.080	13.4	LOS B	0.4	10.5	0.43	0.65	0.43	34.7
7	L2	69	1.0	74	1.0	0.080	10.9	LOS B	0.4	10.5	0.43	0.65	0.43	33.9
4	T1	608	1.0	654	1.0	0.451	4.9	LOS A	3.6	89.6	0.53	0.48	0.53	36.2
Approach		682	1.0	733	1.0	0.451	5.5	LOS A	3.6	89.6	0.52	0.50	0.52	36.0
All Vehicles		1716	1.0	1845	1.0	0.576	6.0	LOS A	4.9	124.2	0.49	0.51	0.49	35.8

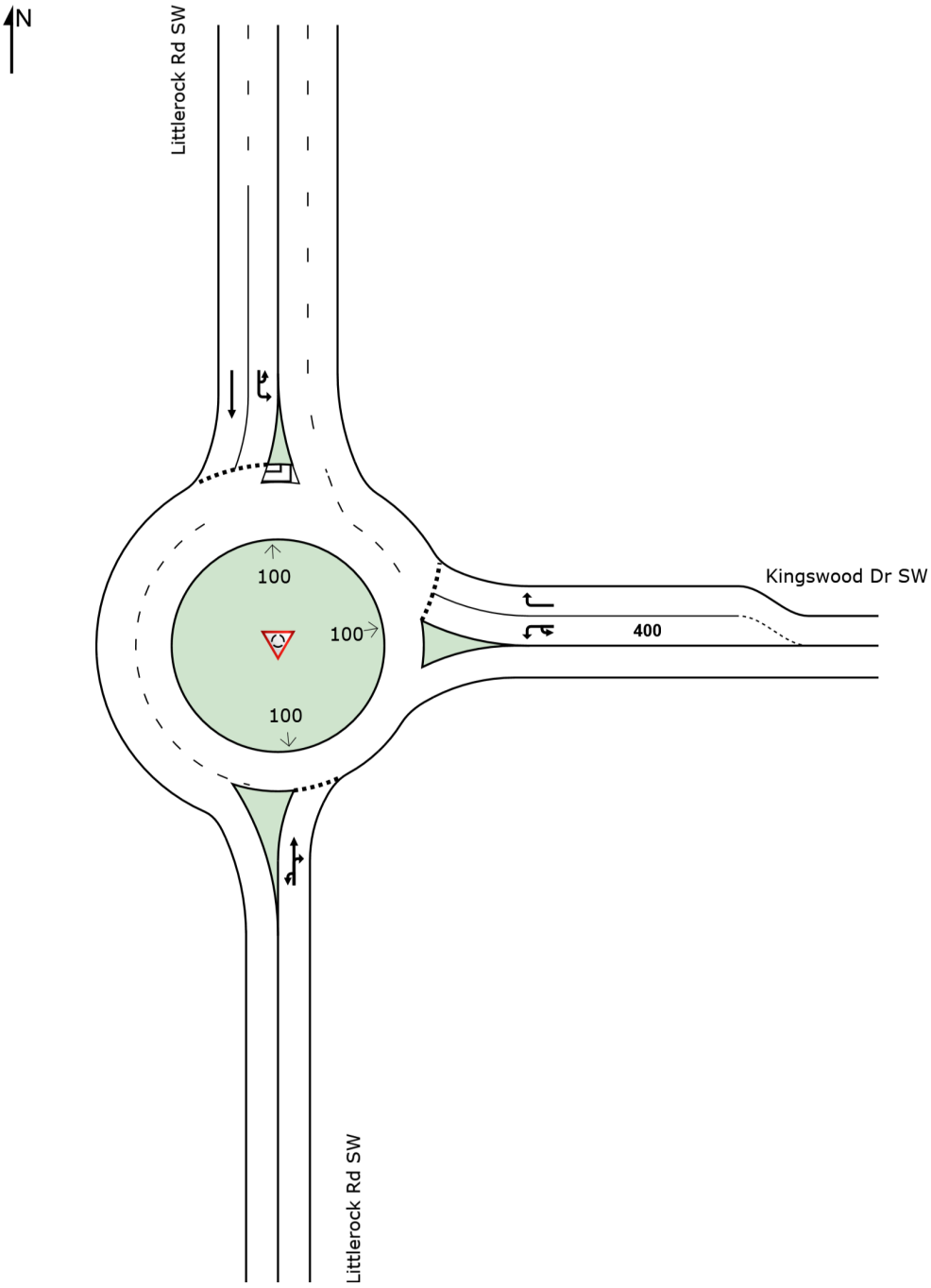
Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per 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: [Baseline 2023 PM Peak Hour Volumes (Site Folder: 11)]

Littlerock Rd SW & Kingswood Dr SW
Site Category: -
Roundabout

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



Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	375	57	0	695	0	37
Future Vol, veh/h	375	57	0	695	0	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
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, %	2	2	2	2	2	2
Mvmt Flow	408	62	0	755	0	40

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	439
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	-	-	0	-	0	618
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	618
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	11.23
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	618	-	-	-
HCM Lane V/C Ratio	0.065	-	-	-
HCM Control Delay (s/veh)	11.2	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-

MOVEMENT SUMMARY

Site: [Forecast 2031 PM Peak Hour Background Volumes (Site Folder: 1)]

Israel Rd SW & Littlerock Rd SW
Site Category: -
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: Littlerock Rd SW														
3u	U	5	1.0	5	1.0	1.071	65.7	LOS F	47.5	1197.3	1.00	2.20	3.94	20.0
3	L2	386	1.0	406	1.0	1.071	63.3	LOS F	47.5	1197.3	1.00	2.20	3.94	19.8
8	T1	509	1.0	536	1.0	1.071	57.2	LOS F	47.5	1197.3	1.00	2.20	3.94	19.7
18	R2	62	1.0	65	1.0	1.071	57.4	LOS F	47.5	1197.3	1.00	2.20	3.94	19.4
Approach		962	1.0	1013	1.0	1.071	59.7	LOS E	47.5	1197.3	1.00	2.20	3.94	19.7
East: Israel Rd SW														
1u	U	5	1.0	5	1.0	0.949	61.0	LOS E	16.3	411.0	1.00	1.54	2.51	21.0
1	L2	100	1.0	105	1.0	0.949	58.6	LOS E	16.3	411.0	1.00	1.54	2.51	20.7
6	T1	250	1.0	263	1.0	0.949	52.6	LOS D	16.3	411.0	1.00	1.54	2.51	20.7
16	R2	436	1.0	459	1.0	0.960	53.0	LOS E	20.0	503.7	1.00	1.62	2.66	20.3
Approach		791	1.0	833	1.0	0.960	53.6	LOS D	20.0	503.7	1.00	1.58	2.59	20.5
North: Littlerock Rd SW														
7u	U	5	1.0	5	1.0	0.693	23.6	LOS C	8.1	204.5	0.98	1.15	1.41	31.6
7	L2	237	1.0	249	1.0	0.693	21.2	LOS C	8.1	204.5	0.98	1.15	1.41	31.0
4	T1	699	1.0	736	1.0	0.693	13.6	LOS B	9.2	233.0	0.99	1.10	1.38	32.3
14	R2	184	1.0	194	1.0	0.693	13.2	LOS B	9.2	233.0	0.99	1.07	1.37	32.1
Approach		1125	1.0	1184	1.0	0.693	15.2	LOS B	9.2	233.0	0.99	1.10	1.39	32.0
West: Israel Rd SW														
5u	U	5	1.0	5	1.0	0.443	15.5	LOS B	2.7	66.9	0.80	0.87	0.88	35.0
5	L2	162	1.0	171	1.0	0.443	13.1	LOS B	2.7	66.9	0.80	0.87	0.88	34.2
2	T1	140	1.0	147	1.0	0.443	7.1	LOS A	2.7	66.9	0.80	0.87	0.88	34.1
12	R2	121	1.0	127	1.0	0.247	7.7	LOS A	1.1	28.6	0.73	0.86	0.73	34.6
Approach		428	1.0	451	1.0	0.443	9.6	LOS A	2.7	66.9	0.78	0.87	0.84	34.3
All Vehicles		3306	1.0	3480	1.0	1.071	36.6	LOS D	47.5	1197.3	0.97	1.51	2.35	24.5

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.

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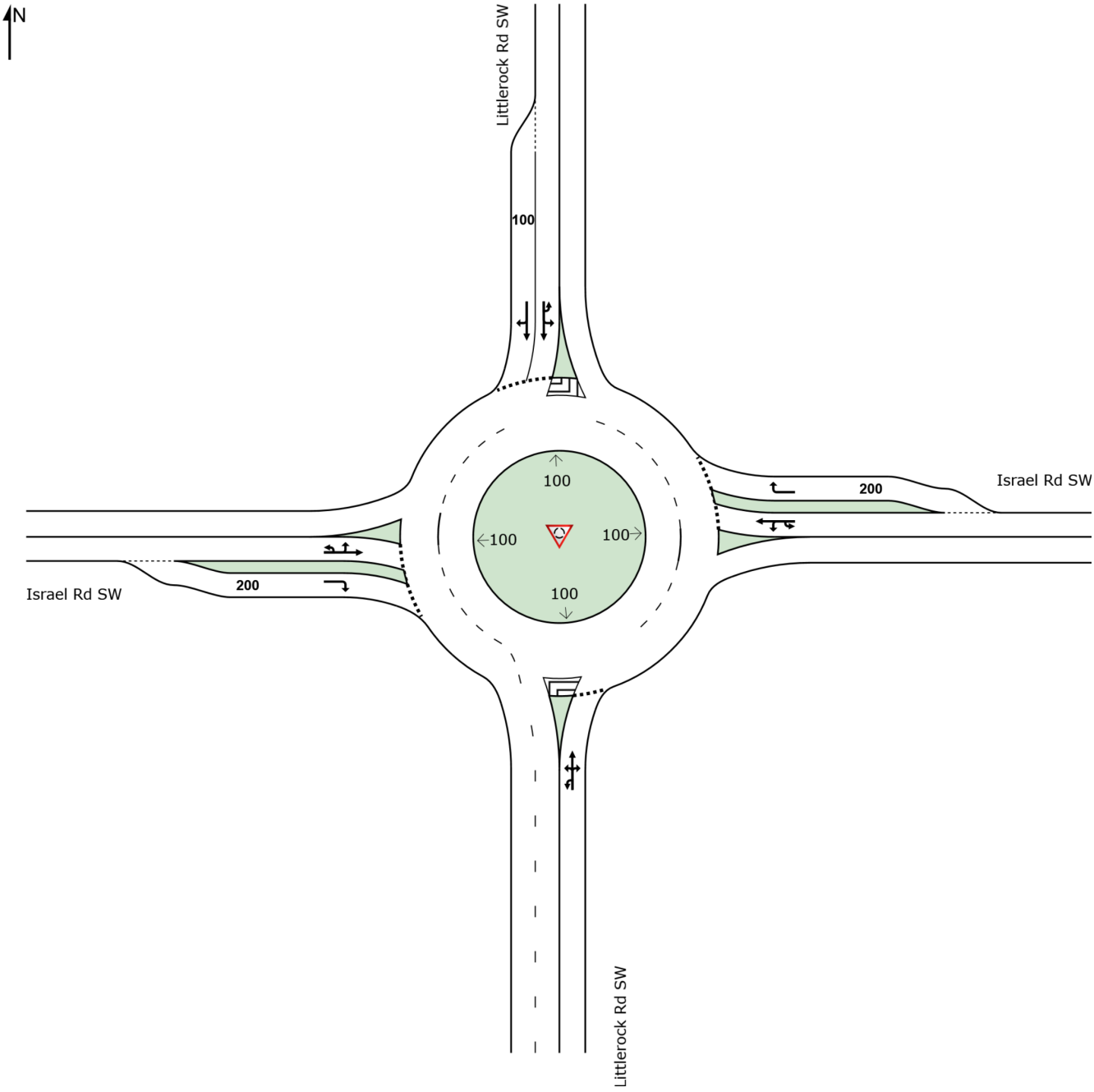
SITE LAYOUT

Site: [Forecast 2031 PM Peak Hour Background Volumes (Site Folder: 1)]

Israel Rd SW & Littlerock Rd SW
Site Category: -
Roundabout

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



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MOVEMENT SUMMARY

Site: [Forecast 2031 PM Peak Hour Background Volumes (Site Folder: 2)]

Israel Rd SW & Tyee Dr SW
Site Category: -
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: Tyee Dr SW														
3u	U	1	1.0	1	1.0	0.081	17.9	LOS B	0.5	12.4	0.79	0.80	0.79	33.7
3	L2	29	1.0	32	1.0	0.081	15.5	LOS B	0.5	12.4	0.79	0.80	0.79	32.9
8	T1	3	1.0	3	1.0	0.081	9.5	LOS A	0.5	12.4	0.79	0.80	0.79	32.9
18	R2	10	1.0	11	1.0	0.081	9.6	LOS A	0.5	12.4	0.79	0.80	0.79	32.0
Approach		43	1.0	48	1.0	0.081	13.8	LOS B	0.5	12.4	0.79	0.80	0.79	32.7
East: Israel Rd SW														
1u	U	3	1.0	3	1.0	0.882	15.4	LOS D	16.9	425.1	0.95	0.63	0.99	36.1
1	L2	13	3.0	14	3.0	0.882	13.1	LOS D	16.9	425.1	0.95	0.63	0.99	35.2
6	T1	450	1.0	500	1.0	0.882	7.1	LOS D	16.9	425.1	0.95	0.63	0.99	35.2
16	R2	477	1.0	530	1.0	0.882	7.1	LOS D	16.9	425.1	0.95	0.63	0.99	34.1
Approach		943	1.0	1047	1.0	0.882	7.2	LOS A	16.9	425.1	0.95	0.63	0.99	34.6
North: Tyee Dr SW														
7u	U	2	1.0	2	1.0	0.528	16.0	LOS B	4.8	121.9	0.86	0.87	0.92	33.7
7	L2	451	1.0	501	1.0	0.528	13.6	LOS B	4.8	121.9	0.86	0.87	0.92	33.0
4	T1	4	3.0	4	3.0	0.528	7.7	LOS A	4.8	121.9	0.86	0.87	0.92	32.9
14	R2	113	1.0	126	1.0	0.207	8.1	LOS A	1.2	30.6	0.72	0.77	0.72	34.4
Approach		570	1.0	633	1.0	0.528	12.5	LOS B	4.8	121.9	0.83	0.85	0.88	33.3
West: Israel Rd SW														
5u	U	3	2.6	3	2.6	0.541	16.9	LOS B	4.5	115.4	0.82	0.88	0.92	35.6
5	L2	70	2.6	78	2.6	0.541	14.4	LOS B	4.5	115.4	0.82	0.88	0.92	34.7
2	T1	281	2.6	312	2.6	0.541	8.5	LOS A	4.5	115.4	0.82	0.88	0.92	34.7
12	R2	36	3.0	39	3.0	0.541	8.6	LOS A	4.5	115.4	0.82	0.88	0.92	33.6
Approach		390	2.6	432	2.6	0.541	9.6	LOS A	4.5	115.4	0.82	0.88	0.92	34.6
All Vehicles		1946	1.3	2161	1.3	0.882	9.4	LOS A	16.9	425.1	0.88	0.75	0.94	34.1

