



HEATH & ASSOCIATES

Transportation Planning & Engineering

TRAFFIC IMPACT ANALYSIS

The Pinnacle at Liberty Bay

Poulsbo, Washington

Revised July 2026

1011 E Main Ave Suite 453 | Puyallup, WA | 98372
(253) 770-1401 | heathtraffic.com

THE PINNACLE AT LIBERTY BAY TRAFFIC IMPACT ANALYSIS

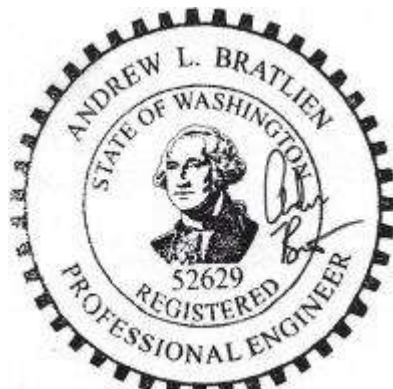
Prepared for:

Montebanc Management, LLC
c/o Paul Devenzio, Chip McBroom

Prepared by:

Heath & Associates
PO Box 397
Puyallup, WA 98371
(253) 770 1401
Heathtraffic.com

License:



7/17/2026



Date: July 20, 2026

To: Michael Bateman, City of Poulsbo

From: Andrew L. Bratlien, P.E., PTOE
Heath & Associates

Subject: The Pinnacle at Liberty Bay - TIA Comment Response

This memorandum provides responses to the comments provided by the City of Poulsbo and Parametrix in the July 1, 2026 memorandum "Traffic Impact Analysis and Transportation Review." The enclosed TIA has been updated based on the comments and responses provided below.

1. COMMENT RESPONSES

Comment #1A: Study Area Consistency: The report does not clearly and consistently identify all study intersections or reconcile which intersections are included in figures versus LOS tables.

Response #1A: Descriptions of existing peak hour volumes (Section 4.4) have been expanded for clarity and consistency. Tables and figures have been updated to identify all seven study intersections.

Comment #1B: Intersection Screening: The TIA does not demonstrate that all intersections with ≥ 10 new trips were evaluated per City requirements. Consider intersections to the south of Johnson Road and to the north of Hostmark Street, based on AM and PM trip distribution figures.

Response #1B: The TIA study area was approved by City staff via email on June 10, 2025. Minor scoping revisions provided by City staff at that time were incorporated to the TIA and are reflected in the report.

Expanded trip distribution forecasts have been developed and attached to this memorandum, documenting eight functionally classified (collector/arterial) intersections within Poulsbo city limits which are expected to be impacted by 10 or more peak hour project trips. The additional intersections, their corresponding 2023 and 2044 Levels of Service, per the January 2025 *City of Poulsbo Transportation Plan Update*, and project-generated PM peak hour trips as a share of 2023 PM peak hour volume, are summarized in the table on the following page.

Intersection	Control ¹	Transportation Plan PM LOS ²		PM Peak Hour Project Trips	
		2023	2044	Trips	As % of 2023 ⁴
SR 305 & NE Lincoln Rd	Signal	D	D	31	+1.1%
SR 305 & NE Liberty Rd	Signal	F	E	19	+0.8%
SR 305 & 7th Ave/Forest Rock	Signal	F	F	15	+0.5%
SR 305 & Bond Rd/SR 307	Signal	E	F	13	+0.3%
NE Hostmark St & 6th Ave NE	MASC	B	C	26	+4.1%
NE Hostmark St & Lincoln Rd	MASC	B	A	23	+3.9%
NE Hostmark St & 4th Ave NE	AWSC	B ³	B ³	23	+3.3%
Front St & NE Sunset St	AWSC	F ³	F ³	11	+0.9%

¹Signal = signalized; AWSC = all-way stop control; MASC = minor-approach stop control

²PM Peak hour intersection Level of Service per January 2025 Poulsbo Transportation Plan Update

³Denotes intersection with adopted LOS F standard

⁴Peak hour project trips as share of total 2044 PM peak hour intersection entering volume

RED denotes intersection operating below adopted LOS standard

The intersections of SR 305 & NE Liberty Road, SR 305 & 7th Avenue/Forest Rock Lane, and SR 305 & Bond Road/SR 307 currently operate below the WSDOT LOS D standard for SR 305 and are anticipated to continue to operate with LOS deficiencies through the 2044 Comprehensive Plan horizon. Project trips are expected to constitute less than one percent of peak hour demand at each LOS-deficient intersection. Further, all LOS-deficient SR 305 intersections have been identified as locations of developer-driven improvements including traffic signal controller, detection, and interconnection upgrades.

The other five collector and arterial intersections expected to serve 10 or more PM peak hour project trips are anticipated to operate at or above their respective minimum LOS standards through 2044. Project trips, which are implicitly included in the Poulsbo Comprehensive Plan long-range travel demand forecasts, are anticipated to constitute less than five percent of total PM peak hour demand at each intersection

Given the limited number of project trips, the planned SR 305 traffic signal control improvements, and the documented long-term adequacy of vehicle capacity at several surrounding intersections according to the Poulsbo Comprehensive Plan, an expanded TIA study area is not recommended.



Comment #1C: Peak Hour Methodology: School-related peak demand and local peak hour variability are not fully documented.

Response #1C: Traffic counts and the associated operational analysis applied Peak Hour Factor (PHF), which reflects the impacts of observed 15-minute volume peaking during each peak hour. The use of PHF allows the operational analysis to capture the impacts of short-duration school-related peaking, particularly during the AM peak hour. Existing PHFs are documented in the traffic count sheets. Peak hour variability at each study intersection is documented in Table 3.

Comment #2A: The intersection of Hostmark/Caldart operates at LOS F (61.9–63.2 sec delay) under 2037 AM conditions, below the City LOS standard (E). Although the LOS F is consistent between 2037 No Build and Build conditions, the vehicle delay increases under the Build scenario.

Response #2A: Long-range (2037) traffic forecasts have been updated. Previous versions included an error in compound growth calculations which resulted in an overestimation of anticipated growth. Based on the corrected traffic volume forecasts, the Hostmark/Caldart intersection is expected to operate at LOS E during the 2037 AM peak hour before and after the addition of project trips. The minimum LOS E standard is satisfied.

Comment #2B: The school route to North Kitsap High School requires a mid-block crossing of Caldart Avenue without stop control. This crossing is aligned with and supported by Comprehensive Plan Policies TR-5.1, TR-5.2, and TR 5.3.

Response #2B: Caldart Avenue currently provides marked pedestrian crossings at the Meredith Heights/Frank Raab Municipal Park driveway, at NE Odin Street, and at Hostmark Street. All of the existing marked crossings could serve pedestrian demand associated with North Kitsap High School. Please clarify the location of the midblock crossing referenced above.

Comment #2C: The transportation analysis should evaluate improvements to the existing school crossing, including installation of a Rectangular Rapid Flashing Beacon (RRFB), to address pedestrian safety and support the City's transportation findings under PMC 14.04, PMC 17.60.040(A)(e), PMC 17.80.060, and Comprehensive Plan Policies TR-1.1 and TR-1.4.

Response #2C: The Hostmark Street & Caldart Avenue intersection provides curb ramps and marked crosswalks on all legs. Hostmark Street also includes signalized pedestrian crossings at two locations to the east of Caldart Avenue. Please clarify the location of the school crossing referenced above.



Comment #3: The information provided in support of the applicant's feasibility determination does not adequately support the conclusion that the Baywatch connection is infeasible due to vertical geometry and stream crossing constraints because the feasibility evaluation does not fully address applicable City codes, policies, and reasonable design alternatives necessary for the City Engineer to determine infeasibility.

Response #3: Response to be provided by ESM.

Comment #4A: Both Road C and Crystallia Court rely exclusively on Sunrise Ridge Ave NE, resulting in one functional access route and a single route condition, not two independent routes as required by City code and implied in the TIA. This is consistency with City code PMC 17.80.050(C).

Response #4A: The project proposes access to NE Crystallia Court and to Sunrise Ridge Avenue, providing two distinct public street connections to the site and satisfying access criteria defined in PMC 17.080.050(C). An internal street network will provide a contiguous connection between the two accesses, preserving full site access in the event of a blockage at either connection. The project also proposes completion of Sunrise Ridge Avenue to the south of the project, facilitating access to the site to/from the north via Caldart Avenue and to/from the south via Johnson Road.

Sunrise Ridge Avenue provides an approximately 390-foot centerline separation between NE Crystallia Court and the proposed Road C intersection. The magnitude of Sunrise Ridge Avenue blockage required for simultaneous closure of both NE Crystallia Court and Road C is significant and unlikely.

Comment #4B: The TIA does not demonstrate that the proposed street network satisfies the redundancy objectives as required under City code PMC 17.80.060.

Response #4B: The project proposes two distinct access routes to the site, satisfying access criteria defined in PMC 17.080.050(C). See Response #4A.

Comment #4D: If, after further analysis, the Baywatch connection is determined by the City Engineer to be infeasible, the information provided does not demonstrate that the proposed Sunrise Ridge access configuration satisfies the applicable City and Fire Code requirements for access, connectivity and emergency response. Specific examples where the site plan of the TIA deviates from City or Fire Code include:

- Any blockage of Sunrise Ridge would significantly reduce site access, which is inconsistent with the intent of PMC 17.80.050(C) to provide access via two different streets and PMC 17.80.060 to provide redundant and efficient connections and emergency access provisions



of IFC 503.1.2. This risk is amplified by steep grades (~12%) and significant elevation change.

Response #4D: The project proposes access via two distinct public streets and a new connection on Sunrise Ridge Avenue to the south, satisfying access criteria defined in PMC 17.80.050(C). See Response #4A.

IFC D107.2 requires a minimum straight-line separation not less than one-half of the length of the maximum overall diagonal dimension of the property. The maximum overall diagonal dimension of the subject site is 1,918 feet, resulting in a minimum straightline separation of 909 feet.

The proposed accesses on NE Crystallia Court and the eastern edge of the subject site on Sunrise Ridge Avenue provide 940 feet of separation, satisfying IFC D107.2 access separation requirements for two separate access roads.

Comment #4E: No alternative mitigation (e.g. emergency access, sprinklering, roadway improvements) has been proposed in the TIA as required under PMC 17.80.050(C) and supporting provisions.

Response #4E: The project proposes access via two distinct public streets and a new connection on Sunrise Ridge Avenue to the south, satisfying access criteria defined in PMC 17.80.050(C). See Response #4A.

Comment #4F: Based on the site conditions, including terrain, steep grades (~12%), and access limitations, the transportation information provided does not adequately demonstrate that the proposed access configuration satisfies the applicable emergency access provisions of IFC 503.1.2 and IFC D107.2.

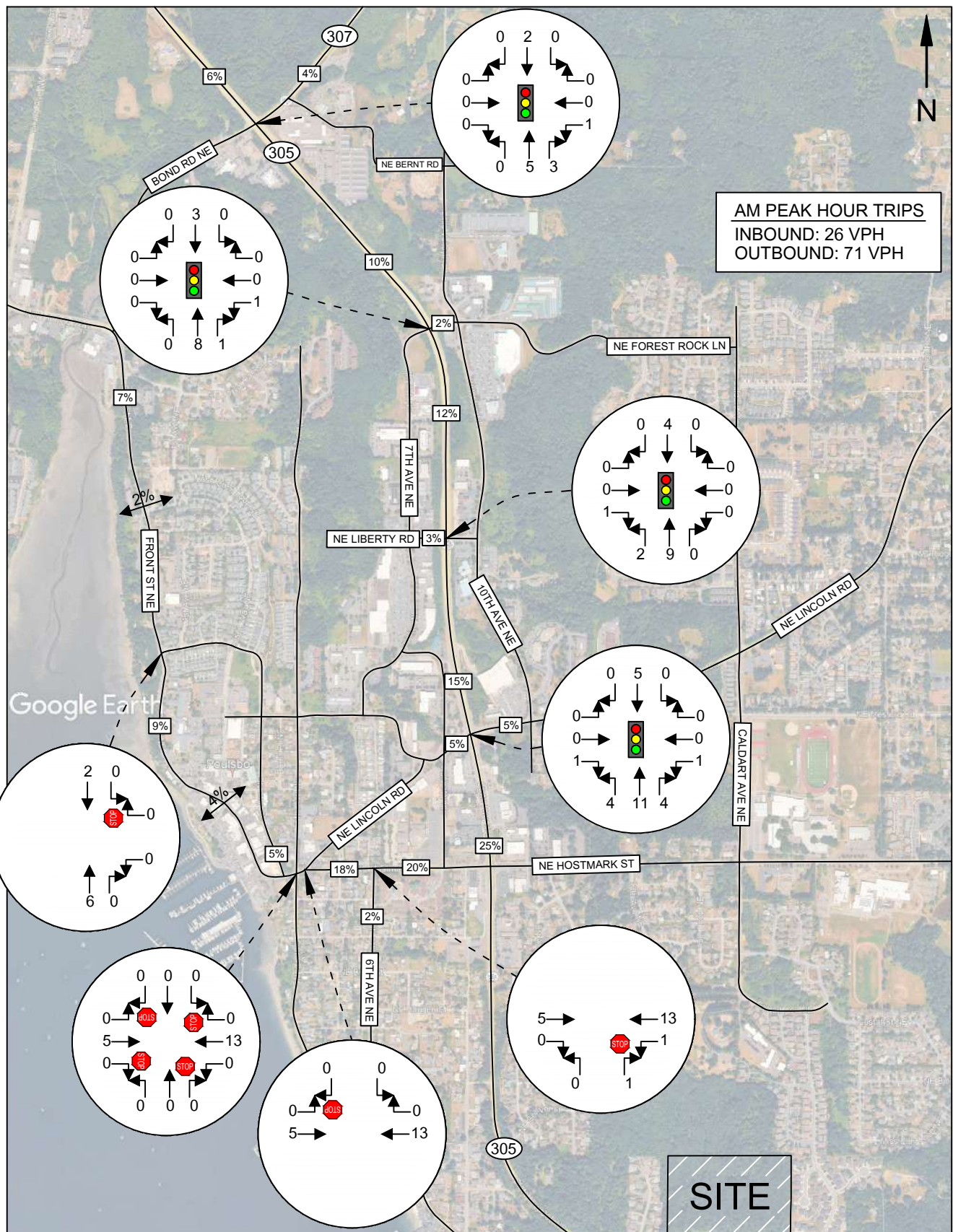
Response #4F: The NE Crystallia Court and Road C accesses satisfy IFC separation requirements for emergency access separation. See Response #4D.

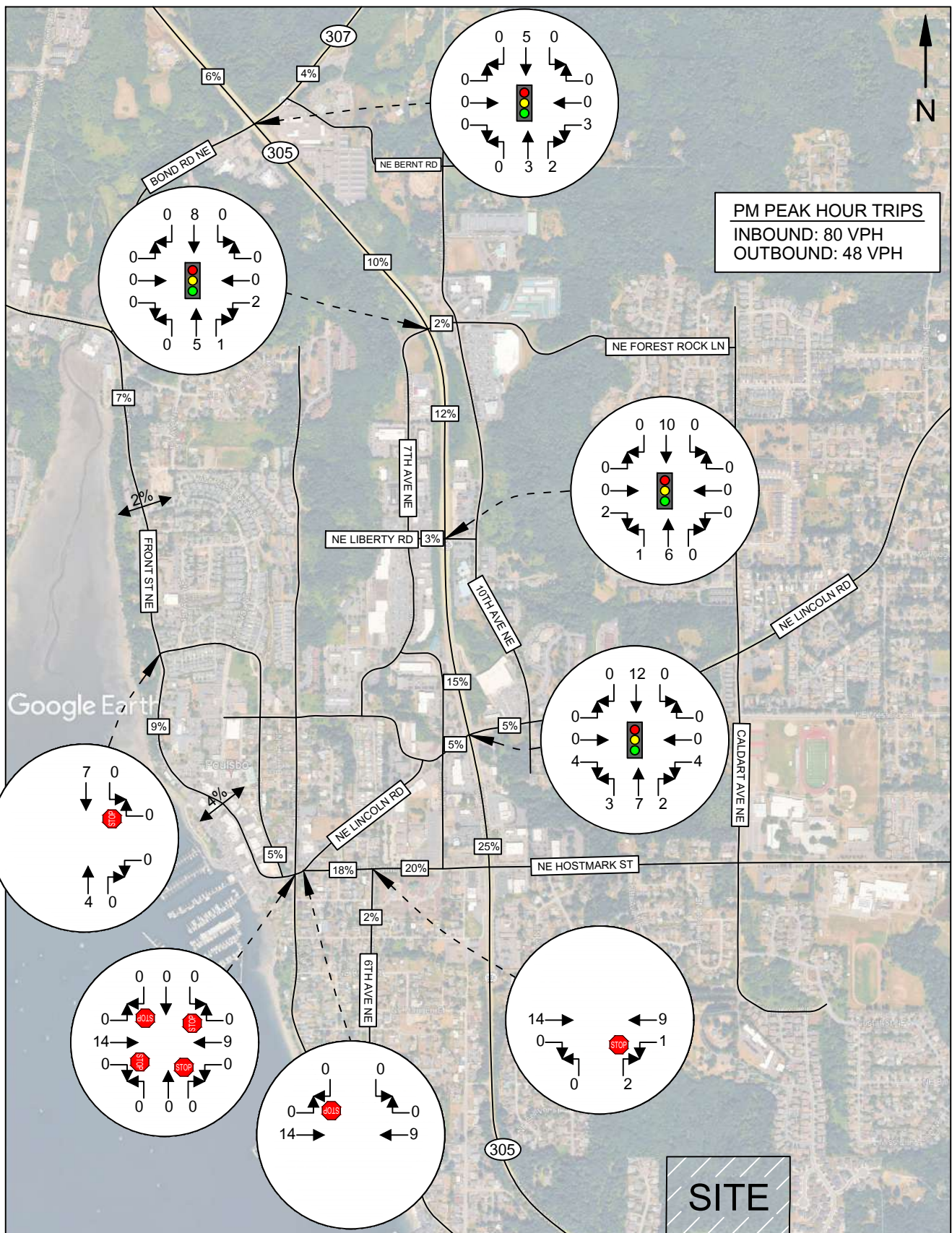
Responses to Comments 3, 4C, 4G, and 4H will be provided by ESM.

Attachment A. Expanded AM Peak Hour Project Trip Distribution

Attachment B. Expanded PM Peak Hour Project Trip Distribution







THE PINNACLE AT LIBERTY BAY TRAFFIC IMPACT ANALYSIS

CONTENTS

1. Introduction.....	5
2. Project Description.....	5
3. Study Area	8
4. Existing Conditions	8
5. Forecast Traffic Demand and Analysis	22
6. Conclusions & Mitigation	40

TABLES

1. Roadway Network	8
2. Bus Routes.....	9
3. 2025 Peak Hours	10
4. Existing Peak Hour Level of Service	17
5. Crash History by Year.....	18
6. Crash History by Type.....	19
7. Crash History by Severity.....	19
8. Project Trip Generation	22
9. Forecast 2032 & 2037 Weekday Peak Hour Level of Service	37



FIGURES

1. Vicinity Map.....	6
2. Site Plan	7
3. Existing AM Peak Hour Volumes	12
4. Existing PM Peak Hour Volumes.....	13
5. Existing AM Peak Hour Non-Motorist Volumes.....	14
6. Existing PM Peak Hour Non-Motorist Volumes	15
7. Safe Walking Route to Schools.....	16
8. Collision History Map.....	21
9. AM Peak Hour Trip Distribution & Assignment	24
10. PM Peak Hour Trip Distribution & Assignment.....	25
11. AM Peak Hour Pipeline Volumes.....	26
12. PM Peak Hour Pipeline Volumes	27
13. Forecast 2032 AM Peak Hour Volumes Without Project.....	28
14. Forecast 2032 PM Peak Hour Volumes Without Project	29
15. Forecast 2032 AM Peak Hour Volumes With Project.....	30
16. Forecast 2032 PM Peak Hour Volumes With Project	31
17. Forecast 2037 AM Peak Hour Volumes Without Project.....	32
18. Forecast 2037 PM Peak Hour Volumes Without Project	33
19. Forecast 2037 AM Peak Hour Volumes With Project.....	34
20. Forecast 2037 PM Peak Hour Volumes With Project	35
21. Construction Route	39



THE PINNACLE AT LIBERTY BAY

TRAFFIC IMPACT ANALYSIS

1. INTRODUCTION

Heath & Associates has been engaged to prepare a Traffic Impact Analysis (TIA) to assess the impacts of a proposed residential development within Poulsbo city limits. The tasks include reviewing existing traffic conditions in the site vicinity and comparing them to future buildout conditions, both with and without the proposed development. As a final step, conclusions, and if necessary, mitigation measures, will be identified. The TIA requirements were established during the scoping process with City staff. This TIA has been updated based on the March 2026 site plan, including a revised layout consisting of 138 dwelling units.

2. PROJECT DESCRIPTION

- **Proposal**

- The Pinnacle at Liberty Bay is a proposed residential development consisting of 138 single-family homes located within Poulsbo.

- **Location**

- The subject site is bordered to the east by Sunset Ridge Avenue NE and single-family residential development, to the west by single-family residential development, and to the south by SR 305 and undeveloped property.
- The site comprises 40.98 acres on four undeveloped tax parcels, 232601-4-001-2009, -3-003-2008, -3-018-2001, and -3-005-2006.

- **Site Access**

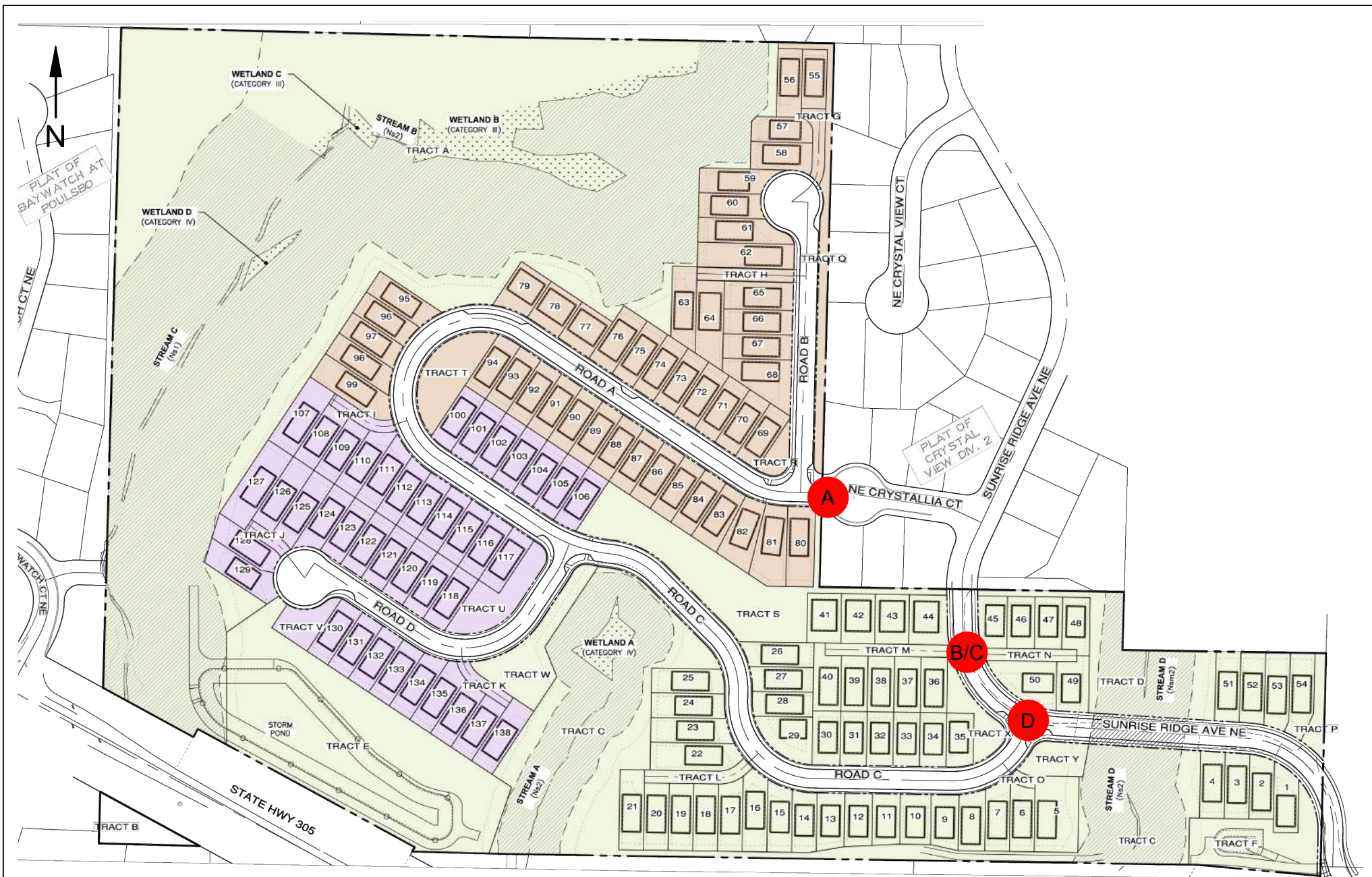
- Access to the site will be provided at four locations:
 1. Access A: Sunrise Ridge Avenue via extension of Crystallia Court
 2. Access B/C: Both sides of Sunrise Ridge Avenue 220 feet south of Crystallia Court
 3. Access D: Sunrise Ridge Avenue 380 feet south of Crystallia Court
- Direct property access will be provided via a network of internal circulating roadways.

A vicinity map is provided in **Figure 1** with the subject site highlighted in blue. A conceptual site plan including access locations is presented in **Figure 2**.



Figure 1: Vicinity Map





3. STUDY AREA

Study intersections were identified through scoping process and approved by City of Poulsbo staff. A total of seven study intersections were included in this analysis:

1. SR 305 & NE Hostmark Street
2. SR 305 & Baywatch Court NE
3. SR 305 & Johnson Road NE
4. NE Hostmark Street & Caldart Avenue NE
5. Johnson Road NE & Sunrise Ridge Avenue NE
6. Caldart Avenue NE & Sunrise Ridge Avenue NE
7. Sunrise Ridge Avenue NE & Crystallia Court

At the time of this analysis, Sunrise Ridge Avenue NE was gated to the northwest of Johnson Road NE. Therefore, the intersection of Sunrise Ridge Avenue NE & Crystallia Court (#7) currently operates with very low traffic volumes and was not included in this study's existing conditions analysis.

The Sunrise Ridge Avenue NE connection to Johnson Road NE will be completed as part of The Pinnacle at Liberty Bay Phase 1; therefore the future conditions analysis considered all seven study intersections.

4. EXISTING CONDITIONS

4.1 Existing Street System

Characteristics of key roadways serving the subject site are provided in **Table 1**.

Table 1: Roadway Network

Functional Classification	Roadway	Speed Limit (mph)	Lanes	Sidewalk	Bike Facilities
Principal Arterial	SR 305	50	2-5	No*	No*
Minor Arterial	Johnson Rd NE	25	2	Yes	No
Neighborhood	NE Hostmark St	15-25	2-3	Yes	Yes
Collector	Caldart Ave NE	20-25	2	Yes	No
Local	Sunrise Ridge Ave NE	25	2	Yes	No
	Baywatch Ct NE	25	2	Yes	No

*SR 305 includes sidewalk and bike facilities only at the roundabout at SR 305 & Johnson Rd NE



4.2 Existing Transit Service

A review of the Kitsap County Transit website indicates that transit is provided within one mile walking distance to/from the site. Route 344 – Poulsbo Central is provided at the intersection of Hostmark Street & Caldart Avenue approximately 3,500 feet north of the site. Route 333 – Silverdale/Bainbridge and Route 390 – Poulsbo/Bainbridge include stops at the intersection of SR 305 & Johnson Road, approximately 3,500 feet south of the project site. Each nearby route is identified in **Table 2** below. For more detailed information, refer to the Kitsap Transit website.

Table 2: Bus Routes

Route	Description	Weekday Service	Saturday	Sunday	Nearest Stop
333	Silverdale TC to Bainbridge Ferry	4:22 AM – 8:55 PM ¹	--	--	SR 305 & Johnson
344	North Viking TC to 10th & Forest Rock	8:30 AM – 7:20 PM	10:30 AM – 6:20 PM	--	Caldart & Hostmark
390	North Viking TC to Bainbridge Ferry	4:00 AM – 9:24 PM	8:08 AM – 7:37 PM	8:10 AM – 5:00 PM	SR 305 & Johnson

4.3 Roadway Improvements

The City of Poulsbo’s (2026-2031) Transportation Improvement Program (TIP) and Washington State Department of Transportation (WSDOT) 2025-2028 Statewide Transportation Improvement Program (STIP) were reviewed to identify planned transportation improvement projects in the site vicinity. The Poulsbo TIP identifies one such improvement, described below.

Noll Road Corridor Improvements (Priority #2): The phased corridor improvement project will connect SR 305 to NE Lincoln Rd via Noll Rd, Langaunet Ln & Maranatha Ln, providing roadway, illumination, sidewalk, and shared use path improvements. The project’s initial phase, including realignment of Noll Road, a new roundabout at the Noll Road/Johnson Road & Sunrise Ridge Avenue intersection, and a new roundabout with nonmotorized facilities at the Johnson Road NE/SR 305 intersection, has been completed. Future phases will provide a roundabout at Noll Road & Mesford Road, an extension of Langaunet Lane, and complete street improvements along the corridor from Noll Road/Storhoff Road to Lincoln Road.

At the time of this analysis, Sunrise Ridge Avenue NE is closed between Noll Road/Johnson Road NE and NE Crystallia Court. The future conditions analyses

¹ Route does not run midday from 7:35 AM to 3:45 PM.



described in this report assumed that Sunrise Ridge Avenue NE will be opened to traffic by 2032, creating a new north-south local street connection between Noll Road/Johnson Road NE and Caldart Avenue to the north. The traffic volume impacts of the Sunrise Ridge Avenue connection are described later in this report.

4.4 Existing Peak Hour Volumes and Travel Patterns

Field data for this study was collected from 7-9 AM and from 4-6 PM on non-holiday school weekdays in May 2025 at the following intersections:

- 1. SR 305 & NE Hostmark Street
- 2. SR 305 & Baywatch Court NE
- 3. SR 305 & Johnson Road NE
- 4. NE Hostmark Street & Caldart Avenue NE
- 5. Johnson Road NE & Sunrise Ridge Avenue NE

Traffic volumes at the following two intersections were estimated as described:

- 6. Caldart Avenue NE & Sunrise Ridge Avenue NE: Estimated based on traffic counts collected at NE Hostmark Street & Caldart Avenue NE, existing development patterns, and street connectivity.
- 7. Sunrise Ridge Avenue NE & Crystallia Court: Traffic volumes estimated based on seven existing single-family homes accessed by Crystallia Court. Sunrise Ridge Avenue NE currently terminates just south of Crystallia Court; therefore, no through trips were estimate.

Traffic counts at each study intersection were reviewed to identify the one-hour peak period during each count, which was then applied to the intersection capacity analysis. The AM and PM peak hours of traffic volumes at each intersection are shown in **Table 3. Figures 3 and 4** illustrate existing AM and PM peak hour volumes. Full turning movement count sheets are available in the appendix.

Table 3: 2025 Peak Hours

ID	Study Intersection	AM Peak Hour	PM Peak Hour
1	SR 305 & NE Hostmark St	7:00 – 8:00 AM	4:00 – 5:00 PM
2	SR 305 & Baywatch Ct NE	8:00 – 9:00 AM	4:30 – 5:30 PM
3	SR 305 & Johnson Rd NE	7:00 – 8:00 AM	4:15 – 5:15 PM
4	NE Hostmark St & Caldart Ave NE	7:15 – 8:15 AM	4:45 – 5:45 PM
5	Johnson Rd & Sunrise Ridge Ave	7:15 – 8:15 AM	4:00 – 5:00 PM



Traffic volume data indicated that the morning peak hour generally coincides with the school drop-off period and the morning commuter "rush hour." These concurrent phenomena are reflected in the AM peak hour analyses described in this report. The afternoon school peak period is generally brief and is offset from the overall afternoon peak hour of travel demand, which occurs later and is characterized by commuters returning home from work as well as recreational and shopping trips. The PM peak hour analysis described in this report focused on the overall systemwide peak to provide a worst-case analysis.