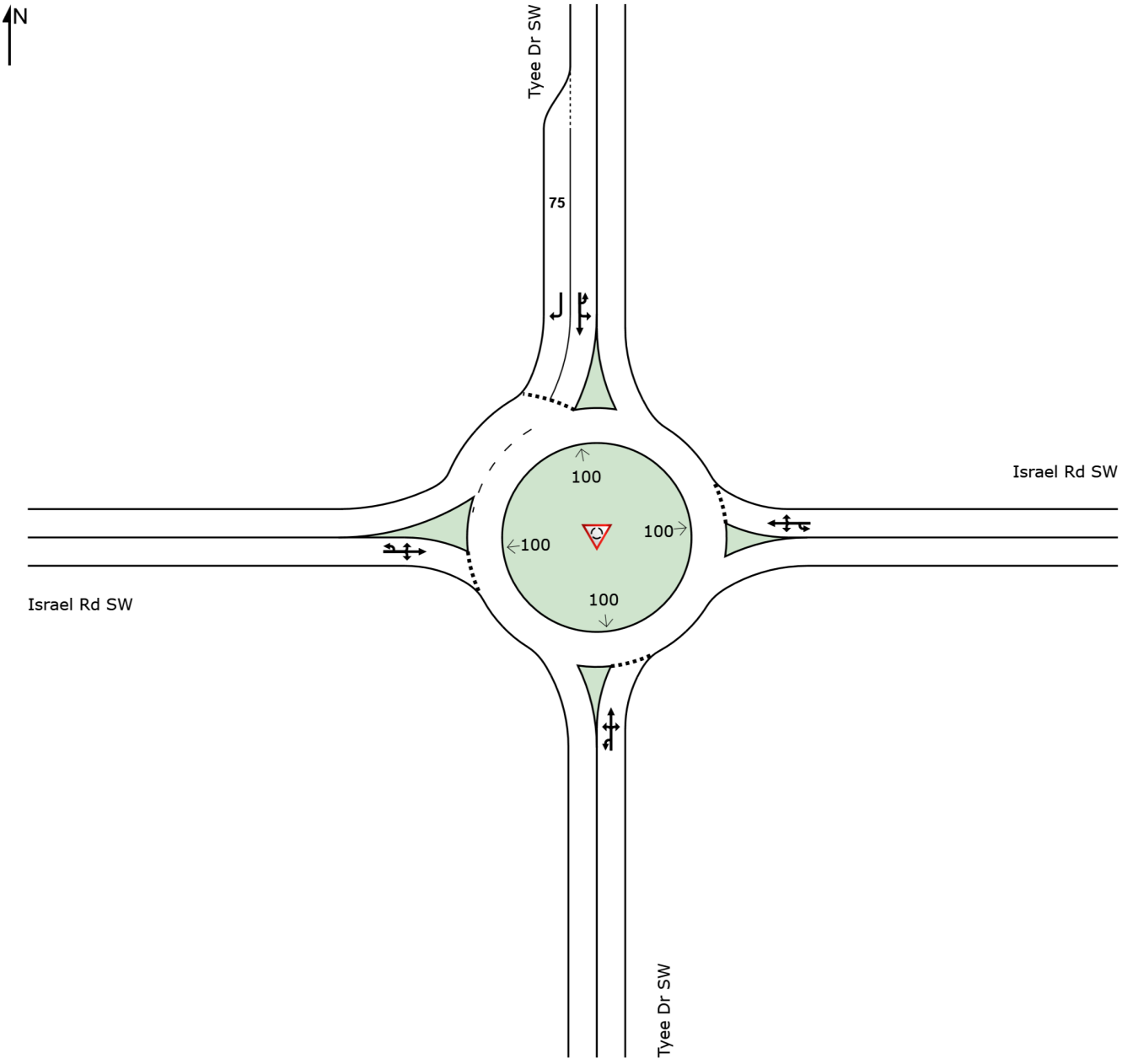
Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per 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: [Forecast 2031 PM Peak Hour Background Volumes (Site Folder: 2)]

Israel Rd SW & Tyee Dr SW
Site Category: -
Roundabout

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



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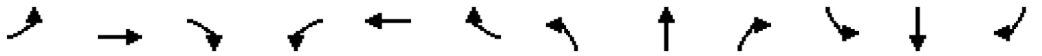

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	295	69	220	452	42	210	181	188	61	148	100
Future Volume (veh/h)	74	295	69	220	452	42	210	181	188	61	148	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1786	1786	1786	1786	1786	1786	1786	1786	1786	1786	1786	1786
Adj Flow Rate, veh/h	89	355	83	265	545	51	253	218	227	73	178	120
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	213	406	95	354	587	55	349	247	258	213	267	180
Arrive On Green	0.05	0.29	0.29	0.13	0.37	0.37	0.09	0.31	0.31	0.04	0.27	0.27
Sat Flow, veh/h	1701	1400	327	1701	1608	151	1701	801	834	1701	995	671
Grp Volume(v), veh/h	89	0	438	265	0	596	253	0	445	73	0	298
Grp Sat Flow(s),veh/h/ln	1701	0	1727	1701	0	1759	1701	0	1636	1701	0	1665
Q Serve(g_s), s	2.9	0.0	19.0	8.1	0.0	25.6	6.7	0.0	20.4	2.4	0.0	12.6
Cycle Q Clear(g_c), s	2.9	0.0	19.0	8.1	0.0	25.6	6.7	0.0	20.4	2.4	0.0	12.6
Prop In Lane	1.00		0.19	1.00		0.09	1.00		0.51	1.00		0.40
Lane Grp Cap(c), veh/h	213	0	501	354	0	642	349	0	505	213	0	447
V/C Ratio(X)	0.42	0.00	0.87	0.75	0.00	0.93	0.73	0.00	0.88	0.34	0.00	0.67
Avail Cap(c_a), veh/h	241	0	559	362	0	681	349	0	654	234	0	619
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.7	0.0	26.6	18.1	0.0	24.0	23.1	0.0	25.9	21.5	0.0	25.7
Incr Delay (d2), s/veh	1.3	0.0	13.4	8.2	0.0	18.5	7.4	0.0	11.0	0.9	0.0	1.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	9.4	3.8	0.0	13.4	2.1	0.0	9.0	1.0	0.0	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	22.0	0.0	40.0	26.3	0.0	42.5	30.5	0.0	36.8	22.4	0.0	27.4
LnGrp LOS	C		D	C		D	C		D	C		C
Approach Vol, veh/h		527			861			698			371	
Approach Delay, s/veh		37.0			37.5			34.5			26.4	
Approach LOS		D			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.0	28.8	14.6	27.3	11.2	25.7	8.7	33.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.5	31.5	10.5	25.5	6.7	29.3	5.5	30.5
Max Q Clear Time (g_c+I1), s	4.4	22.4	10.1	21.0	8.7	14.6	4.9	27.6
Green Ext Time (p_c), s	0.0	2.0	0.0	1.2	0.0	1.5	0.0	1.1

Intersection Summary	
HCM 7th Control Delay, s/veh	34.9
HCM 7th LOS	C

MOVEMENT SUMMARY

Site: [Forecast 2031 PM Peak Hour Background Volumes (Site Folder: 4)]

Tumwater Blvd SW & Littlerock Rd SW
Site Category: -
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: Littlerock Rd SW														
3u	U	5	1.0	5	1.0	0.340	15.3	LOS B	2.5	61.9	0.78	0.70	0.78	36.3
8	T1	266	1.0	283	1.0	0.340	6.9	LOS A	2.5	61.9	0.78	0.70	0.78	35.3
18	R2	301	1.0	320	1.0	0.299	6.6	LOS A	2.3	58.7	0.76	0.72	0.76	34.7
Approach		572	1.0	609	1.0	0.340	6.8	LOS A	2.5	61.9	0.77	0.71	0.77	35.0
East: Tumwater Blvd SW														
1u	U	5	1.0	5	1.0	0.452	13.6	LOS B	2.9	74.2	0.56	0.72	0.56	34.3
1	L2	452	1.0	481	1.0	0.452	11.2	LOS B	2.9	74.2	0.56	0.72	0.56	33.6
16	R2	512	1.0	545	1.0	0.466	6.2	LOS A	3.2	79.6	0.56	0.63	0.56	35.3
Approach		969	1.0	1031	1.0	0.466	8.6	LOS A	3.2	79.6	0.56	0.67	0.56	34.4
North: Littlerock Rd SW														
7u	U	5	1.0	5	1.0	0.727	17.7	LOS B	9.7	244.3	0.89	0.92	1.12	34.0
7	L2	525	1.0	559	1.0	0.727	15.3	LOS B	9.7	244.3	0.89	0.92	1.12	33.2
4	T1	488	1.0	519	1.0	0.727	9.0	LOS A	9.7	244.3	0.80	0.82	0.94	34.3
Approach		1018	1.0	1083	1.0	0.727	12.3	LOS B	9.7	244.3	0.85	0.88	1.03	33.7
All Vehicles		2559	1.0	2722	1.0	0.727	9.6	LOS A	9.7	244.3	0.72	0.76	0.79	34.3

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.

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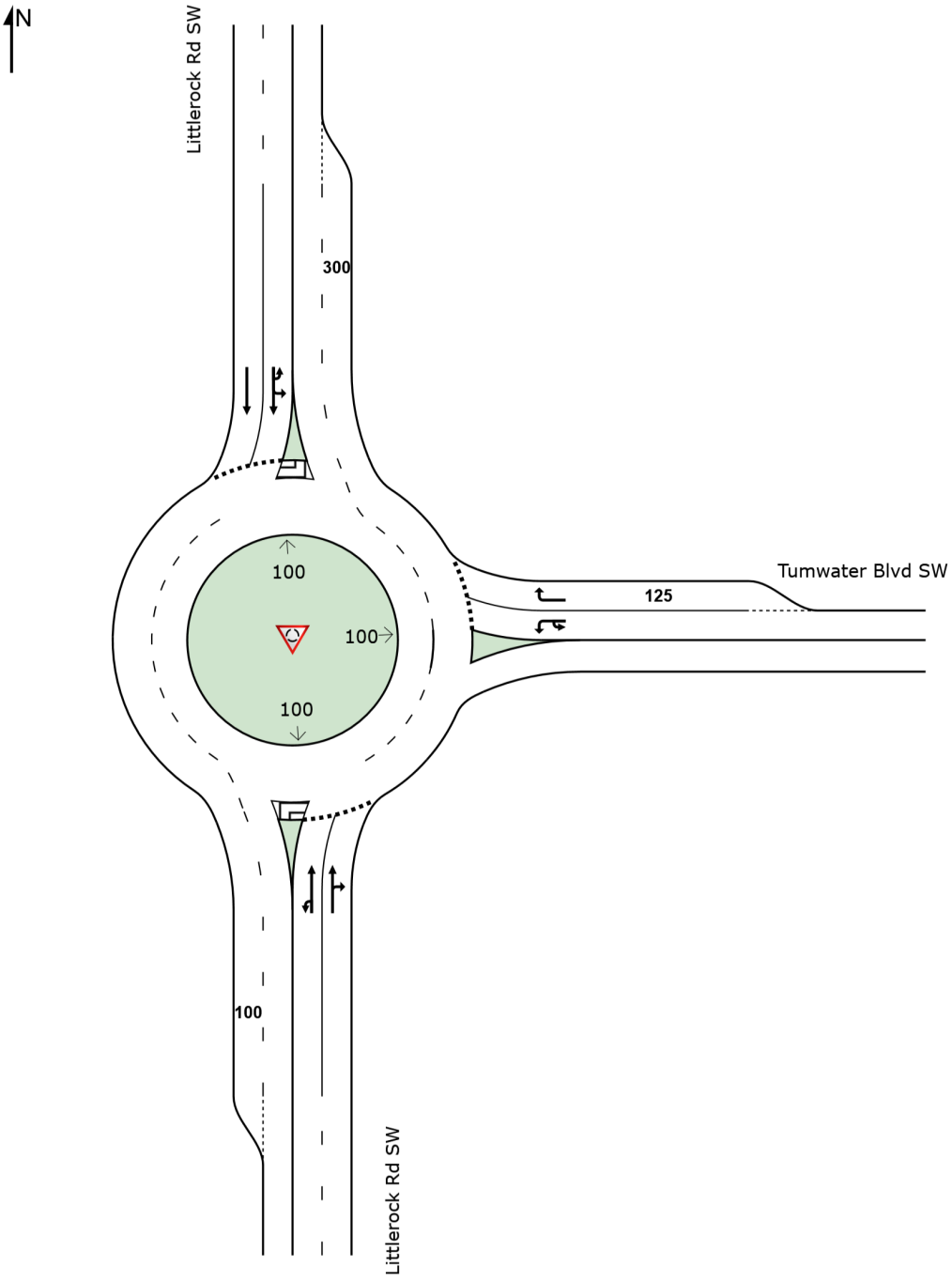
SITE LAYOUT

Site: [Forecast 2031 PM Peak Hour Background Volumes (Site Folder: 4)]

Tumwater Blvd SW & Littlerock Rd SW
Site Category: -
Roundabout

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



MOVEMENT SUMMARY

Site: 101 [Forecast 2031 PM Peak Hour Background Volumes (Site Folder: 5)]

Tumwater Blvd SW & Southbound I-5 Ramp
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: Tumwater Blvd SW														
1	L2	551	1.0	551	1.0	0.366	9.7	LOS A	0.0	0.0	0.00	0.67	0.00	34.9
6	T1	573	1.0	573	1.0	0.340	3.6	LOS A	0.0	0.0	0.00	0.37	0.00	38.3
Approach		1124	1.0	1124	1.0	0.366	6.6	LOS A	0.0	0.0	0.00	0.52	0.00	36.6
North: SB I-5 Ramp														
7	L2	720	4.0	720	4.0	0.722	17.2	LOS B	5.4	140.0	0.76	1.06	1.21	31.7
4	T1	51	4.0	51	4.0	0.722	9.9	LOS A	5.4	140.0	0.75	1.02	1.16	33.7
14	R2	499	4.0	499	4.0	0.722	10.4	LOS B	5.4	140.0	0.75	1.02	1.16	32.6
Approach		1270	4.0	1270	4.0	0.722	14.2	LOS B	5.4	140.0	0.76	1.04	1.19	32.1
West: Tumwater Blvd SW														
2	T1	737	1.0	737	1.0	0.655	10.9	LOS B	4.8	120.8	0.85	1.01	1.18	34.1
12	R2	160	1.0	160	1.0	0.655	10.5	LOS B	4.8	120.8	0.85	1.02	1.17	33.4
Approach		897	1.0	897	1.0	0.655	10.8	LOS B	4.8	120.8	0.85	1.02	1.18	33.9
All Vehicles		3291	2.2	3291	2.2	0.722	10.7	LOS B	5.4	140.0	0.52	0.86	0.78	34.0

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.

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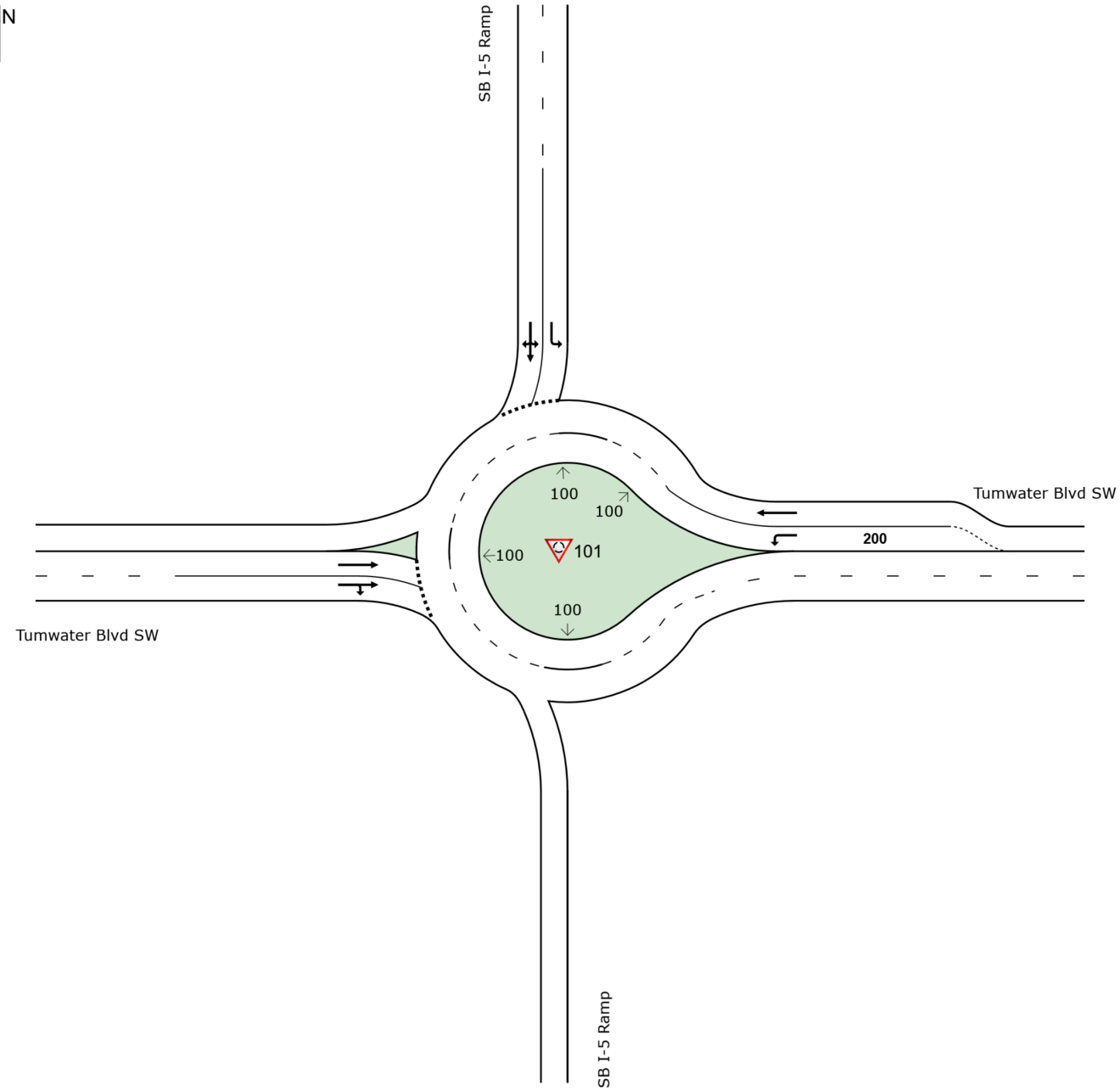
SITE LAYOUT

Site: 101 [Forecast 2031 PM Peak Hour Background Volumes (Site Folder: 5)]

Tumwater Blvd SW & Southbound I-5 Ramp
Site Category: (None)
Roundabout

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



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MOVEMENT SUMMARY

Site: [Forecast 2031 PM Peak Hour Background Volumes (Site Folder: 6)]

Tumwater Blvd SW & Northbound I-5 Ramp
Site Category: -
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: Northbound I-5 Ramp														
3	L2	102	3.0	102	3.0	0.122	12.9	LOS B	0.5	12.0	0.59	0.85	0.59	33.5
8	T1	10	3.0	10	3.0	0.122	663.7	LOS F	0.5	12.0	0.59	0.85	0.59	33.5
18	R2	243	3.0	243	3.0	0.261	7.2	LOS A	1.1	28.6	0.61	0.79	0.61	34.9
Approach		355	3.0	355	3.0	0.261	27.3	LOS C	1.1	28.6	0.60	0.81	0.60	34.4
East: Tumwater Blvd SW														
6	T1	1010	1.0	1010	1.0	0.762	9.1	LOS A	10.6	267.2	0.83	0.85	1.06	35.1
16	R2	2075	1.0	2075	1.0	1.252	58.0	LOS F	0.0	0.0	0.00	0.00	0.00	13.1
Approach		3085	1.0	3085	1.0	1.252	42.0	LOS D	10.6	267.2	0.27	0.28	0.35	16.5
West: Tumwater Blvd SW														
5	L2	300	3.0	300	3.0	0.462	666.6	LOS F	0.0	0.0	0.00	0.54	0.00	36.7
2	T1	1144	3.0	1144	3.0	0.462	3.6	LOS A	0.0	0.0	0.00	0.43	0.00	37.7
Approach		1444	3.0	1444	3.0	0.462	141.3	LOS F	0.0	0.0	0.00	0.45	0.00	37.5
All Vehicles		4884	1.7	4884	1.7	1.252	70.3	LOS E	10.6	267.2	0.22	0.37	0.26	20.8

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.