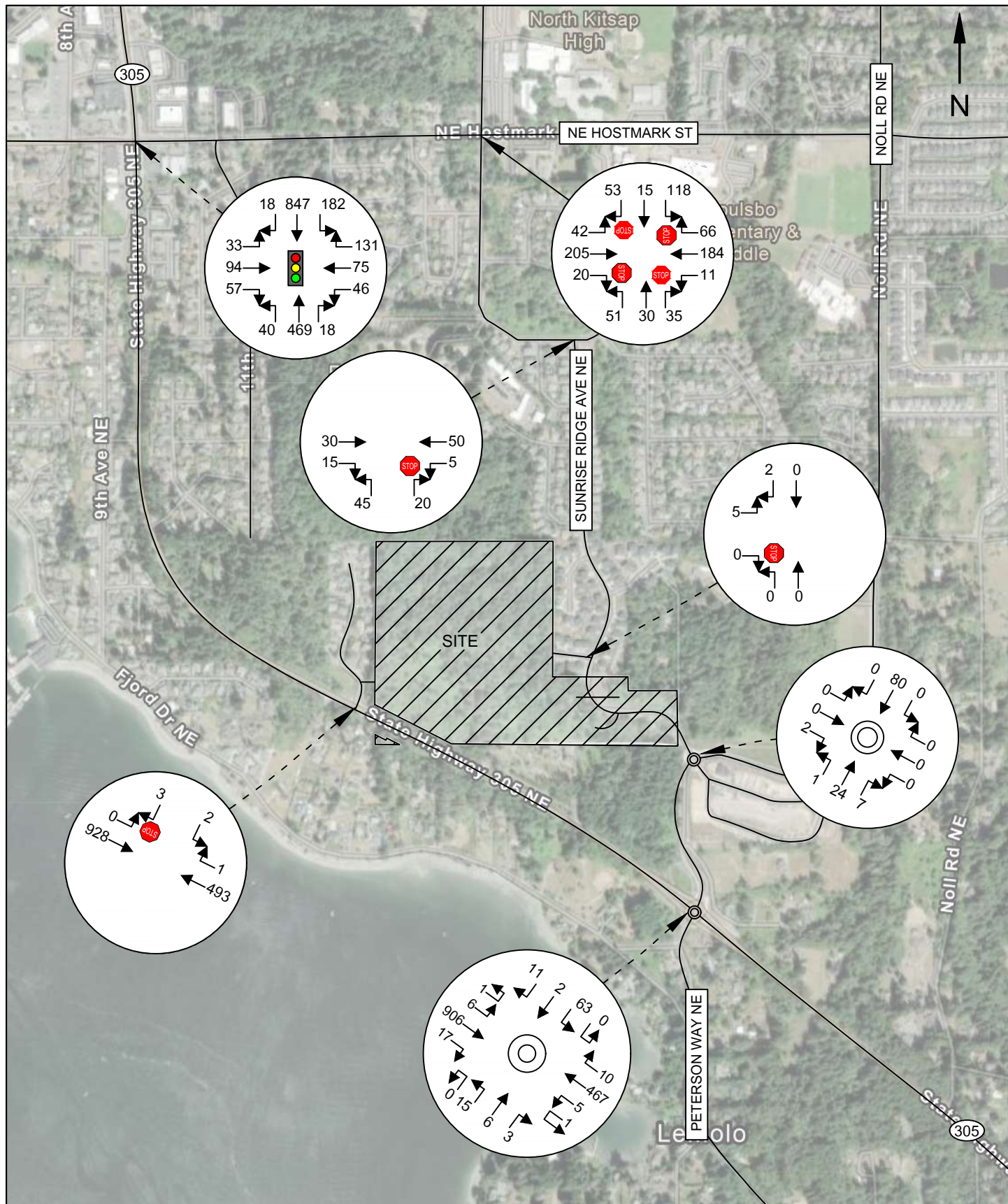
4.5 Existing Nonmotorized Conditions

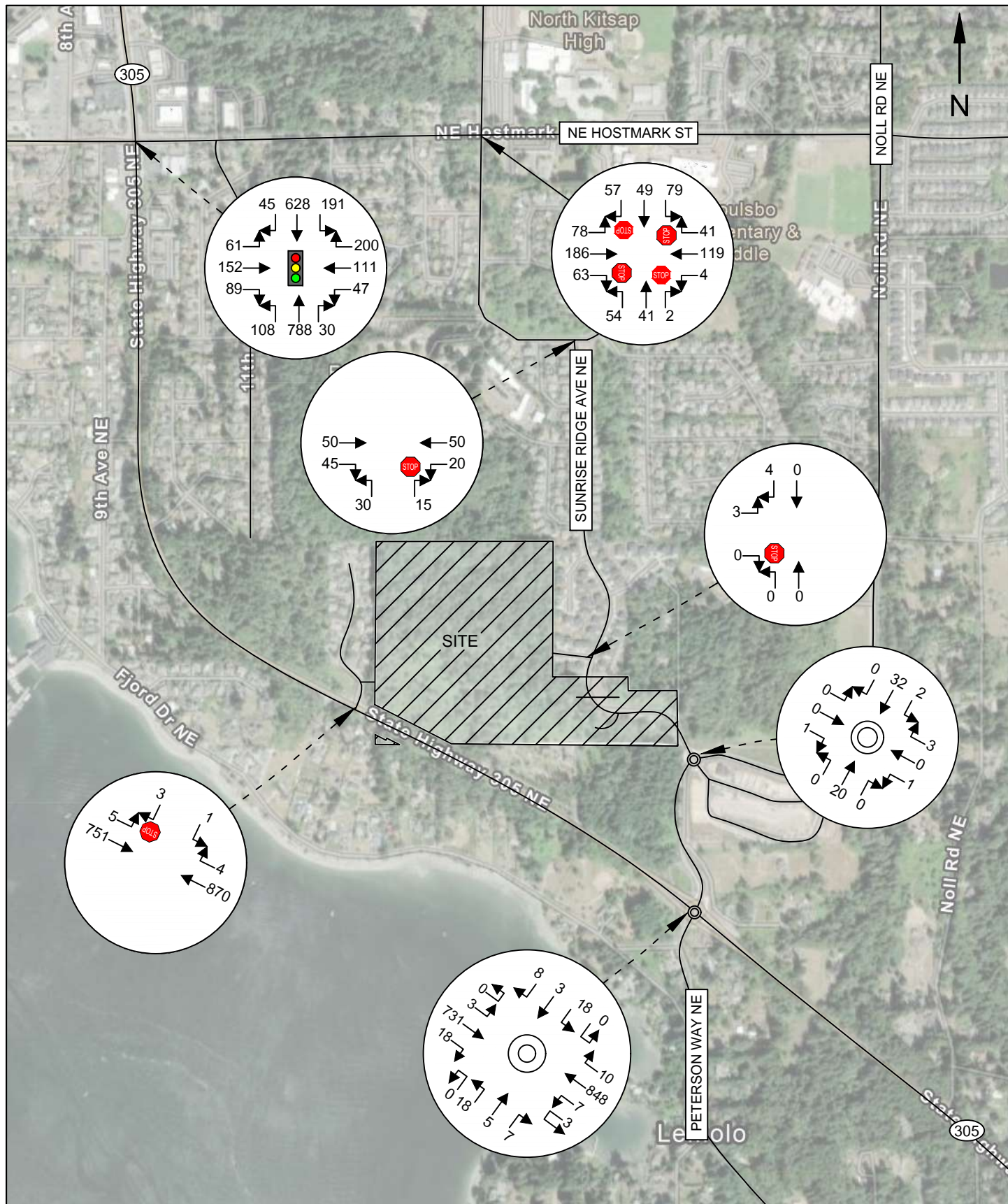
Nonmotorized traffic was included in the AM and PM peak hour counts. Refer to **Figures 5 and 6** for AM and PM peak hour nonmotorized peak hour activity at each study intersection.

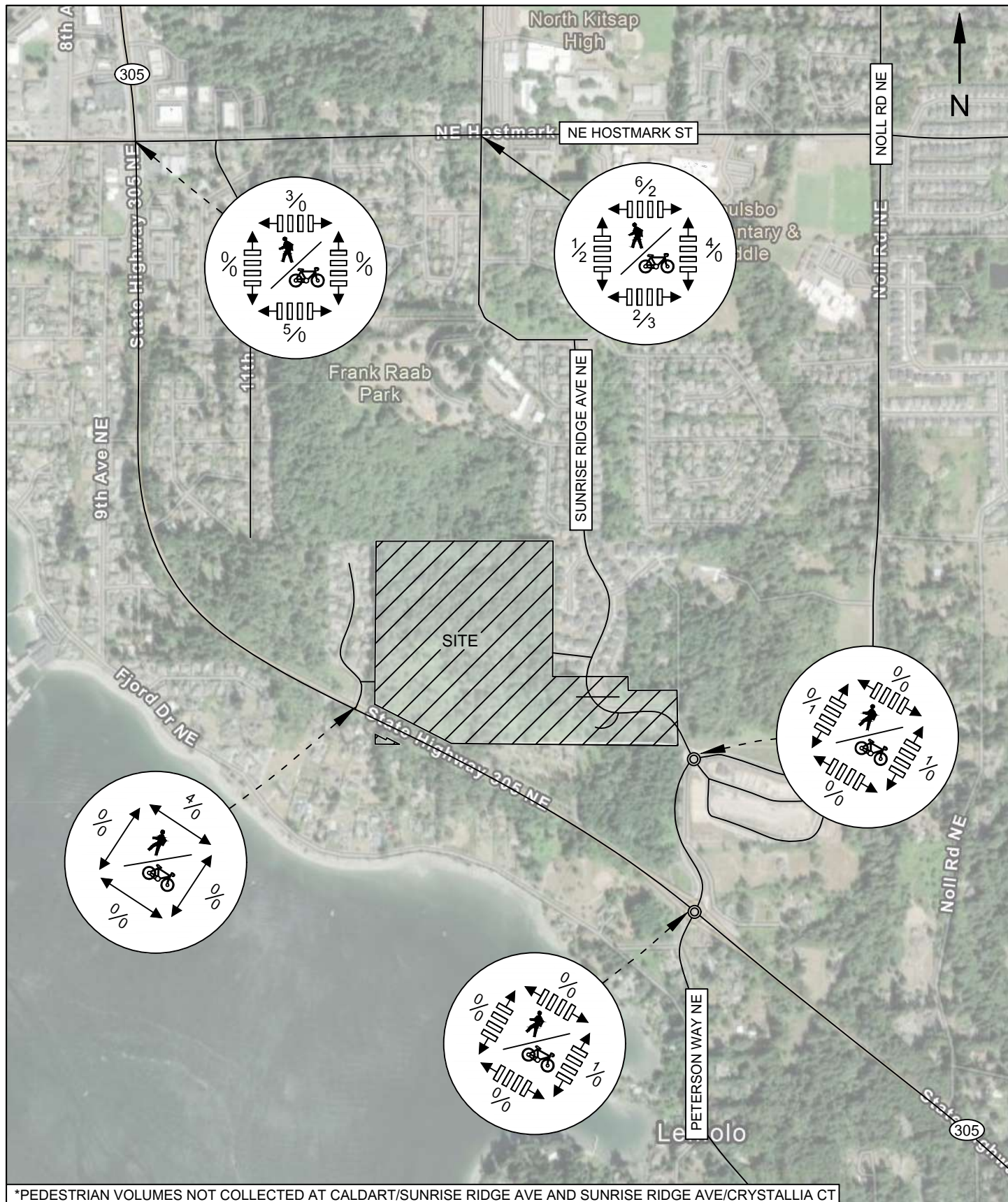
Nonmotorized infrastructure in the project vicinity includes sidewalks along both sides of Sunrise Ridge Avenue NE, Caldart Avenue NE, NE Hostmark Street, and Johnson Road NE. Sidewalks along Johnson Road NE to the south of the project provide a nonmotorized connection to transit stops on SR 305. The planned Noll Road corridor improvements will provide sidewalk and shared-use path facilities to the northeast of the project.

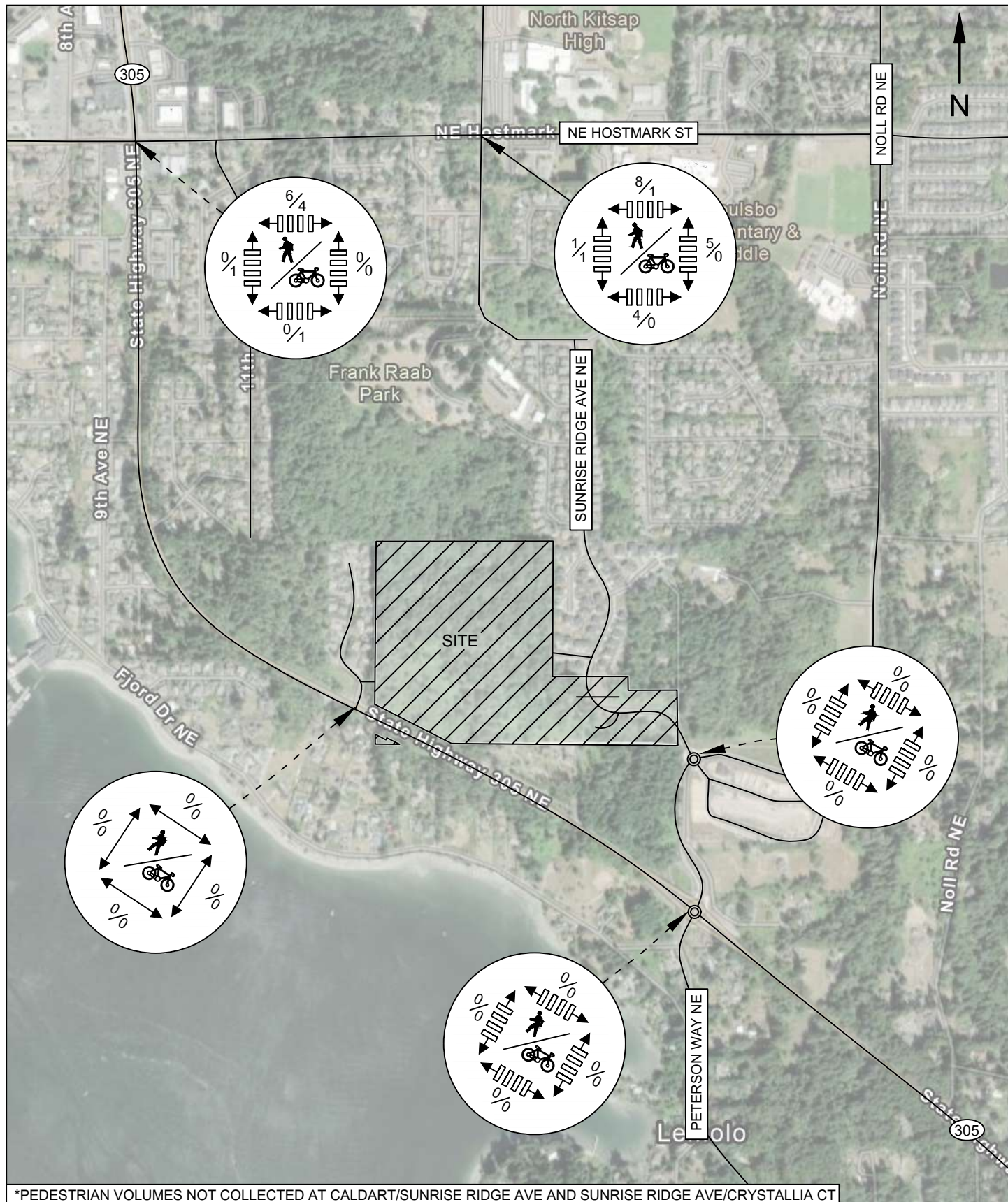
School-aged residents of the project would likely attend Poulsbo Elementary School and Poulsbo Middle School, both located approximately 1.0-miles walking distance to the north of the site. Continuous sidewalk segments, marked crosswalks, and reduced school speed zone signs are provided between the site and schools facilitating student transport. Refer to **Figure 7** for the pedestrian routes to and from each school.



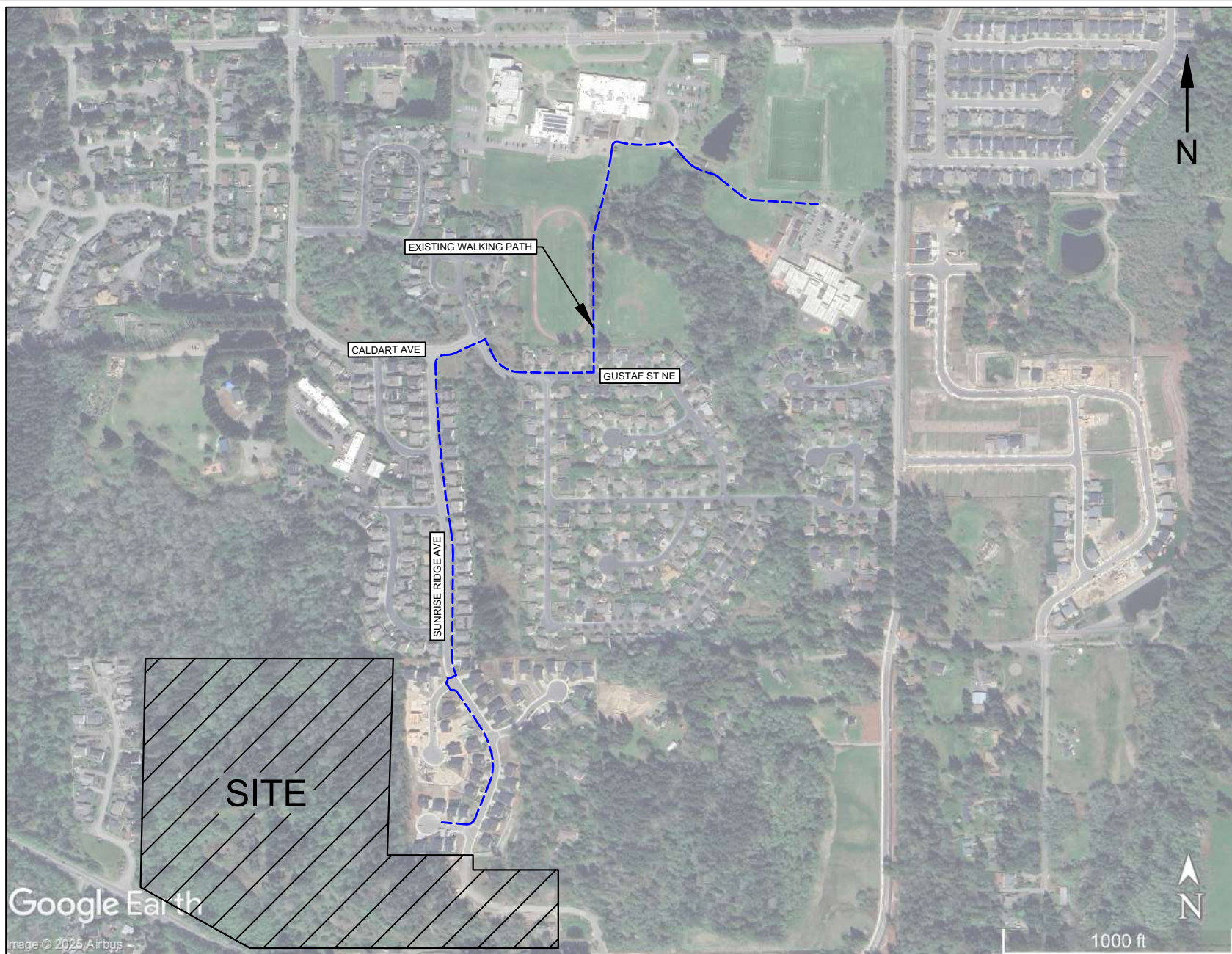








*PEDESTRIAN VOLUMES NOT COLLECTED AT CALDART/SUNRISE RIDGE AVE AND SUNRISE RIDGE AVE/CRYSTALLIA CT



4.6 Existing Level of Service

Level of Service (LOS) is a measure of congestion for transportation facilities which uses a range² from LOS A to LOS F, where LOS A indicates free-flow conditions with low delay and LOS F indicates congested conditions with high delay. For minor-approach stop-controlled intersections, LOS is determined by the highest-delay approach. For all other intersections, LOS is defined by the overall intersection delay.

Signalized and stop-controlled intersection operations were analyzed in Synchro 12 software using *Highway Capacity Manual 7th Edition* methodologies. Roundabout operations were analyzed in Sidra Intersection 10 software using WSDOT Sidra analysis guidance. Results of the existing LOS analysis are summarized in **Table 4**.

Table 4: Existing Peak Hour Level of Service

Delays given in seconds per vehicle

ID	Intersection	Control	Peak Hour	Critical Approach	LOS*	Delay
1	SR 305 & Hostmark St	Signal	AM	Overall	D	35.9
			PM		D	44.0
2	SR 305 & Baywatch Ct	One-Way Stop	AM	SB	C	20.5
			PM		C	23.8
3	SR 305 & Johnson Rd	RAB	AM	Overall	A	7.1
			PM		A	6.4
4	Hostmark St & Caldart Ave	AWSC	AM	Overall	C	15.3
			PM		B	12.0
5	Johnson Rd & Sunrise Ridge Ave	RAB	AM	Overall	A	5.1
			PM		A	5.1
6	Caldart Ave & Sunrise Ridge Ave	TWSC	AM	NB	A	9.4
			PM		A	9.7
7	Sunrise Ridge Ave & Crystallia Ct	One-Way Stop	AM	EB	A	8.5
			PM		A	8.5

*Signalized intersection LOS is based on overall intersection delay;
 Roundabout and AWSC LOS is based on overall intersection delay and stop-controlled delay thresholds;
 Minor-approach stop control LOS is based on worst-approach delay and stop-controlled delay thresholds

² Signalized Intersections - Level of Service

Level of Service	Control Delay (sec/veh)
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 (sec/veh)
A	<10
B	≥10 and <15
C	≥15 and <25
D	≥25 and <35
E	≥35 and <50
F	≥50

Source: *Highway Capacity Manual, 7th Edition*



The City of Poulsbo has adopted a minimum LOS E standard for City intersections. Minimum LOS standards for State-owned facilities are set by WSDOT. The WSDOT minimum LOS standard for SR 305 is LOS D.

All intersections currently operate at LOS D or better, satisfying their respective minimum LOS standards during the AM and PM peak hours.

4.7 Collision History

Crash history data in the project vicinity for the five-year period from 2020 through 2024 was obtained from WSDOT and is summarized below. **Table 5** describes crash history by year.

Table 5: Crash History by Year

(Ref #) Intersection/Segment	2020	2021	2022	2023	2024	Total	Avg/Yr
<i>Study Intersections</i>							
(I1) SR 305 & Hostmark St	2	3	2	1	4	12	2.4
(I2) SR 305 & Baywatch Ct	0	0	1	0	1	2	0.4
(I3) SR 305 & Johnson Rd	3	0	3	3	4	13	2.6
(I4) Hostmark St & Caldart Ave	2	1	0	2	0	5	1.0
(I5) Johnson Rd & Sunrise Ridge	0	0	0	0	0	0	0.0
(I6) Caldart Ave & Sunrise Ridge	0	0	0	0	0	0	0.0
(I7) Sunrise Ridge & Crystallia Ct	0	0	0	0	0	0	0.0
<i>Study Street Segments</i>							
(S1) SR 305 s/o Hostmark St	0	2	3	0	2	7	1.4
(S2) SR 305 s/o Baywatch Ct	0	2	0	0	0	2	0.4
(S3) SR 305 s/o Johnson Rd	1	0	0	1	0	2	0.4
(S4) Caldart Ave n/o Hostmark	0	0	0	1	1	2	0.4
Total (All Intersections & Segments)	8	8	9	8	12	45	9.0

A total of 45 crashes were recorded in the study area during the five-year study period, including 12 resulting in injury. No serious injury or fatal crashes were reported. Crashes are summarized by type in **Table 6** and by severity in **Table 7**.



Table 6: Crash History by Type

Crash Type	Number of Crashes (2020-2024)										
	Intersections							Street Segments			
	I1	I2	I3	I4	I5	I6	I7	S1	S2	S3	S4
Rear-end	5	0	8	3	0	0	0	3	0	1	0
Enter at angle	2	0	1	1	0	0	0	1	0	0	0
Opposite direction	3	0	1	0	0	0	0	2	0	0	0
Same direction	1	0	0	0	0	0	0	0	0	0	0
Pedestrian-Involved	1	0	0	1	0	0	0	0	0	0	0
Sideswipe	0	0	2	0	0	0	0	1	0	1	0
Struck fixed object	0	2	0	0	0	0	0	0	2	0	2
Vehicle overturned	0	0	1	0	0	0	0	0	0	0	0

Table7: Crash History by Severity

(Ref #) Intersection/Segment	Fatal (K)	Serious Injury (A)	Minor Inj. (B)	Possible Inj. (C)	PDO
(I1) SR 305 & Hostmark St	0	0	1	1	10
(I2) SR 305 & Baywatch Ct	0	0	0	0	2
(I3) SR 305 & Johnson Rd	0	0	2	2	9
(I4) Hostmark St & Caldart Ave	0	0	1	2	2
(I5) Johnson Rd & Sunrise Ridge	0	0	0	0	0
(I6) Caldart Ave & Sunrise Ridge	0	0	0	0	0
(I7) Sunrise Ridge & Crystallia Ct	0	0	0	0	0
(S1) SR 305 s/o Hostmark St	0	0	1	1	5
(S2) SR 305 s/o Baywatch Ct	0	0	0	0	2
(S3) SR 305 s/o Johnson Rd	0	0	1	0	1
(S4) Caldart Ave n/o Hostmark	0	0	0	0	2

Six of the 45 total crashes resulted in minor injuries, and six crashes resulted in possible injuries. Two pedestrian-involved crashes were reported and are summarized below. A crash history map is provided in **Figure 8**.

Vehicle Going Straight Hits Pedestrian (August 2023):

This crash occurred in August 2023 at 2:30 PM when a vehicle traveling eastbound on Hostmark Street struck a pedestrian between Caldart Avenue and Noll Road. The crash occurred in daylight with dry roadway conditions. Pedestrian failure to grant

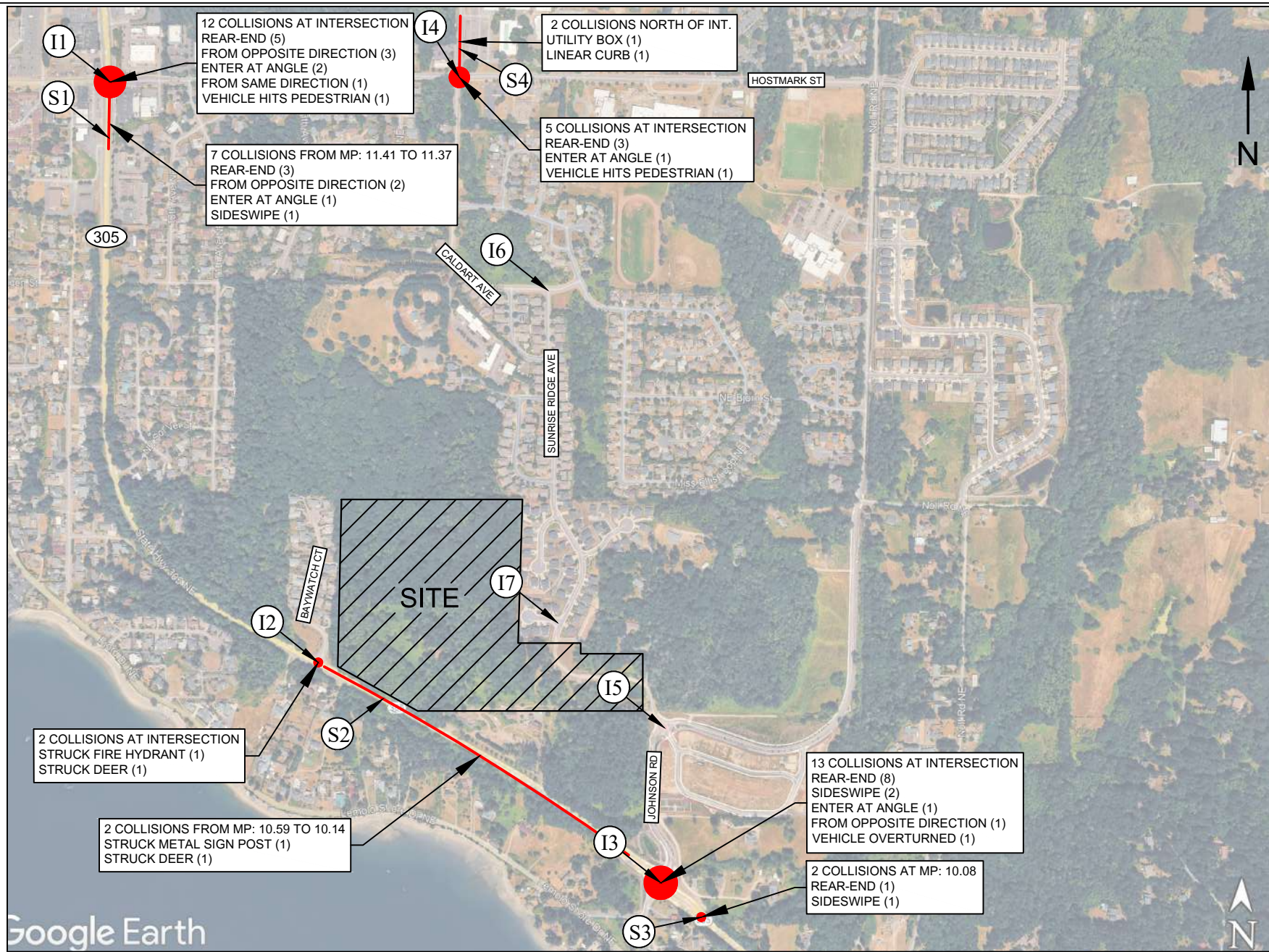


right-of-way to vehicle was cited as a contributing factor. The collision resulted in a suspected minor injury.

Vehicle Going Straight Hits Pedestrian (October 2024):

This crash occurred at the intersection of SR 305 & Hostmark Street in October 2024 at 5:10 PM vehicle traveling southbound on SR 305 struck a pedestrian. The crash occurred during daylight with a dry roadway surface. Pedestrian failure to grant right-of-way to vehicle was cited as a contributing factor. The crash resulted in a suspected minor injury.





5. FORECAST TRAFFIC DEMAND & ANALYSIS

5.1 Project Trip Generation

Trip generation is used to assess the impact a project will have on the surrounding street system by estimating the number of new trips that will enter and exit the site during specific time periods, such as peak hours (AM or PM) or over the course of a day. The expected vehicle trip generation for the proposed project was calculated using data from the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 12th Edition*. For this analysis, Land Use Code (LUC) 210 - Single-Family Detached Housing was selected, with dwelling units used as the input variable and ITE average rates applied to determine the number of trip ends.

A summary of the average weekday daily trips (AWDT), AM peak hour trips, and PM peak hour trips are shown below in **Table 8**.

Table 8: Project Trip Generation

Land Use	Units	AWDT	AM Peak-Hour Trips			PM Peak-Hour Trips		
			In	Out	Total	In	Out	Total
LUC 210 - Single-Family Housing	138	1,254	26	71	97	80	48	128

Based on ITE data, the project is estimated to generate 1,254 daily weekday trips, 97 AM peak hour trips (26 inbound / 71 outbound), and 128 PM peak hour trips (80 inbound / 48 outbound).

5.2 Project Distribution & Assignment

Trip distribution is the process by which project-generated trips are paired with origins and destinations in the vicinity of the project site. The project trip distribution forecast was calculated based on recent traffic counts, existing and anticipated development in the project vicinity, and with consideration for other recent residential projects in the vicinity.

Project trip distribution and assignment forecasts, shown in **Figures 9** and **10**, assumed completion of the Sunrise Ridge Avenue NE corridor which will provide a connection between Noll Road/Johnson Road and Caldart Avenue.



5.3 Future Peak Hour Volumes

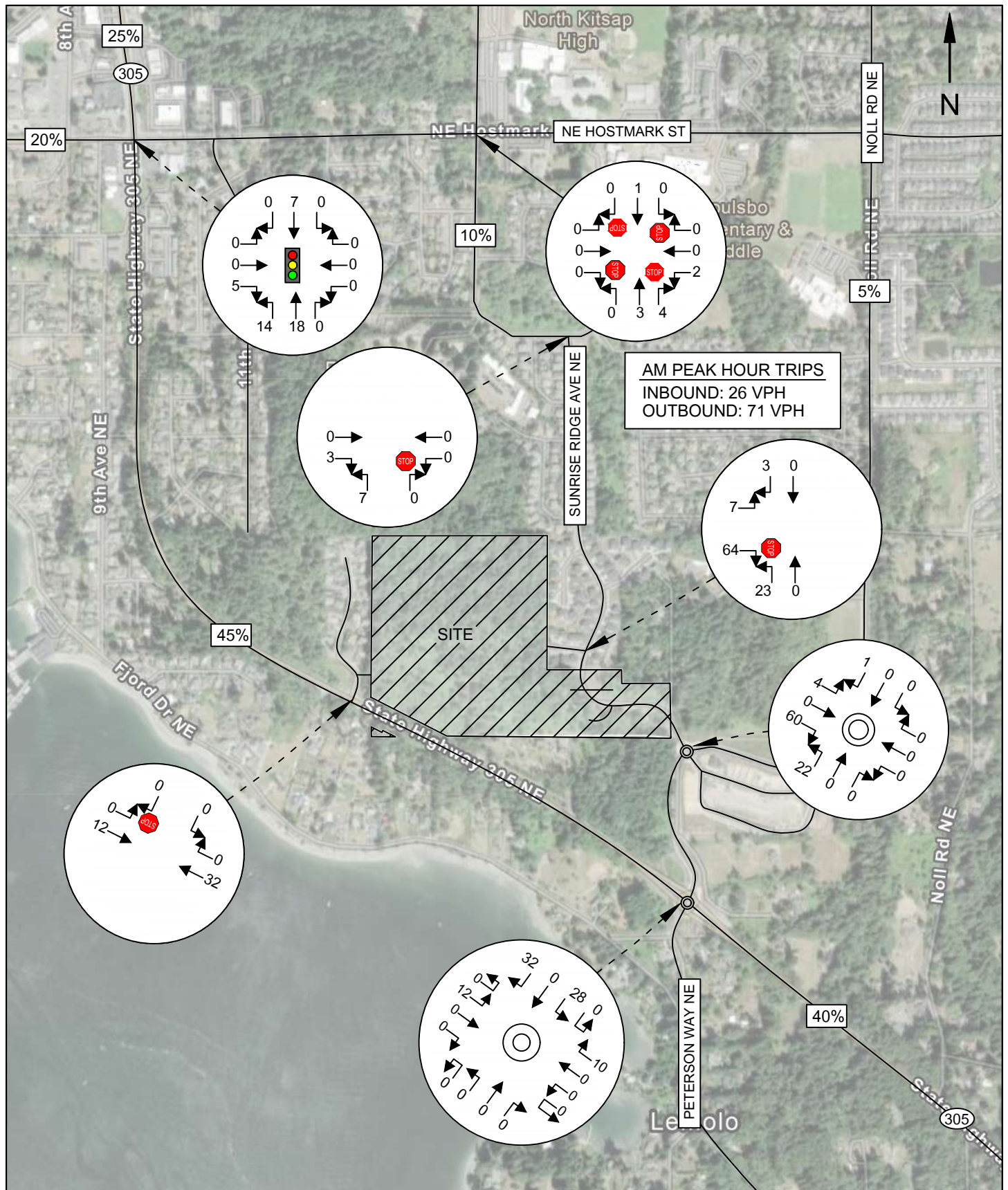
Future traffic volumes were forecast for seven-year (2032) and 12-year (2037) analysis periods. Background (non-Project) traffic volumes were forecast as the sum of two components:

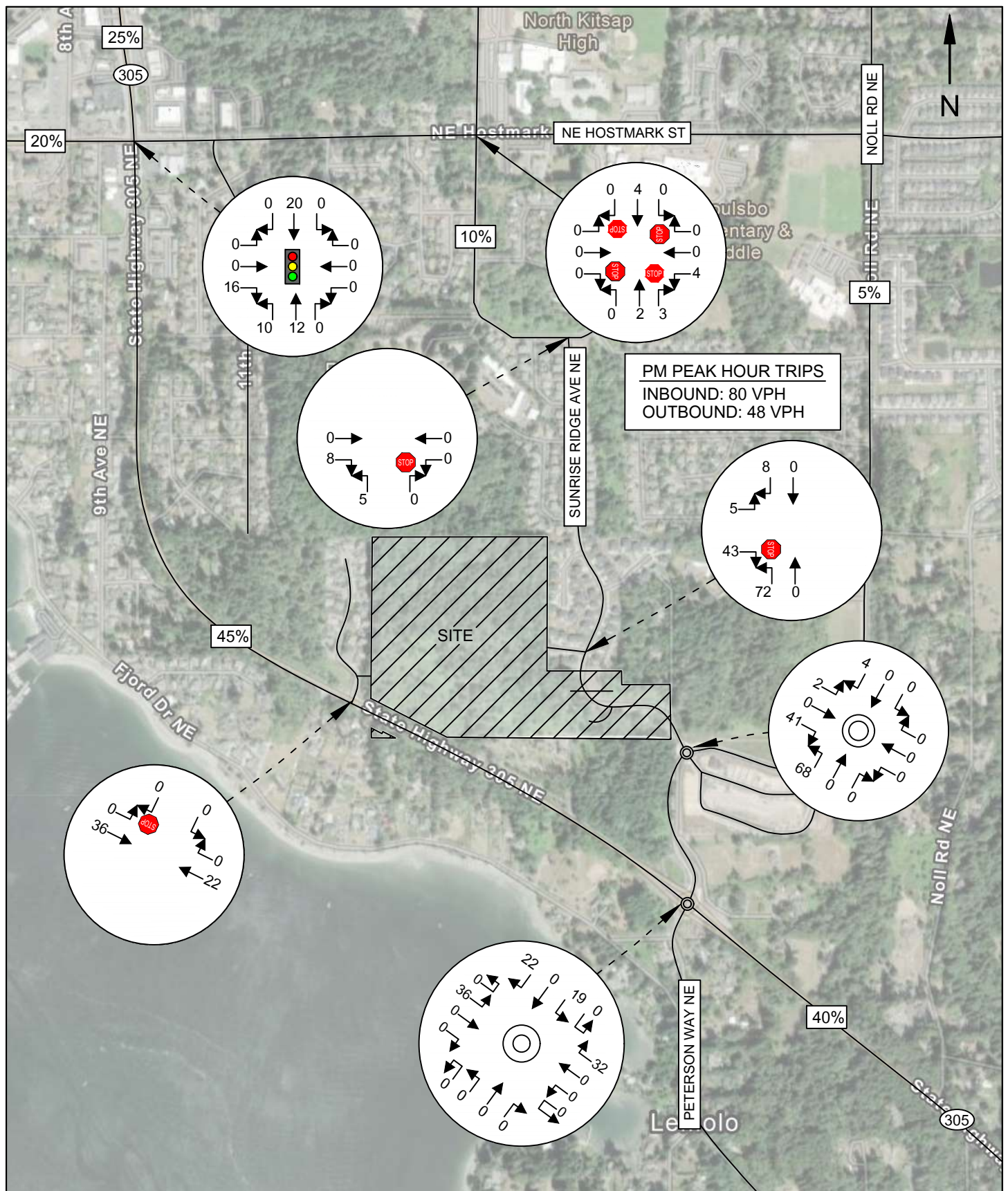
1. **Pipeline growth** reflects the impacts of specific projects which have been permitted in the project vicinity. Pipeline projects were identified by City of Poulsbo staff and included:
 - a. Aktiv Mixed-Use, a 44-unit multifamily residential development located at the corner of NE Harrison Street and 9th Avenue NE.
 - b. Audrey Estates, a 60-unit single-family residential development located to the east of the project site. Audrey Estates is bordered by Noll Road to the east and south, with access on Sunrise Ridge Avenue.
 - c. Sandstone Ridge Plat, an 87-unit single-family residential development located at the corner of Noll Road NE & Langaunet Lane NE.
2. **Background growth** reflects the impacts of other local and regional growth which is anticipated to impact the study area. Background growth was calculated by applying growth rates:
 - a. For SR 305, a growth rate of 0.5 percent per year was applied. This is consistent with SR 305 forecasts identified in the travel demand model, which constitutes the basis of the Transportation Element of the Poulsbo Comprehensive Plan
 - b. For all other streets, a growth rate of 2.0 percent per year was applied. This represents a more aggressive growth forecast than the 1.2 percent per year growth rate identified in the Poulsbo travel demand model. However, this growth rate was selected to allow the analysis to reflect a “worst case” forecast given recent growth in the project vicinity.