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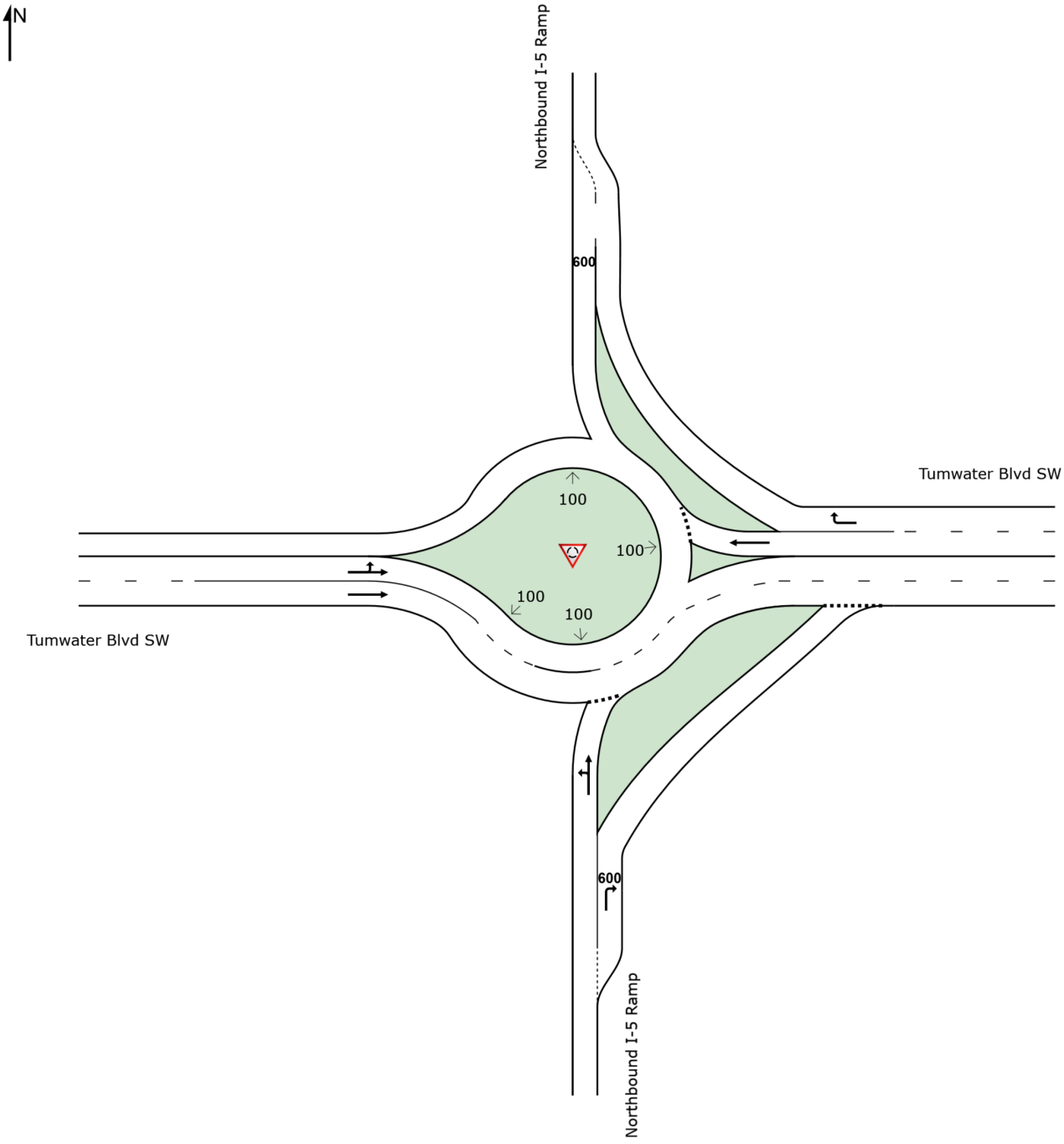
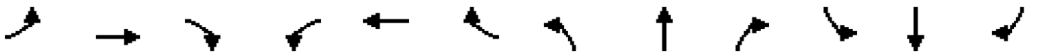
SITE LAYOUT

Site: [Forecast 2031 PM Peak Hour Background Volumes (Site Folder: 6)]

Tumwater Blvd SW & Northbound I-5 Ramp
Site Category: -
Roundabout

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

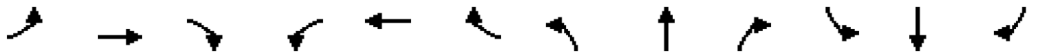




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	148	221	198	154	322	216	177	523	42	114	842	167
Future Volume (veh/h)	148	221	198	154	322	216	177	523	42	114	842	167
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	161	240	215	167	350	235	192	568	46	124	915	182
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
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	211	316	283	305	363	244	239	1213	98	360	1002	199
Arrive On Green	0.07	0.34	0.34	0.08	0.35	0.35	0.09	0.36	0.36	0.06	0.34	0.34
Sat Flow, veh/h	1795	916	821	1781	1044	701	1795	3356	271	1795	2978	592
Grp Volume(v), veh/h	161	0	455	167	0	585	192	303	311	124	550	547
Grp Sat Flow(s),veh/h/ln	1795	0	1737	1781	0	1744	1795	1791	1836	1795	1791	1779
Q Serve(g_s), s	6.6	0.0	27.0	6.9	0.0	38.2	8.0	15.1	15.1	5.2	34.1	34.2
Cycle Q Clear(g_c), s	6.6	0.0	27.0	6.9	0.0	38.2	8.0	15.1	15.1	5.2	34.1	34.2
Prop In Lane	1.00		0.47	1.00		0.40	1.00		0.15	1.00		0.33
Lane Grp Cap(c), veh/h	211	0	599	305	0	606	239	648	664	360	603	599
V/C Ratio(X)	0.76	0.00	0.76	0.55	0.00	0.96	0.80	0.47	0.47	0.34	0.91	0.91
Avail Cap(c_a), veh/h	225	0	601	320	0	609	253	661	678	393	635	630
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.3	0.0	33.7	25.2	0.0	37.1	27.8	28.4	28.5	23.3	36.8	36.9
Incr Delay (d2), s/veh	13.5	0.0	5.6	1.8	0.0	27.7	16.3	0.5	0.5	0.6	17.2	17.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	0.0	12.3	3.1	0.0	20.8	4.4	6.4	6.6	2.2	17.4	17.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	41.8	0.0	39.3	27.0	0.0	64.8	44.1	29.0	29.0	23.9	54.0	54.2
LnGrp LOS	D		D	C		E	D	C	C	C	D	D
Approach Vol, veh/h		616			752			806			1221	
Approach Delay, s/veh		39.9			56.4			32.6			51.1	
Approach LOS		D			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.6	46.4	13.4	44.5	14.5	43.5	13.1	44.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.2	42.8	9.9	40.1	10.9	41.1	9.5	40.5
Max Q Clear Time (g_c+I1), s	7.2	17.1	8.9	29.0	10.0	36.2	8.6	40.2
Green Ext Time (p_c), s	0.1	3.8	0.0	2.4	0.0	2.9	0.0	0.1

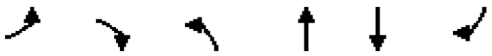
Intersection Summary	
HCM 7th Control Delay, s/veh	45.8
HCM 7th LOS	D



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	565	429	133	586	24	357	487	29	180	762	179
Future Volume (veh/h)	117	565	429	133	586	24	357	487	29	180	762	179
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	127	614	466	145	637	26	388	529	32	196	828	195
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
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	2	2	2
Cap, veh/h	151	678	575	170	702	595	446	938	57	223	966	431
Arrive On Green	0.09	0.37	0.37	0.10	0.38	0.38	0.13	0.28	0.28	0.13	0.27	0.27
Sat Flow, veh/h	1767	1856	1572	1781	1870	1585	3456	3405	206	1781	3554	1585
Grp Volume(v), veh/h	127	614	466	145	637	26	388	276	285	196	828	195
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1781	1870	1585	1728	1777	1833	1781	1777	1585
Q Serve(g_s), s	9.2	40.9	34.8	10.4	42.0	1.4	14.4	17.3	17.4	14.1	28.8	13.3
Cycle Q Clear(g_c), s	9.2	40.9	34.8	10.4	42.0	1.4	14.4	17.3	17.4	14.1	28.8	13.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	151	678	575	170	702	595	446	490	505	223	966	431
V/C Ratio(X)	0.84	0.91	0.81	0.85	0.91	0.04	0.87	0.56	0.57	0.88	0.86	0.45
Avail Cap(c_a), veh/h	183	790	670	212	825	699	517	541	558	291	1131	505
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.7	39.2	37.3	58.0	38.5	25.8	55.7	40.5	40.5	56.0	45.1	39.4
Incr Delay (d2), s/veh	24.1	12.7	6.5	22.7	12.4	0.0	13.4	1.1	1.1	20.7	6.0	0.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	20.6	14.2	5.8	21.3	0.5	7.0	7.7	8.0	7.6	13.4	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	82.8	51.9	43.8	80.7	50.9	25.9	69.1	41.6	41.6	76.8	51.0	40.2
LnGrp LOS	F	D	D	F	D	C	E	D	D	E	D	D
Approach Vol, veh/h		1207			808			949			1219	
Approach Delay, s/veh		52.0			55.5			52.8			53.4	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.8	40.4	17.0	52.1	21.3	39.9	15.7	53.4
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.3	39.7	15.5	55.5	19.5	41.5	13.5	57.5
Max Q Clear Time (g_c+I1), s	16.1	19.4	12.4	42.9	16.4	30.8	11.2	44.0
Green Ext Time (p_c), s	0.2	3.2	0.1	4.7	0.5	4.6	0.1	3.6

Intersection Summary	
HCM 7th Control Delay, s/veh	53.3
HCM 7th LOS	D



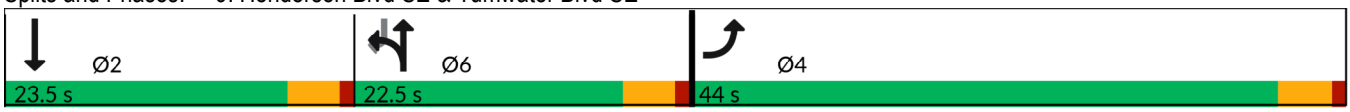
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1088	22	40	265	316	554
Future Volume (vph)	1088	22	40	265	316	554
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			100
Storage Lanes	1	0	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.997					0.850
Flt Protected	0.953			0.994		
Satd. Flow (prot)	1787	0	0	1870	1881	1599
Flt Permitted	0.953			0.994		
Satd. Flow (perm)	1787	0	0	1870	1881	1599
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	1					439
Link Speed (mph)	35			35	35	
Link Distance (ft)	1155			1066	1144	
Travel Time (s)	22.5			20.8	22.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	1183	24	43	288	343	602
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1207	0	0	331	343	602
Turn Type	Prot		Split	NA	NA	custom
Protected Phases	4		6	6	2	
Permitted Phases						6
Detector Phase	4		6	6	2	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	44.0		22.5	22.5	23.5	22.5
Total Split (%)	48.9%		25.0%	25.0%	26.1%	25.0%
Maximum Green (s)	39.5		18.0	18.0	19.0	18.0
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Min	Min	Min	Min
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	39.5			17.7	18.3	17.7
Actuated g/C Ratio	0.44			0.20	0.21	0.20
v/c Ratio	1.52			0.89	0.89	0.90
Control Delay (s/veh)	265.0			62.7	60.6	28.5
Queue Delay	0.0			0.0	0.0	0.0

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay (s/veh)	265.0			62.7	60.6	28.5
LOS	F			E	E	C
Approach Delay (s/veh)	265.0			62.7	40.2	
Approach LOS	F			E	D	
Queue Length 50th (ft)	~985			184	190	91
Queue Length 95th (ft)	#1234			#336	#339	#304
Internal Link Dist (ft)	1075			986	1064	
Turn Bay Length (ft)						100
Base Capacity (vph)	794			378	402	674
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	1.52			0.88	0.85	0.89

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 89			
Natural Cycle: 110			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.52			
Intersection Signal Delay (s/veh): 152.5		Intersection LOS: F	
Intersection Capacity Utilization 105.7%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: Henderson Blvd SE & Tumwater Blvd SE



Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	74	0	999	1146	37
Future Vol, veh/h	0	74	0	999	1146	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	0	76	0	1030	1181	38

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1201	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	228	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	228	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	28.59	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	228	-	-
HCM Lane V/C Ratio	-	0.335	-	-
HCM Control Delay (s/veh)	-	28.6	-	-
HCM Lane LOS	-	D	-	-
HCM 95th %tile Q(veh)	-	1.4	-	-

MOVEMENT SUMMARY

Site: [Forecast 2031 PM Peak Hour Background Volumes (Site Folder: 11)]

Littlerock Rd SW & Kingswood Dr SW
Site Category: -
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: Littlerock Rd SW														
3u	U	5	1.0	5	1.0	0.897	14.2	LOS D	17.4	437.6	0.94	0.57	0.94	35.9
8	T1	906	1.0	974	1.0	0.897	5.8	LOS D	17.4	437.6	0.94	0.57	0.94	34.9
18	R2	200	1.0	215	1.0	0.897	5.8	LOS D	17.4	437.6	0.94	0.57	0.94	33.9
Approach		1111	1.0	1195	1.0	0.897	5.8	LOS A	17.4	437.6	0.94	0.57	0.94	34.8
East: Kingswood Dr SW														
1u	U	5	1.0	5	1.0	0.532	21.9	LOS C	5.8	146.4	1.00	1.00	1.17	31.2
1	L2	300	1.0	323	1.0	0.532	19.5	LOS B	5.8	146.4	1.00	1.00	1.17	30.5
16	R2	122	1.0	131	1.0	0.293	11.8	LOS B	2.3	56.9	0.98	0.94	0.98	32.6
Approach		427	1.0	459	1.0	0.532	17.3	LOS B	5.8	146.4	0.99	0.98	1.12	31.1
North: Littlerock Rd SW														
7u	U	5	1.0	5	1.0	0.120	13.9	LOS B	0.7	17.3	0.54	0.69	0.54	34.4
7	L2	95	1.0	102	1.0	0.120	11.5	LOS B	0.7	17.3	0.54	0.69	0.54	33.6
4	T1	927	1.0	997	1.0	0.758	7.6	LOS A	10.8	272.3	0.89	0.78	1.01	35.0
Approach		1027	1.0	1104	1.0	0.758	8.0	LOS A	10.8	272.3	0.85	0.77	0.96	34.8
All Vehicles		2565	1.0	2758	1.0	0.897	8.6	LOS A	17.4	437.6	0.91	0.72	0.98	34.1

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.