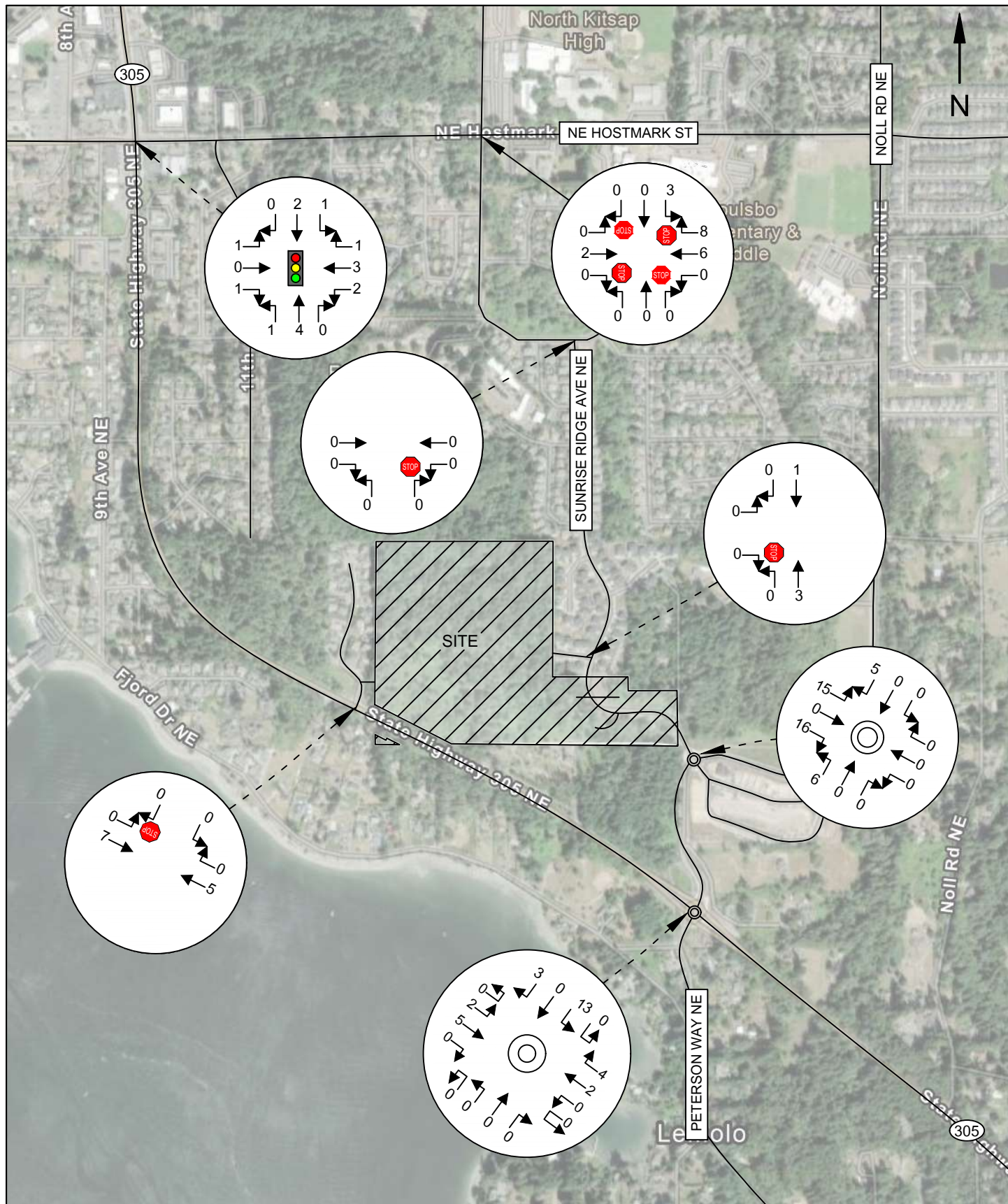
All future year analyses assumed Sunrise Ridge Avenue NE will be opened to traffic by 2032, creating a new north-south local street connection between Noll Road/Johnson Road NE and Caldart Avenue to the north. The new connection will provide a low-speed, circuitous alternative to the more direct Noll Road corridor, and will be designed to discourage cut-through demand. However, some redistribution and cut-through demand may occur. This analysis assumed that the new connection will capture 20 percent of existing AM and PM peak hour demand on the Noll Road corridor to the east. This results in a Sunrise Ridge Avenue traffic volume forecast which is generally consistent with the City of Poulsbo travel demand model forecast.

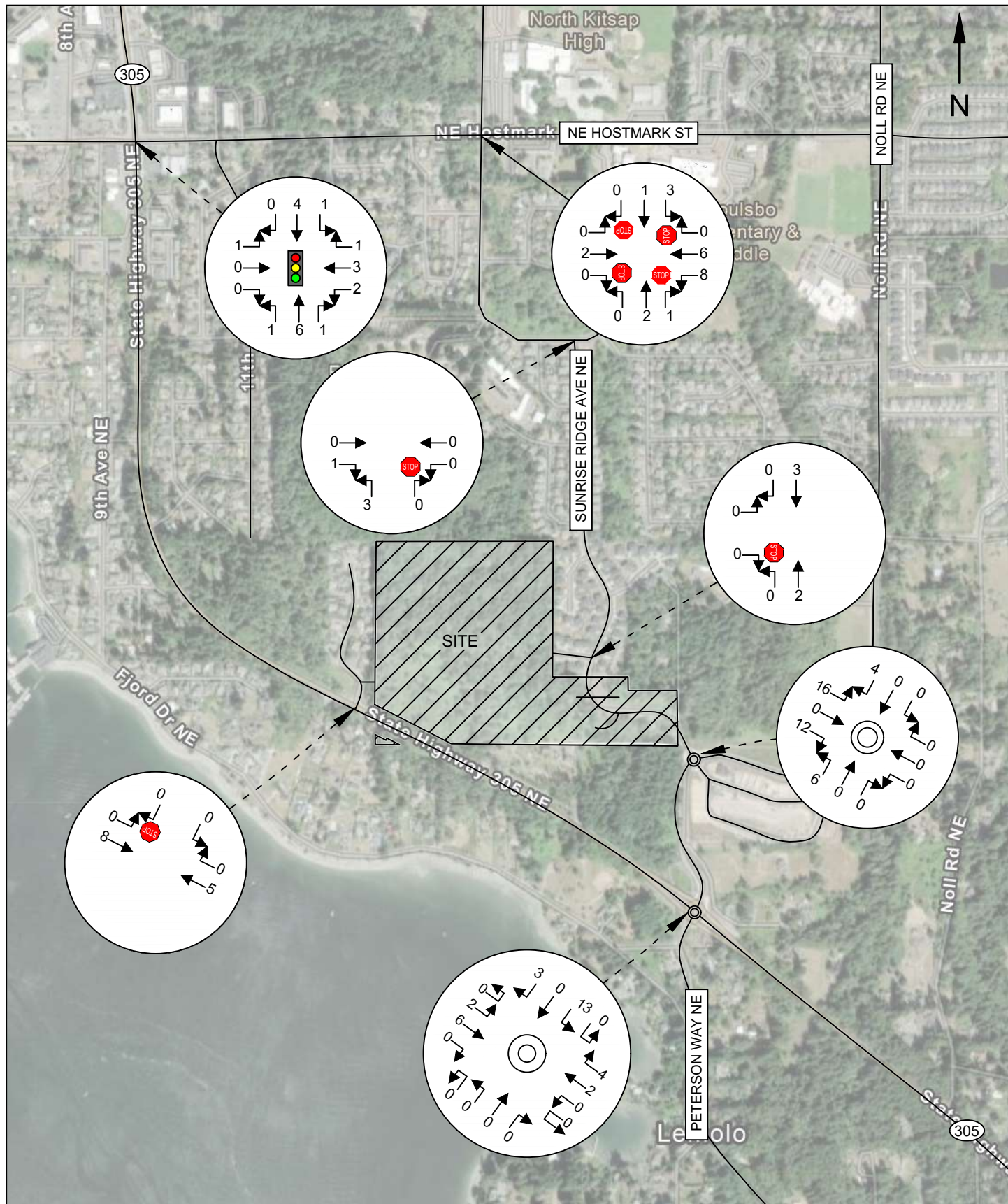
AM and PM peak hour pipeline volumes are shown in **Figures 11 and 12**. Future 2032 and 2037 AM and PM peak hour traffic volumes forecasts are shown graphically in **Figures 13 through 20**.