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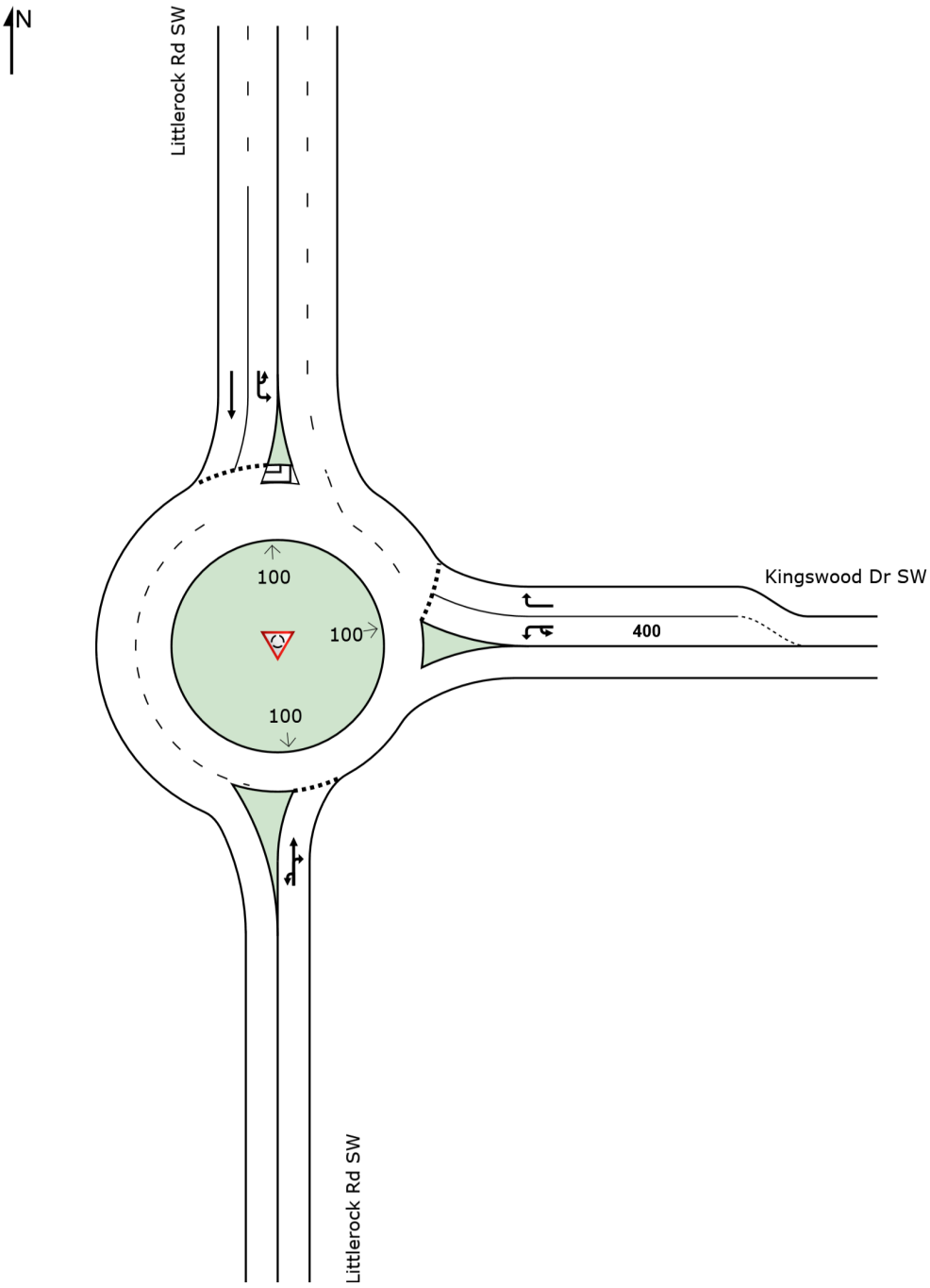
SITE LAYOUT

Site: [Forecast 2031 PM Peak Hour Background Volumes (Site Folder: 11)]

Littlerock Rd SW & Kingswood Dr SW
Site Category: -
Roundabout

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



MOVEMENT SUMMARY

Site: [Forecast 2031 PM Peak Hour Volumes With Project (Site Folder: 1)]

Israel Rd SW & Littlerock Rd SW
Site Category: -
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: Littlerock Rd SW														
3u	U	5	1.0	5	1.0	1.188	113.8	LOS F	71.2	1793.1	1.00	3.01	5.97	14.0
3	L2	386	1.0	406	1.0	1.188	111.4	LOS F	71.2	1793.1	1.00	3.01	5.97	13.9
8	T1	499	1.0	525	1.0	1.188	105.4	LOS F	71.2	1793.1	1.00	3.01	5.97	13.9
18	R2	57	1.0	60	1.0	1.188	105.6	LOS F	71.2	1793.1	1.00	3.01	5.97	13.7
Approach		947	1.0	997	1.0	1.188	107.9	LOS F	71.2	1793.1	1.00	3.01	5.97	13.9
East: Israel Rd SW														
1u	U	5	1.0	5	1.0	0.837	37.6	LOS D	10.9	275.7	1.00	1.31	1.87	26.8
1	L2	100	1.0	105	1.0	0.837	35.2	LOS D	10.9	275.7	1.00	1.31	1.87	26.3
6	T1	262	1.0	276	1.0	0.837	29.2	LOS C	10.9	275.7	1.00	1.31	1.87	26.3
16	R2	465	1.0	489	1.0	0.880	32.3	LOS D	14.7	370.4	1.00	1.41	2.08	25.0
Approach		832	1.0	876	1.0	0.880	31.7	LOS C	14.7	370.4	1.00	1.37	1.99	25.6
North: Littlerock Rd SW														
7u	U	5	1.0	5	1.0	0.696	23.1	LOS C	8.2	206.7	0.97	1.14	1.39	31.3
7	L2	341	1.0	359	1.0	0.696	20.7	LOS C	8.2	206.7	0.97	1.14	1.39	30.7
4	T1	624	1.0	657	1.0	0.696	13.0	LOS B	9.3	234.3	0.98	1.08	1.36	32.6
14	R2	184	1.0	194	1.0	0.696	12.8	LOS B	9.3	234.3	0.99	1.06	1.35	32.3
Approach		1154	1.0	1215	1.0	0.696	15.3	LOS B	9.3	234.3	0.98	1.09	1.37	31.9
West: Israel Rd SW														
5u	U	5	1.0	5	1.0	0.461	15.7	LOS B	2.8	70.8	0.81	0.89	0.91	34.9
5	L2	162	1.0	171	1.0	0.461	13.3	LOS B	2.8	70.8	0.81	0.89	0.91	34.1
2	T1	147	1.0	155	1.0	0.461	7.3	LOS A	2.8	70.8	0.81	0.89	0.91	34.1
12	R2	121	1.0	127	1.0	0.253	7.8	LOS A	1.2	29.3	0.74	0.87	0.74	34.5
Approach		435	1.0	458	1.0	0.461	9.8	LOS A	2.8	70.8	0.79	0.88	0.86	34.2
All Vehicles		3368	1.0	3545	1.0	1.188	44.7	LOS D	71.2	1793.1	0.97	1.67	2.75	22.5

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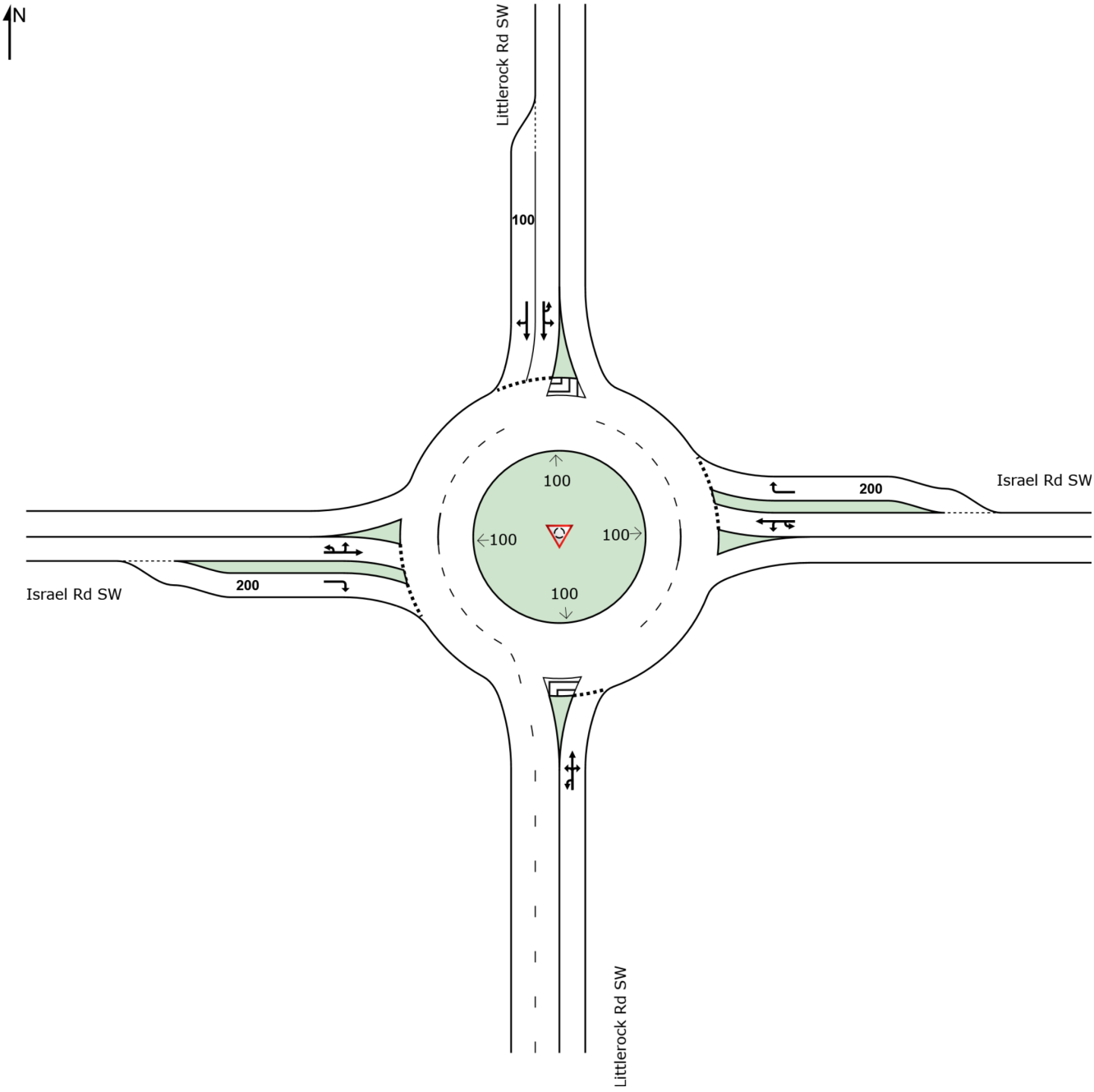
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: [Forecast 2031 PM Peak Hour Volumes With Project (Site Folder: 1)]

Israel Rd SW & Littlerock Rd SW
Site Category: -
Roundabout

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



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MOVEMENT SUMMARY

Site: [Forecast 2031 PM Peak Hour Volumes With Project (Site Folder: 2)]

Israel Rd SW & Tyee Dr SW
Site Category: -
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: Tyee Dr SW														
3u	U	1	1.0	1	1.0	0.354	18.8	LOS B	2.4	60.7	0.88	0.92	0.88	34.2
3	L2	63	1.0	70	1.0	0.354	16.4	LOS B	2.4	60.7	0.88	0.92	0.88	33.5
8	T1	48	1.0	53	1.0	0.354	10.4	LOS B	2.4	60.7	0.88	0.92	0.88	33.4
18	R2	71	1.0	79	1.0	0.354	10.5	LOS B	2.4	60.7	0.88	0.92	0.88	32.4
Approach		183	1.0	203	1.0	0.354	12.5	LOS B	2.4	60.7	0.88	0.92	0.88	33.0
East: Israel Rd SW														
1u	U	3	1.0	3	1.0	1.032	43.0	LOS F	46.4	1170.1	1.00	1.35	2.10	25.4
1	L2	98	3.0	107	3.0	1.032	40.7	LOS F	46.4	1170.1	1.00	1.35	2.10	24.9
6	T1	450	1.0	500	1.0	1.032	34.6	LOS F	46.4	1170.1	1.00	1.35	2.10	24.9
16	R2	477	1.0	530	1.0	1.032	34.6	LOS F	46.4	1170.1	1.00	1.35	2.10	24.4
Approach		1028	1.2	1140	1.2	1.032	35.2	LOS D	46.4	1170.1	1.00	1.35	2.10	24.7
North: Tyee Dr SW														
7u	U	2	1.0	2	1.0	0.665	19.8	LOS B	7.9	199.1	0.99	1.04	1.26	32.3
7	L2	451	1.0	501	1.0	0.665	17.4	LOS B	7.9	199.1	0.99	1.04	1.26	31.6
4	T1	53	3.0	58	3.0	0.665	11.6	LOS B	7.9	199.1	0.99	1.04	1.26	31.5
14	R2	113	1.0	126	1.0	0.235	9.2	LOS A	1.4	36.2	0.79	0.84	0.79	33.9
Approach		619	1.2	686	1.2	0.665	15.4	LOS B	7.9	199.1	0.95	1.00	1.17	32.0
West: Israel Rd SW														
5u	U	3	2.6	3	2.6	0.807	26.4	LOS C	11.1	284.6	1.00	1.23	1.60	31.2
5	L2	70	2.6	78	2.6	0.807	24.0	LOS C	11.1	284.6	1.00	1.23	1.60	30.5
2	T1	276	2.6	307	2.6	0.807	18.0	LOS B	11.1	284.6	1.00	1.23	1.60	30.5
12	R2	147	3.0	160	3.0	0.807	18.1	LOS B	11.1	284.6	1.00	1.23	1.60	29.7
Approach		496	2.7	548	2.7	0.807	18.9	LOS B	11.1	284.6	1.00	1.23	1.60	30.2
All Vehicles		2326	1.5	2577	1.5	1.032	24.7	LOS C	46.4	1170.1	0.98	1.20	1.65	28.1

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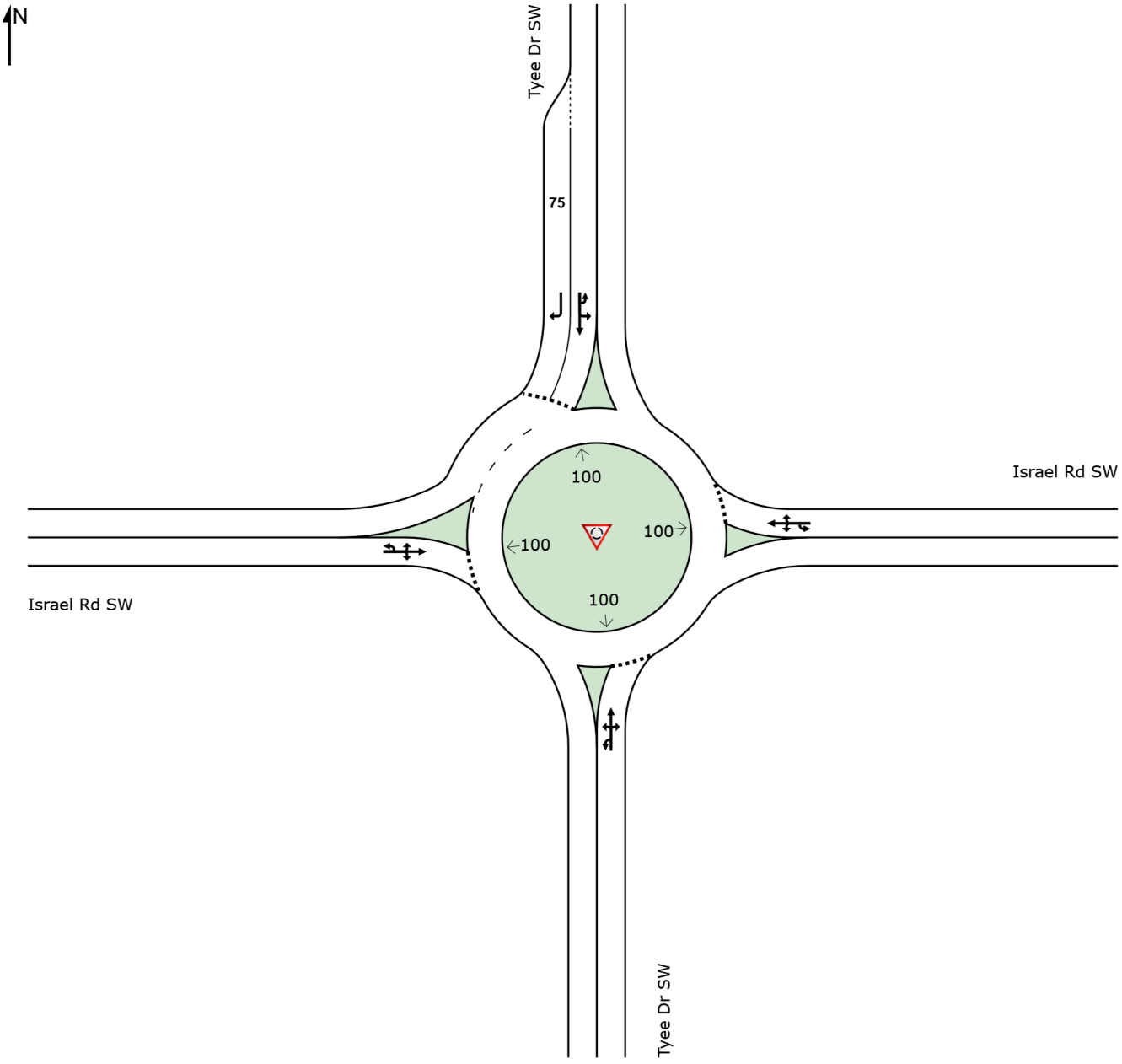
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: [Forecast 2031 PM Peak Hour Volumes With Project (Site Folder: 2)]