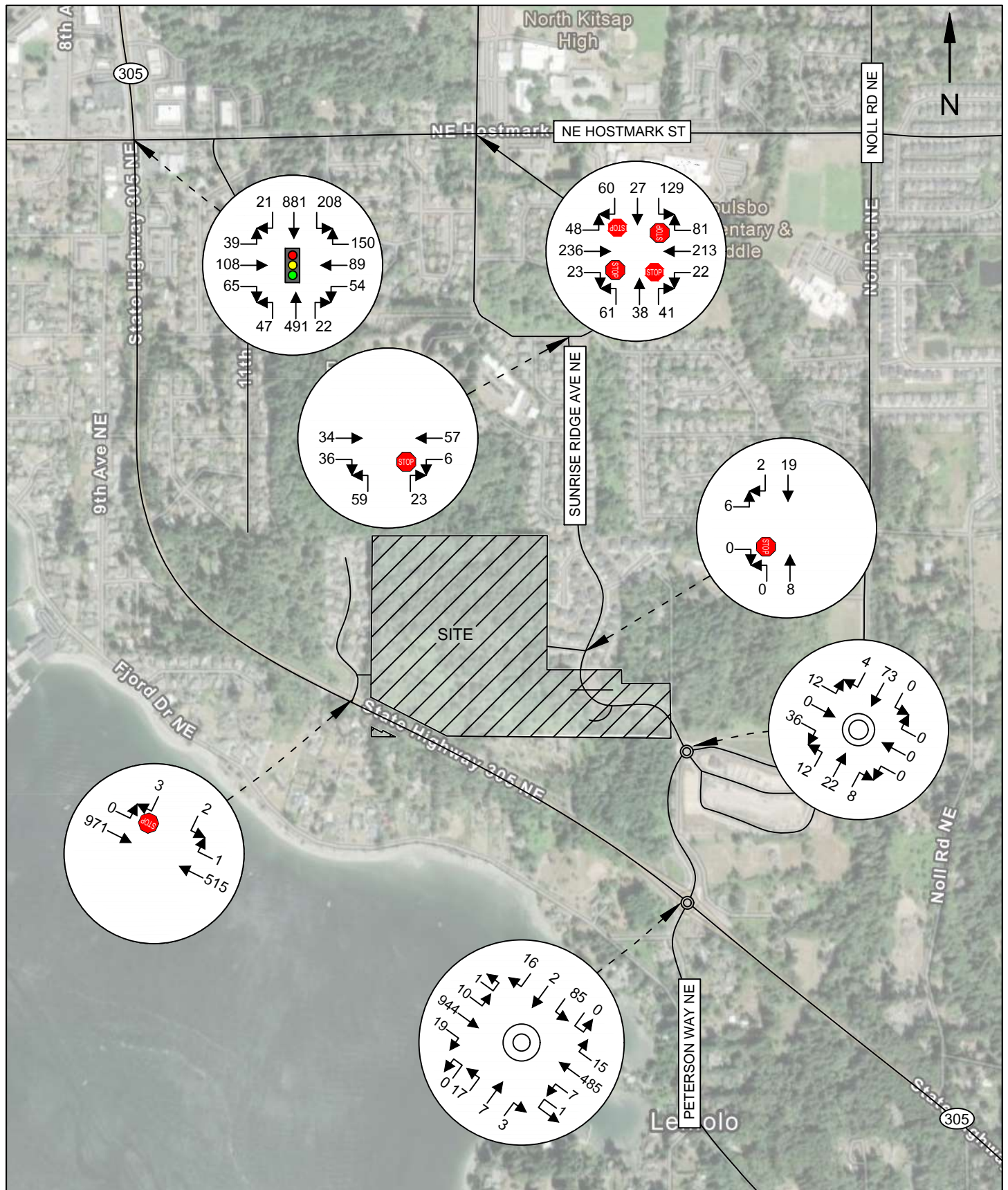


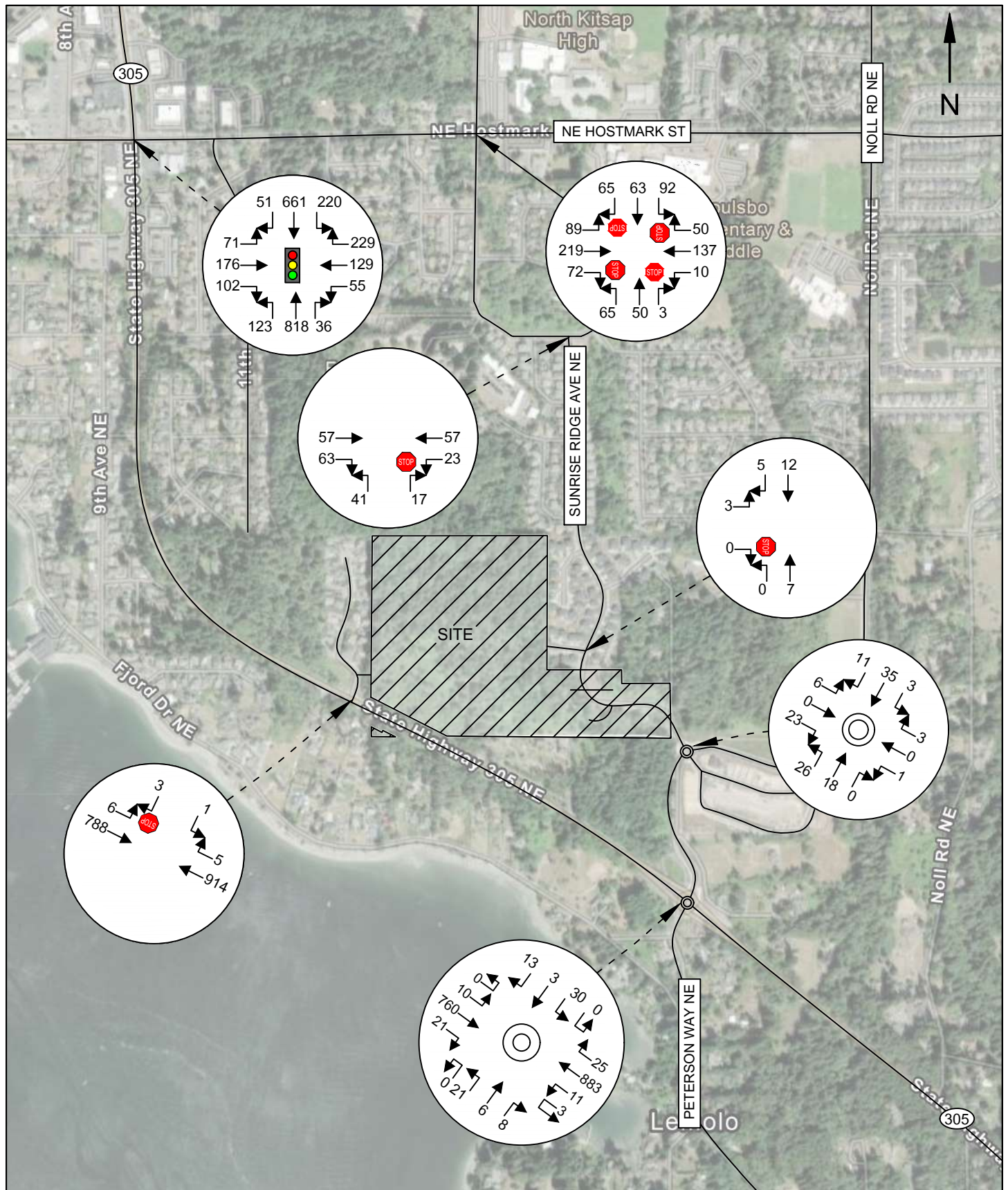


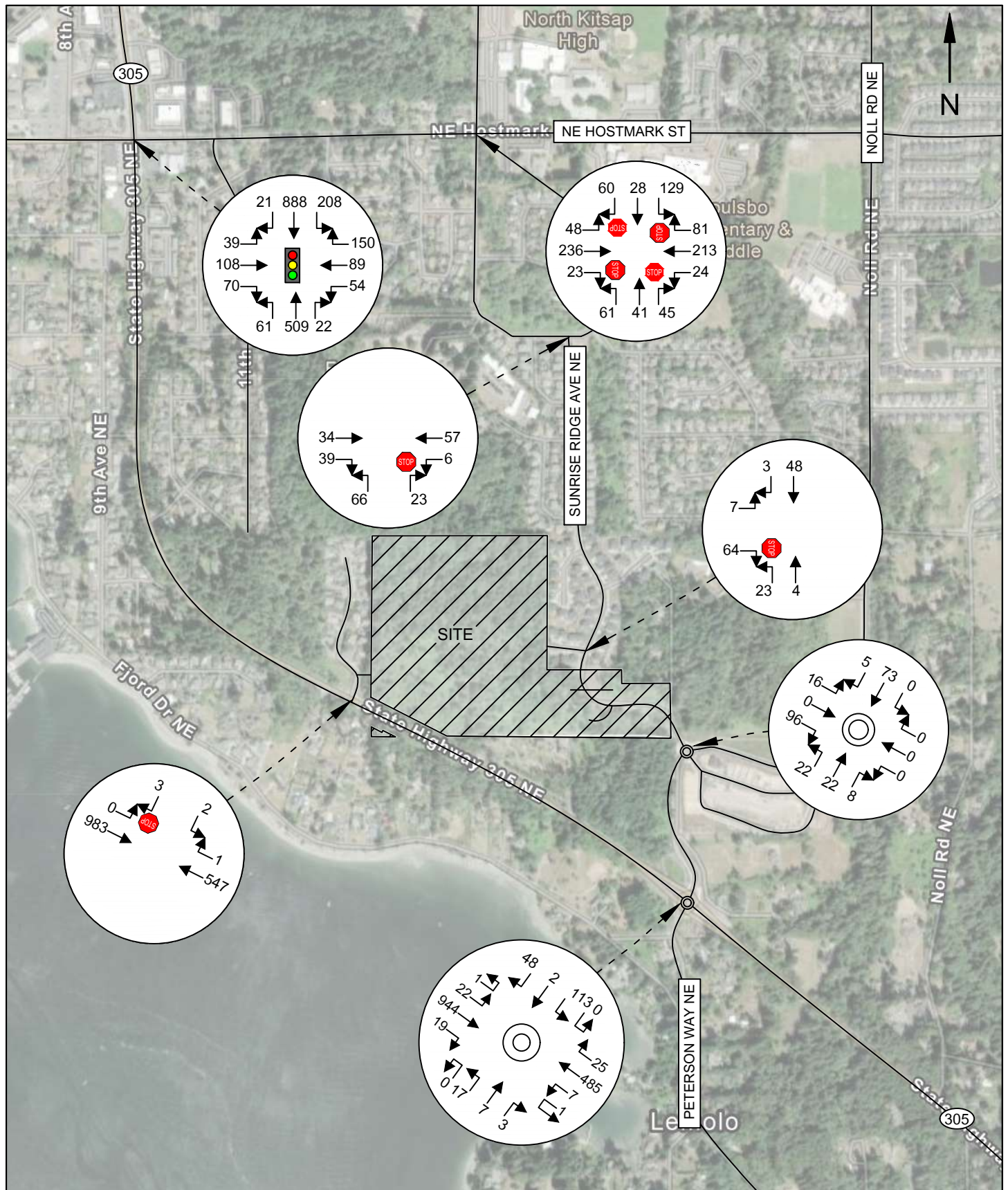


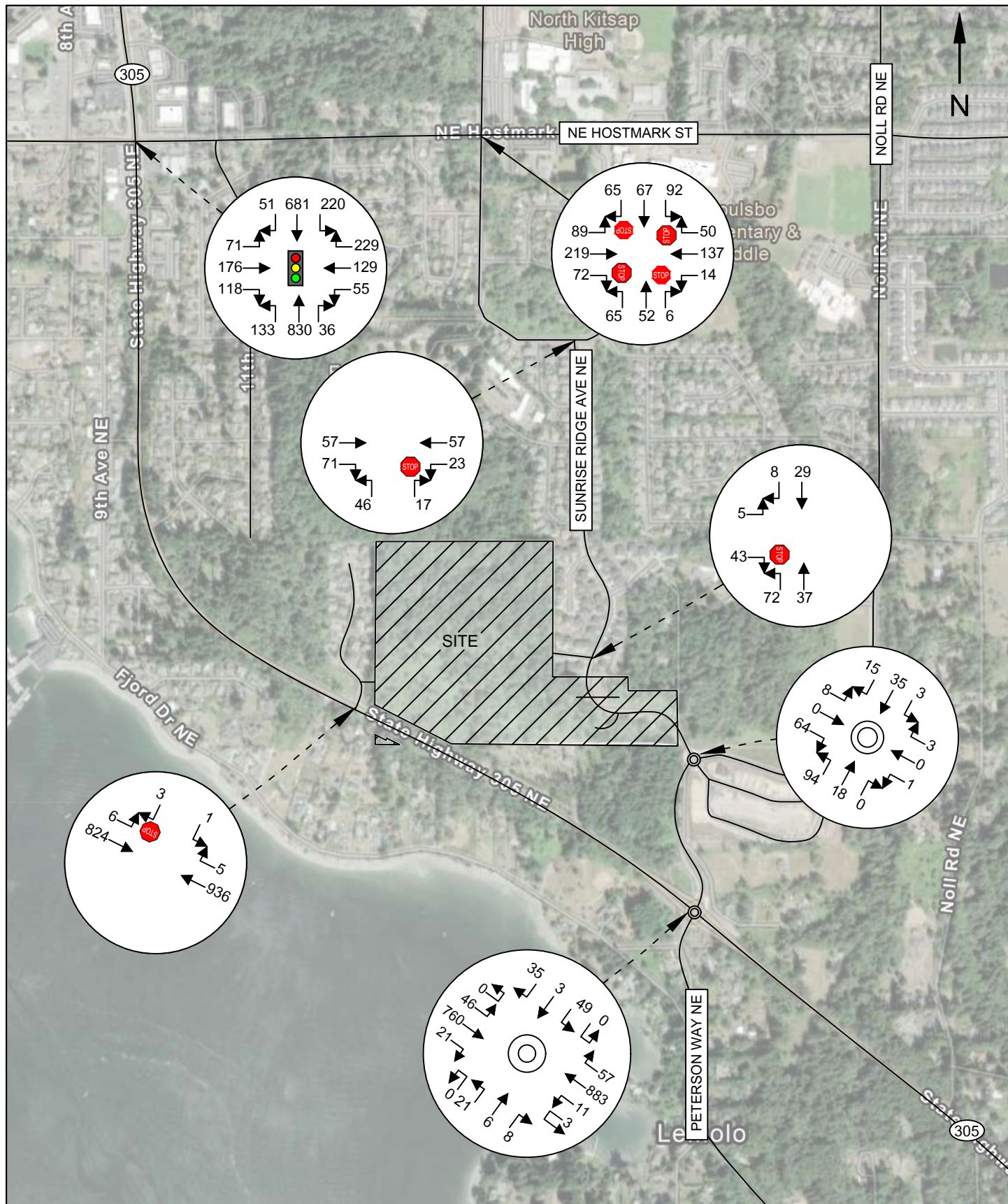


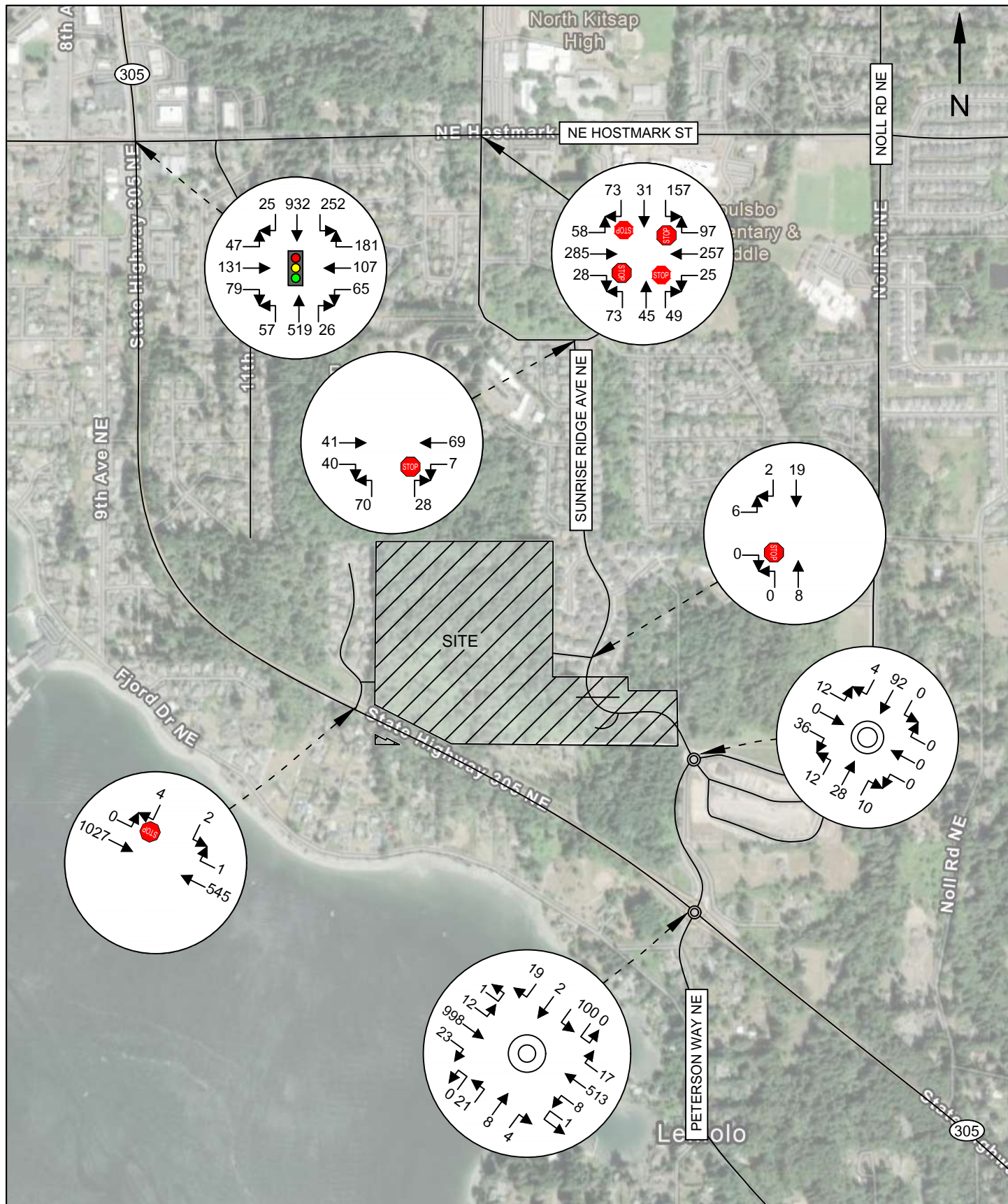


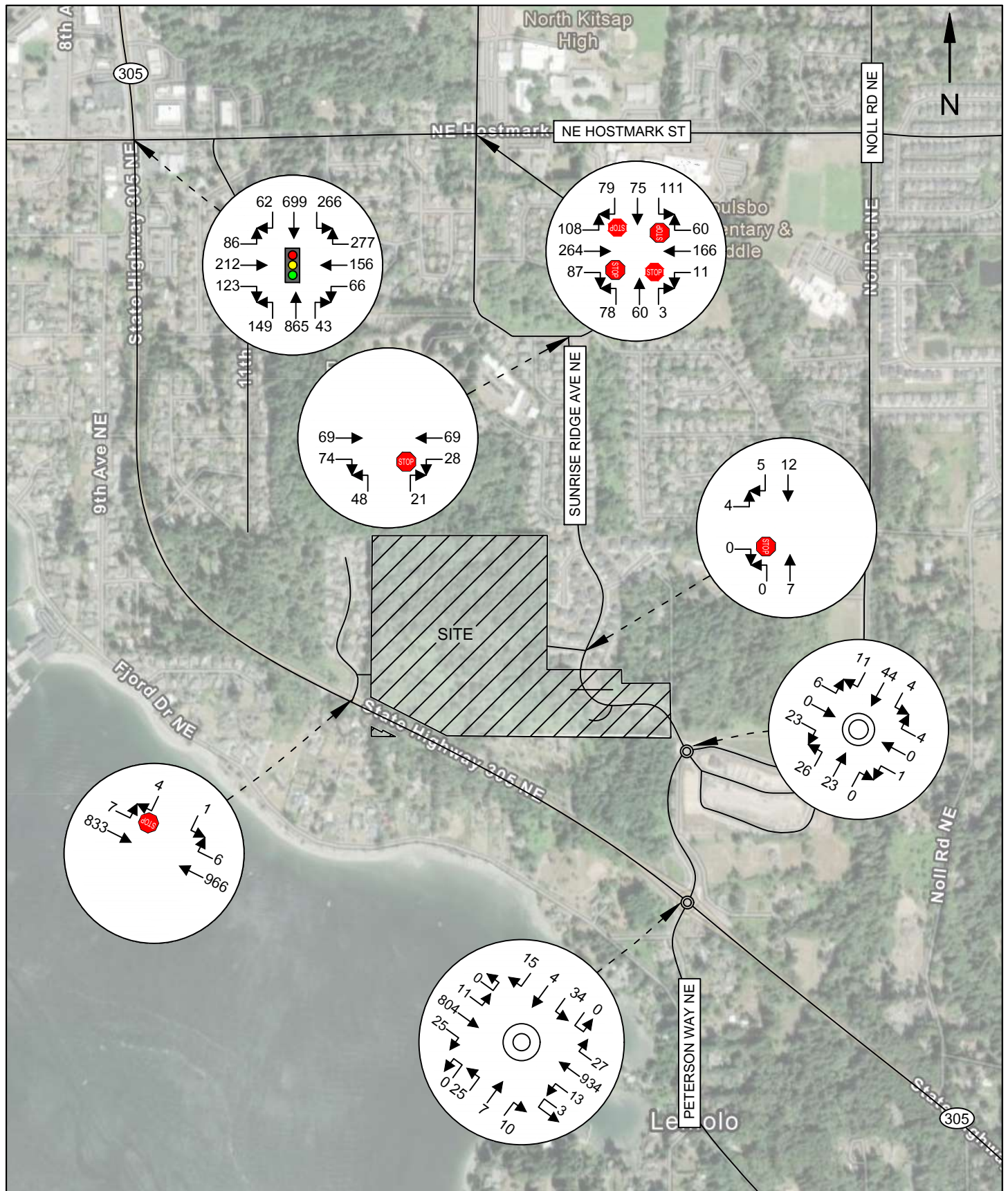


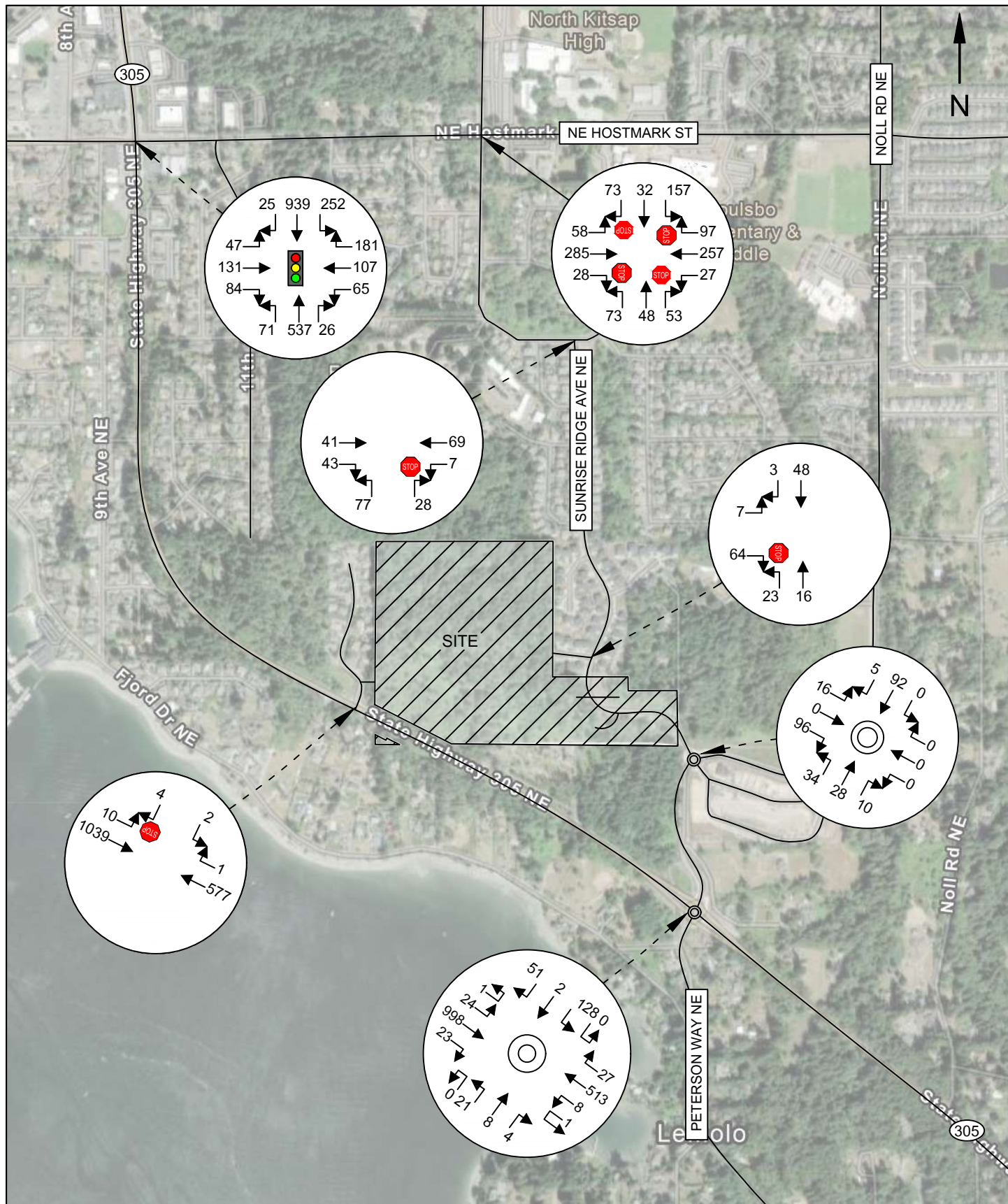


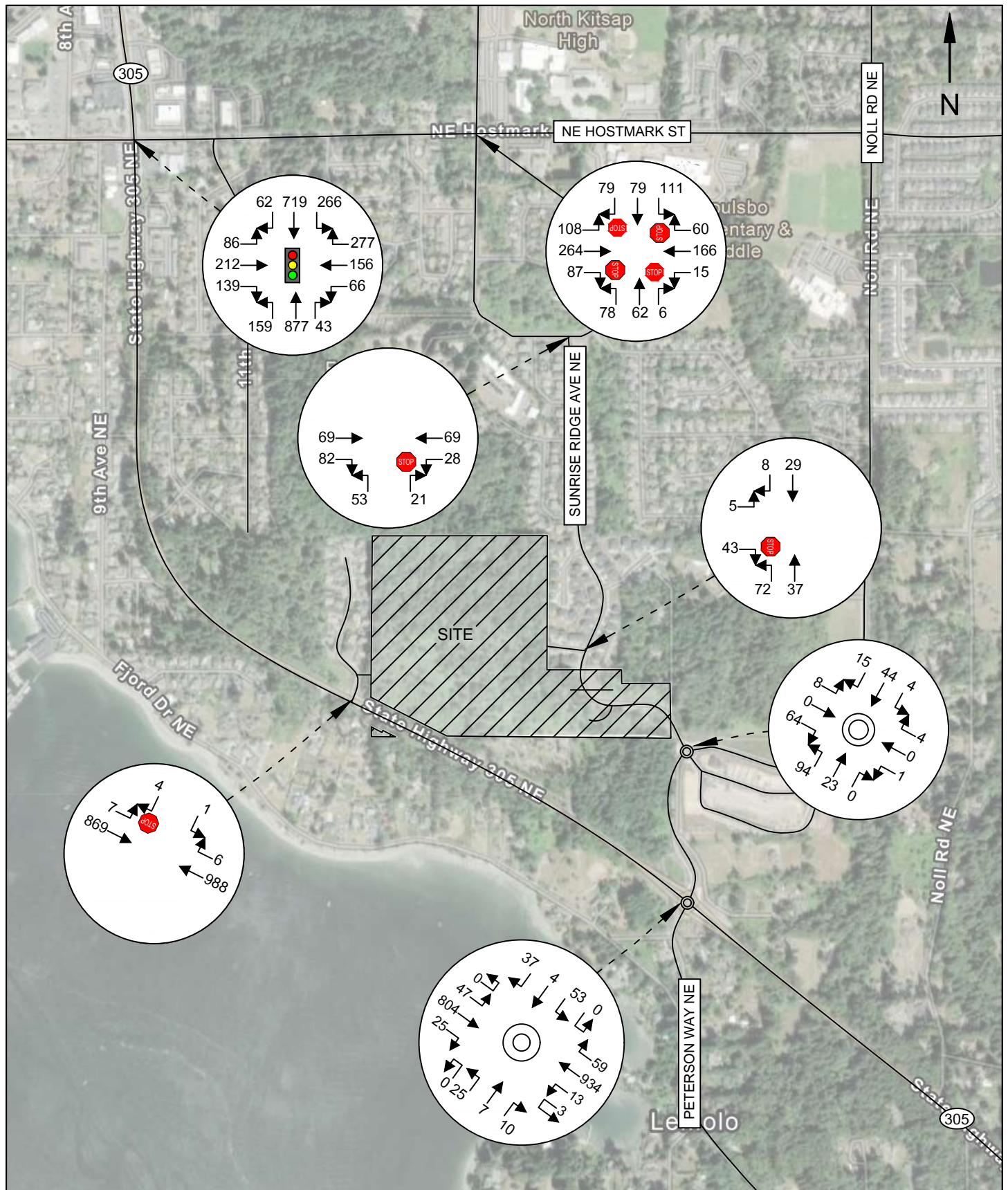












5.5 Project Access

Site access will be provided at four locations, as identified in Figure 2:

1. Access A: Sunrise Ridge Avenue via extension of Crystallia Court
2. Access B/C: Both sides of Sunrise Ridge Avenue 220 feet south of Crystallia Court
3. Access D: Sunrise Ridge Avenue 380 feet south of Crystallia Court

To provide a worst-case operations analysis, this study assumed project-generated trips will be consolidated at the primary access, Access A. The analysis indicates that the associated study intersection Sunrise Ridge Avenue NE & Crystallia Court will operate at LOS A through 2037, maintaining applicable WSDOT and City of Poulsbo minimum LOS standards.

Design of on-site streets, intersections, and frontage improvements should be coordinated with the City of Poulsbo.

5.6 Future Level of Service

Intersection LOS was analyzed for the 2032 and 2037 forecasting horizons both without and with project-generated trips. Intersection delay and LOS results are summarized in **Table 9**. The 2032 analysis assumed that existing Peak Hour Factor (PHF) would remain unchanged. The 2037 analysis applied a PHF of 1.0 on SR 305 intersections, consistent with WSDOT Synchro protocol for long-range analyses, while maintaining the counted 2025 PHFs on local intersections.

Hostmark Street & Caldart Avenue will operate at LOS E during the 2037 AM peak hour before and after the addition of project trips, satisfying the City of Poulsbo minimum LOS E standard. The 2037 analysis assumes existing school-related volume peaking will increase proportional to ongoing commercial and residential growth in the intersection vicinity. The addition of project trips will not impact intersection LOS. 95th percentile queues are anticipated to extend 10-11 vehicles on the eastbound and westbound approaches in the 2037 AM peak hour and will not significantly increase with the addition of project-generated trips.

SR 305 & Baywatch Court NE will operate acceptably at LOS C through 2037. with average delay of 27 seconds or less on southbound approach. The southbound left-turn movement will operate at LOS E by 2037. However, project-generated trips are not anticipated to utilize Baywatch Court NE. 95th percentile queues are anticipated to extend no more than one car-length through 2037 before and after project trips. SR 305 & Baywatch Court NE delay forecasts are slightly lower in 2037 than 2032 due to the application of a 1.0 PHF on SR 305 intersections in the long-range forecasting horizon, consistent with WSDOT Synchro protocol.



Table 9: Forecast 2032 & 2037 Weekday Peak Hour Level of Service*Delays Given in Seconds per Vehicle*

ID	Intersection	Control	Peak Hour	Crt. Apprch	Without Project		With Project	
					LOS	Delay	LOS	Delay
2032 Intersection Operations								
1	SR 305 & Hostmark St	Signal	AM	Overall	D	36.5	D	37.1
			PM		D	44.5	D	44.7
2	SR 305 & Baywatch Ct	One-Way Stop	AM	SB	C	21.8	C	22.9
			PM		D	25.8	D	27.2
3	SR 305 & Johnson Rd	RAB	AM	Overall	A	7.4	A	7.7
			PM		A	6.6	A	7.0
4	Hostmark St & Caldart Ave	AWSC	AM	Overall	C	24.0	C	24.9
			PM		B	14.9	C	15.2
5	Johnson Rd & Sunrise Ridge	RAB	AM	Overall	A	5.6	A	5.8
			PM		A	6.0	A	6.7
6	Caldart Ave & Sunrise Ridge	TWSC	AM	NB	A	9.7	A	9.8
			PM		B	10.0	B	10.1
7	Sunrise Ridge & Crystallia Ct	One-Way Stop	AM	EB	A	8.7	A	8.8
			PM		A	8.6	A	8.8
2037 Intersection Operations								
1	SR 305 & Hostmark St	Signal	AM	Overall	D	36.5	D	37.1
			PM		D	44.9	D	45.2
2	SR 305 & Baywatch Ct	One-Way Stop	AM	SB	C	18.9	C	19.7
			PM		C	22.3	C	23.3
3	SR 305 & Johnson Rd	RAB	AM	Overall	A	7.3	A	7.6
			PM		A	6.6	A	6.9
4	Hostmark St & Caldart Ave	AWSC	AM	Overall	E	35.7	E	39.4
			PM		C	18.3	C	18.5
5	Johnson Rd & Sunrise Ridge	RAB	AM	Overall	A	5.6	A	5.8
			PM		A	6.0	A	6.7
6	Caldart Ave & Sunrise Ridge	TWSC	AM	NB	A	9.8	A	9.9
			PM		B	10.2	B	10.3
7	Sunrise Ridge & Crystallia Ct	One-Way Stop	AM	EB	A	8.7	A	8.8
			PM		A	8.6	A	8.8

*Signalized intersection LOS is based on overall intersection delay;

Roundabout (RAB) and AWSC LOS is based on overall intersection delay and stop-controlled delay thresholds;

Minor-approach stop control LOS is based on worst-approach delay and stop-controlled delay thresholds

All study intersections will satisfy their respective City and WSDOT minimum LOS standards through 2037 with project trips.



5.7 SR 305 Connectivity

A previous draft TIA report included a site access on Baywatch Court NE, a local access street to the southwest of the subject site which intersects SR 305 at a minor-approach stop-controlled intersection on a relatively high-speed horizontal curve. The elimination of the Baywatch Court NE connection in the currently proposed site plan will result in project trips accessing SR 305 to the south via the roundabout intersection at Johnson Road or to the northwest via the signalized intersection at NE Hostmark Street, avoiding significant increases in entering and exiting traffic volumes at the stop-controlled Baywatch Court NE intersection.

A planning-level travel time analysis was developed to refine the project trip assignment forecast between the SR 305 & Hostmark Street intersection and the site. The analysis, which incorporated posted speed limits on each route, indicated that the SR 305/Johnson Road NE provides a shorter travel time route (168 seconds) than Hostmark Street/Caldart Avenue (181 seconds). Project trips to/from the north and west are therefore likely to utilize SR 305 and Johnson Road NE rather than the lower-speed Hostmark Street/Caldart Avenue corridors.

The operational analysis described in the previous section indicates that SR 305 intersections on Hostmark Street and Johnson Road provide adequate capacity to support project trips through the 2037 analysis horizon.

5.8 Future Nonmotorized Transportation Conditions

The internal circulating street network will include sidewalks and marked pedestrian crosswalks internal to the project site. On-site nonmotorized facilities will provide connections to the existing nonmotorized transportation network, including sidewalks and marked crosswalks to the north of the site.

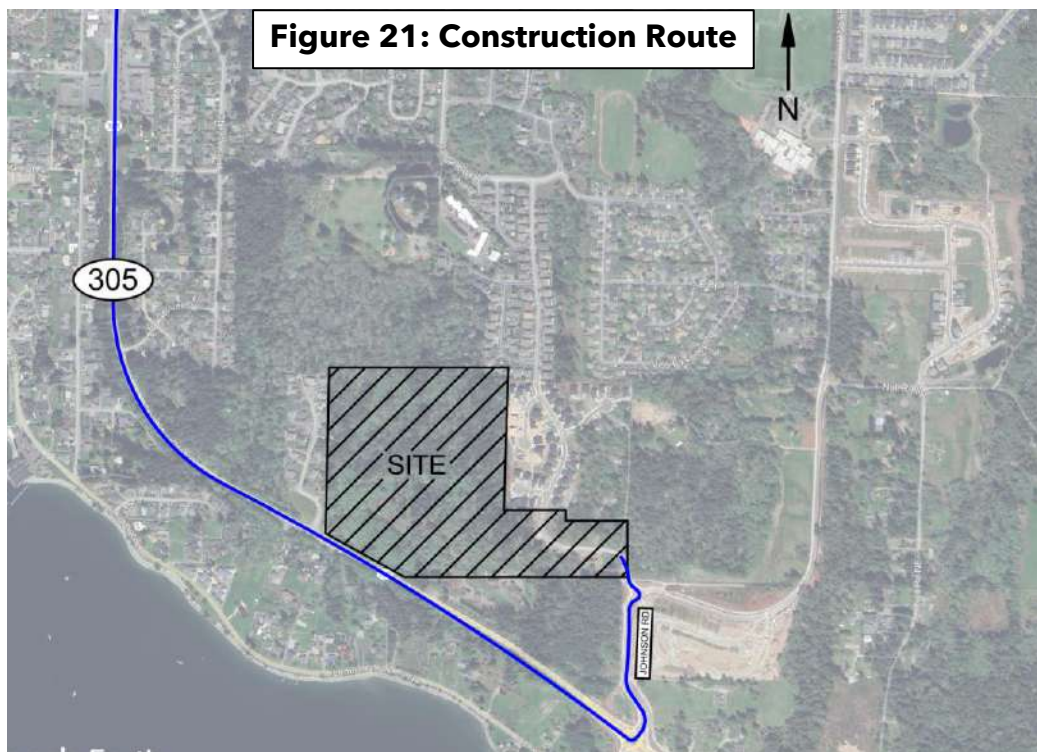
Pedestrian routes to schools in the project vicinity are described in Section 4.5 and shown graphically in Figure 7.



5.9 Construction Traffic

Truck activity will vary throughout project construction, with an estimated maximum of 60-80 trucks per day during a 3-4-week mass grading and import phase. Construction activity will involve a maximum of 20 on-site construction employees.

Construction traffic is anticipated to primarily utilize Johnson Road, a City arterial, to access SR 305, a state route. The anticipated construction route is illustrated in **Figure 21**. Any route restrictions or preferences may be coordinated with the City.



6. CONCLUSIONS & MITIGATION

The Pinnacle at Liberty Bay is a proposed residential development consisting of 138 single-family homes located within Poulsbo. The subject site comprises 40.98 acres on four undeveloped tax parcels. Site ingress/egress is proposed via NE Crystallia Court and Sunrise Ridge Avenue NE.

Existing traffic operations were analyzed at six intersections in the project vicinity. All study intersections currently operate at LOS D or better, satisfying WSDOT and City of Poulsbo minimum LOS standards. A crash history analysis indicated no serious injury or fatal crashes in the study area and no safety deficiencies were identified.

The project is anticipated to generate 1,254 average weekday daily trips, 97 AM peak hour trips, and 128 PM peak hour trips. Future pipeline growth in the study area will include three nearby residential developments. Additional background traffic growth was forecast using travel demand forecasts provided by the City of Poulsbo.

Future traffic conditions were analyzed for 2032 and 2037 horizon years. Traffic forecasts assumed completion of the Sunrise Ridge Avenue NE connection between Noll Road and Caldart Avenue, including redistribution of travel demand. All study intersections are expected to operate at or above their respective City and WSDOT minimum LOS standards through 2037 before and after the addition of project trips.

Construction activity will vary over the anticipated 12-month construction period. Trucks are encouraged to utilize state routes and should coordinate preferred truck routes with the City of Poulsbo.

The following mitigation recommendations are provided for consideration:

1. Design of on-site streets, intersections, and frontage improvements should be coordinated with the City of Poulsbo.
2. The project will be subject to Traffic Impact Fees (TIF) as imposed by the City of Poulsbo (PMC 3.86). Fees are based on project-generated trips, assessed at \$564.00 per net new daily trip. The estimated fee calculation is:

$$1,254 \text{ daily trips} \times \$564.00 \text{ per daily trip} = \mathbf{\$707,256.00}$$

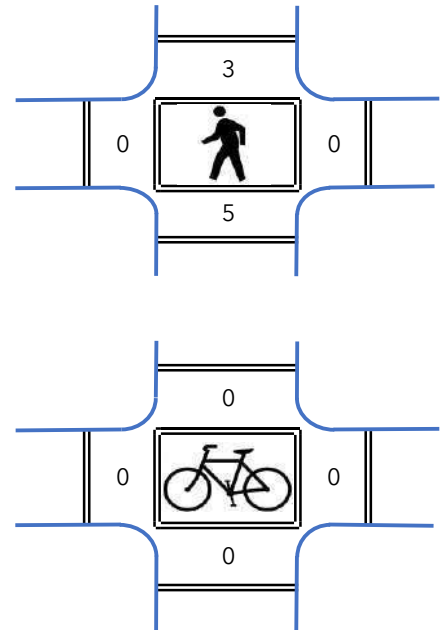
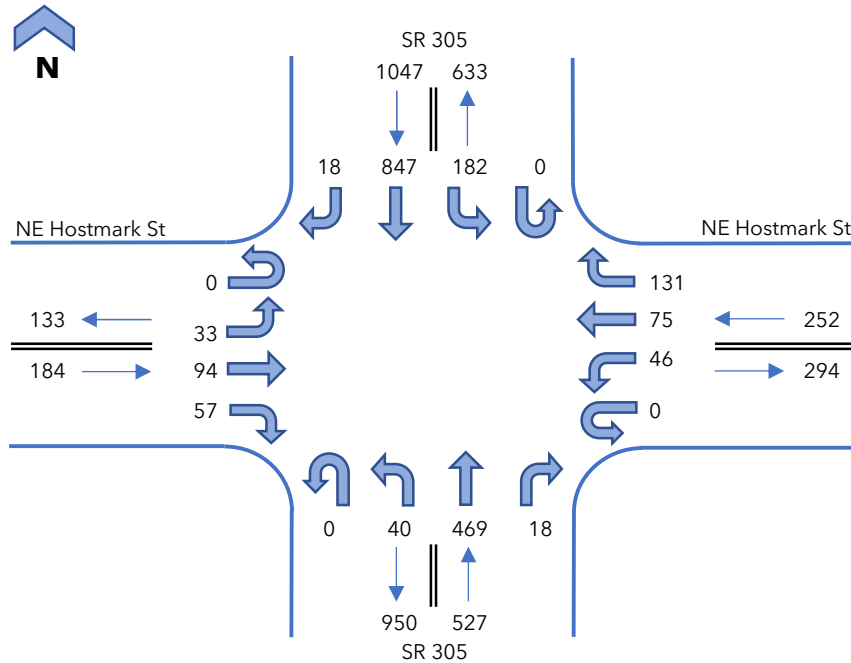
Traffic impact fees will be calculated and determined by the City at the time of building permit issuance.



THE PINNACLE AT LIBERTY BAY TRAFFIC IMPACT ANALYSIS

APPENDIX



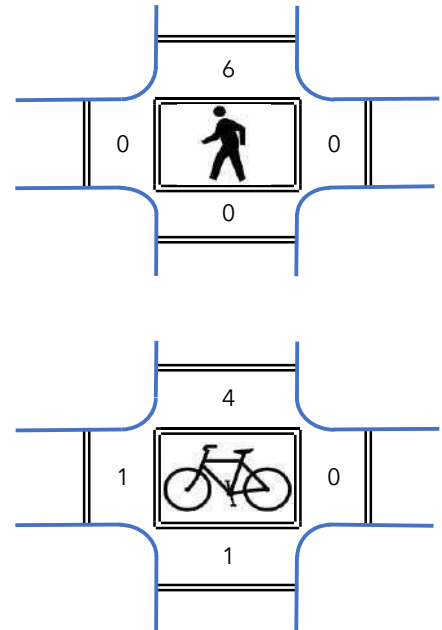
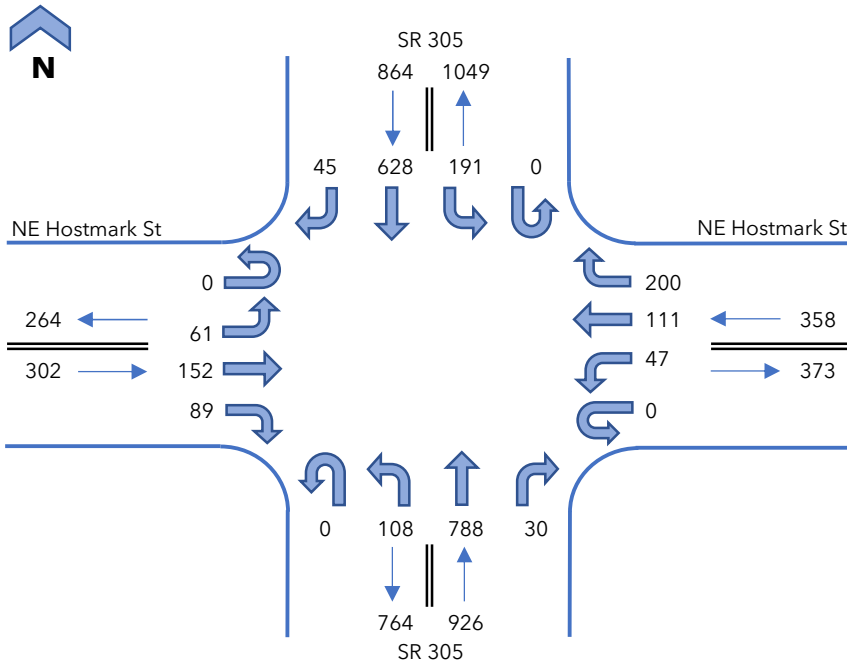
NE Hostmark Street & SR 305


Interval Start Time	NE Hostmark St Eastbound				NE Hostmark St Westbound				SR 305 Northbound				SR 305 Southbound				15 Minute Totals	Hourly Totals
	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT		
7:00 AM	0	2	12	9	0	5	12	26	0	5	110	1	0	28	200	5	415	2010
7:15 AM	0	11	29	18	0	19	16	29	0	6	111	4	0	50	226	4	523	
7:30 AM	0	12	30	14	0	10	19	41	0	12	111	7	0	64	200	5	525	
7:45 AM	0	8	23	16	0	12	28	35	0	17	137	6	0	40	221	4	547	
8:00 AM	0	12	7	11	0	5	17	24	0	9	118	6	0	17	180	6	412	
8:15 AM	0	11	11	9	0	7	14	24	0	9	128	5	0	12	180	3	413	
8:30 AM	0	8	14	10	0	7	13	19	0	21	122	7	0	30	168	7	426	
8:45 AM	0	9	15	14	0	12	13	33	0	8	150	7	0	23	163	6	453	
Count Total	0	73	141	101	0	77	132	231	0	87	987	43	0	264	1538	40	3714	--
Peak Hour Total	0	33	94	57	0	46	75	131	0	40	469	18	0	182	847	18	2010	--
PHF	0.79				0.84				0.82				0.93				0.92	--
Heavy Vehicles	0	2	5	2	0	2	3	8	0	2	27	1	0	9	53	2	116	--
HV %	0.0%	6.1%	5.3%	3.5%	0.0%	4.3%	4.0%	6.1%	0.0%	5.0%	5.8%	5.6%	0.0%	4.9%	6.3%	11.1%	5.8%	--

Interval Start Time	Heavy Vehicles				
	EB	WB	NB	SB	Total
7:00 AM	2	1	7	10	20
7:15 AM	4	3	10	15	32
7:30 AM	2	7	2	22	33
7:45 AM	1	2	11	17	31
8:00 AM	4	3	5	20	32
8:15 AM	3	3	9	16	31
8:30 AM	1	2	11	22	36
8:45 AM	3	3	10	13	29
Count Total	20	24	65	135	244
Peak Hour Total	9	13	30	64	116
Peak Hour HV%	4.9%	5.2%	5.7%	6.1%	5.8%

Pedestrians (Leg)				
E	W	N	S	Total
0	0	1	3	4
0	0	1	0	1
0	0	0	1	1
0	0	1	1	2
0	1	0	1	2
0	0	2	1	3
2	2	3	2	9
0	0	2	2	4
2	3	10	11	26
0	0	3	5	8

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	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

NE Hostmark Street & SR 305


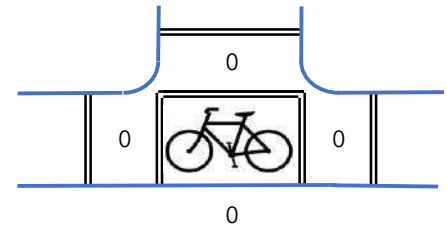
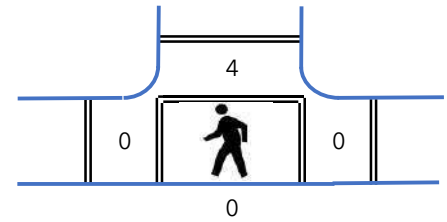
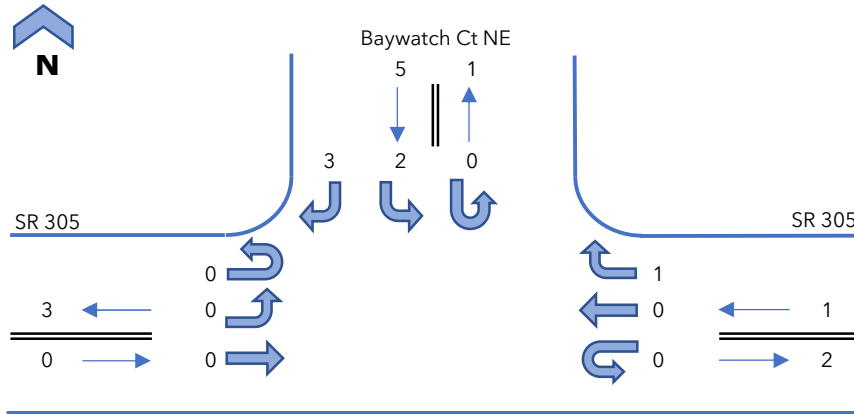
Interval Start Time	NE Hostmark St Eastbound				NE Hostmark St Westbound				SR 305 Northbound				SR 305 Southbound				15 Minute Totals	Hourly Totals
	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT		
4:00 PM	0	19	39	16	0	12	25	48	0	21	205	5	0	49	164	12	615	2450
4:15 PM	0	13	34	27	0	15	23	47	0	31	191	12	0	52	146	12	603	
4:30 PM	0	13	43	24	0	9	41	62	0	28	182	5	0	43	150	15	615	
4:45 PM	0	16	36	22	0	11	22	43	0	28	210	8	0	47	168	6	617	
5:00 PM	0	12	40	30	0	4	26	31	0	20	169	4	0	54	173	9	572	
5:15 PM	0	11	23	21	0	2	24	31	1	28	175	7	0	51	160	7	541	
5:30 PM	0	20	38	14	0	7	13	27	0	17	216	6	0	38	149	14	559	
5:45 PM	0	16	22	15	0	6	17	16	0	23	191	7	0	48	137	12	510	
Count Total	0	120	275	169	0	66	191	305	1	196	1539	54	0	382	1247	87	4632	--
Peak Hour Total	0	61	152	89	0	47	111	200	0	108	788	30	0	191	628	45	2450	--
PHF	0.94				0.80				0.94				0.96				0.99	--
Heavy Vehicles	0	4	4	1	0	0	1	2	0	2	30	0	0	2	11	2	59	--
HV %	0.0%	6.6%	2.6%	1.1%	0.0%	0.0%	0.9%	1.0%	0.0%	1.9%	3.8%	0.0%	0.0%	1.0%	1.8%	4.4%	2.4%	--

Interval Start Time	Heavy Vehicles				
	EB	WB	NB	SB	Total
4:00 PM	1	1	4	2	8
4:15 PM	0	1	9	1	11
4:30 PM	3	0	15	6	24
4:45 PM	5	1	4	6	16
5:00 PM	0	4	3	5	12
5:15 PM	0	0	8	4	12
5:30 PM	0	0	9	2	11
5:45 PM	2	0	9	1	12
Count Total	11	7	61	27	106
Peak Hour Total	9	3	32	15	59
Peak Hour HV%	3.0%	0.8%	3.5%	1.7%	2.4%

Pedestrians (Leg)				
E	W	N	S	Total
0	0	4	0	4
0	0	1	0	1
0	0	0	0	0
0	0	1	0	1
0	1	0	3	4
1	1	1	1	4
0	0	3	2	5
1	0	5	1	7
2	2	15	7	26
0	0	6	0	6

Bicycles (Leg)				
E	W	N	S	Total
0	0	0	0	0
0	0	3	0	3
0	0	0	0	0
0	1	1	1	3
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	4	1	6
0	1	4	1	6

SR 305 & Baywatch Court NE



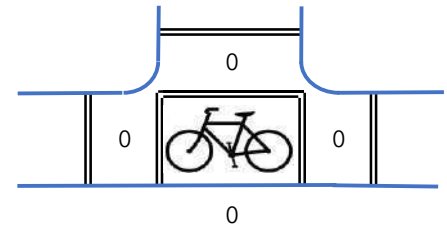
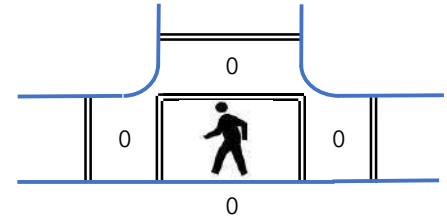
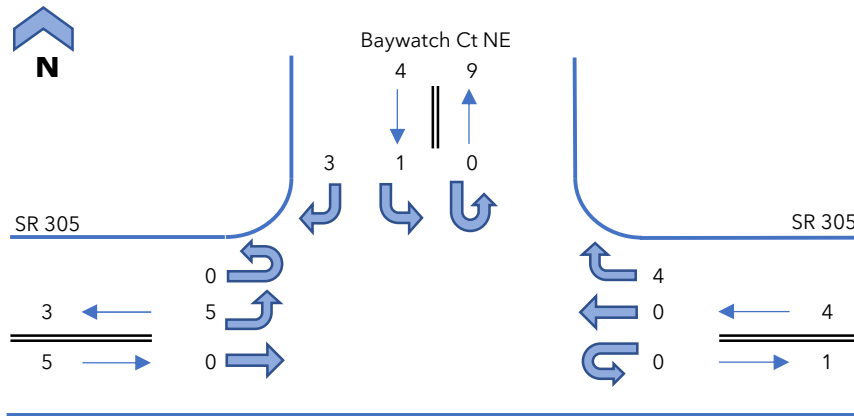
Interval Start Time	SR 305 Eastbound				SR 305 Westbound				Baywatch Ct NE Southbound				15 Minute Totals	Hourly Totals
	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT		
7:00 AM	0	0	0	--	0	--	0	0	--	--	--	--	0	1
7:15 AM	0	0	0	--	0	--	0	0	--	--	--	--	0	0
7:30 AM	0	0	0	--	0	--	0	0	--	--	--	--	0	2
7:45 AM	0	0	0	--	0	--	0	0	--	--	--	--	0	0
8:00 AM	0	0	0	--	0	--	0	0	--	--	--	--	0	2
8:15 AM	0	0	0	--	0	--	0	0	--	--	--	--	0	4
8:30 AM	0	0	0	--	0	--	0	0	--	--	--	--	0	3
8:45 AM	0	0	0	--	0	--	0	1	--	--	--	--	0	6
Count Total	0	0	0	--	0	--	0	1	--	--	--	--	0	--
Peak Hour Total	0	0	0	--	0	--	0	1	--	--	--	--	0	--
PHF	#DIV/0!				0.25				--				0.50	--
Heavy Vehicles	0	0	0	--	0	--	0	0	--	--	--	--	0	--
HV %	0.0%	0.0%	0.0%	--	0.0%	--	0.0%	0.0%	--	--	--	--	0.0%	--

Interval Start Time	Heavy Vehicles				
	EB	WB	NB	SB	Total
7:00 AM	0	0	--	0	0
7:15 AM	0	0	--	0	0
7:30 AM	0	0	--	0	0
7:45 AM	0	0	--	0	0
8:00 AM	0	0	--	0	0
8:15 AM	0	0	--	0	0
8:30 AM	0	0	--	0	0
8:45 AM	0	0	--	0	0
Count Total	0	0	--	0	0
Peak Hour Total	0	0	--	0	0
Peak Hour HV%	0.0%	0.0%	--	0.0%	0.0%

Pedestrians (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	4	0	4
0	0	0	0	0
0	0	0	0	0
0	0	4	0	4

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	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

SR 305 & Baywatch Court NE



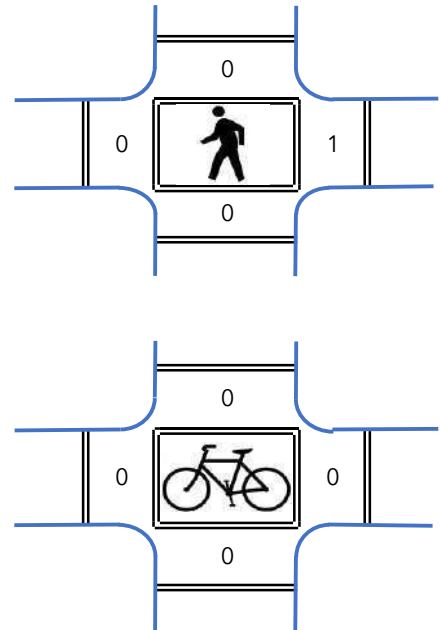
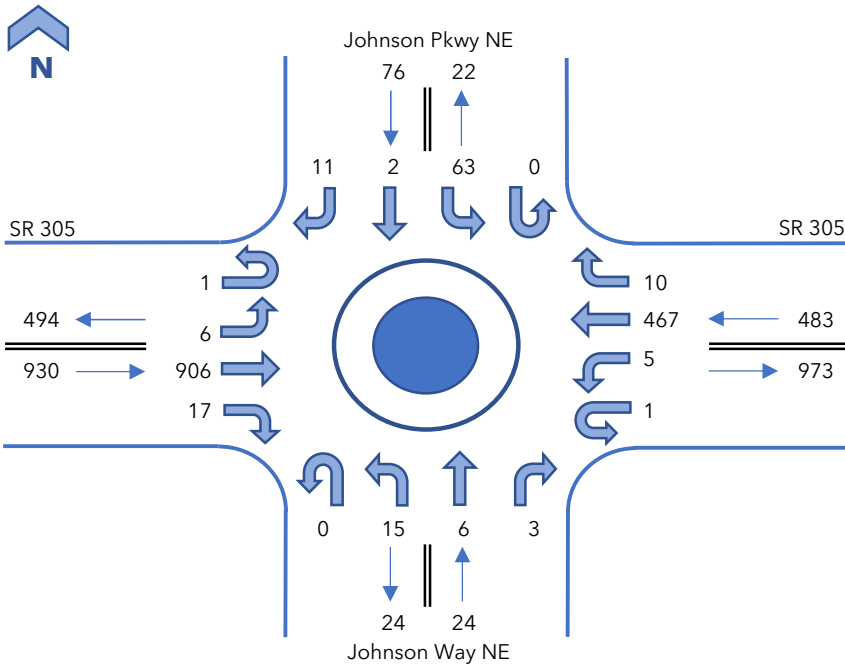
Interval Start Time	SR 305 Eastbound				SR 305 Westbound				Baywatch Ct NE Southbound				15 Minute Totals	Hourly Totals
	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT		
4:00 AM	0	0	0	--	0	--	0	0	--	--	--	--	0	
4:15 AM	0	0	0	--	0	--	0	0	--	--	--	--	0	
4:30 AM	0	0	0	--	0	--	0	0	--	--	--	1	1	
4:45 AM	0	1	0	--	0	--	0	2	--	--	--	0	3	4
5:00 AM	0	3	0	--	0	--	0	0	--	--	--	1	4	8
5:15 AM	0	1	0	--	0	--	0	2	--	--	--	1	5	13
5:30 AM	0	0	0	--	0	--	0	1	--	--	--	0	1	13
5:45 AM	0	0	0	--	0	--	0	1	--	--	--	0	1	11
Count Total	0	5	0	--	0	--	0	6	--	--	--	3	15	--
Peak Hour Total	0	5	0	--	0	--	0	4	--	--	--	3	13	--
PHF	0.42				0.50				0.50				0.65	--
Heavy Vehicles	0	1	0	--	0	--	0	0	--	--	--	0	2	--
HV %	0.0%	20.0%	0.0%	--	0.0%	--	0.0%	0.0%	--	--	--	0.0%	15.4%	--