Israel Rd SW & Tyee Dr SW
Site Category: -
Roundabout

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



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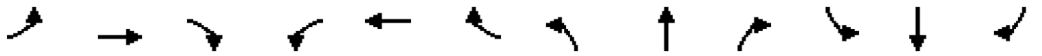


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	337	80	220	514	42	227	181	188	61	148	106
Future Volume (veh/h)	78	337	80	220	514	42	227	181	188	61	148	106
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1786	1786	1786	1786	1786	1786	1786	1786	1786	1786	1786	1786
Adj Flow Rate, veh/h	94	406	96	265	619	51	273	218	227	73	178	128
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	180	430	102	319	615	51	331	245	255	204	260	187
Arrive On Green	0.05	0.31	0.31	0.12	0.38	0.38	0.08	0.31	0.31	0.04	0.27	0.27
Sat Flow, veh/h	1701	1396	330	1701	1628	134	1701	801	834	1701	966	695
Grp Volume(v), veh/h	94	0	502	265	0	670	273	0	445	73	0	306
Grp Sat Flow(s),veh/h/ln	1701	0	1727	1701	0	1762	1701	0	1636	1701	0	1661
Q Serve(g_s), s	3.1	0.0	23.5	8.3	0.0	31.3	6.7	0.0	21.5	2.5	0.0	13.7
Cycle Q Clear(g_c), s	3.1	0.0	23.5	8.3	0.0	31.3	6.7	0.0	21.5	2.5	0.0	13.7
Prop In Lane	1.00		0.19	1.00		0.08	1.00		0.51	1.00		0.42
Lane Grp Cap(c), veh/h	180	0	532	319	0	666	331	0	500	204	0	447
V/C Ratio(X)	0.52	0.00	0.94	0.83	0.00	1.01	0.82	0.00	0.89	0.36	0.00	0.68
Avail Cap(c_a), veh/h	200	0	532	323	0	666	331	0	623	221	0	588
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.7	0.0	27.9	19.0	0.0	25.7	26.5	0.0	27.4	22.6	0.0	27.1
Incr Delay (d2), s/veh	2.4	0.0	25.8	16.2	0.0	36.4	15.4	0.0	12.8	1.1	0.0	2.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	13.2	4.5	0.0	19.2	3.7	0.0	9.8	1.0	0.0	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	24.1	0.0	53.7	35.2	0.0	62.2	41.9	0.0	40.3	23.7	0.0	29.2
LnGrp LOS	C		D	D		F	D		D	C		C
Approach Vol, veh/h		596			935			718			379	
Approach Delay, s/veh		49.0			54.5			40.9			28.2	
Approach LOS		D			D			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	8.2	29.8	14.8	30.0	11.2	26.8	9.0	35.8
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	4.5	31.5	10.5	25.5	6.7	29.3	5.5	30.5
Max Q Clear Time (g_c+I1), s	4.5	23.5	10.3	25.5	8.7	15.7	5.1	33.3
Green Ext Time (p_c), s	0.0	1.8	0.0	0.0	0.0	1.5	0.0	0.0

Intersection Summary	
HCM 7th Control Delay, s/veh	45.8
HCM 7th LOS	D

MOVEMENT SUMMARY

Site: [Forecast 2031 PM Peak Hour Volumes With Project (Site Folder: 4)]

Tumwater Blvd SW & Littlerock Rd SW
Site Category: -
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: Littlerock Rd SW														
3u	U	5	1.0	5	1.0	0.308	14.7	LOS B	2.1	54.0	0.71	0.64	0.71	36.5
8	T1	266	1.0	283	1.0	0.308	6.3	LOS A	2.1	54.0	0.71	0.64	0.71	35.5
18	R2	312	1.0	332	1.0	0.284	6.1	LOS A	2.1	53.6	0.69	0.68	0.69	34.9
Approach		583	1.0	620	1.0	0.308	6.3	LOS A	2.1	54.0	0.70	0.66	0.70	35.2
East: Tumwater Blvd SW														
1u	U	5	1.0	5	1.0	0.453	13.6	LOS B	2.9	73.7	0.55	0.72	0.55	34.4
1	L2	460	1.0	489	1.0	0.453	11.2	LOS B	2.9	73.7	0.55	0.72	0.55	33.6
16	R2	497	1.0	529	1.0	0.449	6.1	LOS A	3.0	74.4	0.54	0.63	0.54	35.3
Approach		962	1.0	1023	1.0	0.453	8.6	LOS A	3.0	74.4	0.55	0.67	0.55	34.5
North: Littlerock Rd SW														
7u	U	5	1.0	5	1.0	0.675	16.8	LOS B	8.0	201.9	0.86	0.88	1.03	34.4
7	L2	450	1.0	479	1.0	0.675	14.4	LOS B	8.0	201.9	0.86	0.88	1.03	33.7
4	T1	488	1.0	519	1.0	0.675	8.5	LOS A	8.0	201.9	0.78	0.80	0.89	34.5
Approach		943	1.0	1003	1.0	0.675	11.4	LOS B	8.0	201.9	0.82	0.84	0.95	34.1
All Vehicles		2488	1.0	2647	1.0	0.675	9.1	LOS A	8.0	201.9	0.69	0.73	0.74	34.5

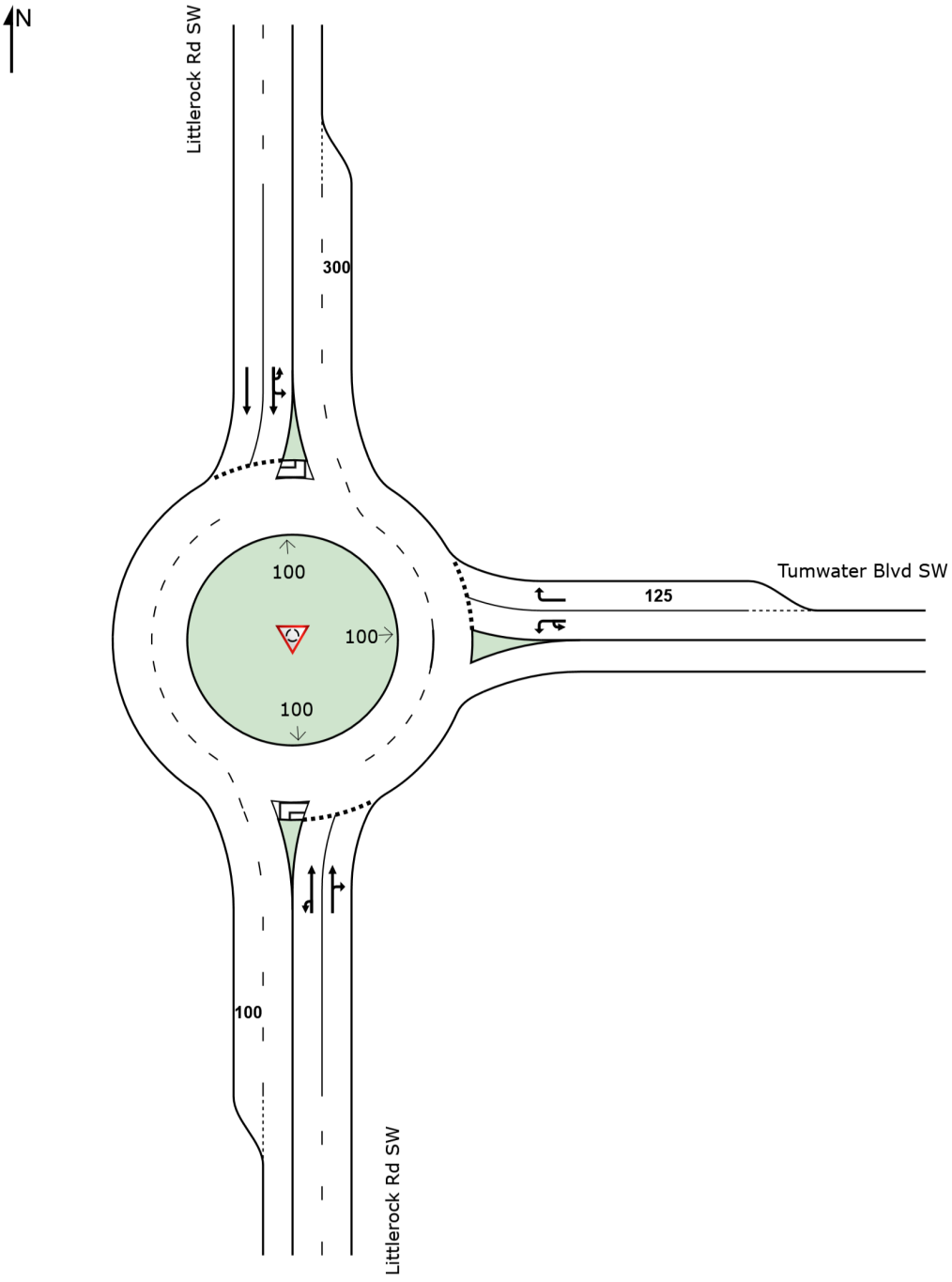
Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per 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: [Forecast 2031 PM Peak Hour Volumes With Project (Site Folder: 4)]

Tumwater Blvd SW & Littlerock Rd SW
Site Category: -
Roundabout

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



MOVEMENT SUMMARY

Site: 101 [Forecast 2031 PM Peak Hour Volumes With Project (Site Folder: 5)]

Tumwater Blvd SW & Southbound I-5 Ramp
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: Tumwater Blvd SW														
1	L2	551	1.0	551	1.0	0.368	9.7	LOS A	0.0	0.0	0.00	0.67	0.00	34.9
6	T1	603	1.0	603	1.0	0.357	3.6	LOS A	0.0	0.0	0.00	0.37	0.00	38.3
Approach		1154	1.0	1154	1.0	0.368	6.5	LOS A	0.0	0.0	0.00	0.51	0.00	36.6
North: SB I-5 Ramp														
7	L2	720	4.0	720	4.0	0.792	19.2	LOS B	7.1	182.3	0.81	1.14	1.45	30.7
4	T1	51	4.0	51	4.0	0.792	11.6	LOS B	7.1	182.3	0.80	1.10	1.38	33.1
14	R2	605	4.0	605	4.0	0.792	12.0	LOS B	7.1	182.3	0.80	1.10	1.38	32.0
Approach		1376	4.0	1376	4.0	0.792	15.8	LOS B	7.1	182.3	0.80	1.12	1.42	31.4
West: Tumwater Blvd SW														
2	T1	805	1.0	805	1.0	0.721	11.6	LOS B	5.7	142.7	0.87	1.05	1.28	33.7
12	R2	184	1.0	184	1.0	0.721	11.1	LOS B	5.7	142.7	0.87	1.06	1.27	33.1
Approach		989	1.0	989	1.0	0.721	11.5	LOS B	5.7	142.7	0.87	1.05	1.28	33.6
All Vehicles		3519	2.2	3519	2.2	0.792	11.5	LOS B	7.1	182.3	0.56	0.90	0.91	33.6

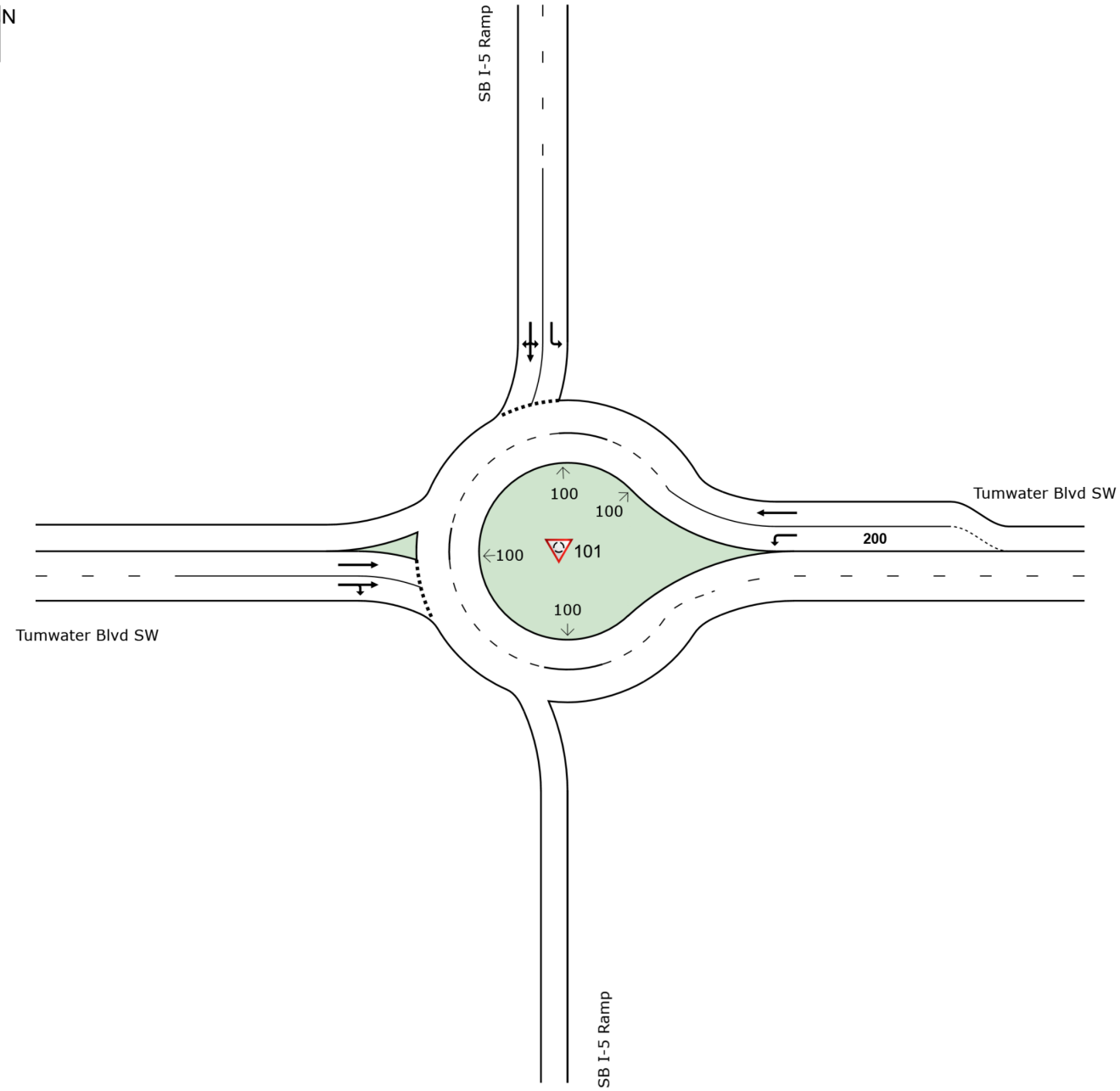
Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per 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: 101 [Forecast 2031 PM Peak Hour Volumes With Project (Site Folder: 5)]

Tumwater Blvd SW & Southbound I-5 Ramp
Site Category: (None)
Roundabout

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



Organisation: HEATH & ASSOCIATES | Licence: PLUS / 1PC | Created: Thursday, August 17, 2023 10:48:26 AM
Project: C:\Users\kyoung.HEATH\Heath and Associates\Traffic Studies - Documents\Sidra\4917\Yorkshire August 2023 Update.sip9

MOVEMENT SUMMARY

Site: [Forecast 2031 PM Peak Hour Volumes With Project (Site Folder: 6)]

Tumwater Blvd SW & Northbound I-5 Ramp
Site Category: -
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: Northbound I-5 Ramp														
3	L2	125	3.0	125	3.0	0.151	13.2	LOS B	0.6	15.2	0.61	0.87	0.61	33.3
8	T1	10	3.0	10	3.0	0.151	880.4	LOS F	0.6	15.2	0.61	0.87	0.61	33.3
18	R2	243	3.0	243	3.0	0.265	7.4	LOS A	1.2	29.7	0.62	0.80	0.62	34.8
Approach		378	3.0	378	3.0	0.265	32.4	LOS C	1.2	29.7	0.62	0.82	0.62	34.3
East: Tumwater Blvd SW														
6	T1	1017	1.0	1017	1.0	0.812	11.9	LOS B	13.5	340.5	0.92	1.01	1.34	33.6
16	R2	2075	1.0	2075	1.0	1.252	58.0	LOS F	0.0	0.0	0.00	0.00	0.00	13.1
Approach		3092	1.0	3092	1.0	1.252	42.8	LOS D	13.5	340.5	0.30	0.33	0.44	16.4
West: Tumwater Blvd SW														
5	L2	363	3.0	363	3.0	0.484	883.0	LOS F	0.0	0.0	0.00	0.57	0.00	36.4
2	T1	1149	3.0	1149	3.0	0.484	3.6	LOS A	0.0	0.0	0.00	0.43	0.00	37.7
Approach		1512	3.0	1512	3.0	0.484	214.7	LOS F	0.0	0.0	0.00	0.46	0.00	37.4
All Vehicles		4982	1.8	4982	1.8	1.252	94.2	LOS F	13.5	340.5	0.23	0.41	0.32	20.8

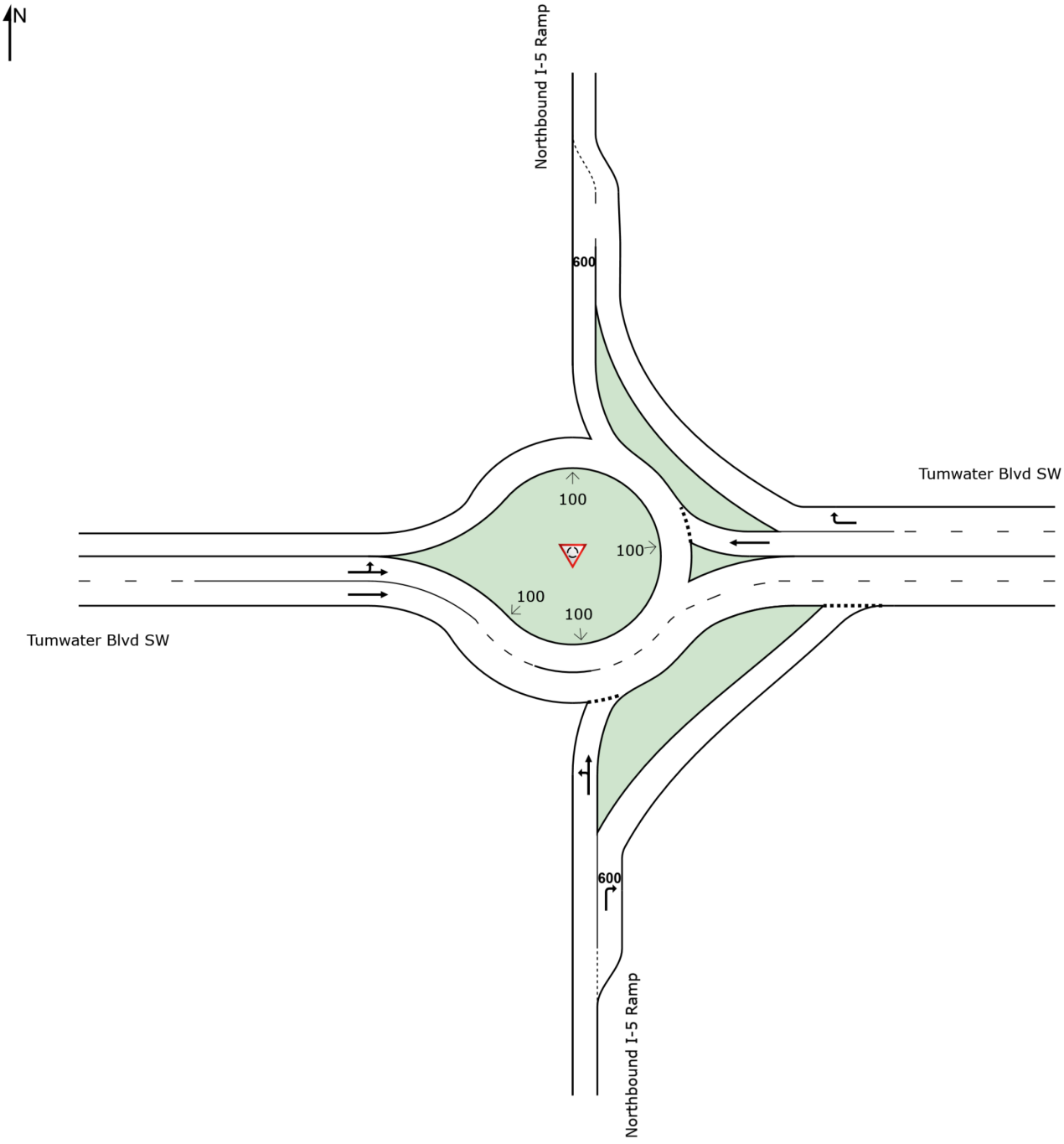
Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per 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.

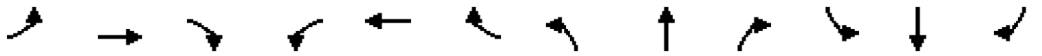
SITE LAYOUT

Site: [Forecast 2031 PM Peak Hour Volumes With Project (Site Folder: 6)]

Tumwater Blvd SW & Northbound I-5 Ramp
Site Category: -
Roundabout

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

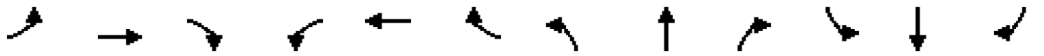




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	153	224	228	154	326	216	221	523	42	114	842	174
Future Volume (veh/h)	153	224	228	154	326	216	221	523	42	114	842	174
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1870	1870	1870	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	166	243	248	167	354	235	240	568	46	124	915	189
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
Percent Heavy Veh, %	1	1	1	2	2	2	1	1	1	1	1	1
Cap, veh/h	205	293	299	272	360	239	246	1231	99	364	991	205
Arrive On Green	0.08	0.34	0.34	0.08	0.34	0.34	0.09	0.37	0.37	0.06	0.34	0.34
Sat Flow, veh/h	1795	855	873	1781	1049	696	1795	3356	271	1795	2956	610
Grp Volume(v), veh/h	166	0	491	167	0	589	240	303	311	124	554	550
Grp Sat Flow(s),veh/h/ln	1795	0	1728	1781	0	1745	1795	1791	1836	1795	1791	1775
Q Serve(g_s), s	7.0	0.0	30.8	7.1	0.0	39.4	10.4	15.2	15.2	5.3	35.1	35.2
Cycle Q Clear(g_c), s	7.0	0.0	30.8	7.1	0.0	39.4	10.4	15.2	15.2	5.3	35.1	35.2
Prop In Lane	1.00		0.51	1.00		0.40	1.00		0.15	1.00		0.34
Lane Grp Cap(c), veh/h	205	0	592	272	0	599	246	657	673	364	601	595
V/C Ratio(X)	0.81	0.00	0.83	0.61	0.00	0.98	0.97	0.46	0.46	0.34	0.92	0.92
Avail Cap(c_a), veh/h	213	0	592	284	0	599	246	657	673	395	624	619
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.9	0.0	35.6	26.8	0.0	38.4	29.2	28.5	28.5	23.7	37.7	37.7
Incr Delay (d2), s/veh	19.8	0.0	9.6	3.6	0.0	32.3	50.2	0.5	0.5	0.6	19.0	19.3
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	0.0	14.5	3.3	0.0	22.1	7.8	6.5	6.7	2.3	18.2	18.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	48.6	0.0	45.2	30.5	0.0	70.6	79.4	29.0	29.0	24.3	56.7	57.0
LnGrp LOS	D		D	C		E	E	C	C	C	E	E
Approach Vol, veh/h		657			756			854			1228	
Approach Delay, s/veh		46.1			61.8			43.1			53.6	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.7	47.7	13.6	44.9	15.4	44.0	13.5	45.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.2	42.8	9.9	40.1	10.9	41.1	9.5	40.5
Max Q Clear Time (g_c+I1), s	7.3	17.2	9.1	32.8	12.4	37.2	9.0	41.4
Green Ext Time (p_c), s	0.0	3.8	0.0	2.0	0.0	2.4	0.0	0.0

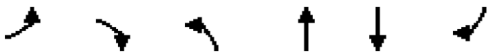
Intersection Summary	
HCM 7th Control Delay, s/veh	51.4
HCM 7th LOS	D



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	117	565	429	133	586	45	357	504	29	194	773	179
Future Volume (veh/h)	117	565	429	133	586	45	357	504	29	194	773	179
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Lane Width Adj.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	127	614	466	145	637	49	388	548	32	211	840	195
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
Percent Heavy Veh, %	3	3	3	2	2	2	2	2	2	2	2	2
Cap, veh/h	151	677	574	170	701	594	445	919	54	237	973	434
Arrive On Green	0.09	0.36	0.36	0.10	0.37	0.37	0.13	0.27	0.27	0.13	0.27	0.27
Sat Flow, veh/h	1767	1856	1572	1781	1870	1585	3456	3412	199	1781	3554	1585
Grp Volume(v), veh/h	127	614	466	145	637	49	388	285	295	211	840	195
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1781	1870	1585	1728	1777	1835	1781	1777	1585
Q Serve(g_s), s	9.3	41.3	35.1	10.5	42.4	2.6	14.5	18.3	18.4	15.3	29.5	13.4
Cycle Q Clear(g_c), s	9.3	41.3	35.1	10.5	42.4	2.6	14.5	18.3	18.4	15.3	29.5	13.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	151	677	574	170	701	594	445	479	494	237	973	434
V/C Ratio(X)	0.84	0.91	0.81	0.85	0.91	0.08	0.87	0.60	0.60	0.89	0.86	0.45
Avail Cap(c_a), veh/h	182	784	664	210	818	694	513	537	554	289	1122	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.2	39.6	37.7	58.5	38.9	26.5	56.2	41.8	41.8	56.0	45.4	39.5
Incr Delay (d2), s/veh	24.5	13.0	6.7	23.1	12.7	0.1	13.8	1.5	1.4	23.8	6.4	0.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	20.9	14.4	5.8	21.5	1.0	7.1	8.2	8.5	8.4	13.7	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	83.7	52.7	44.4	81.6	51.7	26.6	69.9	43.2	43.2	79.8	51.8	40.2
LnGrp LOS	F	D	D	F	D	C	E	D	D	E	D	D
Approach Vol, veh/h		1207			831			968			1246	
Approach Delay, s/veh		52.7			55.4			53.9			54.7	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	39.9	17.1	52.4	21.4	40.5	15.8	53.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	21.3	39.7	15.5	55.5	19.5	41.5	13.5	57.5
Max Q Clear Time (g_c+I1), s	17.3	20.4	12.5	43.3	16.5	31.5	11.3	44.4
Green Ext Time (p_c), s	0.2	3.3	0.1	4.7	0.4	4.4	0.1	3.6

Intersection Summary	
HCM 7th Control Delay, s/veh	54.1
HCM 7th LOS	D



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	1102	22	40	265	316	575
Future Volume (vph)	1102	22	40	265	316	575
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	0			100
Storage Lanes	1	0	0			1
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	0.997					0.850
Flt Protected	0.953			0.994		
Satd. Flow (prot)	1787	0	0	1870	1881	1599
Flt Permitted	0.953			0.994		
Satd. Flow (perm)	1787	0	0	1870	1881	1599
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	1					456
Link Speed (mph)	35			35	35	
Link Distance (ft)	1155			1066	1144	
Travel Time (s)	22.5			20.8	22.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%
Adj. Flow (vph)	1198	24	43	288	343	625
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1222	0	0	331	343	625
Turn Type	Prot		Split	NA	NA	custom
Protected Phases	4		6	6	2	
Permitted Phases						6
Detector Phase	4		6	6	2	6
Switch Phase						
Minimum Initial (s)	5.0		5.0	5.0	5.0	5.0
Minimum Split (s)	22.5		22.5	22.5	22.5	22.5
Total Split (s)	44.0		22.5	22.5	23.5	22.5
Total Split (%)	48.9%		25.0%	25.0%	26.1%	25.0%
Maximum Green (s)	39.5		18.0	18.0	19.0	18.0
Yellow Time (s)	3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0			0.0	0.0	0.0
Total Lost Time (s)	4.5			4.5	4.5	4.5
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)	3.0		3.0	3.0	3.0	3.0
Recall Mode	None		Min	Min	Min	Min
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	39.5			17.7	18.3	17.7
Actuated g/C Ratio	0.44			0.20	0.21	0.20
v/c Ratio	1.54			0.89	0.89	0.92
Control Delay (s/veh)	273.3			62.7	60.6	30.3
Queue Delay	0.0			0.0	0.0	0.0

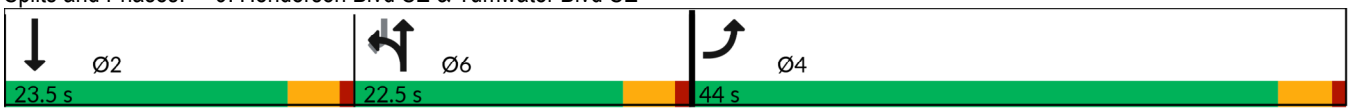
Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Total Delay (s/veh)	273.3			62.7	60.6	30.3
LOS	F			E	E	C
Approach Delay (s/veh)	273.3			62.7	41.0	
Approach LOS	F			E	D	
Queue Length 50th (ft)	~1003			184	190	96
Queue Length 95th (ft)	#1254			#336	#339	#319
Internal Link Dist (ft)	1075			986	1064	
Turn Bay Length (ft)						100
Base Capacity (vph)	794			378	402	687
Starvation Cap Reductn	0			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	1.54			0.88	0.85	0.91

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 89			
Natural Cycle: 120			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 1.54			
Intersection Signal Delay (s/veh): 156.4		Intersection LOS: F	
Intersection Capacity Utilization 106.4%		ICU Level of Service G	
Analysis Period (min) 15			

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: Henderson Blvd SE & Tumwater Blvd SE



Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	85	0	1011	1164	37
Future Vol, veh/h	0	85	0	1011	1164	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	Free	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	97	97	97	97	97	97
Heavy Vehicles, %	0	0	1	1	1	1
Mvmt Flow	0	88	0	1042	1200	38

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	1219	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.2	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.3	-	-	-	-
Pot Cap-1 Maneuver	0	222	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	222	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s/v	31.42	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	222	-	-
HCM Lane V/C Ratio	-	0.395	-	-
HCM Control Delay (s/veh)	-	31.4	-	-
HCM Lane LOS	-	D	-	-
HCM 95th %tile Q(veh)	-	1.8	-	-

MOVEMENT SUMMARY

Site: [Forecast 2031 PM Peak Hour Volumes With Project (Site Folder: 11)]

Littlerock Rd SW & Kingswood Dr SW
Site Category: -
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: Littlerock Rd SW														
3u	U	5	1.0	5	1.0	0.907	14.4	LOS D	18.7	471.8	0.98	0.58	0.98	35.8
8	T1	916	1.0	985	1.0	0.907	6.0	LOS D	18.7	471.8	0.98	0.58	0.98	34.8
18	R2	202	1.0	217	1.0	0.907	6.1	LOS D	18.7	471.8	0.98	0.58	0.98	33.8
Approach		1123	1.0	1208	1.0	0.907	6.1	LOS A	18.7	471.8	0.98	0.58	0.98	34.6
East: Kingswood Dr SW														
1u	U	5	1.0	5	1.0	0.560	23.4	LOS C	6.4	160.4	1.00	1.02	1.21	30.6
1	L2	304	1.0	327	1.0	0.560	21.0	LOS C	6.4	160.4	1.00	1.02	1.21	30.0
16	R2	122	1.0	131	1.0	0.305	12.3	LOS B	2.4	60.0	1.00	0.95	1.00	32.3
Approach		431	1.0	463	1.0	0.560	18.5	LOS B	6.4	160.4	1.00	1.00	1.15	30.6
North: Littlerock Rd SW														
7u	U	5	1.0	5	1.0	0.120	14.0	LOS B	0.7	17.4	0.55	0.69	0.55	34.4
7	L2	95	1.0	102	1.0	0.120	11.5	LOS B	0.7	17.4	0.55	0.69	0.55	33.6
4	T1	941	1.0	1012	1.0	0.772	7.9	LOS A	11.4	288.4	0.90	0.80	1.05	34.9
Approach		1041	1.0	1119	1.0	0.772	8.3	LOS A	11.4	288.4	0.87	0.79	1.00	34.8
All Vehicles		2595	1.0	2790	1.0	0.907	9.0	LOS A	18.7	471.8	0.94	0.74	1.02	33.9

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.