Interval Start Time	Heavy Vehicles				
	EB	WB	NB	SB	Total
4:00 AM	0	0	--	0	0
4:15 AM	0	0	--	0	0
4:30 AM	0	0	--	0	0
4:45 AM	0	0	--	0	0
5:00 AM	1	0	--	0	1
5:15 AM	0	0	--	1	1
5:30 AM	0	0	--	0	0
5:45 AM	0	0	--	0	0
Count Total	1	0	--	1	2
Peak Hour Total	1	0	--	1	2
Peak Hour HV%	20.0%	0.0%	--	25.0%	15.4%

Interval Start Time	Pedestrians (Leg)				
	E	W	N	S	Total
4:00 AM	0	0	1	0	1
4:15 AM	0	0	0	0	0
4:30 AM	0	0	0	0	0
4:45 AM	0	0	0	0	0
5:00 AM	0	0	0	0	0
5:15 AM	0	0	0	0	0
5:30 AM	0	0	0	0	0
5:45 AM	0	0	0	0	0
Count Total	0	0	1	0	1
Peak Hour Total	0	0	0	0	0

Interval Start Time	Bicycles (Leg)				
	E	W	N	S	Total
4:00 AM	0	0	0	0	0
4:15 AM	0	0	0	0	0
4:30 AM	0	0	0	0	0
4:45 AM	0	0	0	0	0
5:00 AM	0	0	0	0	0
5:15 AM	0	0	0	0	0
5:30 AM	0	0	0	0	0
5:45 AM	0	0	0	0	0
Count Total	0	0	0	0	0
Peak Hour Total	0	0	0	0	0

SR 305 & Johnson Parkway NE



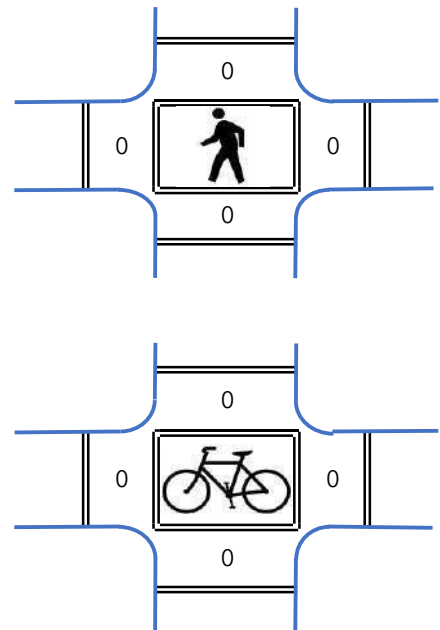
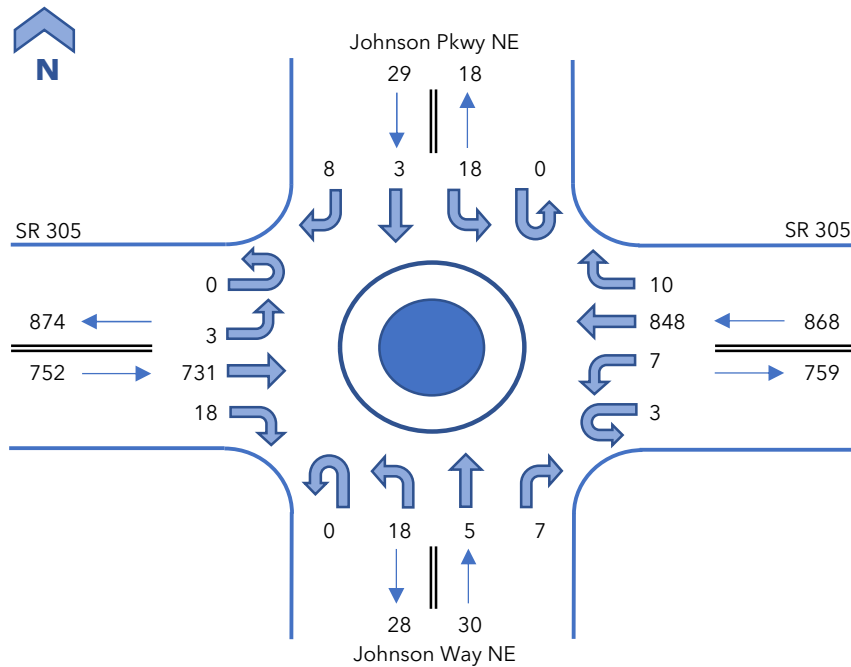
Interval Start Time	SR 305				SR 305				Johnson Way NE				Johnson Pkwy NE				15 Minute Totals	Hourly Totals
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT		
7:00 AM	0	0	207	0	0	0	120	1	0	8	1	0	0	10	0	2	349	1514
7:15 AM	0	5	271	4	0	1	100	4	0	2	0	2	0	16	0	1	406	
7:30 AM	1	1	199	6	1	4	127	3	0	1	4	1	1	15	1	4	369	
7:45 AM	0	0	229	7	0	0	120	2	0	4	1	0	0	22	1	4	390	
8:00 AM	0	2	184	5	1	2	131	2	0	4	2	1	0	10	3	2	349	
8:15 AM	1	1	187	6	1	1	136	1	0	4	2	1	0	2	1	2	346	
8:30 AM	2	4	168	4	1	0	119	3	0	5	1	0	0	7	0	3	317	
8:45 AM	0	2	158	5	0	3	165	4	0	4	2	0	0	2	0	5	350	
Count Total	4	15	1603	37	4	11	1018	20	0	32	13	5	1	84	6	23	2876	--
Peak Hour Total	1	6	906	17	1	5	467	10	0	15	6	3	1	63	2	11	1514	--
PHF	0.83				0.89				0.67				0.71				0.93	--
Heavy Vehicles	0	1	70	2	0	0	27	0	0	0	0	0	1	2	0	0	103	--
HV %	0.0%	16.7%	7.7%	11.8%	0.0%	0.0%	5.8%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	3.2%	0.0%	0.0%	6.8%	--

Interval Start Time	Heavy Vehicles				
	EB	WB	NB	SB	Total
7:00 AM	7	6	0	0	13
7:15 AM	11	8	0	0	19
7:30 AM	18	6	0	2	26
7:45 AM	25	7	0	1	33
8:00 AM	19	5	0	0	24
8:15 AM	15	6	2	1	24
8:30 AM	20	8	0	2	30
8:45 AM	15	11	0	0	26
Count Total	130	57	2	6	195
Peak Hour Total	73	27	0	3	103
Peak Hour HV%	7.8%	5.6%	0.0%	3.9%	6.8%

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

SR 305 & Johnson Parkway NE



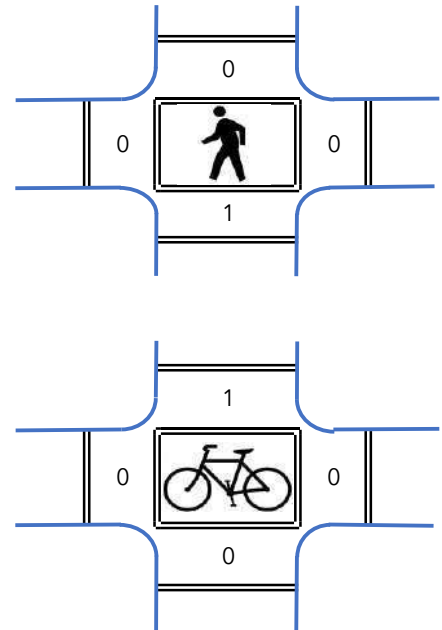
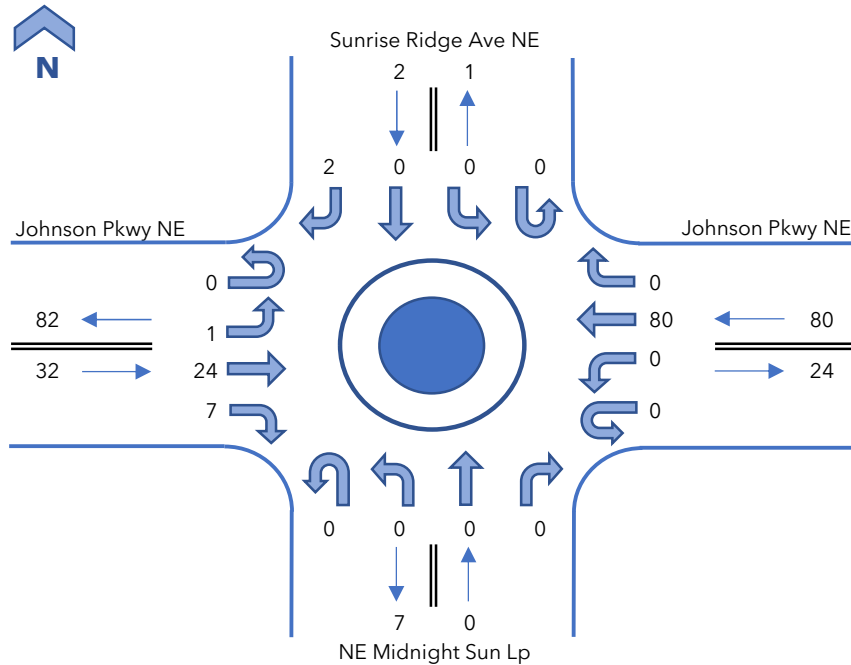
Interval Start Time	SR 305				SR 305				Johnson Way NE				Johnson Pkwy NE				15 Minute Totals	Hourly Totals
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT		
4:00 PM	0	1	166	7	0	2	212	6	0	4	0	2	0	4	2	4	410	1670 1679 1637 1653 1614
4:15 PM	0	2	186	3	0	1	244	0	0	5	1	1	0	3	2	2	450	
4:30 PM	0	0	178	4	2	2	180	2	0	6	1	2	0	3	1	2	383	
4:45 PM	0	0	179	7	0	0	219	5	0	2	1	3	0	8	0	3	427	
5:00 PM	0	1	188	4	1	4	205	3	0	5	2	1	0	4	0	1	419	
5:15 PM	1	3	171	3	0	0	211	1	0	7	1	0	0	6	1	3	408	
5:30 PM	0	0	165	3	0	3	209	5	0	2	1	3	0	5	1	2	399	
5:45 PM	0	1	136	4	0	1	224	2	0	11	2	3	0	1	0	3	388	
Count Total	1	8	1369	35	3	13	1704	24	0	42	9	15	0	34	7	20	3284	--
Peak Hour Total	0	3	731	18	3	7	848	10	0	18	5	7	0	18	3	8	1679	--
PHF	0.97				0.89				0.83				0.66				0.93	--
Heavy Vehicles	0	0	11	0	0	0	26	1	0	1	0	0	0	1	0	1	41	--
HV %	0.0%	0.0%	1.5%	0.0%	0.0%	0.0%	3.1%	10.0%	0.0%	5.6%	0.0%	0.0%	0.0%	5.6%	0.0%	12.5%	2.4%	--

Interval Start Time	Heavy Vehicles				
	EB	WB	NB	SB	Total
4:00 PM	1	4	0	0	5
4:15 PM	1	5	0	1	7
4:30 PM	5	15	1	1	22
4:45 PM	2	4	0	0	6
5:00 PM	3	3	0	0	6
5:15 PM	6	9	1	0	16
5:30 PM	1	8	0	1	10
5:45 PM	1	9	0	0	10
Count Total	20	57	2	3	82
Peak Hour Total	11	27	1	2	41
Peak Hour HV%	1.5%	3.1%	3.3%	6.9%	2.4%

Pedestrians (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	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

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	1	0	1
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

Johnson Parkway NE & Sunrise Ridge NE



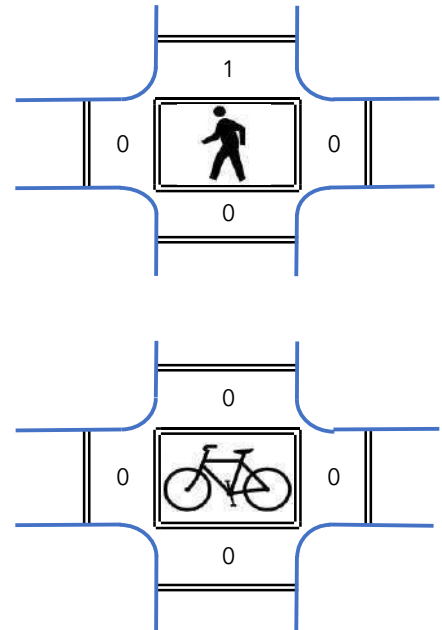
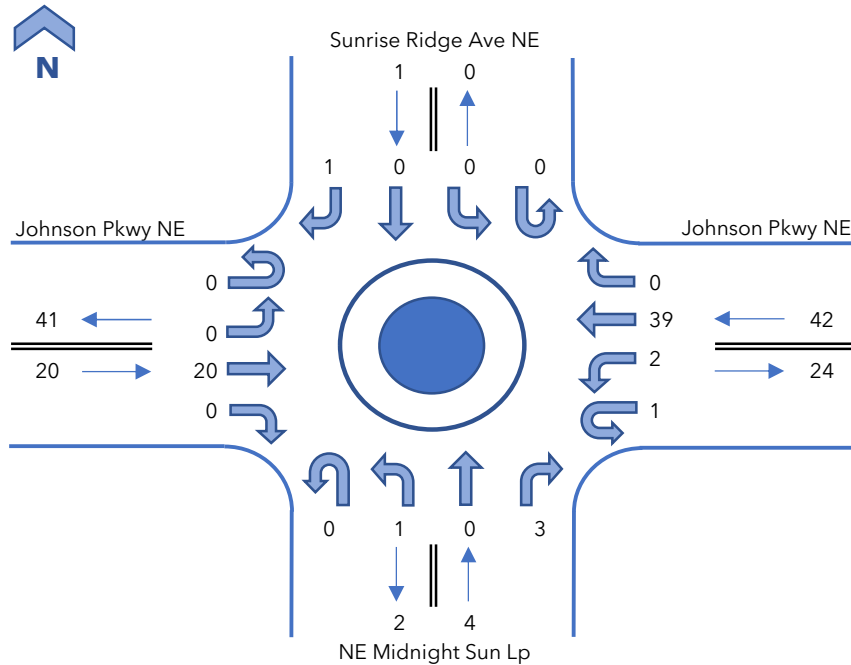
Interval Start Time	Johnson Pkwy NE				Johnson Pkwy NE				NE Midnight Sun Lp				Sunrise Ridge Ave NE				15 Minute Totals	Hourly Totals
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT		
7:00 AM	0	0	2	0	0	0	12	0	0	1	0	0	0	0	0	0	15	110 114 93 77 64
7:15 AM	0	0	7	4	0	0	19	0	0	0	0	0	0	0	0	0	30	
7:30 AM	0	1	9	1	0	0	22	0	0	0	0	0	0	0	1	0	34	
7:45 AM	0	0	3	1	0	0	27	0	0	0	0	0	0	0	0	0	31	
8:00 AM	0	0	5	1	0	0	12	0	0	0	0	0	0	0	1	0	19	
8:15 AM	0	0	3	1	0	0	3	0	0	2	0	0	0	0	0	0	9	
8:30 AM	0	1	2	3	0	0	12	0	0	0	0	0	0	0	0	0	18	
8:45 AM	0	0	7	3	0	0	6	0	0	0	0	1	0	0	0	1	18	
Count Total	0	2	38	14	0	0	113	0	0	3	0	1	0	0	0	3	174	--
Peak Hour Total	0	1	24	7	0	0	80	0	0	0	0	0	0	0	0	2	114	--
PHF	0.73				0.74				#DIV/0!				0.50				0.84	--
Heavy Vehicles	0	0	1	1	0	0	4	0	0	0	0	0	0	0	0	0	6	--
HV %	0.0%	0.0%	4.2%	14.3%	0.0%	0.0%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.3%	--

Interval Start Time	Heavy Vehicles				
	EB	WB	NB	SB	Total
7:00 AM	0	0	0	0	0
7:15 AM	0	0	0	0	0
7:30 AM	1	2	0	0	3
7:45 AM	0	2	0	0	2
8:00 AM	1	0	0	0	1
8:15 AM	0	0	1	0	1
8:30 AM	1	2	0	0	3
8:45 AM	2	0	0	0	2
Count Total	5	6	1	0	12
Peak Hour Total	2	4	0	0	6
Peak Hour HV%	6.3%	5.0%	#DIV/0!	0.0%	5.3%

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

Johnson Parkway NE & Sunrise Ridge NE



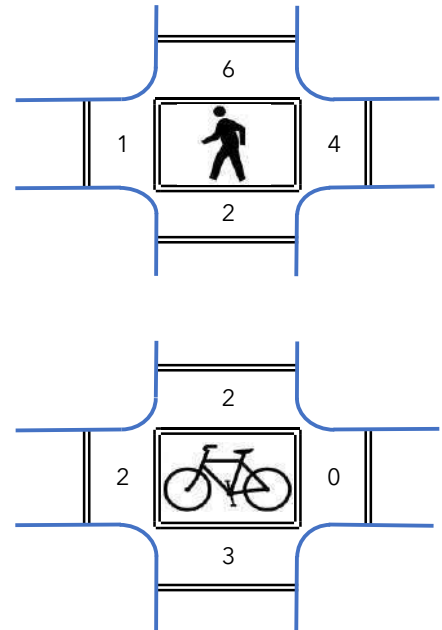
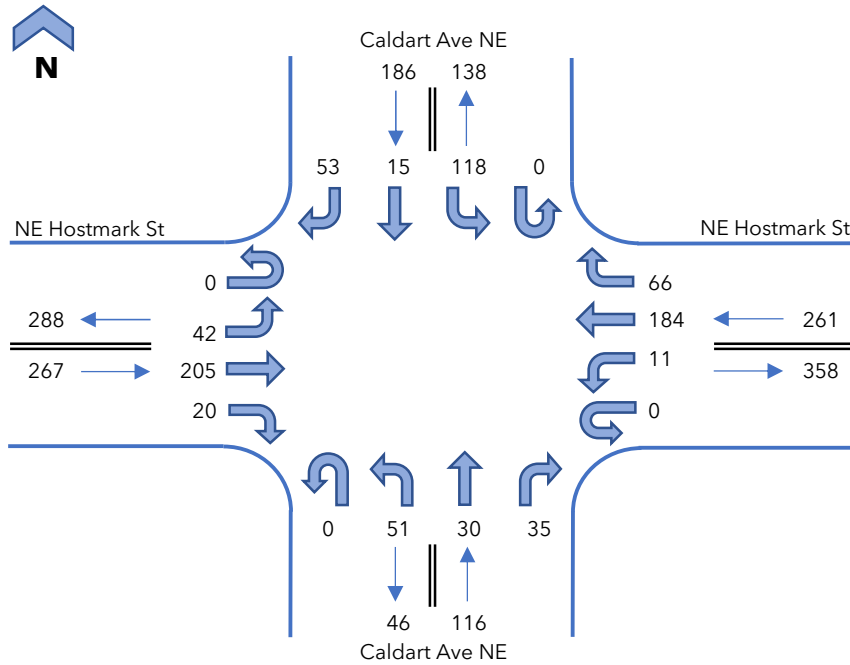
Interval Start Time	Johnson Pkwy NE				Johnson Pkwy NE				NE Midnight Sun Lp				Sunrise Ridge Ave NE				15 Minute Totals	Hourly Totals
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT		
4:00 PM	0	0	6	0	0	1	9	0	0	0	0	0	0	0	0	0	16	67
4:15 PM	0	0	5	0	0	0	9	0	0	1	0	1	0	0	0	0	16	
4:30 PM	0	0	3	0	1	1	9	0	0	0	0	1	0	0	0	1	16	
4:45 PM	0	0	6	0	0	0	12	0	0	0	0	1	0	0	0	0	19	
5:00 PM	0	0	4	0	0	0	5	0	0	0	0	0	0	0	0	0	9	
5:15 PM	0	0	3	1	0	0	10	0	0	1	0	0	0	0	0	1	16	
5:30 PM	0	0	6	0	0	0	7	0	0	3	0	0	0	0	0	0	16	
5:45 PM	0	0	2	3	0	0	3	1	0	2	0	0	0	0	0	0	11	
Count Total	0	0	35	4	1	2	64	1	0	7	0	3	0	0	0	2	119	--
Peak Hour Total	0	0	20	0	1	2	39	0	0	1	0	3	0	0	0	1	67	--
PHF	0.83				0.88				0.50				0.25				0.88	--
Heavy Vehicles	0	0	2	0	0	0	4	0	0	0	0	0	0	0	0	0	6	--
HV %	0.0%	0.0%	10.0%	0.0%	0.0%	0.0%	10.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.0%	--

Interval Start Time	Heavy Vehicles				
	EB	WB	NB	SB	Total
4:00 PM	0	1	0	0	1
4:15 PM	1	2	0	0	3
4:30 PM	1	1	0	0	2
4:45 PM	0	0	0	0	0
5:00 PM	0	0	0	0	0
5:15 PM	2	0	1	0	3
5:30 PM	0	0	1	0	1
5:45 PM	0	0	0	0	0
Count Total	4	4	2	0	10
Peak Hour Total	2	4	0	0	6
Peak Hour HV%	10.0%	9.5%	0.0%	0.0%	9.0%

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

NE Hostmark Street & Caldart Avenue NE



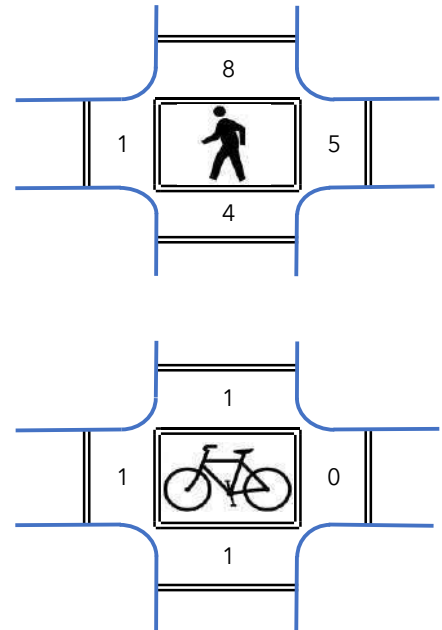
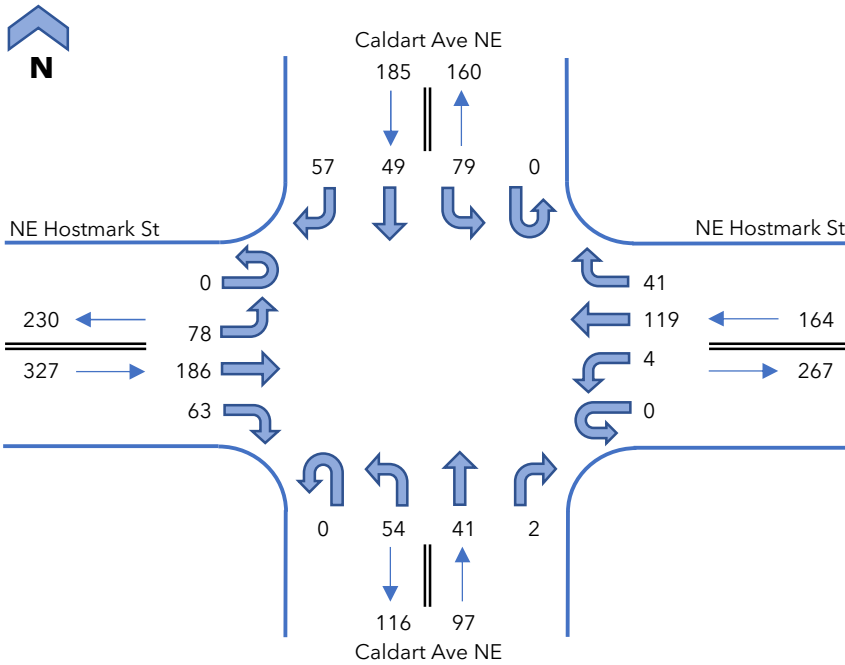
Interval Start Time	NE Hostmark St				NE Hostmark St				Caldart Ave NE				Caldart Ave NE				15 Minute Totals	Hourly Totals
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT		
7:00 AM	0	5	22	5	0	0	26	5	0	13	4	0	0	3	1	8	92	809
7:15 AM	0	8	57	10	0	1	37	5	0	16	3	1	0	26	1	18	183	
7:30 AM	0	13	70	2	0	6	46	17	0	12	2	21	0	56	5	6	256	
7:45 AM	0	14	53	4	0	3	67	37	0	15	20	13	0	32	2	18	278	
8:00 AM	0	7	25	4	0	1	34	7	0	8	5	0	0	4	7	11	113	
8:15 AM	0	5	15	4	0	0	23	1	0	23	5	2	0	8	2	11	99	
8:30 AM	0	4	29	6	0	0	11	4	0	8	4	0	0	9	7	9	91	
8:45 AM	0	6	14	6	0	1	23	6	0	13	5	3	0	14	9	13	113	
Count Total	0	62	285	41	0	12	267	82	0	108	48	40	0	152	34	94	1225	--
Peak Hour Total	0	42	205	20	0	11	184	66	0	51	30	35	0	118	15	53	830	--
PHF	0.79				0.61				0.60				0.69				0.75	--
Heavy Vehicles	0	0	12	1	0	0	13	0	0	0	1	2	0	9	0	2	40	--
HV %	0.0%	0.0%	5.9%	5.0%	0.0%	0.0%	7.1%	0.0%	0.0%	0.0%	3.3%	5.7%	0.0%	7.6%	0.0%	3.8%	4.8%	--

Interval Start Time	Heavy Vehicles				
	EB	WB	NB	SB	Total
7:00 AM	2	1	0	0	3
7:15 AM	8	4	1	4	17
7:30 AM	4	4	1	6	15
7:45 AM	0	2	1	1	4
8:00 AM	1	3	0	0	4
8:15 AM	1	2	1	0	4
8:30 AM	2	1	0	1	4
8:45 AM	3	0	0	1	4
Count Total	21	17	4	13	55
Peak Hour Total	13	13	3	11	40
Peak Hour HV%	4.9%	5.0%	2.6%	5.9%	4.8%

Pedestrians (Leg)				
E	W	N	S	Total
0	0	0	1	1
1	0	1	0	2
2	0	1	1	4
1	1	3	1	6
0	0	1	0	1
0	0	0	0	0
2	1	0	3	6
0	0	0	0	0
6	2	6	6	20
4	1	6	2	13

Bicycles (Leg)				
E	W	N	S	Total
0	0	0	0	0
0	2	1	2	5
0	0	0	1	1
0	0	1	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	2	2	3	7
0	2	2	3	7

NE Hostmark Street & Caldart Avenue NE



Interval Start Time	NE Hostmark St				NE Hostmark St				Caldart Ave NE				Caldart Ave NE				15 Minute Totals	Hourly Totals	
	Eastbound				Westbound				Northbound				Southbound						
	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT	UT	LT	T	RT			
4:00 PM	0	8	37	21	0	2	48	12	0	21	12	2	0	19	9	14	205	766	
4:15 PM	0	10	35	16	0	0	37	17	0	17	16	1	0	8	7	15	179		
4:30 PM	0	8	54	12	0	0	22	13	0	11	7	0	0	15	8	10	160		
4:45 PM	0	17	64	14	0	1	24	8	0	11	8	1	0	41	19	14	222		
5:00 PM	0	16	37	22	0	3	40	14	0	15	12	0	0	21	11	14	205		766
5:15 PM	0	21	40	17	0	0	26	10	0	13	13	0	0	6	10	14	170		757
5:30 PM	0	24	45	10	0	0	29	9	0	15	8	1	0	11	9	15	176		773
5:45 PM	0	22	27	7	0	1	18	4	0	7	9	2	0	7	7	13	124		675
Count Total	0	126	339	119	0	7	244	87	0	110	85	7	0	128	80	109	1441	--	
Peak Hour Total	0	78	186	63	0	4	119	41	0	54	41	2	0	79	49	57	773	--	
PHF	0.86				0.72				0.90				0.63				0.87	--	
Heavy Vehicles	0	2	1	0	0	0	0	1	0	0	0	0	0	0	0	2	6	--	
HV %	0.0%	2.6%	0.5%	0.0%	0.0%	0.0%	0.0%	2.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.5%	0.8%	--	

Interval Start Time	Heavy Vehicles				
	EB	WB	NB	SB	Total
4:00 PM	0	1	0	1	2
4:15 PM	0	0	1	1	2
4:30 PM	0	0	0	0	0
4:45 PM	2	1	0	0	3
5:00 PM	0	0	0	1	1
5:15 PM	0	0	0	0	0
5:30 PM	1	0	0	1	2
5:45 PM	2	0	0	0	2
Count Total	5	2	1	4	12
Peak Hour Total	3	1	0	2	6
Peak Hour HV%	0.9%	0.6%	0.0%	1.1%	0.8%

Pedestrians (Leg)				
E	W	N	S	Total
1	0	2	1	4
0	0	5	0	5
3	0	2	0	5
2	1	2	0	5
0	0	2	2	4
1	0	1	2	4
2	0	3	0	5
0	0	0	0	0
9	1	17	5	32
5	1	8	4	18

Bicycles (Leg)				
E	W	N	S	Total
0	0	0	2	2
0	1	0	0	1
1	2	1	1	5
0	0	0	1	1
0	0	0	0	0
0	1	0	0	1
0	0	1	0	1
0	0	0	0	0
1	4	2	4	11
0	1	1	1	3

THE PINNACLE AT LIBERTY BAY TRAFFIC IMPACT ANALYSIS

APPENDIX ITE Sheets



Single-Family Detached Housing

(210)

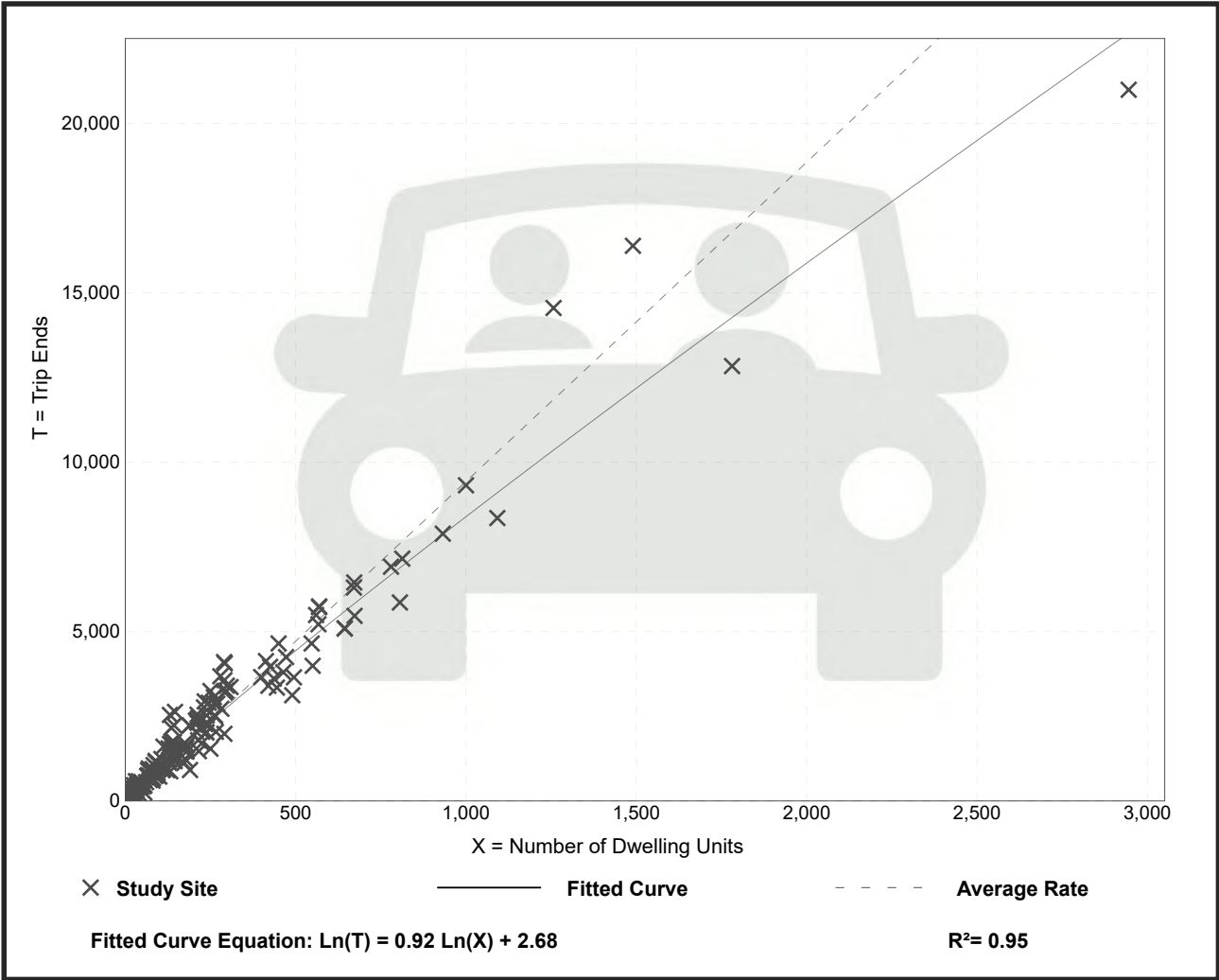
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 174
Avg. Num. of Dwelling Units: 246
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

Data Plot and Equation



Single-Family Detached Housing

(210)

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:

192

Avg. Num. of Dwelling Units:

226

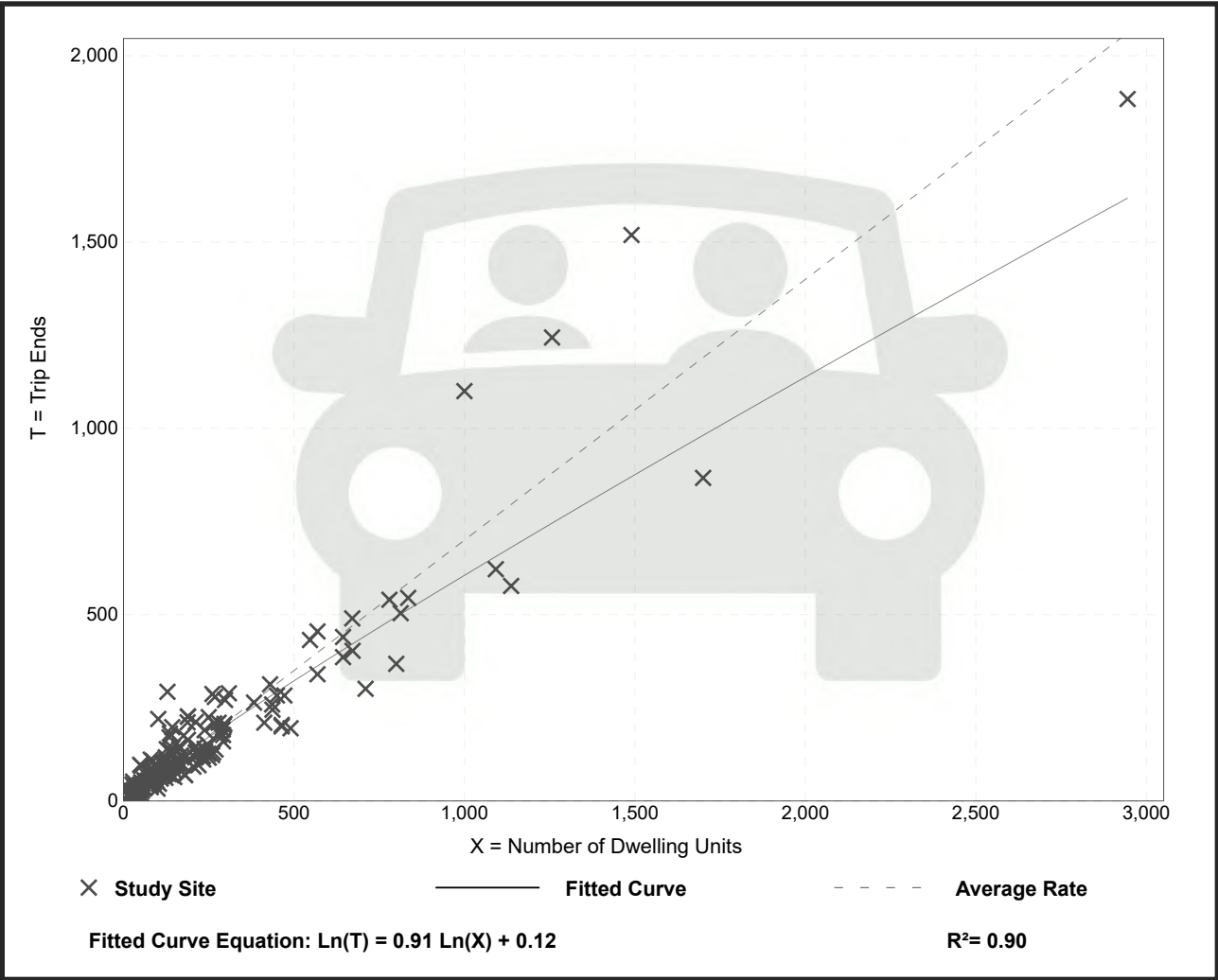
Directional Distribution:

25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation



Single-Family Detached Housing

(210)

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:

208

Avg. Num. of Dwelling Units:

248

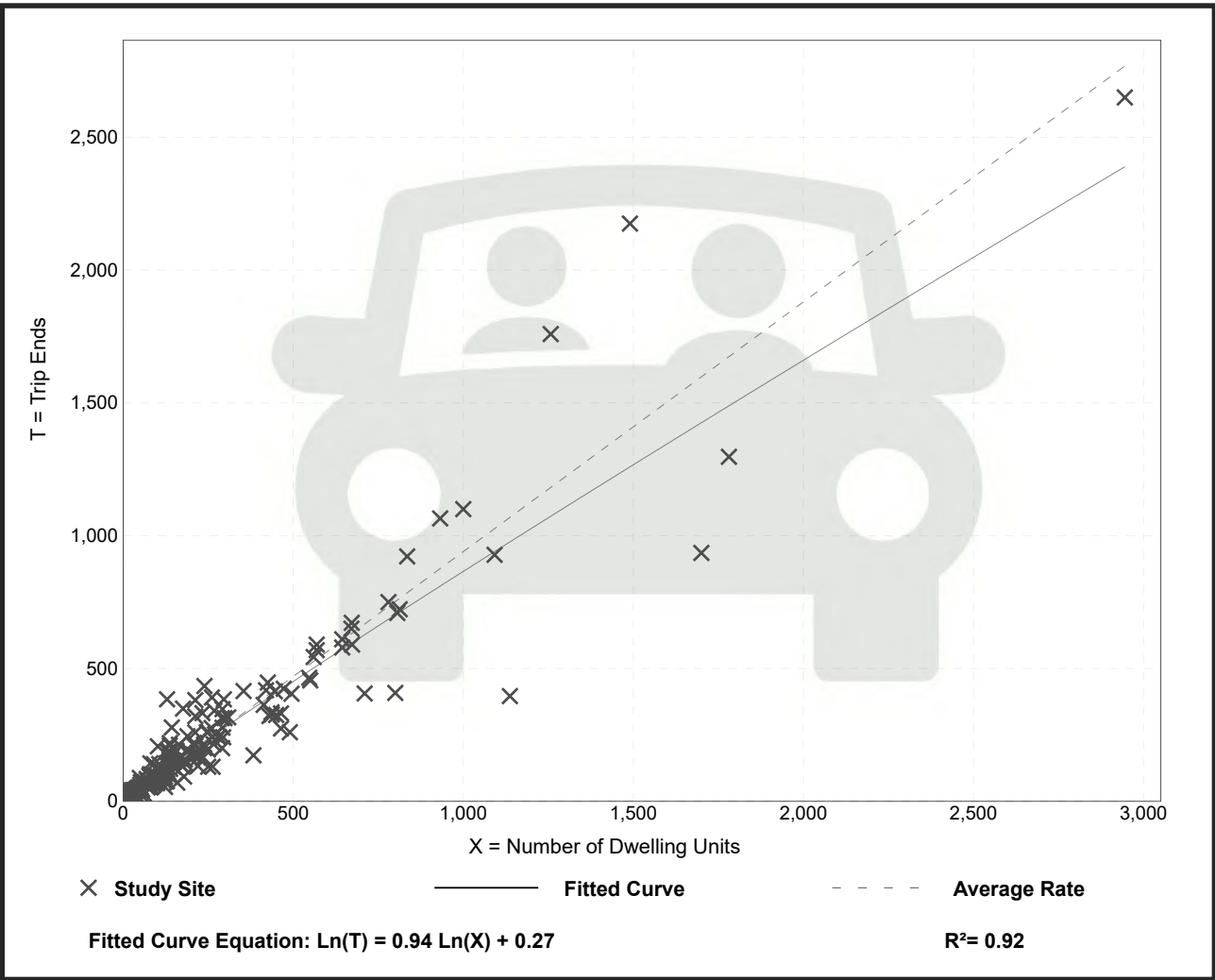
Directional Distribution:

63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



THE PINNACLE AT LIBERTY BAY TRAFFIC IMPACT ANALYSIS

APPENDIX *Existing Level of Service*



HCM 7th Signalized Intersection Summary

1: SR305 & NE Hostmark St

Existing AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	94	57	46	75	131	40	469	18	182	847	18
Future Volume (veh/h)	33	94	57	46	75	131	40	469	18	182	847	18
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)	0.98		0.97	0.99		0.98	1.00		0.98	1.00		0.99
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	1716	1730	1744	1744	1744	1716	1730	1716	1716	1730	1716	1646
Adj Flow Rate, veh/h	36	102	62	50	82	77	43	510	20	198	921	20
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, %	6	5	4	4	4	6	5	6	6	5	6	11
Cap, veh/h	166	164	136	158	183	149	48	576	23	826	1939	42
Arrive On Green	0.02	0.09	0.09	0.03	0.10	0.10	0.03	0.21	0.21	0.50	0.68	0.68
Sat Flow, veh/h	1634	1730	1440	1661	1744	1421	1647	2802	110	1647	2860	62
Grp Volume(v), veh/h	36	102	62	50	82	77	43	221	309	198	392	549
Grp Sat Flow(s),veh/h/ln	1634	1730	1440	1661	1744	1421	1647	1218	1693	1647	1218	1704
Q Serve(g_s), s	2.4	6.8	4.9	3.3	5.3	2.2	3.1	21.2	21.2	8.2	18.3	18.3
Cycle Q Clear(g_c), s	2.4	6.8	4.9	3.3	5.3	2.2	3.1	21.2	21.2	8.2	18.3	18.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		0.04
Lane Grp Cap(c), veh/h	166	164	136	158	183	149	48	250	348	826	826	1156
V/C Ratio(X)	0.22	0.62	0.46	0.32	0.45	0.52	0.90	0.88	0.89	0.24	0.47	0.47
Avail Cap(c_a), veh/h	343	332	276	321	334	272	316	437	607	826	826	1156
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	48.0	52.3	51.4	47.4	50.5	6.5	58.1	46.3	46.3	17.0	9.2	9.2
Incr Delay (d2), s/veh	0.6	3.9	2.4	1.1	1.7	2.8	40.1	33.4	26.5	0.1	2.0	1.4
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(95%),veh/ln	1.8	5.6	3.3	2.5	4.3	4.0	3.3	13.4	16.8	5.4	8.3	10.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	48.6	56.1	53.8	48.6	52.2	9.2	98.2	79.6	72.8	17.1	11.1	10.6
LnGrp LOS	D	E	D	D	D	A	F	E	E	B	B	B
Approach Vol, veh/h	200			209			573			1139		
Approach Delay, s/veh	54.0			35.5			77.4			11.9		
Approach LOS	D			D			E			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	65.2	29.7	8.8	16.3	8.5	86.4	7.6	17.6				
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	18.9	43.5	16.1	23.5	23.5	38.9	16.1	23.5				
Max Q Clear Time (g_c+I1), s	10.2	23.2	5.3	8.8	5.1	20.3	4.4	7.3				
Green Ext Time (p_c), s	0.4	1.9	0.1	0.5	0.1	3.8	0.0	0.5				
Intersection Summary												
HCM 7th Control Delay, s/veh	35.9											
HCM 7th LOS	D											

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	928	493	1	2	3
Future Vol, veh/h	0	928	493	1	2	3
Conflicting Peds, #/hr	4	0	0	4	4	4
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	105	-	-	55	60	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	8	6	1	1	1
Mvmt Flow	0	998	530	1	2	3
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	535	0	-	0	1536	538
Stage 1	-	-	-	-	534	-
Stage 2	-	-	-	-	1002	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1038	-	-	-	128	545
Stage 1	-	-	-	-	590	-
Stage 2	-	-	-	-	357	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1034	-	-	-	128	541
Mov Cap-2 Maneuver	-	-	-	-	128	-
Stage 1	-	-	-	-	588	-
Stage 2	-	-	-	-	355	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0	0		20.49		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1034	-	-	-	128	541
HCM Lane V/C Ratio	-	-	-	-	0.017	0.006
HCM Ctrl Dly (s/v)	0	-	-	-	33.7	11.7
HCM Lane LOS	A	-	-	-	D	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0

MOVEMENT SUMMARY



Site: [99] SR 305 & Johnson Rd (Existing AM Peak Hour)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: Johnson Way															
3u	U	All MCs	1	1.0	1	1.0	0.042	15.8	LOS B	0.2	4.4	0.63	0.77	0.63	30.8
3	L2	All MCs	16	1.0	16	1.0	0.042	12.4	LOS B	0.2	4.4	0.63	0.77	0.63	32.5
8	T1	All MCs	6	1.0	6	1.0	0.042	6.7	LOS A	0.2	4.4	0.63	0.77	0.63	30.0
18	R2	All MCs	3	1.0	3	1.0	0.042	11.4	LOS B	0.2	4.4	0.63	0.77	0.63	32.9
Approach			27	1.0	27	1.0	0.042	11.0	LOS B	0.2	4.4	0.63	0.77	0.63	31.8
East: SR 305															
1u	U	All MCs	1	1.0	1	1.0	0.251	12.0	LOS B	1.5	40.6	0.16	0.46	0.16	37.8
1	L2	All MCs	5	1.0	5	1.0	0.251	11.4	LOS B	1.5	40.6	0.16	0.46	0.16	35.8
6	T1	All MCs	502	6.0	502	6.0	0.251	6.0	LOS A	1.5	40.6	0.16	0.46	0.16	40.8
16	R2	All MCs	11	1.0	11	1.0	0.114	5.8	LOS A	0.6	15.7	0.15	0.46	0.15	36.2
Approach			519	5.8	519	5.8	0.251	6.1	LOS A	1.5	40.6	0.16	0.46	0.16	40.7
North: Johnson Rd															
7u	U	All MCs	1	1.0	1	1.0	0.095	13.7	LOS B	0.3	8.8	0.45	0.70	0.45	31.0
7	L2	All MCs	68	3.0	68	3.0	0.095	10.4	LOS B	0.3	8.8	0.45	0.70	0.45	32.7
4	T1	All MCs	2	1.0	2	1.0	0.095	4.7	LOS A	0.3	8.8	0.45	0.70	0.45	30.3
14	R2	All MCs	12	1.0	12	1.0	0.095	6.0	LOS A	0.3	8.8	0.45	0.70	0.45	33.3
Approach			83	2.6	83	2.6	0.095	9.7	LOS A	0.3	8.8	0.45	0.70	0.45	32.7
West: SR 305															
5u	U	All MCs	1	1.0	1	1.0	0.515	12.3	LOS B	4.3	113.5	0.34	0.47	0.34	37.1
5	L2	All MCs	6	17.0	6	17.0	0.515	12.2	LOS B	4.3	113.5	0.34	0.47	0.34	34.7
2	T1	All MCs	974	8.0	974	8.0	0.515	7.2	LOS A	4.3	113.5	0.33	0.47	0.33	39.8
12	R2	All MCs	18	12.0	18	12.0	0.234	6.3	LOS A	1.4	36.2	0.28	0.47	0.28	35.7
Approach			1000	8.1	1000	8.1	0.515	7.3	LOS A	4.3	113.5	0.33	0.47	0.33	39.7
All Vehicles			1629	7.0	1629	7.0	0.515	7.1	LOS A	4.3	113.5	0.28	0.48	0.28	39.4

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

 **Site: [99] SR 305 & Johnson Rd (Existing AM Peak Hour)**

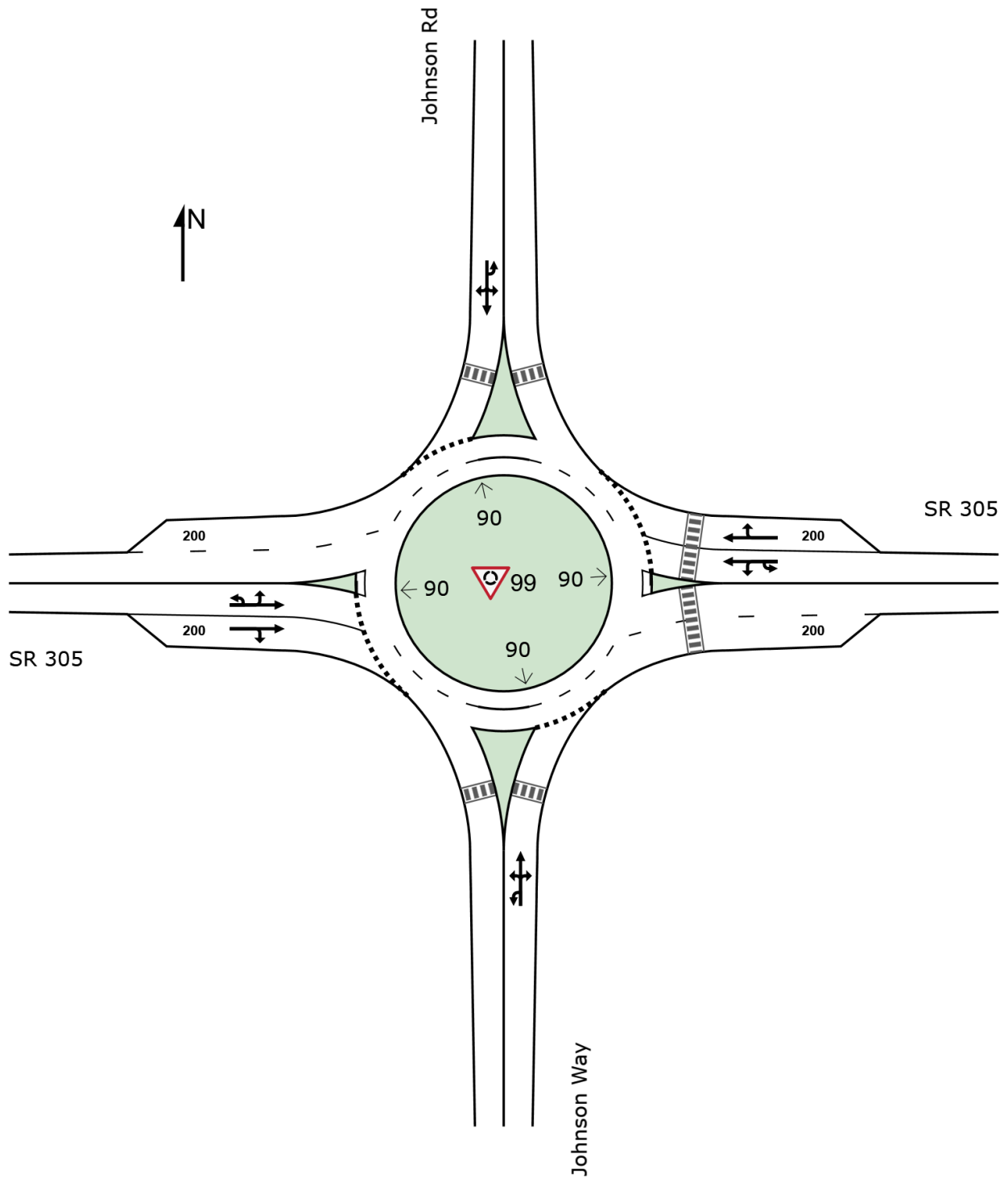
New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

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



MOVEMENT SUMMARY



Site: [1] Johnson & Sunrise Ridge - Existing AM (Folder1)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: NE Midnight Sun Loop															
3u	U	All MCs	1	3.0	1	3.0	0.004	7.1	LOS A	0.0	0.4	0.11	0.45	0.11	23.5
3	L2	All MCs	1	3.0	1	3.0	0.004	5.7	LOS A	0.0	0.4	0.11	0.45	0.11	23.5
8	T1	All MCs	1	3.0	1	3.0	0.004	1.9	LOS A	0.0	0.4	0.11	0.45	0.11	23.7
18	R2	All MCs	1	3.0	1	3.0	0.004	2.2	LOS A	0.0	0.4	0.11	0.45	0.11	23.6
Approach			5	3.0	5	3.0	0.004	4.2	LOS A	0.0	0.4	0.11	0.45	0.11	23.6
East: Johnson Rd NE															
1u	U	All MCs	1	3.0	1	3.0	0.073	10.8	LOS B	0.3	7.8	0.05	0.46	0.05	34.8
1	L2	All MCs	1	3.0	1	3.0	0.073	8.9	LOS A	0.3	7.8	0.05	0.46	0.05	34.8
6	T1	All MCs	95	3.0	95	3.0	0.073	4.8	LOS A	0.3	7.8	0.05	0.46	0.05	35.5
16	R2	All MCs	1	3.0	1	3.0	0.073	4.6	LOS A	0.3	7.8	0.05	0.46	0.05	35.1
Approach			99	3.0	99	3.0	0.073	5.0	LOS A	0.3	7.8	0.05	0.46	0.05	35.4
North: Sunrise Ridge Ave NE															
7u	U	All MCs	1	3.0	1	3.0	0.005	11.2	LOS B	0.0	0.5	0.21	0.56	0.21	33.6
7	L2	All MCs	1	3.0	1	3.0	0.005	9.3	LOS A	0.0	0.5	0.21	0.56	0.21	33.6
4	T1	All MCs	1	3.0	1	3.0	0.005	5.2	LOS A	0.0	0.5	0.21	0.56	0.21	34.2
14	R2	All MCs	2	3.0	2	3.0	0.005	5.0	LOS A	0.0	0.5	0.21	0.56	0.21	33.9
Approach			6	3.0	6	3.0	0.005	7.1	LOS A	0.0	0.5	0.21	0.56	0.21	33.8
West: Johnson Rd NE															
5u	U	All MCs	1	3.0	1	3.0	0.030	10.8	LOS B	0.1	3.2	0.05	0.49	0.05	34.7
5	L2	All MCs	1	3.0	1	3.0	0.030	8.9	LOS A	0.1	3.2	0.05	0.49	0.05	34.7
2	T1	All MCs	29	3.0	29	3.0	0.030	4.8	LOS A	0.1	3.2	0.05	0.49	0.05	35.4
12	R2	All MCs	8	3.0	8	3.0	0.030	4.6	LOS A	0.1	3.2	0.05	0.49	0.05	35.1
Approach			39	3.0	39	3.0	0.030	5.1	LOS A	0.1	3.2	0.05	0.49	0.05	35.3
All Vehicles			149	3.0	149	3.0	0.073	5.1	LOS A	0.3	7.8	0.06	0.47	0.06	34.8

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

 Site: [1] Johnson & Sunrise Ridge - Existing AM (Folder1)

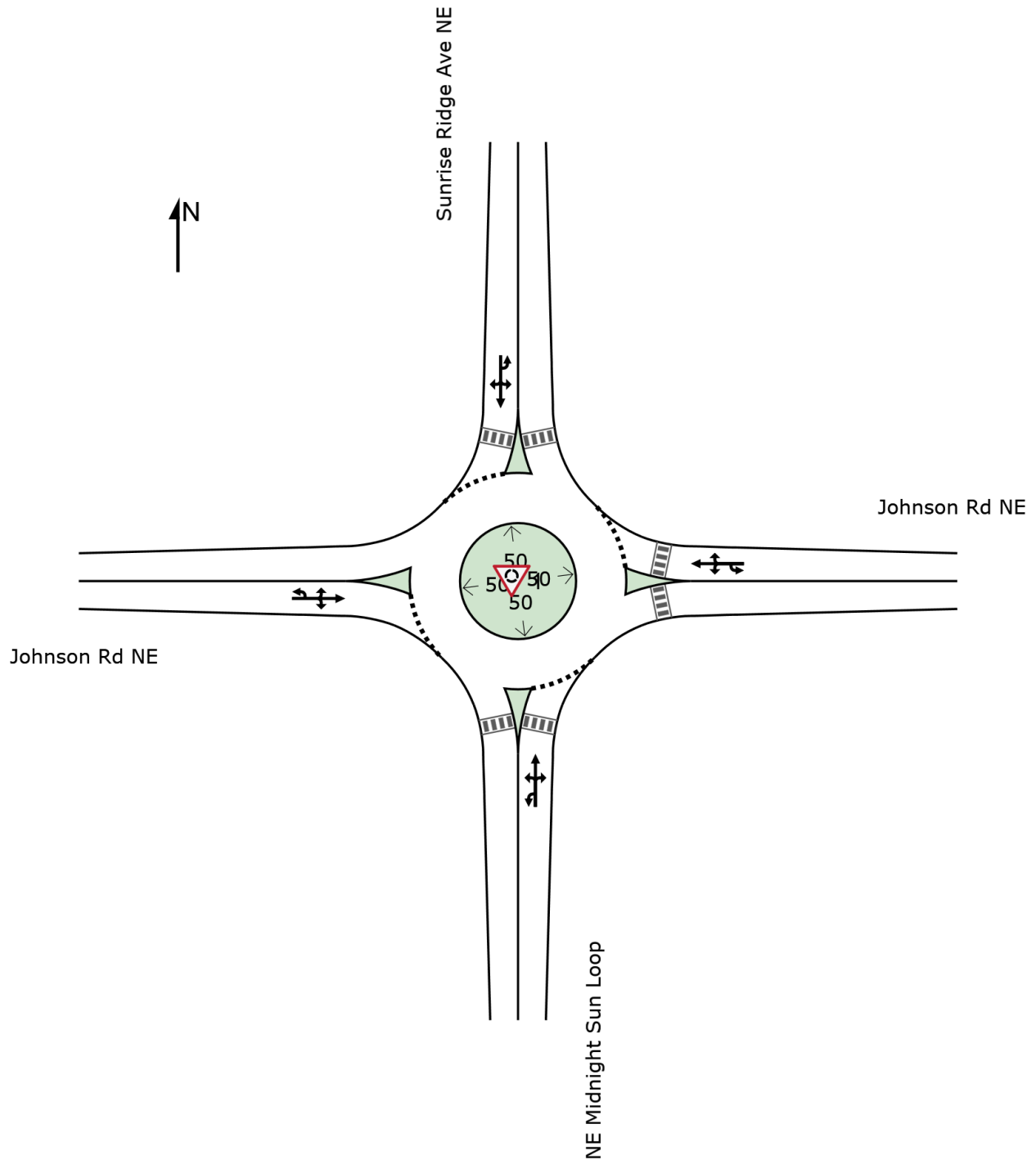
New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

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



SIDRA INTERSECTION 10.0 | Copyright © 2000-2025 Akcelik and Associates Pty Ltd | [sidrasolutions.com](https://www.sidrasolutions.com)

Organisation: HEATH & ASSOCIATES | Licence: PLUS / 1PC | Created: Monday, July 7, 2025 2:13:18 PM

Project: C:\Users\LucasMaulin\Heath and Associates\Office Access - Documents\Project Files\Pinnacle at Liberty Bay - 5576\5-Analysis\Sidra\Johnson & Sunrise Ridge.sipx

Intersection	
Intersection Delay, s/veh	15.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	42	205	20	11	184	66	51	30	35	118	15	53
Future Vol, veh/h	42	205	20	11	184	66	51	30	35	118	15	53
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.87	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles, %	1	6	5	1	7	1	1	3	6	7	1	4
Mvmt Flow	56	273	27	15	245	88	59	40	47	157	20	71
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay, s/veh	16.8	15.9	12.1	13.1
HCM LOS	C	C	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	44%	16%	4%	89%	0%
Vol Thru, %	26%	77%	70%	11%	0%
Vol Right, %	30%	7%	25%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	116	267	261	133	53
LT Vol	51	42	11	118	0
Through Vol	30	205	184	15	0
RT Vol	35	20	66	0	53
Lane Flow Rate	145	356	348	177	71
Geometry Grp	4a	2	2	5	5
Degree of Util (X)	0.267	0.583	0.56	0.366	0.121
Departure Headway (Hd)	6.628	5.897	5.794	7.439	6.165
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	540	616	626	484	581
Service Time	4.681	3.911	3.808	5.184	3.91
HCM Lane V/C Ratio	0.269	0.578	0.556	0.366	0.122
HCM Control Delay, s/veh	12.1	16.8	15.9	14.4	9.8
HCM Lane LOS	B	C	C	B	A
HCM 95th-tile Q	1.1	3.8	3.5	1.7	0.4

HCM 7th TWSC
7: Sunrise Ridge Ave NE & Caldart Ave NE

Existing AM Peak Hour

Intersection						
Int Delay, s/veh	3.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	30	15	5	50	45	20
Future Vol, veh/h	30	15	5	50	45	20
Conflicting Peds, #/hr	0	10	10	0	10	10
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	33	16	5	54	49	22
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	59	0	126	61
Stage 1	-	-	-	-	51	-
Stage 2	-	-	-	-	75	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1545	-	869	1004
Stage 1	-	-	-	-	972	-
Stage 2	-	-	-	-	948	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1532	-	851	988
Mov Cap-2 Maneuver	-	-	-	-	851	-
Stage 1	-	-	-	-	964	-
Stage 2	-	-	-	-	936	-
Approach	EB	WB		NB		
HCM Ctrl Dly, s/v	0	0.67		9.4		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	889	-	-	164	-	
HCM Lane V/C Ratio	0.079	-	-	0.004	-	
HCM Ctrl Dly (s/v)	9.4	-	-	7.4	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.3	-	-	0	-	

HCM 7th Signalized Intersection Summary
1: SR305 & NE Hostmark St

Existing PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	152	89	47	111	200	108	788	30	191	628	45
Future Volume (veh/h)	61	152	89	47	111	200	108	788	30	191	628	45
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)	0.99		0.96	0.99		0.96	1.00		0.96	1.00		0.97
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	1702	1758	1786	1786	1786	1786	1772	1744	1786	1786	1772	1744
Adj Flow Rate, veh/h	62	154	90	47	112	56	109	796	30	193	634	45
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	7	3	1	1	1	1	2	4	1	1	2	4
Cap, veh/h	175	201	166	143	183	149	129	863	33	659	1712	121
Arrive On Green	0.04	0.11	0.11	0.03	0.10	0.10	0.08	0.30	0.30	0.39	0.61	0.61
Sat Flow, veh/h	1621	1758	1455	1701	1786	1450	1688	2850	107	1701	2790	198
Grp Volume(v), veh/h	62	154	90	47	112	56	109	346	480	193	286	393
Grp Sat Flow(s),veh/h/ln	1621	1758	1455	1701	1786	1450	1688	1238	1720	1701	1258	1729
Q Serve(g_s), s	4.1	10.2	7.0	3.0	7.2	2.1	7.7	32.4	32.4	9.4	13.6	13.6
Cycle Q Clear(g_c), s	4.1	10.2	7.0	3.0	7.2	2.1	7.7	32.4	32.4	9.4	13.6	13.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.06	1.00		0.11
Lane Grp Cap(c), veh/h	175	201	166	143	183	149	129	375	521	659	772	1062
V/C Ratio(X)	0.35	0.77	0.54	0.33	0.61	0.38	0.85	0.92	0.92	0.29	0.37	0.37
Avail Cap(c_a), veh/h	320	337	279	314	342	278	323	444	616	659	772	1062
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	46.0	51.6	50.2	46.9	51.6	11.8	54.7	40.5	40.5	25.4	11.6	11.6
Incr Delay (d2), s/veh	1.2	6.0	2.7	1.3	3.3	1.6	14.0	30.4	24.3	0.2	1.4	1.0
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(95%),veh/ln	3.1	8.4	4.8	2.4	6.1	2.9	6.7	18.6	23.5	6.8	6.9	8.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	47.2	57.6	52.9	48.2	54.9	13.4	68.7	70.9	64.7	25.7	12.9	12.6
LnGrp LOS	D	E	D	D	D	B	E	E	E	C	B	B
Approach Vol, veh/h	306			215			935			872		
Approach Delay, s/veh	54.1			42.6			67.5			15.6		
Approach LOS	D			D			E			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	51.5	41.3	8.5	18.7	14.1	78.7	9.9	17.3				
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	18.9	43.5	16.1	23.5	23.5	38.9	16.1	23.5				
Max Q Clear Time (g_c+I1), s	11.4	34.4	5.0	12.2	9.7	15.6	6.1	9.2				
Green Ext Time (p_c), s	0.4	2.4	0.1	0.7	0.3	2.7	0.1	0.5				
Intersection Summary												
HCM 7th Control Delay, s/veh	44.0											
HCM 7th LOS	D											

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	751	870	4	1	3
Future Vol, veh/h	5	751	870	4	1	3
Conflicting Peds, #/hr	1	0	0	1	1	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	105	-	-	55	60	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	10	2	3	1	10	1
Mvmt Flow	5	808	935	4	1	3

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	941	0	0 1756 937
Stage 1	-	-	- 936 -
Stage 2	-	-	- 819 -
Critical Hdwy	4.2	-	- 6.5 6.21
Critical Hdwy Stg 1	-	-	- 5.5 -
Critical Hdwy Stg 2	-	-	- 5.5 -
Follow-up Hdwy	2.29	-	- 3.59 3.309
Pot Cap-1 Maneuver	697	-	- 89 322
Stage 1	-	-	- 369 -
Stage 2	-	-	- 420 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	696	-	- 88 322
Mov Cap-2 Maneuver	-	-	- 88 -
Stage 1	-	-	- 366 -
Stage 2	-	-	- 419 -

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.07	0	23.79
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	696	-	-	-	88	322
HCM Lane V/C Ratio	0.008	-	-	-	0.012	0.01
HCM Ctrl Dly (s/v)	10.2	-	-	-	46.2	16.3
HCM Lane LOS	B	-	-	-	E	C
HCM 95th %tile Q(veh)	0	-	-	-	0	0

MOVEMENT SUMMARY



Site: [99 (2)] SR 305 & Johnson Rd (Existing PM Peak Hour)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: Johnson Way															
3u	U	All MCs	1	1.0	1	1.0	0.045	14.5	LOS B	0.2	4.2	0.53	0.72	0.53	31.2
3	L2	All MCs	19	6.0	19	6.0	0.045	11.5	LOS B	0.2	4.2	0.53	0.72	0.53	32.4
8	T1	All MCs	5	1.0	5	1.0	0.045	5.4	LOS A	0.2	4.2	0.53	0.72	0.53	30.4
18	R2	All MCs	8	1.0	8	1.0	0.045	7.5	LOS A	0.2	4.2	0.53	0.72	0.53	33.5
Approach			33	3.9	33	3.9	0.045	9.7	LOS A	0.2	4.2	0.53	0.72	0.53	32.3
East: SR 305															
1u	U	All MCs	3	1.0	3	1.0	0.438	12.0	LOS B	3.4	87.2	0.19	0.45	0.19	37.7
1	L2	All MCs	8	1.0	8	1.0	0.438	11.4	LOS B	3.4	87.2	0.19	0.45	0.19	35.7
6	T1	All MCs	912	3.0	912	3.0	0.438	6.3	LOS A	3.4	87.2	0.18	0.45	0.18	41.2
16	R2	All MCs	11	10.0	11	10.0	0.199	5.9	LOS A	1.1	29.4	0.16	0.46	0.16	36.0
Approach			933	3.1	933	3.1	0.438	6.4	LOS A	3.4	87.2	0.18	0.45	0.18	41.1
North: Johnson Rd															
7u	U	All MCs	1	1.0	1	1.0	0.047	15.0	LOS B	0.2	4.5	0.57	0.75	0.57	30.9
7	L2	All MCs	19	6.0	19	6.0	0.047	12.1	LOS B	0.2	4.5	0.57	0.75	0.57	32.1
4	T1	All MCs	3	1.0	3	1.0	0.047	6.0	LOS A	0.2	4.5	0.57	0.75	0.57	30.2
14	R2	All MCs	9	1.0	9	1.0	0.047	8.6	LOS A	0.2	4.5	0.57	0.75	0.57	33.2
Approach			32	4.0	32	4.0	0.047	10.7	LOS B	0.2	4.5	0.57	0.75	0.57	32.2
West: SR 305															
5u	U	All MCs	1	1.0	1	1.0	0.377	12.0	LOS B	2.6	67.1	0.18	0.45	0.18	37.7
5	L2	All MCs	3	1.0	3	1.0	0.377	11.4	LOS B	2.6	67.1	0.18	0.45	0.18	35.8
2	T1	All MCs	786	2.0	786	2.0	0.377	6.1	LOS A	2.6	67.1	0.18	0.45	0.18	41.5
12	R2	All MCs	19	1.0	19	1.0	0.171	5.8	LOS A	0.9	23.9	0.16	0.46	0.16	36.2
Approach			810	2.0	810	2.0	0.377	6.2	LOS A	2.6	67.1	0.18	0.46	0.18	41.3
All Vehicles			1809	2.6	1809	2.6	0.438	6.4	LOS A	3.4	87.2	0.19	0.46	0.19	40.8

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

 **Site: [99 (2)] SR 305 & Johnson Rd (Existing PM Peak Hour)**

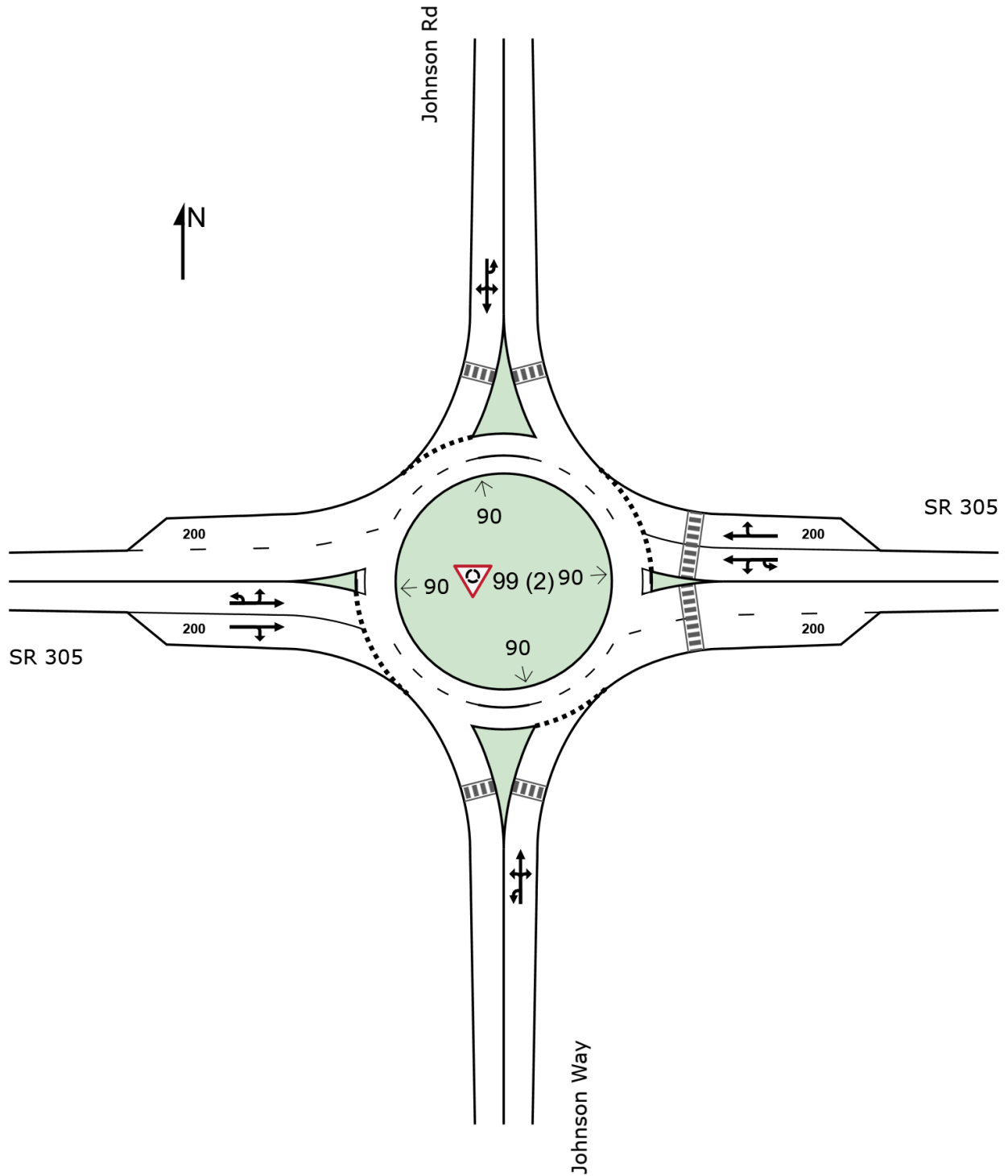
New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

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



MOVEMENT SUMMARY



Site: [1 (2)] Johnson & Sunrise Ridge - Existing AP (Folder1)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: NE Midnight Sun Loop															
3u	U	All MCs	1	3.0	1	3.0	0.005	7.1	LOS A	0.0	0.5	0.10	0.42	0.10	23.7
3	L2	All MCs	1	3.0	1	3.0	0.005	5.7	LOS A	0.0	0.5	0.10	0.42	0.10	23.7
8	T1	All MCs	1	3.0	1	3.0	0.005	1.8	LOS A	0.0	0.5	0.10	0.42	0.10	23.9
18	R2	All MCs	3	3.0	3	3.0	0.005	2.2	LOS A	0.0	0.5	0.10	0.42	0.10	23.8
Approach			7	3.0	7	3.0	0.005	3.5	LOS A	0.0	0.5	0.10	0.42	0.10	23.8
East: Johnson Rd NE															
1u	U	All MCs	1	3.0	1	3.0	0.035	10.8	LOS B	0.1	3.6	0.04	0.47	0.04	34.8
1	L2	All MCs	1	3.0	1	3.0	0.035	8.9	LOS A	0.1	3.6	0.04	0.47	0.04	34.8
6	T1	All MCs	44	3.0	44	3.0	0.035	4.8	LOS A	0.1	3.6	0.04	0.47	0.04	35.4
16	R2	All MCs	1	3.0	1	3.0	0.035	4.6	LOS A	0.1	3.6	0.04	0.47	0.04	35.1
Approach			48	3.0	48	3.0	0.035	5.1	LOS A	0.1	3.6	0.04	0.47	0.04	35.4
North: Sunrise Ridge Ave NE															
7u	U	All MCs	1	3.0	1	3.0	0.004	11.0	LOS B	0.0	0.4	0.14	0.58	0.14	33.5
7	L2	All MCs	1	3.0	1	3.0	0.004	9.1	LOS A	0.0	0.4	0.14	0.58	0.14	33.5
4	T1	All MCs	1	3.0	1	3.0	0.004	5.0	LOS A	0.0	0.4	0.14	0.58	0.14	34.1
14	R2	All MCs	1	3.0	1	3.0	0.004	4.8	LOS A	0.0	0.4	0.14	0.58	0.14	33.8
Approach			5	3.0	5	3.0	0.004	7.5	LOS A	0.0	0.4	0.14	0.58	0.14	33.7
West: Johnson Rd NE															
5u	U	All MCs	1	3.0	1	3.0	0.020	10.8	LOS B	0.1	2.1	0.04	0.49	0.04	34.7
5	L2	All MCs	1	3.0	1	3.0	0.020	8.9	LOS A	0.1	2.1	0.04	0.49	0.04	34.7
2	T1	All MCs	23	3.0	23	3.0	0.020	4.8	LOS A	0.1	2.1	0.04	0.49	0.04	35.3
12	R2	All MCs	1	3.0	1	3.0	0.020	4.6	LOS A	0.1	2.1	0.04	0.49	0.04	35.0
Approach			26	3.0	26	3.0	0.020	5.3	LOS A	0.1	2.1	0.04	0.49	0.04	35.2
All Vehicles			85	3.0	85	3.0	0.035	5.1	LOS A	0.1	3.6	0.05	0.48	0.05	33.9

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

 **Site: [1 (2)] Johnson & Sunrise Ridge - Existing AP (Folder1)**

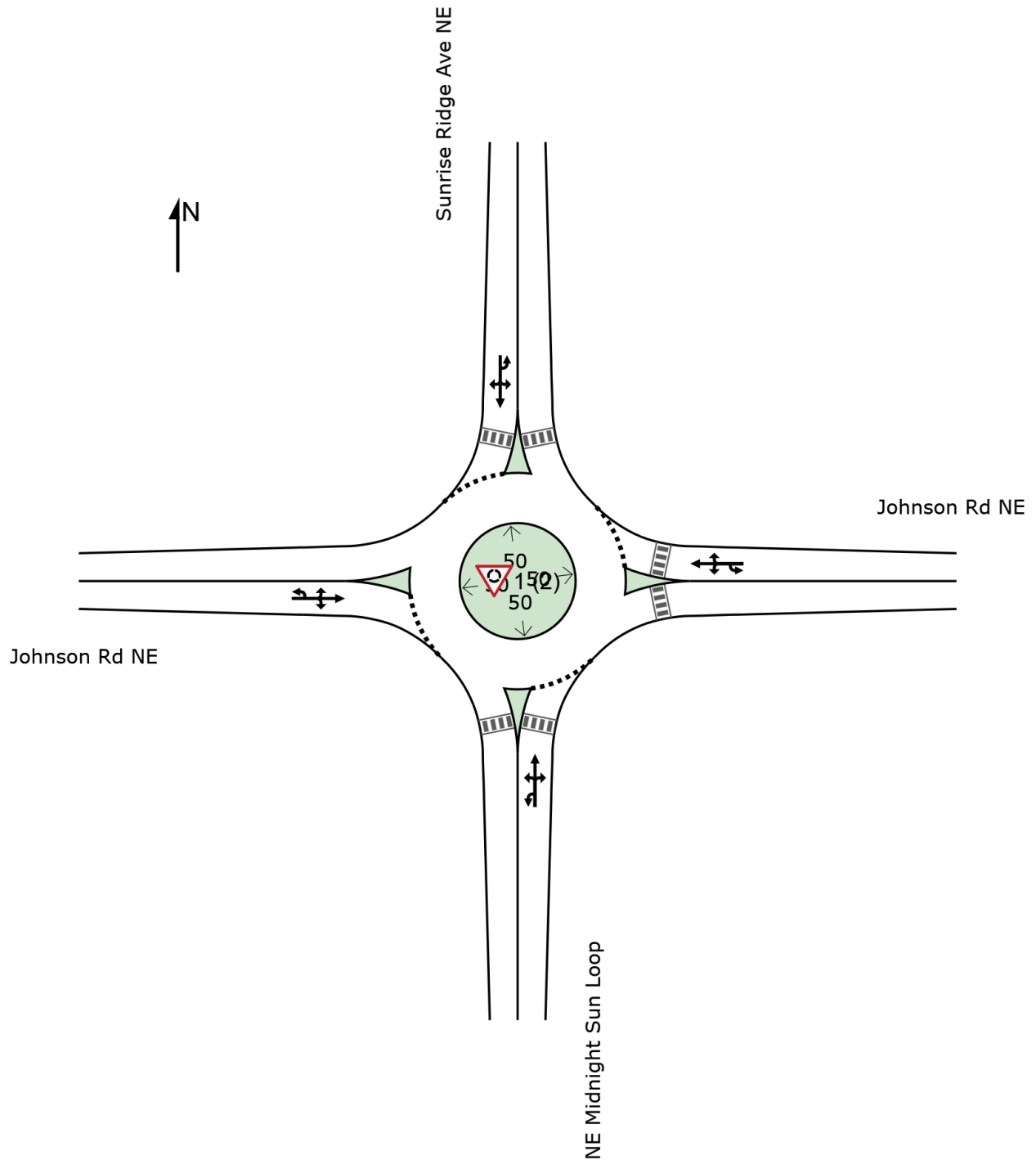
New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

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



SIDRA INTERSECTION 10.0 | Copyright © 2000-2025 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: HEATH & ASSOCIATES | Licence: PLUS / 1PC | Created: Monday, July 7, 2025 2:12:24 PM

Project: C:\Users\LucasMaulin\Heath and Associates\Office Access - Documents\Project Files\Pinnacle at Liberty Bay - 5576\5-Analysis\Sidra\Johnson & Sunrise Ridge.sipx

Intersection	
Intersection Delay, s/veh	12
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	78	186	63	4	119	41	54	41	2	79	49	57
Future Vol, veh/h	78	186	63	4	119	41	54	41	2	79	49	57
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	3	1	1	1	1	2	1	1	1	1	1	4
Mvmt Flow	90	214	72	5	137	47	62	47	2	91	56	66
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay, s/veh	14	10.4	10.5	10.7
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	56%	24%	2%	62%	0%
Vol Thru, %	42%	57%	73%	38%	0%
Vol Right, %	2%	19%	25%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	97	327	164	128	57
LT Vol	54	78	4	79	0
Through Vol	41	186	119	49	0
RT Vol	2	63	41	0	57
Lane Flow Rate	111	376	189	147	66
Geometry Grp	4a	2	2	5	5
Degree of Util (X)	0.187	0.537	0.278	0.266	0.1
Departure Headway (Hd)	6.027	5.139	5.312	6.508	5.484
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	594	703	675	552	653
Service Time	4.076	3.176	3.356	4.251	3.226
HCM Lane V/C Ratio	0.187	0.535	0.28	0.266	0.101
HCM Control Delay, s/veh	10.5	14	10.4	11.6	8.8
HCM Lane LOS	B	B	B	B	A
HCM 95th-tile Q	0.7	3.2	1.1	1.1	0.3

HCM 7th TWSC
7: Sunrise Ridge Ave NE & Caldart Ave NE

Existing PM Peak Hour

Intersection						
Int Delay, s/veh	2.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	50	45	20	50	30	15
Future Vol, veh/h	50	45	20	50	30	15
Conflicting Peds, #/hr	0	10	10	0	10	10
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	54	49	22	54	33	16
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	113	0	197	99
Stage 1	-	-	-	-	89	-
Stage 2	-	-	-	-	108	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1476	-	792	957
Stage 1	-	-	-	-	935	-
Stage 2	-	-	-	-	917	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1464	-	767	941
Mov Cap-2 Maneuver	-	-	-	-	767	-
Stage 1	-	-	-	-	927	-
Stage 2	-	-	-	-	895	-
Approach	EB		WB		NB	
HCM Ctrl Dly, s/v	0		2.14		9.68	
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	817	-	-	514	-	
HCM Lane V/C Ratio	0.06	-	-	0.015	-	
HCM Ctrl Dly (s/v)	9.7	-	-	7.5	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

THE PINNACLE AT LIBERTY BAY TRAFFIC IMPACT ANALYSIS

APPENDIX

Forecast 2032 Level of Service



HCM 7th Signalized Intersection Summary

1: SR305 & NE Hostmark St

Forecast 2032 AM Peak Hour
Without Project

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	108	65	54	89	150	47	491	22	208	881	21
Future Volume (veh/h)	39	108	65	54	89	150	47	491	22	208	881	21
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)	0.99		0.98	0.99		0.98	1.00		0.98	1.00		0.99
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	1716	1730	1744	1744	1744	1716	1730	1716	1716	1730	1716	1646
Adj Flow Rate, veh/h	42	117	71	59	97	98	51	534	24	226	958	23
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, %	6	5	4	4	4	6	5	6	6	5	6	11
Cap, veh/h	172	175	146	165	198	161	58	601	27	787	1878	45
Arrive On Green	0.03	0.10	0.10	0.04	0.11	0.11	0.04	0.22	0.22	0.48	0.66	0.66
Sat Flow, veh/h	1634	1730	1443	1661	1744	1423	1647	2784	125	1647	2853	68
Grp Volume(v), veh/h	42	117	71	59	97	98	51	233	325	226	409	572
Grp Sat Flow(s),veh/h/ln	1634	1730	1443	1661	1744	1423	1647	1218	1690	1647	1218	1703
Q Serve(g_s), s	2.8	7.8	5.6	3.8	6.3	3.0	3.7	22.3	22.4	10.0	20.7	20.7
Cycle Q Clear(g_c), s	2.8	7.8	5.6	3.8	6.3	3.0	3.7	22.3	22.4	10.0	20.7	20.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		0.04
Lane Grp Cap(c), veh/h	172	175	146	165	198	161	58	263	365	787	802	1121
V/C Ratio(X)	0.24	0.67	0.49	0.36	0.49	0.61	0.88	0.89	0.89	0.29	0.51	0.51
Avail Cap(c_a), veh/h	342	332	277	318	334	273	316	437	606	787	802	1121
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	47.0	52.0	51.0	46.3	49.9	7.2	57.6	45.6	45.7	18.9	10.5	10.5
Incr Delay (d2), s/veh	0.7	4.3	2.5	1.3	1.9	3.6	30.5	32.8	26.1	0.2	2.3	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(95%),veh/ln	2.1	6.5	3.8	2.9	5.1	5.1	3.6	13.9	17.5	6.7	9.3	11.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	47.7	56.3	53.4	47.6	51.8	10.8	88.1	78.4	71.8	19.1	12.8	12.2
LnGrp LOS	D	E	D	D	D	B	F	E	E	B	B	B
Approach Vol, veh/h	230			254			609			1207		
Approach Delay, s/veh	53.8			35.0			75.7			13.7		
Approach LOS	D			D			E			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	62.4	30.9	9.6	17.2	9.2	84.0	8.1	18.6				
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	18.9	43.5	16.1	23.5	23.5	38.9	16.1	23.5				
Max Q Clear Time (g_c+I1), s	12.0	24.4	5.8	9.8	5.7	22.7	4.8	8.3				
Green Ext Time (p_c), s	0.4	2.0	0.1	0.6	0.1	3.8	0.1	0.6				
Intersection Summary												
HCM 7th Control Delay, s/veh	36.5											
HCM 7th LOS	D											

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	971	515	1	2	3
Future Vol, veh/h	0	971	515	1	2	3
Conflicting Peds, #/hr	4	0	0	4	4	4
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	105	-	-	55	60	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	8	6	1	1	1
Mvmt Flow	0	1044	554	1	2	3
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	559	0	-	0	1606	562
Stage 1	-	-	-	-	558	-
Stage 2	-	-	-	-	1048	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1017	-	-	-	116	529
Stage 1	-	-	-	-	575	-
Stage 2	-	-	-	-	339	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1014	-	-	-	116	525
Mov Cap-2 Maneuver	-	-	-	-	116	-
Stage 1	-	-	-	-	573	-
Stage 2	-	-	-	-	338	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0	0		21.83		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1014	-	-	-	116	525
HCM Lane V/C Ratio	-	-	-	-	0.019	0.006
HCM Ctrl Dly (s/v)	0	-	-	-	36.7	11.9
HCM Lane LOS	A	-	-	-	E	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0

MOVEMENT SUMMARY

 Site: [99 (3)] SR 305 & Johnson Rd - Forecast 2032 AM

Without (Existing AM Peak Hour)

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: Johnson Way															
3u	U	All MCs	1	1.0	1	1.0	0.050	16.3	LOS B	0.2	5.5	0.67	0.79	0.67	30.6
3	L2	All MCs	18	1.0	18	1.0	0.050	12.8	LOS B	0.2	5.5	0.67	0.79	0.67	32.3
8	T1	All MCs	8	1.0	8	1.0	0.050	7.2	LOS A	0.2	5.5	0.67	0.79	0.67	29.8
18	R2	All MCs	3	1.0	3	1.0	0.050	12.8	LOS B	0.2	5.5	0.67	0.79	0.67	32.7
Approach			30	1.0	30	1.0	0.050	11.5	LOS B	0.2	5.5	0.67	0.79	0.67	31.6
East: SR 305															
1u	U	All MCs	1	1.0	1	1.0	0.266	12.0	LOS B	1.7	43.3	0.18	0.46	0.18	37.7
1	L2	All MCs	8	1.0	8	1.0	0.266	11.4	LOS B	1.7	43.3	0.18	0.46	0.18	35.7
6	T1	All MCs	522	6.0	522	6.0	0.266	6.1	LOS A	1.7	43.3	0.18	0.46	0.18	40.7
16	R2	All MCs	16	1.0	16	1.0	0.121	5.8	LOS A	0.6	16.6	0.17	0.47	0.17	36.2
Approach			546	5.8	546	5.8	0.266	6.1	LOS A	1.7	43.3	0.18	0.46	0.18	40.5
North: Johnson Rd															
7u	U	All MCs	1	1.0	1	1.0	0.131	13.9	LOS B	0.5	12.5	0.48	0.70	0.48	31.0
7	L2	All MCs	91	3.0	91	3.0	0.131	10.6	LOS B	0.5	12.5	0.48	0.70	0.48	32.6
4	T1	All MCs	2	1.0	2	1.0	0.131	4.8	LOS A	0.5	12.5	0.48	0.70	0.48	30.3
14	R2	All MCs	17	1.0	17	1.0	0.131	6.2	LOS A	0.5	12.5	0.48	0.70	0.48	33.3
Approach			112	2.6	112	2.6	0.131	9.9	LOS A	0.5	12.5	0.48	0.70	0.48	32.6
West: SR 305															
5u	U	All MCs	1	1.0	1	1.0	0.553	12.5	LOS B	4.8	127.3	0.42	0.48	0.42	36.8
5	L2	All MCs	11	17.0	11	17.0	0.553	12.5	LOS B	4.8	127.3	0.42	0.48	0.42	34.5
2	T1	All MCs	1015	8.0	1015	8.0	0.553	7.7	LOS A	4.8	127.3	0.40	0.48	0.40	39.5
12	R2	All MCs	20	12.0	20	12.0	0.251	6.5	LOS A	1.5	39.3	0.33	0.49	0.33	35.5
Approach			1047	8.2	1047	8.2	0.553	7.7	LOS A	4.8	127.3	0.39	0.48	0.39	39.4
All Vehicles			1735	6.9	1735	6.9	0.553	7.4	LOS A	4.8	127.3	0.34	0.50	0.34	39.0

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

 **Site: [99 (3)] SR 305 & Johnson Rd - Forecast 2032 AM**
Without (Existing AM Peak Hour)

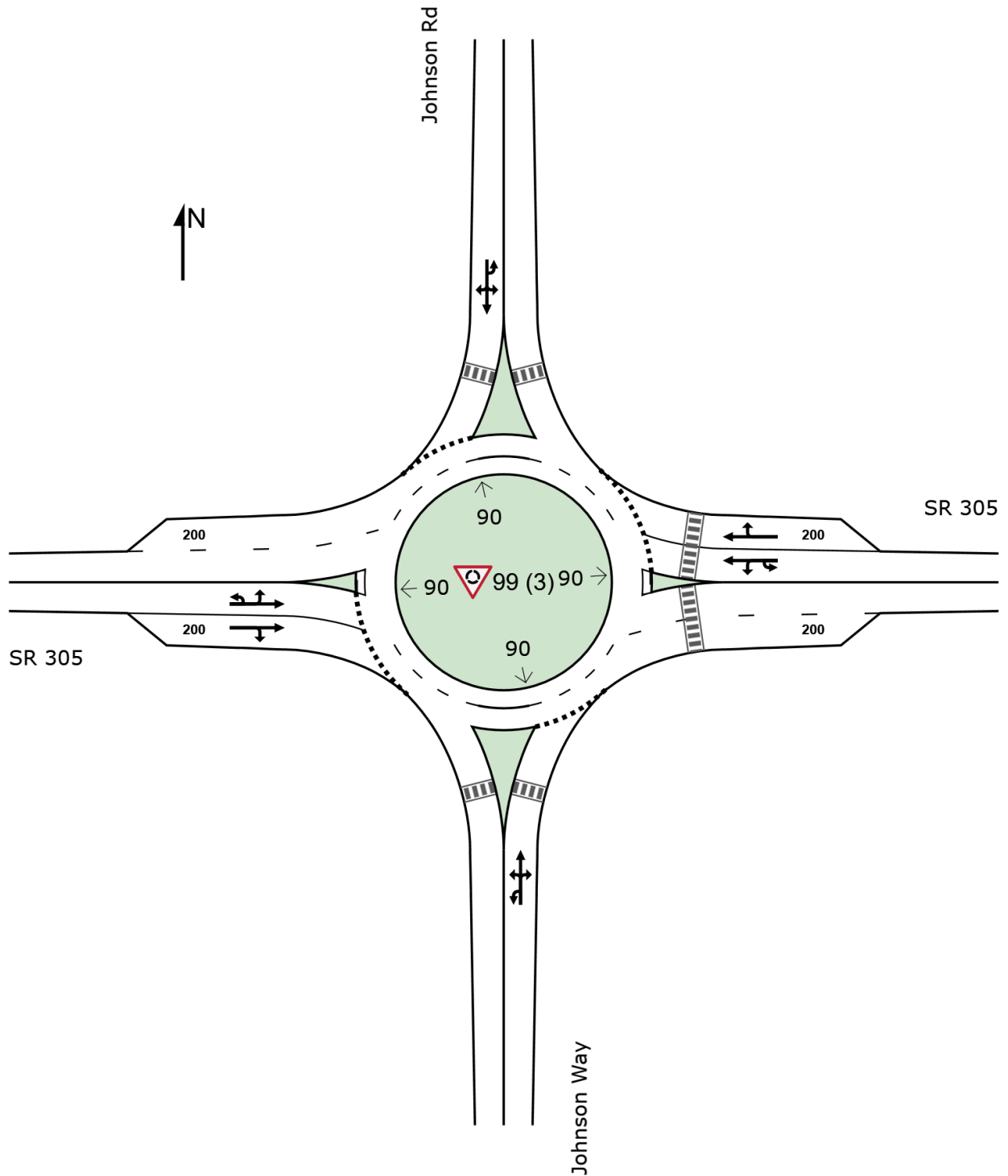
New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

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



MOVEMENT SUMMARY

 **Site: [1 (3)] Johnson & Sunrise Ridge - 2032 AM Without (Folder1)**

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: NE Midnight Sun Loop															
3u	U	All MCs	1	3.0	1	3.0	0.004	7.2	LOS A	0.0	0.4	0.15	0.45	0.15	23.5
3	L2	All MCs	1	3.0	1	3.0	0.004	5.8	LOS A	0.0	0.4	0.15	0.45	0.15	23.5
8	T1	All MCs	1	3.0	1	3.0	0.004	2.0	LOS A	0.0	0.4	0.15	0.45	0.15	23.7
18	R2	All MCs	1	3.0	1	3.0	0.004	2.3	LOS A	0.0	0.4	0.15	0.45	0.15	23.6
Approach			5	3.0	5	3.0	0.004	4.3	LOS A	0.0	0.4	0.15	0.45	0.15	23.6
East: Johnson Rd NE															
1u	U	All MCs	1	3.0	1	3.0	0.071	10.9	LOS B	0.3	7.5	0.09	0.46	0.09	34.7
1	L2	All MCs	1	3.0	1	3.0	0.071	8.9	LOS A	0.3	7.5	0.09	0.46	0.09	34.7
6	T1	All MCs	87	3.0	87	3.0	0.071	4.9	LOS A	0.3	7.5	0.09	0.46	0.09	35.3
16	R2	All MCs	5	3.0	5	3.0	0.071	4.7	LOS A	0.3	7.5	0.09	0.46	0.09	35.0
Approach			94	3.0	94	3.0	0.071	5.0	LOS A	0.3	7.5	0.09	0.46	0.09	35.3
North: Sunrise Ridge Ave NE															
7u	U	All MCs	1	3.0	1	3.0	0.051	11.2	LOS B	0.2	5.4	0.21	0.56	0.21	34.1
7	L2	All MCs	14	3.0	14	3.0	0.051	9.3	LOS A	0.2	5.4	0.21	0.56	0.21	34.1
4	T1	All MCs	1	3.0	1	3.0	0.051	5.2	LOS A	0.2	5.4	0.21	0.56	0.21	34.7
14	R2	All MCs	43	3.0	43	3.0	0.051	5.0	LOS A	0.2	5.4	0.21	0.56	0.21	34.4
Approach			60	3.0	60	3.0	0.051	6.1	LOS A	0.2	5.4	0.21	0.56	0.21	34.3
West: Johnson Rd NE															
5u	U	All MCs	1	3.0	1	3.0	0.040	10.9	LOS B	0.2	4.3	0.09	0.54	0.09	34.1
5	L2	All MCs	14	3.0	14	3.0	0.040	9.0	LOS A	0.2	4.3	0.09	0.54	0.09	34.1
2	T1	All MCs	26	3.0	26	3.0	0.040	4.9	LOS A	0.2	4.3	0.09	0.54	0.09	34.8
12	R2	All MCs	10	3.0	10	3.0	0.040	4.7	LOS A	0.2	4.3	0.09	0.54	0.09	34.5
Approach			51	3.0	51	3.0	0.040	6.1	LOS A	0.2	4.3	0.09	0.54	0.09	34.5
All Vehicles			210	3.0	210	3.0	0.071	5.6	LOS A	0.3	7.5	0.13	0.51	0.13	34.4

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

 **Site: [1 (3)] Johnson & Sunrise Ridge - 2032 AM Without**
(Folder1)

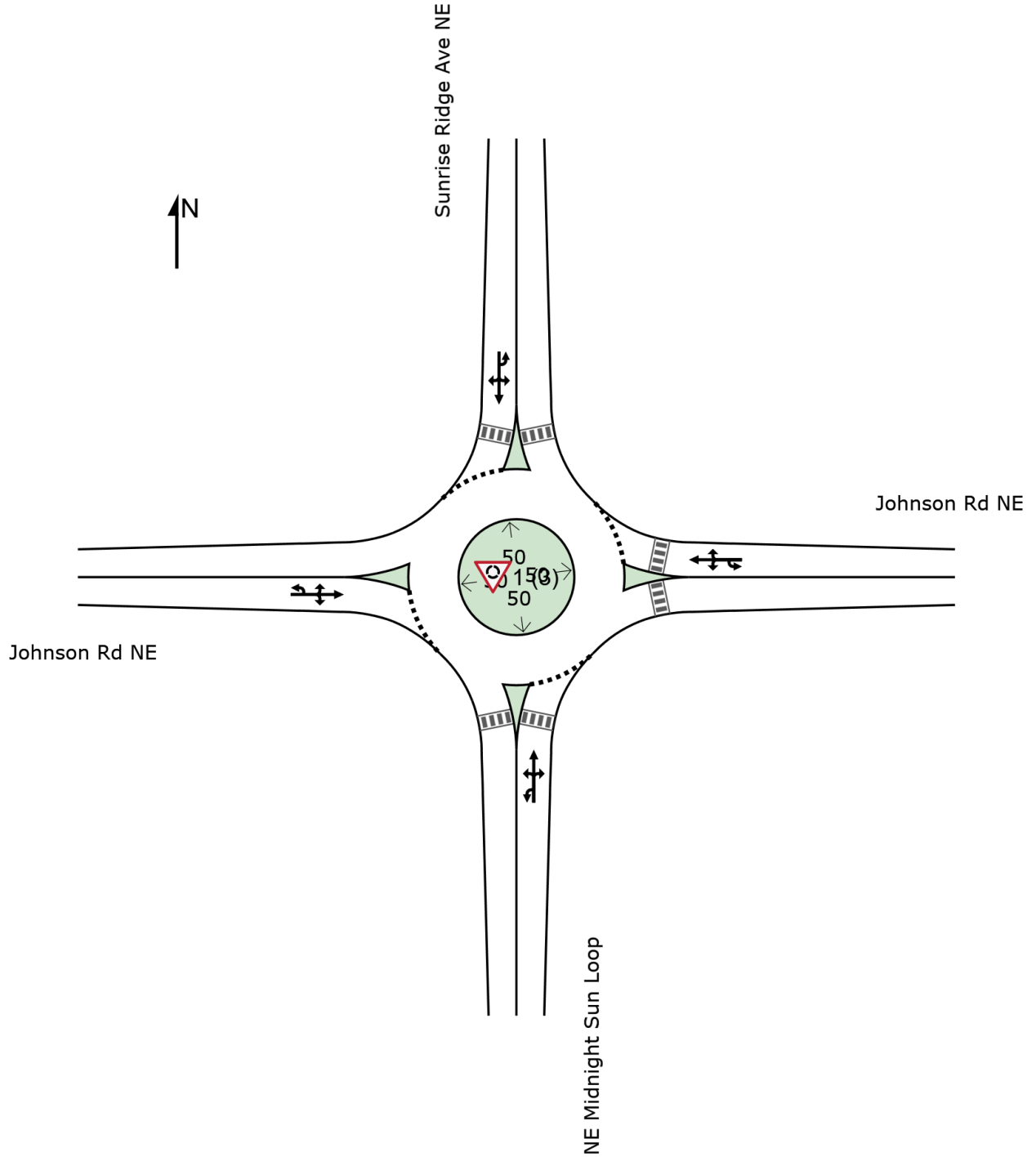
New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

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



Intersection	
Intersection Delay, s/veh	22.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	48	236	23	22	213	81	61	38	41	129	27	60
Future Vol, veh/h	48	236	23	22	213	81	61	38	41	129	27	60
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.87	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles, %	1	6	5	1	7	1	1	3	6	7	1	4
Mvmt Flow	64	315	31	29	284	108	70	51	55	172	36	80
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay, s/veh	26.5	26.4	15	16.2
HCM LOS	D	D	B	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	44%	16%	7%	83%	0%
Vol Thru, %	27%	77%	67%	17%	0%
Vol Right, %	29%	7%	26%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	140	307	316	156	60
LT Vol	61	48	22	129	0
Through Vol	38	236	213	27	0
RT Vol	41	23	81	0	60
Lane Flow Rate	175	409	421	208	80
Geometry Grp	4a	2	2	5	5
Degree of $\angle$ (I)	0.371	0.744	0.749	0.476	0.155
Departure Headway (Hd)	7.603	6.653	6.516	8.246	6.993
Convergence, $\angle$ /N	$\angle$ es	$\angle$ es	$\angle$ es	$\angle$ es	$\angle$ es
Cap	475	549	560	439	516
Service Time	5.616	4.653	4.516	5.946	4.693
HCM Lane V/C Ratio	0.368	0.745	0.752	0.474	0.155
HCM Control Delay, s/veh	15	26.5	26.4	18.2	11
HCM Lane LOS	B	D	D	C	B
HCM 95th-tile Q	1.7	6.4	6.5	2.5	0.5

HCM 7th TWSC
7: Sunrise Ridge Ave NE & Caldart Ave NE

Forecast 2032 AM Peak Hour
Without Project

Intersection						
Int Delay, s/veh	3.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	34	36	6	57	59	23
Future Vol, veh/h	34	36	6	57	59	23
Conflicting Peds, #/hr	0	10	10	0	10	10
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	37	39	7	62	64	25
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	86	0	152	77
Stage 1	-	-	-	-	67	-
Stage 2	-	-	-	-	85	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1510	-	840	985
Stage 1	-	-	-	-	956	-
Stage 2	-	-	-	-	938	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1498	-	823	968
Mov Cap-2 Maneuver	-	-	-	-	823	-
Stage 1	-	-	-	-	948	-
Stage 2	-	-	-	-	926	-
Approach	EB		WB		NB	
HCM Ctrl Dly, s/v	0		0.71		9.68	
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	859	-	-	171	-	
HCM Lane V/C Ratio	0.104	-	-	0.004	-	
HCM Ctrl Dly (s/v)	9.7	-	-	7.4	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.3	-	-	0	-	