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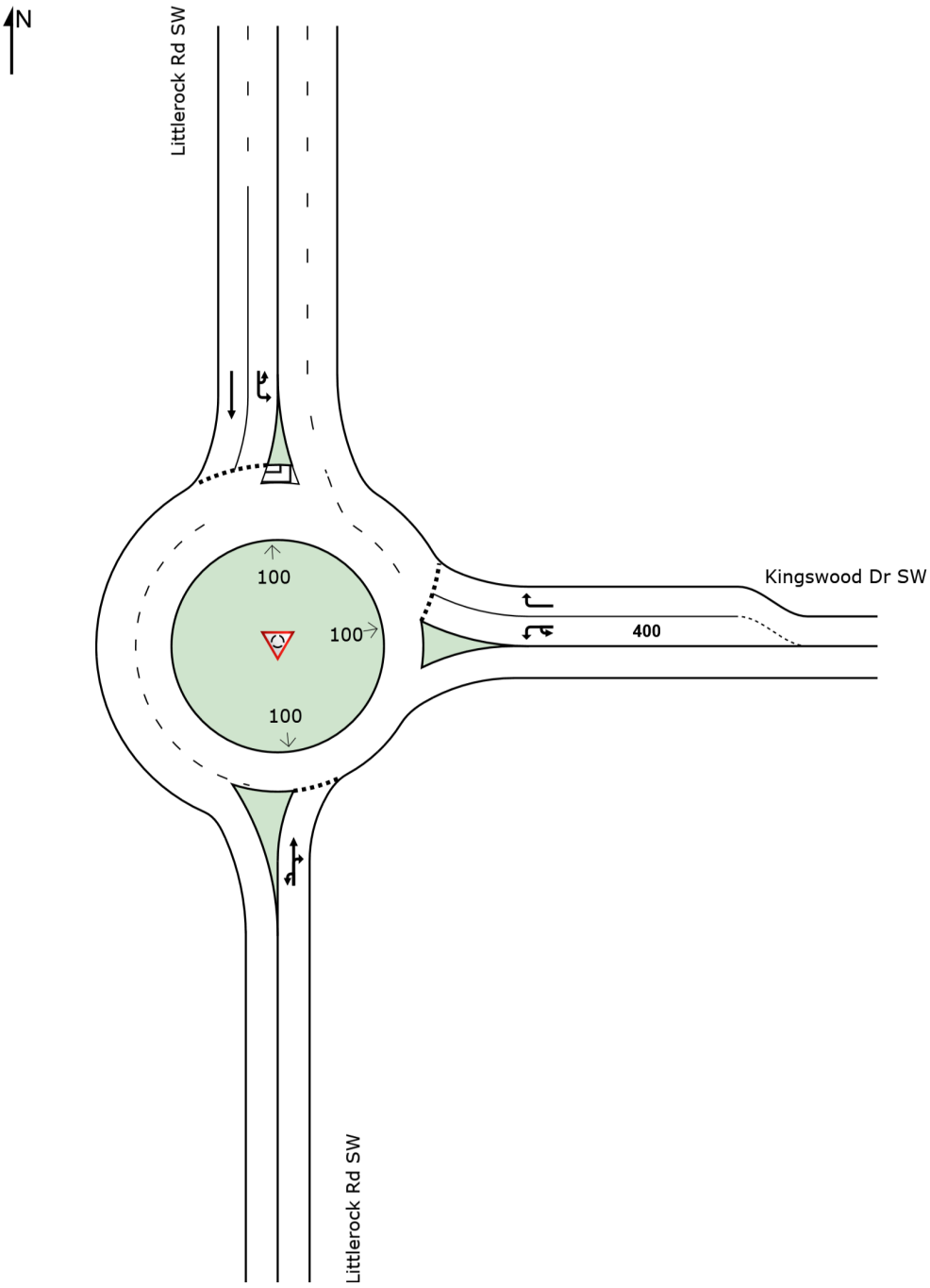
SITE LAYOUT

Site: [Forecast 2031 PM Peak Hour Volumes With Project (Site Folder: 11)]

Littlerock Rd SW & Kingswood Dr SW
Site Category: -
Roundabout

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



MOVEMENT SUMMARY

Site: [Forecast 2031 PM Peak Hour Volumes With Project (Site Folder: B)]

Tumwater Blvd SW & Tyee Dr Extension
Site Category: -
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: Tumwater Blvd SW														
1u	U	5	2.0	5	2.0	0.433	12.3	LOS B	3.3	83.5	0.16	0.36	0.16	38.7
6	T1	1057	2.0	1057	2.0	0.433	3.7	LOS A	3.3	83.6	0.15	0.37	0.15	37.7
16	R2	186	2.0	186	2.0	0.433	4.2	LOS A	3.3	83.6	0.15	0.39	0.15	36.4
Approach		1248	2.0	1248	2.0	0.433	3.8	LOS A	3.3	83.6	0.15	0.37	0.15	37.5
North: Tyee Drive Extension														
7u	U	5	2.0	5	2.0	0.316	15.9	LOS B	1.2	30.5	0.60	0.88	0.63	33.8
7	L2	202	2.0	202	2.0	0.316	13.5	LOS B	1.2	30.5	0.60	0.88	0.63	33.1
14	R2	8	2.0	8	2.0	0.316	7.7	LOS A	1.2	30.5	0.60	0.88	0.63	32.1
Approach		215	2.0	215	2.0	0.316	13.4	LOS B	1.2	30.5	0.60	0.88	0.63	33.0
West: Tumwater Blvd SW														
5u	U	5	2.0	5	2.0	0.345	13.3	LOS B	2.3	57.9	0.48	0.51	0.48	37.3
5	L2	11	2.0	11	2.0	0.345	10.9	LOS B	2.3	57.9	0.48	0.51	0.48	36.4
2	T1	822	2.0	822	2.0	0.345	4.7	LOS A	2.3	59.2	0.48	0.49	0.48	36.5
Approach		838	2.0	838	2.0	0.345	4.9	LOS A	2.3	59.2	0.48	0.49	0.48	36.5
All Vehicles		2301	2.0	2301	2.0	0.433	5.1	LOS A	3.3	83.6	0.31	0.47	0.32	36.6

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.

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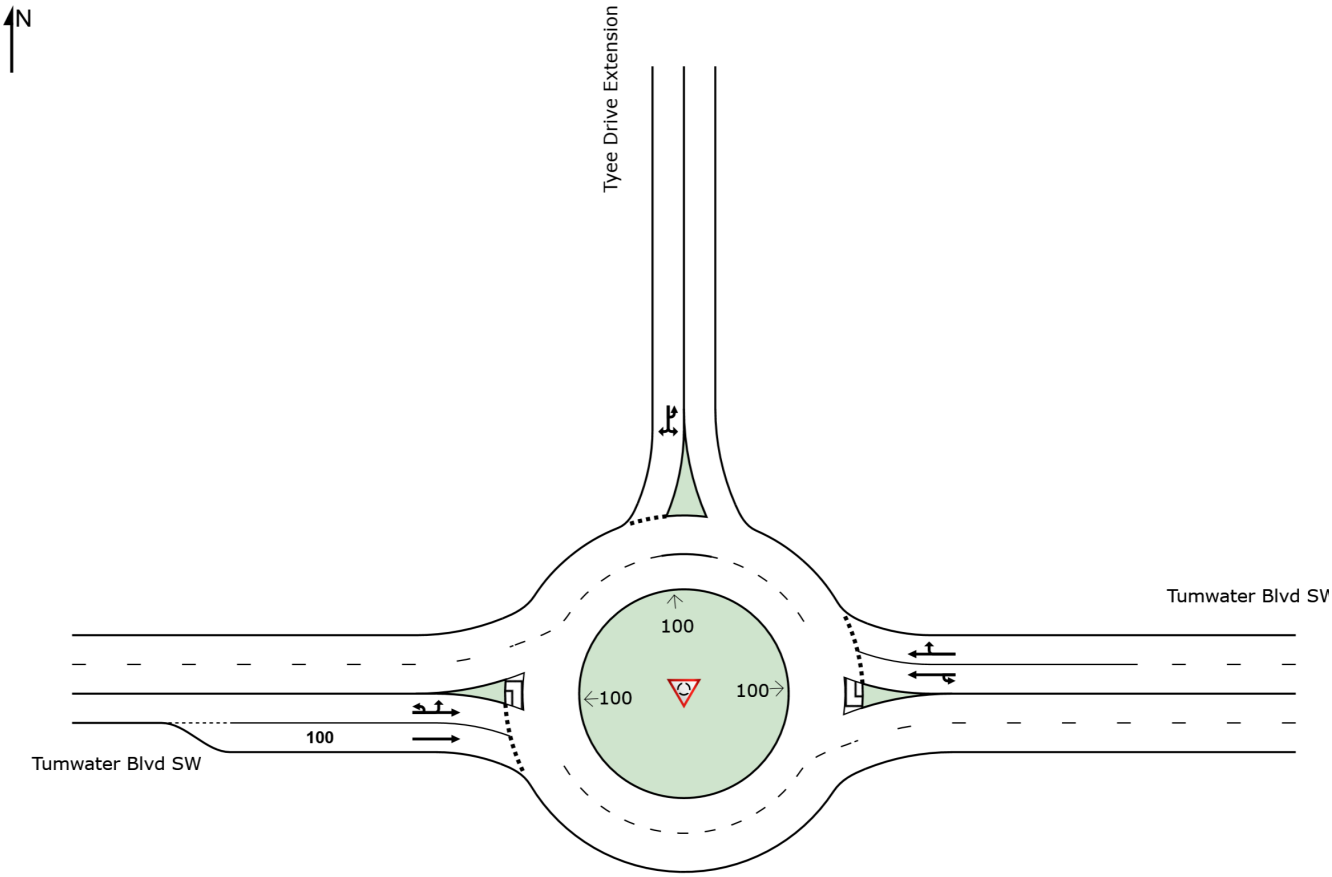
SITE LAYOUT

Site: [Forecast 2031 PM Peak Hour Volumes With Project (Site Folder: B)]

Tumwater Blvd SW & Tyee Dr Extension
Site Category: -
Roundabout

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



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YORKSHIRE
TRAFFIC IMPACT ANALYSIS

APPENDIX: MISCELLANIOUS

Full Build: AM Peak Hour Forecast Intersection Volumes

Annual Growth Rate: 4 %

# of Years to Horizon: 8

2031

3. Israel Road SW & Linderson Way SW

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Adjusted 2022	30	46	12	23	192	121	79	57	56	64	220	51
Baseline 2023	31	47	12	23	196	123	81	58	57	65	224	52
Project Trips	2	0	0	0	25	0	0	0	7	20	73	7
Pipeline	10	41	0	0	29	12	4	18	22	37	37	60
2031 Without	52	105	17	32	297	181	114	98	100	126	344	131
2031 With	54	105	17	32	322	181	114	98	107	146	417	138

5. Tumwater Boulevard SW & Southbound I-5 Ramp

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Adjusted 2022	116	4	1616	0	126	174	0	0	0	52	395	0
Baseline 2023	118	4	1648	0	129	177	0	0	0	53	403	0
Project Trips	42	0	0	0	12	0	0	0	0	42	118	0
Pipeline	82	0	136	0	189	27	0	0	0	31	132	0
2031 Without	244	6	2392	0	365	270	0	0	0	104	683	0
2031 With	286	6	2392	0	377	270	0	0	0	146	801	0

6. Tumwater Boulevard SW & Northbound I-5 Ramp

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Adjusted 2022	0	0	0	569	221	0	470	1	65	0	1515	485
Baseline 2023	0	0	0	580	225	0	479	1	66	0	1545	495
Project Trips	0	0	0	0	3	0	0	0	9	0	8	110
Pipeline	0	0	0	71	164	0	39	0	46	0	128	124
2031 Without	0	0	0	865	473	0	695	1	137	0	2243	801
2031 With	0	0	0	865	476	0	695	1	146	0	2251	911

Full Build: PM Peak Hour Forecast Intersection Volumes

Annual Growth Rate: 4 %

# of Years to Horizon: 8

2031

1.Israel Road SW & Littlerock Road SW

	SBR	SBT	SBL	SBU	WBR	WBT	WBL	WBU	NBR	NBT	NBL	NBU	EBR	EBT	EBL	EBU
Historic 2015 Volumes	115	403	131	5	258	148	54	5	31	257	239	5	74	80	101	5
Baseline 2023	135	472	153	5	302	173	63	5	36	301	280	5	87	94	118	5
Project Trips	0	0	29	0	19	12	0	0	0	0	0	0	0	7	0	0
Pipeline	0	53	27	0	22	13	13	0	12	97	3	0	2	12	0	0
2031 Without	184	699	237	5	436	250	100	5	62	509	386	5	121	140	162	5
2031 With	184	699	266	5	455	262	100	5	62	509	386	5	121	147	162	5

2. Israel Road SW & Tyee Drive SW

	SBR	SBT	SBL	SBU	WBR	WBT	WBL	WBU	NBR	NBT	NBL	NBU	EBR	EBT	EBL	EBU
Baseline 2022	59		242	1	250	252		2						154	39	2
Adjusted 2022 (up 24%)	73		300	1	310	312		2						191	48	2
Baseline 2023	75		306	1	316	319		3						195	49	3
Project Trips	0	14	0	0	0	0	85	0	57	10	24	0	36	0	0	0
Pipeline	11	4	32	0	44	14	13	0	10	3	29	0	36	14	2	0
2031 Without	113	4	451	2	477	450	13	3	10	3	29	0	36	281	70	3
2031 With	113	18	451	2	477	450	98	3	67	13	53	0	72	281	70	3

3. Israel Road SW & Linderson Way SW

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Historic 2015 Volumes	51	81	38	26	259	135	110	87	108	29	166	40
Baseline 2023	60	95	45	30	303	158	129	102	127	34	195	47
Project Trips	6	0	0	0	62	0	0	0	17	11	42	4
Pipeline	18	18	0	0	37	4	12	41	37	22	29	10
2031 Without	100	148	61	42	452	220	188	181	210	69	295	74
2031 With	106	148	61	42	514	220	188	181	227	80	337	78

4. Tumwater Boulevard SW & Littlerock Road SW

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Historic 2015 Volumes		283	306	278		224	105	134				
Baseline 2023		332	359	326		262	123	157				
Project Trips		0	0	0		8	11	0				
Pipeline		34	34	66		93	133	51				
2031 Without		488	525	512		452	301	266				
2031 With		488	525	512		460	312	266				

5. Tumwater Boulevard SW & Southbound I-5 Ramp

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Historic 2015 Volumes	234	32	405	0	275	319	0	0	0	71	342	0
Baseline 2023	274	37	475	0	322	374	0	0	0	83	401	0
Project Trips	106	0	0	0	30	0	0	0	0	24	68	0
Pipeline	124	0	71	0	132	39	0	0	0	46	189	0
2031 Without	499	51	720	0	573	551	0	0	0	160	737	0
2031 With	605	51	720	0	603	551	0	0	0	184	805	0

6. Tumwater Boulevard SW & Northbound I-5 Ramp

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Historic 2015 Volumes	0	0	0	1209	550	0	135	6	44	0	611	136
Baseline 2023	0	0	0	1417	644	0	158	7	52	0	716	159
Project Trips	0	0	0	0	7	0	0	0	23	0	5	63
Pipeline	0	0	0	136	128	0	27	0	31	0	164	82
2031 Without	0	0	0	2075	1010	0	243	10	102	0	1144	300
2031 With	0	0	0	2075	1017	0	243	10	125	0	1149	363

7. Capitol Boulevard & Israel Road

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Historic 2015 Volumes	88	514	71	135	193	94	25	317	106	121	131	80
Baseline 2023	103	602	83	158	226	110	29	371	124	142	153	94
Project Trips	7	0	0	0	4	0	0	0	44	30	3	5
Pipeline	26	18	0	0	13	3	2	15	7	4	11	20
2031 Without	167	842	114	216	322	154	42	523	177	198	221	148
2031 With	174	842	114	216	326	154	42	523	221	228	224	153

8. Tumwater Boulevard & Capitol Boulevard

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Historic 2015 Volumes	106	475	112	15	325	83	18	304	199	244	305	64
Baseline 2023	124	557	131	18	381	97	21	356	233	286	357	75
Project Trips	0	11	14	21	0	0	0	17	0	0	0	0
Pipeline	9	0	0	0	65	0	0	0	38	38	76	14
2031 Without	179	762	180	24	586	133	29	487	357	429	565	117
2031 With	179	773	194	45	586	133	29	504	357	429	565	117

9. Tumwater Boulevard SE & Henderson Boulevard SE

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Historic 2015 Volumes	323	197	0	0	0	0	0	165	22	12	0	651
Baseline 2023	378	231	0	0	0	0	0	193	26	14	0	763
Project Trips	21	0	0	0	0	0	0	0	0	0	0	14
Pipeline	36	0	0	0	0	0	0	0	5	3	0	44
2031 Without	554	316	0	0	0	0	0	265	40	22	0	1088
2031 With	575	316	0	0	0	0	0	265	40	22	0	1102

10. Littlerock Road SW & Miner Drive SW ***Adjustment Factor: 48% per Intersection #1 Volumes***

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Baseline 2023	16	528	0	0	0	0	0	445	0	33	0	0
Adjusted 2023	24	781	0	0	0	0	0	659	0	49	0	0
Project Trips	0	18	0	0	0	0	0	12	0	11	0	0
Pipeline	5	77	0	0	0	0	0	98	0	7	0	0
2031 Without	37	1146	0	0	0	0	0	999	0	74	0	0
2031 With	37	1164	0	0	0	0	0	1011	0	85	0	0

11. Littlerock Road SW & Kingswood Drive SW

	SBR	SBT	SBL	SBU	WBR	WBT	WBL	WBU	NBR	NBT	NBL	NBU	EBR	EBT	EBL	EBU
Historic 2015 Volumes	0	519	59	0	75		178	0	125	496		0				
Baseline 2023	0	608	69	5	88		209	5	146	581		5				
Project Trips	0	14	0	0	0		4	0	2	10		0				
Pipeline	0	95	0	0	2		15	0	0	111		0				
2031 Without	0	927	95	5	122		300	5	200	906		7				
2031 With	0	941	95	5	122		304	5	202	916		7				

B. Tumwater Boulevard SW & Project Access

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Project Trips	8		92	136	0						0	11
2031 Without					1072						897	
2031 With	8	0	92	136	1072	0	0	0	0	0	897	11

Phase 1: PM Peak Hour Forecast Intersection Volumes

Annual Growth Rate: 4 %

# of Years to Horizon: 3

2026

1.Israel Road SW & Littlerock Road SW

	SBR	SBT	SBL	SBU	WBR	WBT	WBL	WBU	NBR	NBT	NBL	NBU	EBR	EBT	EBL	EBU
Historic 2015 Volumes	115	403	131	5	258	148	54	5	31	257	239	5	74	80	101	5
Baseline 2023	135	472	153	5	302	173	63	5	36	301	280	5	87	94	118	5
Project Trips	0	0	7	0	6	1	5	24	24	0	0	0	0	2	0	0
Pipeline	0	53	27	0	22	13	13	0	12	97	3	0	2	12	0	0
2026 Without	152	584	200	5	362	208	84	5	53	436	318	5	100	117	133	5
2026 With	152	584	207	5	368	209	89	29	77	436	318	5	100	119	133	5

2. Israel Road SW & Tyee Drive SW

	SBR	SBT	SBL	SBU	WBR	WBT	WBL	WBU	NBR	NBT	NBL	NBU	EBR	EBT	EBL	EBU
Baseline 2022	59	242		1	250	252		2						154	39	2
Adjusted 2022 (up 24%)	73	300		1	310	312		2						191	48	2
Baseline 2023	75	306		1	316	319		3						195	49	3
Project Trips	1	0		0	0	23		0						25	0	12
Pipeline	11	4	32	0	44	14	13	0	10	3	29	0	36	14	2	0
2026 Without	95	348	32	1	400	373	13	3	10	3	29	0	36	233	57	3
2026 With	96	348	32	1	400	396	13	3	10	3	29	0	36	258	57	15

3. Israel Road SW & Linderson Way SW

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Historic 2015 Volumes	51	81	38	26	259	135	110	87	108	29	166	40
Baseline 2023	60	95	45	30	303	158	129	102	127	34	195	47
Project Trips	4	0	0	0	13	0	0	0	6	4	8	13
Pipeline	18	18	0	0	37	4	12	41	37	22	29	10
2026 Without	85	125	50	34	378	182	157	156	179	60	248	63
2026 With	89	125	50	34	391	182	157	156	185	64	256	76

4. Tumwater Boulevard SW & Littlerock Road SW

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Historic 2015 Volumes		283	306	278		224	105	134				
Baseline 2023		332	359	326		262	123	157				
Project Trips		2	3	23		0	0	1				
Pipeline		34	34	66		93	133	51				
2026 Without		407	437	432		388	271	228				
2026 With		409	440	455		388	271	229				

5. Tumwater Boulevard SW & Southbound I-5 Ramp

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Historic 2015 Volumes	234	32	405	0	275	319	0	0	0	71	342	0
Baseline 2023	274	37	475	0	322	374	0	0	0	83	401	0
Project Trips	19	0	0	0	4	0	0	0	0	3	0	0
Pipeline	124	0	71	0	132	39	0	0	0	46	189	0
2026 Without	432	42	605	0	494	459	0	0	0	140	640	0
2026 With	451	42	605	0	498	459	0	0	0	143	640	0

A. Israel Road SW & Project Access

	SBR	SBT	SBL	WBR	WBT	WBL	NBR	NBT	NBL	EBR	EBT	EBL
Project Trips					36		37			57	0	
2026 Without					659		0			0	375	
2026 With					695		37			57	375	

BIKE PARKING:

LOT 1, BUILDING 1:
- SHORT TERM: 240 UNITS / 4 = 60 x 05 = 30 STALLS
- LONG TERM: 240 UNITS / 4 = 60 + 30 = 90 STALLS

LOT 2, BUILDING 2:
- SHORT TERM: 116 UNITS / 4 = 44 x 05 = 22 STALLS
- LONG TERM: 116 UNITS / 4 = 44 + 22 = 66 STALLS

LOT 3, BUILDING 3I:
- SHORT TERM: 154 UNITS / 4 = 39 x 05 = 20 STALLS
- LONG TERM: 154 UNITS / 4 = 39 + 19 = 58 STALLS

LOT 4, BUILDING 4:
- SHORT TERM RESIDENTIAL: 42 UNITS / 4 = 11 x 05 = 6 STALLS
- SHORT TERM COMMERCIAL: 2 STALLS
- SHORT TERM TOTAL: 6 + 2 = 8 STALLS
- LONG TERM RESIDENTIAL: 42 UNITS / 4 = 11 + 5 = 16 STALLS
- LONG TERM COMMERCIAL: 1 STALL
- LONG TERM RESIDENTIAL: 16 + 1 = 17 STALLS

LOT 5, BUILDING 5:
- SHORT TERM: 160 UNITS / 4 = 40 x 05 = 20 STALLS
- LONG TERM: 160 UNITS / 4 = 40 + 20 = 60 STALLS

LOT 6, BUILDING 6:
- SHORT TERM: 160 UNITS / 4 = 40 x 05 = 20 STALLS
- LONG TERM: 160 UNITS / 4 = 40 + 20 = 60 STALLS

LOT 7, BUILDING 7 SELF STORAGE:
- SHORT TERM: 2 STALL
- LONG TERM: 1 STALL

LOT 8, BUILDING 8:
- SHORT TERM: 218 UNITS / 4 = 55 x 05 = 28 STALLS
- LONG TERM: 218 UNITS / 4 = 55 + 27 = 82 STALLS

LOT 9, CLUBHOUSE:
- SHORT TERM: 1 STALL
- LONG TERM: 1 STALL

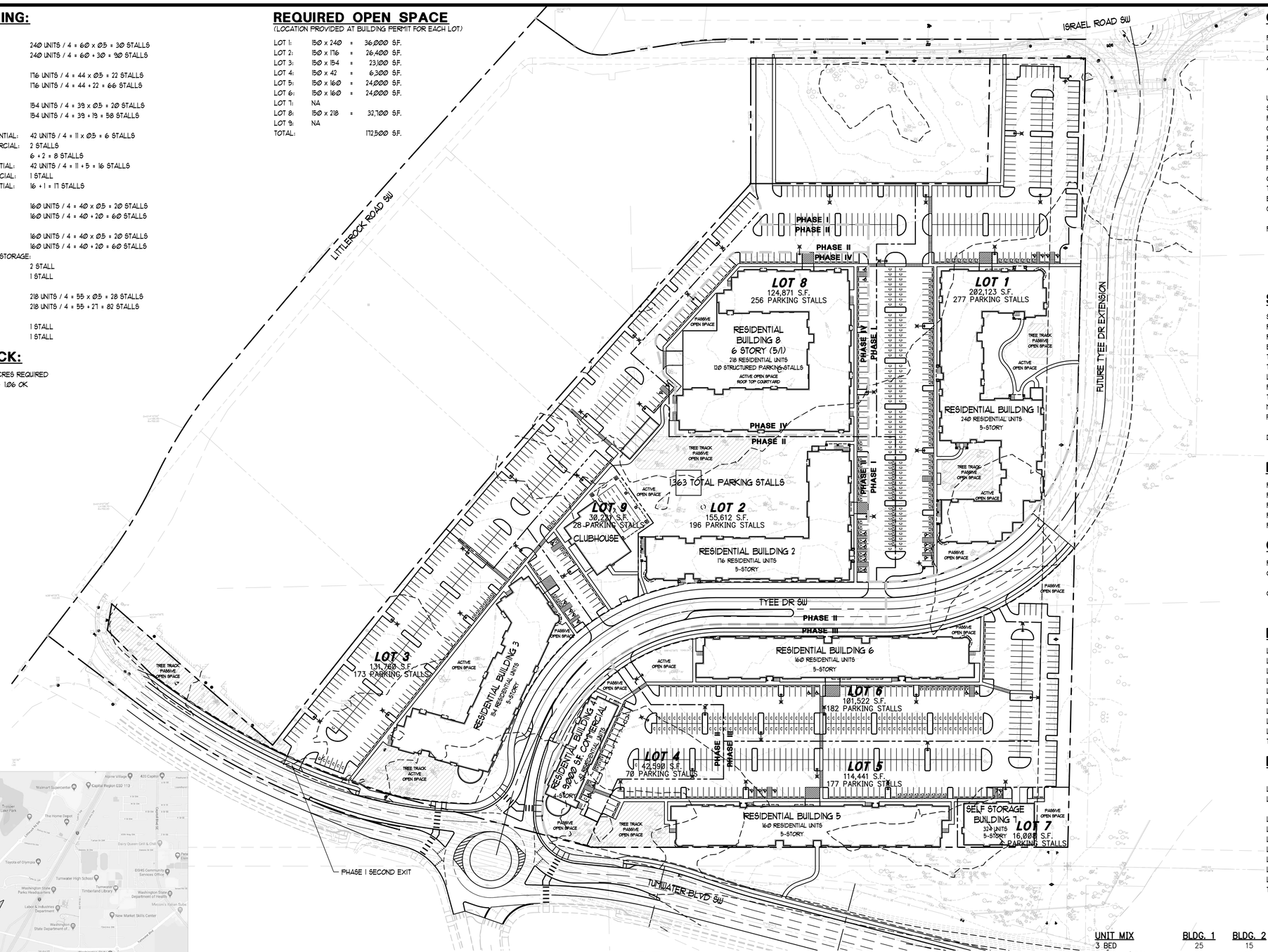
TREE TRACK:

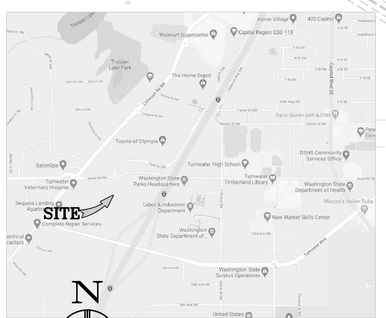
21.1 ACRES x 5% = 1.06 ACRES REQUIRED
1.06 ACRES PROVIDED > 1.06 OK

REQUIRED OPEN SPACE

(LOCATION PROVIDED AT BUILDING PERMIT FOR EACH LOT)

LOT 1:	150 x 240	=	36,000 S.F.
LOT 2:	150 x 176	=	26,400 S.F.
LOT 3:	150 x 154	=	23,100 S.F.
LOT 4:	150 x 42	=	6,300 S.F.
LOT 5:	150 x 160	=	24,000 S.F.
LOT 6:	150 x 160	=	24,000 S.F.
LOT 7:	NA		
LOT 8:	150 x 218	=	32,700 S.F.
LOT 9:	NA		
TOTAL:			172,500 S.F.





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VICINITY MAP

N.T.S.

N

SITE PLAN

SCALE: 1"=80'

GENERAL DATA

PARCEL NUMBER:	12704440103, 12704431300, 12704440100
LEGAL:	SECTION 4, TOWNSHIP 17 N, RANGE 2 W WM.
OWNER:	FOURTH STREET HOUSING, LLC
APPLICANT:	FOURTH STREET HOUSING, LLC PO BOX 159 ARLINGTON, WA 98223
WATER:	CITY OF TUMWATER
SEWER:	CITY OF TUMWATER
POWER / GAS:	PUGET SOUND ENERGY
CABLE / PHONE:	COMCAST, CENTURYLINK, WAVE
REFUSE COLLECTION:	WASTE CONNECTIONS (LEMAY)
ZONE:	GC6
FIRE SPRINKLER:	YES - NFPA 13
FIRE ALARM:	YES
OCCUPANCY:	R-2
TYPE OF CONSTRUCTION:	V-A
BUILDING HEIGHT:	65'
CODE:	2018 IBC
PARKING:	TOTAL 1,367 STALLS 1220 STALLS REQUIRED 930 STANDARD STALLS 120 STRUCTURED PARKING STALLS 6 GARAGE STALLS 311 COMPACT STALLS EV INFRASTRUCTURE (1,342 x 20 = 274 STATIONS)

SITE AREAS

SITE AREA:	1,072,850 S.F.
ROW DEDICATION:	105,121 S.F.
REMAINING SITE AREA:	919,148 S.F.
BUILDING FOOTPRINT:	254,759 S.F.
TOTAL BUILDING AREA:	1,155,130 S.F.
TOTAL LANDSCAPING:	247,123 S.F. (27%)
LANDSCAPING REQUIRED:	137,872 S.F. (15%)
PAVING AREA:	381,950 S.F.
TOTAL IMPERVIOUS AREA:	671,425 S.F. (73%)
MAXIMUM IMPERVIOUS:	781,276 S.F. (85%)
FAR CALC.:	1,155,130 / 919,148 = 1.26
DENSITY:	1150 UNITS / 21.1 ACRES = 54.5 UNITS / ACRE

ROW AREA

ROW AREA:	105,121 S.F.
ROW LANDSCAPING:	30,205 S.F.
ROW PAVING:	50,386 S.F.
ROW SIDEWALK:	24,116 S.F.
ROW TOTAL IMPERVIOUS:	75,102 S.F.

OPEN SPACE CALCULATIONS

RESIDENTIAL UNITS:	1150
OPEN SPACE REQUIRED:	172,500 S.F.
(1150 UNITS x 150 S.F.)	
OPEN SPACE PROVIDED:	210,050 S.F.
ACTIVE OPEN SPACE:	139,314 S.F.
PASSIVE OPEN SPACE:	70,736 S.F.

PARKING PROVIDED:

LOT 1:	277 STALLS	(56) EV STALLS
LOT 2:	196 STALLS	(39) EV STALLS
LOT 3:	173 STALLS	(35) EV STALLS
LOT 4:	72 STALLS	(14) EV STALLS
LOT 5:	177 STALLS	(35) EV STALLS
LOT 6:	184 STALLS	(37) EV STALLS
LOT 7:	4 STALLS	(1) EV STALLS
LOT 8:	256 STALLS	(51) EV STALLS IN GARAGE
LOT 9:	28 STALLS	(6) EV STALLS
TOTAL:	1,367 STALLS	(274) EV STALLS

BUILDING AREA:

		BUILDING FOOTPRINT:	FLOOR AREA:
LOT 1:		45,848 S.F.	227,901 S.F.
LOT 2:	BUILDING 2:	31,049 S.F.	154,781 S.F.
	GARAGE:	1,440 S.F.	1,440 S.F.
LOT 3:		28,242 S.F.	138,334 S.F.
LOT 4:		12,762 S.F.	48,561 S.F.
LOT 5:		27,533 S.F.	137,665 S.F.
LOT 6:		27,497 S.F.	137,485 S.F.
LOT 7:		7,662 S.F.	39,210 S.F.
LOT 8:		62,233 S.F.	259,248 S.F.
LOT 9:		10,493 S.F.	10,493 S.F. INCLUDING POOL
TOTAL:		254,759 S.F.	1,155,130 S.F.

UNIT MIX	BLDG. 1	BLDG. 2	BLDG. 3	BLDG. 4	BLDG. 5	BLDG. 6	BLDG. 8	TOTAL
3 BED	25	15	14	3	10	10	14	91
2 BED w/ DEN	15	20	25	6	28	28	19	140
2 BED / 2 BATH	68	22	15	3	18	18	26	168
2 BED / 1 BATH	1	–	–	–	–	–	–	1
1 BED w/ DEN	39	35	19	12	14	14	29	163
1 BED	23	40	28	9	41	41	44	226
STUDIO w/ DEN	44	29	25	–	20	20	52	190
STUDIO	25	17	28	9	29	29	34	171
TOTAL UNITS	240	176	154	42	160	160	218	1150

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3809 REGISTERED ARCHITECT
GLENN C. WELLS
STATE OF WASHINGTON

date: 05-25-22
drawn: R.C.T.
checked: G.C.W.

city issue:
- 08-17-22 FINAL SITE PLAN REVIEW
- 11-15-22 BINDING SITE PLAN REVIEW
- 12-05-22 ARCHITECTURAL SITE PLAN

revisions: -

title: SITE PLAN
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