HCM 7th Signalized Intersection Summary
1: SR305 & NE Hostmark St

Forecast 2032 PM Peak Hour
Without Project

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	176	102	55	129	229	123	818	36	220	661	51
Future Volume (veh/h)	71	176	102	55	129	229	123	818	36	220	661	51
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)	0.99		0.96	0.99		0.96	1.00		0.96	1.00		0.97
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	1702	1758	1786	1786	1786	1786	1772	1744	1786	1786	1772	1744
Adj Flow Rate, veh/h	72	178	103	56	130	85	124	826	36	222	668	52
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	7	3	1	1	1	1	2	4	1	1	2	4
Cap, veh/h	185	221	183	150	203	165	145	889	39	610	1624	126
Arrive On Green	0.05	0.13	0.13	0.04	0.11	0.11	0.09	0.31	0.31	0.36	0.59	0.59
Sat Flow, veh/h	1621	1758	1458	1701	1786	1455	1688	2831	123	1701	2768	215
Grp Volume(v), veh/h	72	178	103	56	130	85	124	361	501	222	303	417
Grp Sat Flow(s),veh/h/ln	1621	1758	1458	1701	1786	1455	1688	1238	1716	1701	1258	1726
Q Serve(g_s), s	4.7	11.8	8.0	3.5	8.4	3.4	8.7	33.9	33.9	11.6	15.8	15.8
Cycle Q Clear(g_c), s	4.7	11.8	8.0	3.5	8.4	3.4	8.7	33.9	33.9	11.6	15.8	15.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		0.12
Lane Grp Cap(c), veh/h	185	221	183	150	203	165	145	389	539	610	738	1012
V/C Ratio(X)	0.39	0.81	0.56	0.37	0.64	0.52	0.86	0.93	0.93	0.36	0.41	0.41
Avail Cap(c_a), veh/h	319	337	280	311	342	279	323	444	615	610	738	1012
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	44.5	51.0	49.3	45.5	50.9	13.1	54.1	39.9	39.9	28.4	13.5	13.5
Incr Delay (d2), s/veh	1.3	8.0	2.7	1.5	3.4	2.5	13.2	30.8	24.6	0.4	1.7	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	0.0	0.0	0.0
%ile BackOfQ(95%),veh/ln	3.5	9.6	5.5	2.8	7.1	4.4	7.5	19.3	24.4	8.2	8.0	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	45.9	59.1	52.0	47.0	54.2	15.6	67.3	70.6	64.5	28.8	15.2	14.8
LnGrp LOS	D	E	D	D	D	B	E	E	E	C	B	B
Approach Vol, veh/h	353			271			986			942		
Approach Delay, s/veh	54.3			40.6			67.1			18.2		
Approach LOS	D			D			E			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	48.0	42.7	9.2	20.1	15.3	75.4	10.7	18.6				
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	18.9	43.5	16.1	23.5	23.5	38.9	16.1	23.5				
Max Q Clear Time (g_c+I1), s	13.6	35.9	5.5	13.8	10.7	17.8	6.7	10.4				
Green Ext Time (p_c), s	0.4	2.3	0.1	0.8	0.3	2.8	0.1	0.7				
Intersection Summary												
HCM 7th Control Delay, s/veh	44.5											
HCM 7th LOS	D											

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	788	914	5	1	3
Future Vol, veh/h	6	788	914	5	1	3
Conflicting Peds, #/hr	1	0	0	1	1	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	105	-	-	55	60	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	10	2	3	1	10	1
Mvmt Flow	6	847	983	5	1	3
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	989	0	-	0	1845	985
Stage 1	-	-	-	-	984	-
Stage 2	-	-	-	-	861	-
Critical Hdwy	4.2	-	-	-	6.5	6.21
Critical Hdwy Stg 1	-	-	-	-	5.5	-
Critical Hdwy Stg 2	-	-	-	-	5.5	-
Follow-up Hdwy	2.29	-	-	-	3.59	3.309
Pot Cap-1 Maneuver	668	-	-	-	78	302
Stage 1	-	-	-	-	350	-
Stage 2	-	-	-	-	401	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	667	-	-	-	78	302
Mov Cap-2 Maneuver	-	-	-	-	78	-
Stage 1	-	-	-	-	346	-
Stage 2	-	-	-	-	401	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0.08	0		25.81		
HCM LOS	D					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	667	-	-	-	78	302
HCM Lane V/C Ratio	0.01	-	-	-	0.014	0.011
HCM Ctrl Dly (s/v)	10.4	-	-	-	52.1	17.1
HCM Lane LOS	B	-	-	-	F	C
HCM 95th %tile Q(veh)	0	-	-	-	0	0

MOVEMENT SUMMARY

 **Site: [99 (5)] SR 305 & Johnson Rd - Forecast 2032 PM Without (PM Peak Hour)**

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site
Site Category: (None)
Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.	Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: Johnson Way															
3u	U	All MCs	1	1.0	1	1.0	0.054	14.8	LOS B	0.2	5.2	0.55	0.74	0.55	31.1
3	L2	All MCs	23	6.0	23	6.0	0.054	11.7	LOS B	0.2	5.2	0.55	0.74	0.55	32.3
8	T1	All MCs	6	1.0	6	1.0	0.054	5.7	LOS A	0.2	5.2	0.55	0.74	0.55	30.3
18	R2	All MCs	9	1.0	9	1.0	0.054	7.9	LOS A	0.2	5.2	0.55	0.74	0.55	33.4
Approach			39	3.9	39	3.9	0.054	10.0	LOS A	0.2	5.2	0.55	0.74	0.55	32.2
East: SR 305															
1u	U	All MCs	3	1.0	3	1.0	0.471	12.1	LOS B	3.7	95.6	0.23	0.45	0.23	37.5
1	L2	All MCs	12	1.0	12	1.0	0.471	11.5	LOS B	3.7	95.6	0.23	0.45	0.23	35.6
6	T1	All MCs	949	3.0	949	3.0	0.471	6.5	LOS A	3.7	95.6	0.22	0.46	0.22	41.1
16	R2	All MCs	27	10.0	27	10.0	0.214	6.0	LOS A	1.2	31.6	0.19	0.46	0.19	35.9
Approach			991	3.2	991	3.2	0.471	6.5	LOS A	3.7	95.6	0.22	0.46	0.22	40.8
North: Johnson Rd															
7u	U	All MCs	1	1.0	1	1.0	0.076	15.4	LOS B	0.3	7.6	0.59	0.77	0.59	30.7
7	L2	All MCs	32	6.0	32	6.0	0.076	12.5	LOS B	0.3	7.6	0.59	0.77	0.59	31.9
4	T1	All MCs	3	1.0	3	1.0	0.076	6.3	LOS A	0.3	7.6	0.59	0.77	0.59	30.0
14	R2	All MCs	14	1.0	14	1.0	0.076	9.3	LOS A	0.3	7.6	0.59	0.77	0.59	32.9
Approach			51	4.2	51	4.2	0.076	11.3	LOS B	0.3	7.6	0.59	0.77	0.59	32.0
West: SR 305															
5u	U	All MCs	1	1.0	1	1.0	0.403	12.1	LOS B	2.9	74.3	0.23	0.46	0.23	37.5
5	L2	All MCs	11	1.0	11	1.0	0.403	11.5	LOS B	2.9	74.3	0.23	0.46	0.23	35.6
2	T1	All MCs	817	2.0	817	2.0	0.403	6.3	LOS A	2.9	74.3	0.23	0.46	0.23	41.2
12	R2	All MCs	23	1.0	23	1.0	0.183	5.9	LOS A	1.0	25.9	0.21	0.47	0.21	36.1
Approach			852	2.0	852	2.0	0.403	6.3	LOS A	2.9	74.3	0.23	0.46	0.23	41.0
All Vehicles			1932	2.7	1932	2.7	0.471	6.6	LOS A	3.7	95.6	0.24	0.47	0.24	40.4

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Without (PM Peak Hour)

Site Scenario: 1 | Local Volumes

The diagram illustrates a roundabout intersection. A north arrow is located in the upper left. Johnson Rd runs vertically through the center, with traffic flowing both north and south. Johnson Way runs vertically on the right side, with traffic flowing south. SR 305 runs horizontally on the left and right sides, with traffic flowing both east and west. The roundabout has a central green island with a red yield sign and the text "99 (5) 90". The approach roads have two lanes each, with a 200-foot width indicated. The roundabout has a 90-foot diameter. The intersection is labeled with "90" at the top, bottom, left, and right, indicating the flow of traffic. The roundabout is surrounded by a dashed line, and the approach roads have a solid line. The roundabout is labeled with "90" at the top, bottom, left, and right, indicating the flow of traffic. The roundabout is surrounded by a dashed line, and the approach roads have a solid line.

MOVEMENT SUMMARY

 **Site: [1 (5)] Johnson & Sunrise Ridge - 2032 PM Without (Folder1)**

Output produced by SIDRA INTERSECTION Version: 10.0.5.217

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: NE Midnight Sun Loop															
3u	U	All MCs	1	3.0	1	3.0	0.005	7.2	LOS A	0.0	0.5	0.16	0.42	0.16	23.6
3	L2	All MCs	1	3.0	1	3.0	0.005	5.8	LOS A	0.0	0.5	0.16	0.42	0.16	23.6
8	T1	All MCs	1	3.0	1	3.0	0.005	2.0	LOS A	0.0	0.5	0.16	0.42	0.16	23.9
18	R2	All MCs	3	3.0	3	3.0	0.005	2.3	LOS A	0.0	0.5	0.16	0.42	0.16	23.8
Approach			7	3.0	7	3.0	0.005	3.7	LOS A	0.0	0.5	0.16	0.42	0.16	23.7
East: Johnson Rd NE															
1u	U	All MCs	1	3.0	1	3.0	0.043	10.9	LOS B	0.2	4.5	0.12	0.49	0.12	34.5
1	L2	All MCs	3	3.0	3	3.0	0.043	9.0	LOS A	0.2	4.5	0.12	0.49	0.12	34.5
6	T1	All MCs	40	3.0	40	3.0	0.043	5.0	LOS A	0.2	4.5	0.12	0.49	0.12	35.2
16	R2	All MCs	12	3.0	12	3.0	0.043	4.7	LOS A	0.2	4.5	0.12	0.49	0.12	34.8
Approach			57	3.0	57	3.0	0.043	5.3	LOS A	0.2	4.5	0.12	0.49	0.12	35.0
North: Sunrise Ridge Ave NE															
7u	U	All MCs	1	3.0	1	3.0	0.029	11.0	LOS B	0.1	3.0	0.15	0.55	0.15	34.3
7	L2	All MCs	7	3.0	7	3.0	0.029	9.1	LOS A	0.1	3.0	0.15	0.55	0.15	34.3
4	T1	All MCs	1	3.0	1	3.0	0.029	5.0	LOS A	0.1	3.0	0.15	0.55	0.15	34.9
14	R2	All MCs	26	3.0	26	3.0	0.029	4.8	LOS A	0.1	3.0	0.15	0.55	0.15	34.6
Approach			35	3.0	35	3.0	0.029	5.8	LOS A	0.1	3.0	0.15	0.55	0.15	34.5
West: Johnson Rd NE															
5u	U	All MCs	1	3.0	1	3.0	0.041	10.8	LOS B	0.2	4.3	0.07	0.59	0.07	33.6
5	L2	All MCs	30	3.0	30	3.0	0.041	8.9	LOS A	0.2	4.3	0.07	0.59	0.07	33.6
2	T1	All MCs	20	3.0	20	3.0	0.041	4.9	LOS A	0.2	4.3	0.07	0.59	0.07	34.2
12	R2	All MCs	1	3.0	1	3.0	0.041	4.6	LOS A	0.2	4.3	0.07	0.59	0.07	33.9
Approach			52	3.0	52	3.0	0.041	7.3	LOS A	0.2	4.3	0.07	0.59	0.07	33.9
All Vehicles			151	3.0	151	3.0	0.043	6.0	LOS A	0.2	4.5	0.11	0.53	0.11	33.8

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

(Folder1)

Site Scenario: 1 | Local Volumes

The diagram illustrates a four-way roundabout with a central green island. The roundabout has four exits, each with a speed limit of 50. A red triangle warning sign is placed on the approach to the roundabout. The roads are labeled: Sunrise Ridge Ave NE (top), Johnson Rd NE (right), NE Midnight Sun Loop (bottom), and Johnson Rd NE (left). A north arrow points towards the top left.

Intersection	
Intersection Delay, s/veh	14.9
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	89	219	72	10	137	50	65	50	3	92	63	65
Future Vol, veh/h	89	219	72	10	137	50	65	50	3	92	63	65
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	3	1	1	1	1	2	1	1	1	1	1	4
Mvmt Flow	102	252	83	11	157	57	75	57	3	106	72	75
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay, s/veh	18.9	12.1	11.8	12.2
HCM LOS	C	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	55%	23%	5%	59%	0%
Vol Thru, %	42%	58%	70%	41%	0%
Vol Right, %	3%	19%	25%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	118	380	197	155	65
LT Vol	65	89	10	92	0
Through Vol	50	219	137	63	0
RT Vol	3	72	50	0	65
Lane Flow Rate	136	437	226	178	75
Geometry Grp	4a	2	2	5	5
Degree of Util (X)	0.246	0.666	0.361	0.343	0.123
Departure Headway (Hd)	6.521	5.489	5.74	6.925	5.908
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	547	655	620	517	602
Service Time	4.617	3.559	3.825	4.706	3.688
HCM Lane V/C Ratio	0.249	0.667	0.365	0.344	0.125
HCM Control Delay, s/veh	11.8	18.9	12.1	13.3	9.5
HCM Lane LOS	B	C	B	B	A
HCM 95th-tile Q	1	5	1.6	1.5	0.4

HCM 7th TWSC
7: Sunrise Ridge Ave NE & Caldart Ave NE

Forecast 2032 PM Peak Hour
Without Project

Intersection						
Int Delay, s/veh	2.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	57	63	23	57	41	17
Future Vol, veh/h	57	63	23	57	41	17
Conflicting Peds, #/hr	0	10	10	0	10	10
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	62	68	25	62	45	18
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	140	0	228	116
Stage 1	-	-	-	-	106	-
Stage 2	-	-	-	-	122	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1443	-	760	936
Stage 1	-	-	-	-	918	-
Stage 2	-	-	-	-	903	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1431	-	734	920
Mov Cap-2 Maneuver	-	-	-	-	734	-
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	880	-
Approach	EB	WB		NB		
HCM Ctrl Dly, s/v	0	2.17		10.02		
HCM LOS				B		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	780	-	-	517	-	
HCM Lane V/C Ratio	0.081	-	-	0.017	-	
HCM Ctrl Dly (s/v)	10	-	-	7.6	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-	

HCM 7th Signalized Intersection Summary
1: SR305 & NE Hostmark St

Forecast 2032 AM Peak Hour
With Project

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	108	70	54	89	150	61	509	22	208	888	21
Future Volume (veh/h)	39	108	70	54	89	150	61	509	22	208	888	21
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)	0.99		0.98	0.99		0.98	1.00		0.98	1.00		0.99
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	1716	1730	1744	1744	1744	1716	1730	1716	1716	1730	1716	1646
Adj Flow Rate, veh/h	42	117	76	59	97	98	66	553	24	226	965	23
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, %	6	5	4	4	4	6	5	6	6	5	6	11
Cap, veh/h	172	176	147	165	198	162	78	620	27	776	1845	44
Arrive On Green	0.03	0.10	0.10	0.04	0.11	0.11	0.05	0.22	0.22	0.47	0.65	0.65
Sat Flow, veh/h	1634	1730	1443	1661	1744	1423	1647	2789	121	1647	2853	68
Grp Volume(v), veh/h	42	117	76	59	97	98	66	241	336	226	412	576
Grp Sat Flow(s),veh/h/ln	1634	1730	1443	1661	1744	1423	1647	1218	1691	1647	1218	1703
Q Serve(g_s), s	2.8	7.8	6.0	3.8	6.3	3.0	4.8	23.0	23.1	10.1	21.7	21.7
Cycle Q Clear(g_c), s	2.8	7.8	6.0	3.8	6.3	3.0	4.8	23.0	23.1	10.1	21.7	21.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		0.04
Lane Grp Cap(c), veh/h	172	176	147	165	198	162	78	271	376	776	788	1101
V/C Ratio(X)	0.24	0.67	0.52	0.36	0.49	0.61	0.85	0.89	0.89	0.29	0.52	0.52
Avail Cap(c_a), veh/h	342	332	277	318	334	273	316	437	606	776	788	1101
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	47.0	51.9	51.1	46.3	49.9	7.5	56.8	45.2	45.3	19.4	11.3	11.3
Incr Delay (d2), s/veh	0.7	4.3	2.8	1.3	1.9	3.6	21.7	32.5	25.8	0.2	2.5	1.8
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(95%),veh/ln	2.1	6.5	4.1	2.9	5.1	5.1	4.4	14.2	17.9	6.8	9.8	12.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	47.7	56.2	53.9	47.6	51.8	11.1	78.4	77.7	71.1	19.6	13.8	13.1
LnGrp LOS	D	E	D	D	D	B	E	E	E	B	B	B
Approach Vol, veh/h	235			254			643			1214		
Approach Delay, s/veh	54.0			35.1			74.3			14.6		
Approach LOS	D			D			E			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	61.5	31.7	9.6	17.2	10.6	82.6	8.1	18.6				
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	18.9	43.5	16.1	23.5	23.5	38.9	16.1	23.5				
Max Q Clear Time (g_c+I1), s	12.1	25.1	5.8	9.8	6.8	23.7	4.8	8.3				
Green Ext Time (p_c), s	0.4	2.1	0.1	0.6	0.1	3.8	0.1	0.6				
Intersection Summary												
HCM 7th Control Delay, s/veh	37.1											
HCM 7th LOS	D											

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	983	547	1	2	3
Future Vol, veh/h	0	983	547	1	2	3
Conflicting Peds, #/hr	4	0	0	4	4	4
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	105	-	-	55	60	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	8	6	1	1	1
Mvmt Flow	0	1057	588	1	2	3
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	593	0	-	0	1653	596
Stage 1	-	-	-	-	592	-
Stage 2	-	-	-	-	1061	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	988	-	-	-	109	505
Stage 1	-	-	-	-	555	-
Stage 2	-	-	-	-	334	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	984	-	-	-	108	502
Mov Cap-2 Maneuver	-	-	-	-	108	-
Stage 1	-	-	-	-	553	-
Stage 2	-	-	-	-	333	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0	0		22.92		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	984	-	-	-	108	502
HCM Lane V/C Ratio	-	-	-	-	0.02	0.006
HCM Ctrl Dly (s/v)	0	-	-	-	39	12.2
HCM Lane LOS	A	-	-	-	E	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0

MOVEMENT SUMMARY

 **Site: [99 (4)] SR 305 & Johnson Rd - Forecast 2032 AM With**
(AM Peak Hour)

Output produced by SIDRA INTERSECTION Version: 10.0.9.250

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: Johnson Way															
3u	U	All MCs	1	1.0	1	1.0	0.053	16.6	LOS B	0.2	6.0	0.69	0.81	0.69	30.4
3	L2	All MCs	18	1.0	18	1.0	0.053	13.2	LOS B	0.2	6.0	0.69	0.81	0.69	32.1
8	T1	All MCs	8	1.0	8	1.0	0.053	7.5	LOS A	0.2	6.0	0.69	0.81	0.69	29.7
18	R2	All MCs	3	1.0	3	1.0	0.053	13.7	LOS B	0.2	6.0	0.69	0.81	0.69	32.5
Approach			30	1.0	30	1.0	0.053	11.9	LOS B	0.2	6.0	0.69	0.81	0.69	31.5
East: SR 305															
1u	U	All MCs	1	1.0	1	1.0	0.275	12.1	LOS B	1.7	43.4	0.21	0.46	0.21	37.6
1	L2	All MCs	8	1.0	8	1.0	0.275	11.5	LOS B	1.7	43.4	0.21	0.46	0.21	35.7
6	T1	All MCs	522	6.0	522	6.0	0.275	6.1	LOS A	1.7	43.4	0.20	0.46	0.20	40.6
16	R2	All MCs	27	1.0	27	1.0	0.125	5.9	LOS A	0.6	16.6	0.20	0.47	0.20	36.1
Approach			557	5.7	557	5.7	0.275	6.2	LOS A	1.7	43.4	0.20	0.46	0.20	40.3
North: Johnson Rd															
7u	U	All MCs	1	1.0	1	1.0	0.206	14.1	LOS B	0.8	21.0	0.50	0.70	0.50	31.2
7	L2	All MCs	122	3.0	122	3.0	0.206	10.8	LOS B	0.8	21.0	0.50	0.70	0.50	32.8
4	T1	All MCs	2	1.0	2	1.0	0.206	5.0	LOS A	0.8	21.0	0.50	0.70	0.50	30.5
14	R2	All MCs	52	1.0	52	1.0	0.206	6.4	LOS A	0.8	21.0	0.50	0.70	0.50	33.5
Approach			176	2.4	176	2.4	0.206	9.5	LOS A	0.8	21.0	0.50	0.70	0.50	33.0
West: SR 305															
5u	U	All MCs	1	1.0	1	1.0	0.576	12.7	LOS B	5.1	135.4	0.49	0.51	0.49	36.6
5	L2	All MCs	24	17.0	24	17.0	0.576	12.7	LOS B	5.1	135.4	0.49	0.51	0.49	34.2
2	T1	All MCs	1015	8.0	1015	8.0	0.576	8.0	LOS A	5.1	135.4	0.46	0.51	0.46	39.2
12	R2	All MCs	20	12.0	20	12.0	0.262	6.7	LOS A	1.5	41.2	0.38	0.50	0.38	35.3
Approach			1060	8.3	1060	8.3	0.576	8.1	LOS A	5.1	135.4	0.46	0.51	0.46	39.0
All Vehicles			1824	6.8	1824	6.8	0.576	7.7	LOS A	5.1	135.4	0.39	0.52	0.39	38.5

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

 **Site: [99 (4)] SR 305 & Johnson Rd - Forecast 2032 AM With**
(AM Peak Hour)

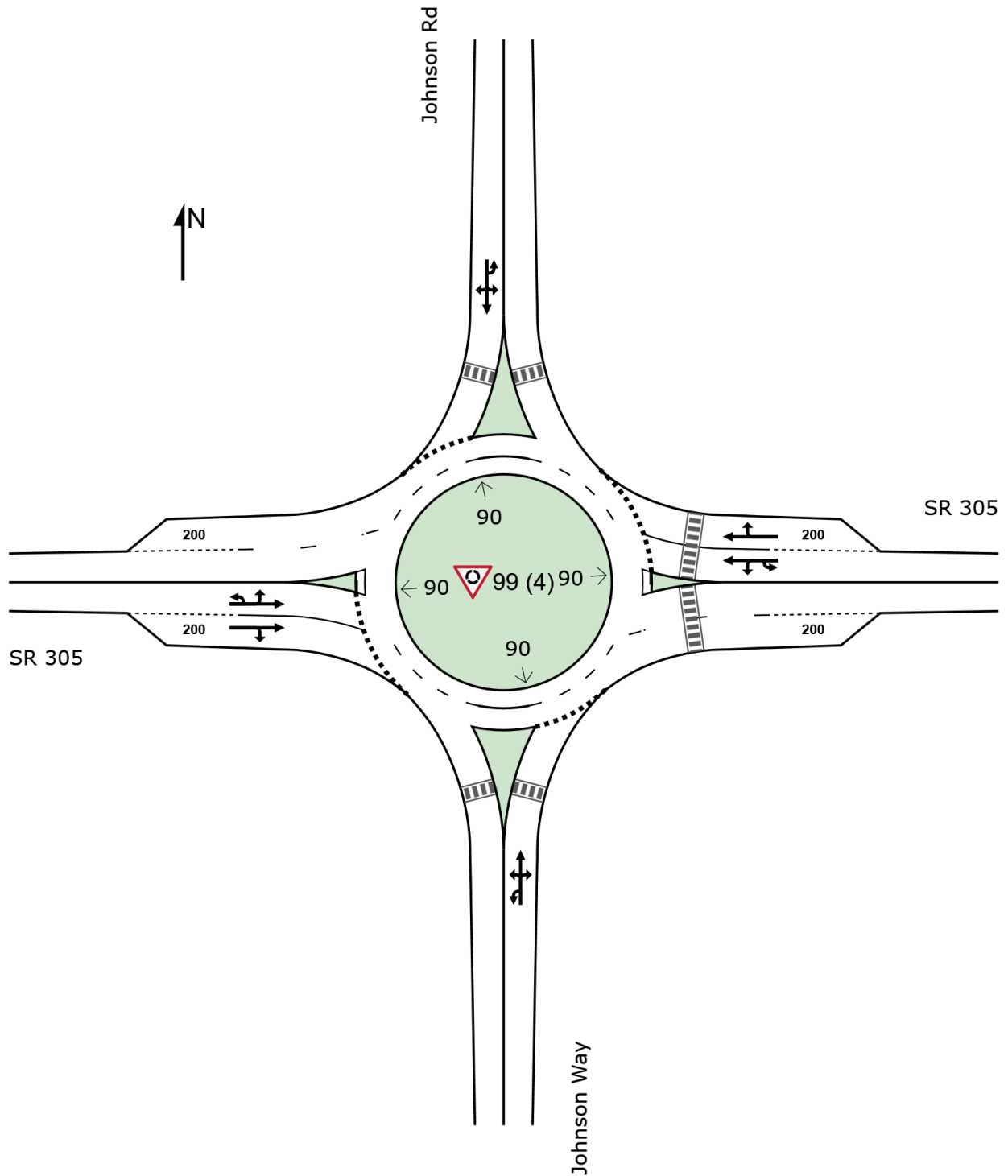
New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

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



MOVEMENT SUMMARY

 **Site: [1 (4)] Johnson & Sunrise Ridge - 2032 AM With (Folder1)**

Output produced by SIDRA INTERSECTION Version: 10.0.9.250

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: NE Midnight Sun Loop															
3u	U	All MCs	1	3.0	1	3.0	0.004	7.3	LOS A	0.0	0.4	0.20	0.45	0.20	23.5
3	L2	All MCs	1	3.0	1	3.0	0.004	5.9	LOS A	0.0	0.4	0.20	0.45	0.20	23.5
8	T1	All MCs	1	3.0	1	3.0	0.004	2.1	LOS A	0.0	0.4	0.20	0.45	0.20	23.7
18	R2	All MCs	1	3.0	1	3.0	0.004	2.4	LOS A	0.0	0.4	0.20	0.45	0.20	23.6
Approach			5	3.0	5	3.0	0.004	4.4	LOS A	0.0	0.4	0.20	0.45	0.20	23.5
East: Johnson Rd NE															
1u	U	All MCs	1	3.0	1	3.0	0.074	11.0	LOS B	0.3	8.0	0.14	0.46	0.14	34.5
1	L2	All MCs	1	3.0	1	3.0	0.074	9.1	LOS A	0.3	8.0	0.14	0.46	0.14	34.5
6	T1	All MCs	87	3.0	87	3.0	0.074	5.0	LOS A	0.3	8.0	0.14	0.46	0.14	35.2
16	R2	All MCs	7	3.0	7	3.0	0.074	4.8	LOS A	0.3	8.0	0.14	0.46	0.14	34.9
Approach			96	3.0	96	3.0	0.074	5.1	LOS A	0.3	8.0	0.14	0.46	0.14	35.1
North: Sunrise Ridge Ave NE															
7u	U	All MCs	1	3.0	1	3.0	0.114	11.2	LOS B	0.5	13.0	0.23	0.54	0.23	34.3
7	L2	All MCs	18	3.0	18	3.0	0.114	9.3	LOS A	0.5	13.0	0.23	0.54	0.23	34.3
4	T1	All MCs	1	3.0	1	3.0	0.114	5.3	LOS A	0.5	13.0	0.23	0.54	0.23	34.9
14	R2	All MCs	114	3.0	114	3.0	0.114	5.0	LOS A	0.5	13.0	0.23	0.54	0.23	34.6
Approach			135	3.0	135	3.0	0.114	5.7	LOS A	0.5	13.0	0.23	0.54	0.23	34.6
West: Johnson Rd NE															
5u	U	All MCs	1	3.0	1	3.0	0.061	10.9	LOS B	0.3	6.7	0.10	0.58	0.10	33.7
5	L2	All MCs	40	3.0	40	3.0	0.061	9.0	LOS A	0.3	6.7	0.10	0.58	0.10	33.7
2	T1	All MCs	26	3.0	26	3.0	0.061	4.9	LOS A	0.3	6.7	0.10	0.58	0.10	34.3
12	R2	All MCs	10	3.0	10	3.0	0.061	4.7	LOS A	0.3	6.7	0.10	0.58	0.10	34.0
Approach			77	3.0	77	3.0	0.061	7.1	LOS A	0.3	6.7	0.10	0.58	0.10	33.9
All Vehicles			313	3.0	313	3.0	0.114	5.8	LOS A	0.5	13.0	0.17	0.53	0.17	34.3

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

 **Site: [1 (4)] Johnson & Sunrise Ridge - 2032 AM With**
(Folder1)

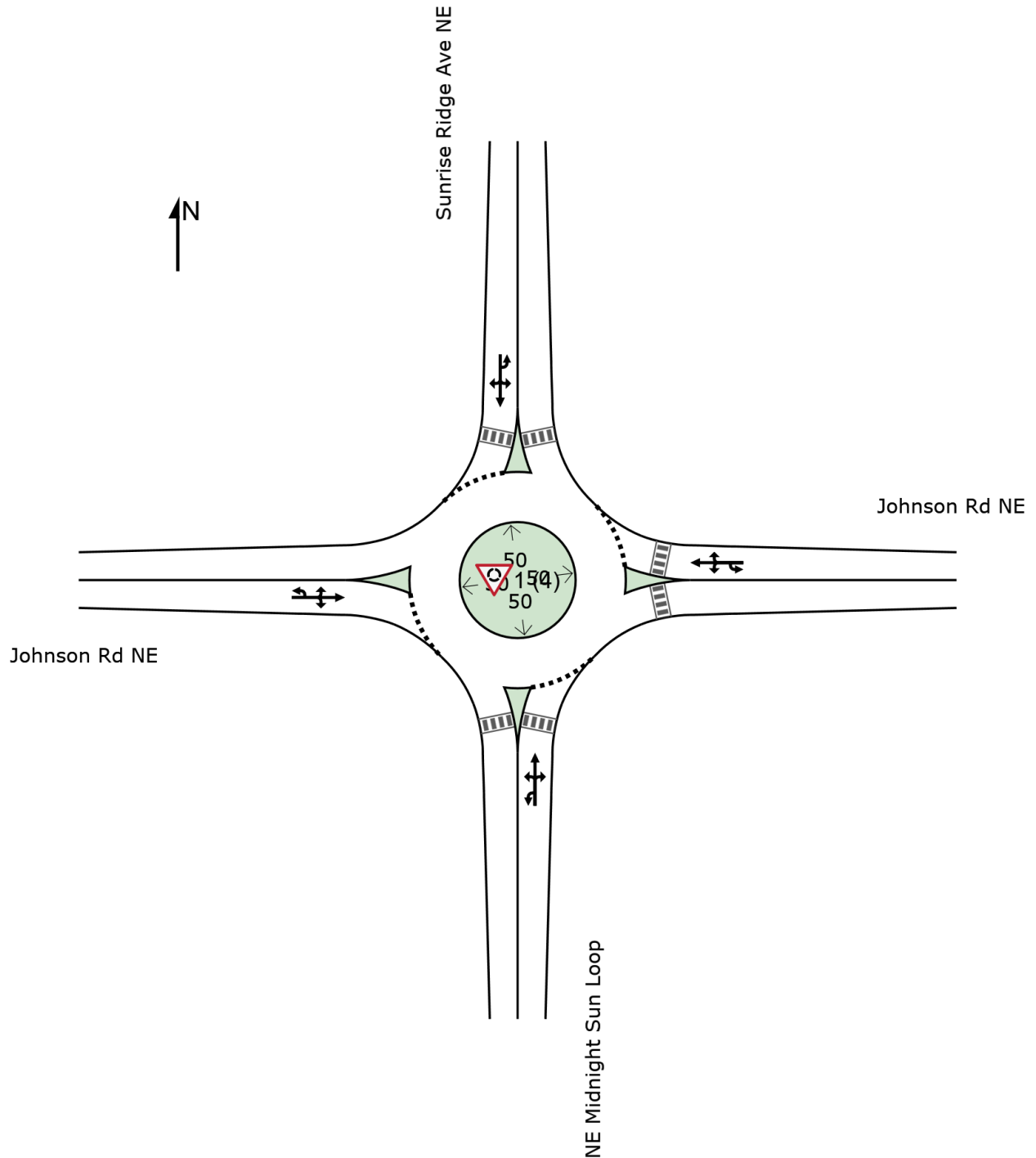
New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

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



HCM 7th TWSC
5: Sunrise Ridge Ave & Crystallia Ct

Forecast 2032 AM Peak Hour
With Project

Intersection						
Int Delay, s/veh	6.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	64	23	8	19	3
Future Vol, veh/h	7	64	23	8	19	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	70	25	9	21	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	81	22	24	0	-	0
Stage 1	22	-	-	-	-	-
Stage 2	59	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	921	1055	1591	-	-	-
Stage 1	1000	-	-	-	-	-
Stage 2	964	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	907	1055	1591	-	-	-
Mov Cap-2 Maneuver	907	-	-	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	964	-	-	-	-	-
Approach	EB	NB		SB		
HCM Ctrl Dly, s/v	8.75	5.42		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1335	-	1038	-	-	
HCM Lane V/C Ratio	0.016	-	0.074	-	-	
HCM Ctrl Dly (s/v)	7.3	0	8.7	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

Intersection	
Intersection Delay, s/veh	24.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	48	236	23	24	213	81	61	41	45	129	28	60
Future Vol, veh/h	48	236	23	24	213	81	61	41	45	129	28	60
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.87	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles, %	1	6	5	1	7	1	1	3	6	7	1	4
Mvmt Flow	64	315	31	32	284	108	70	55	60	172	37	80
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay, s/veh	28.5	28.9	15.6	16.5
HCM LOS	D	D	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	41%	16%	8%	82%	0%
Vol Thru, %	28%	77%	67%	18%	0%
Vol Right, %	31%	7%	25%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	147	307	318	157	60
LT Vol	61	48	24	129	0
Through Vol	41	236	213	28	0
RT Vol	45	23	81	0	60
Lane Flow Rate	185	409	424	209	80
Geometry Grp	4a	2	2	5	5
Degree of Util (X)	0.393	0.766	0.777	0.483	0.157
Departure Headway (Hd)	7.649	6.739	6.597	8.307	7.056
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	469	540	551	433	507
Service Time	5.722	4.761	4.617	6.071	4.82
HCM Lane V/C Ratio	0.394	0.757	0.77	0.483	0.158
HCM Control Delay, s/veh	15.6	28.5	28.9	18.6	11.1
HCM Lane LOS	C	D	D	C	B
HCM 95th-tile Q	1.8	6.8	7.1	2.6	0.6

Intersection						
Int Delay, s/veh	4.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	34	39	6	57	66	23
Future Vol, veh/h	34	39	6	57	66	23
Conflicting Peds, #/hr	0	10	10	0	10	10
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	37	42	7	62	72	25
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	89	0	153	78
Stage 1	-	-	-	-	68	-
Stage 2	-	-	-	-	85	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1506	-	838	982
Stage 1	-	-	-	-	955	-
Stage 2	-	-	-	-	938	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1493	-	821	966
Mov Cap-2 Maneuver	-	-	-	-	821	-
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	926	-
Approach	EB		WB		NB	
HCM Ctrl Dly, s/v	0		0.71		9.75	
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	854	-	-	171	-	
HCM Lane V/C Ratio	0.113	-	-	0.004	-	
HCM Ctrl Dly (s/v)	9.8	-	-	7.4	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.4	-	-	0	-	

HCM 7th Signalized Intersection Summary
1: SR305 & NE Hostmark St

Forecast 2032 PM Peak Hour
With Project

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	176	118	55	129	229	133	830	36	220	681	51
Future Volume (veh/h)	71	176	118	55	129	229	133	830	36	220	681	51
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)	0.99		0.96	0.99		0.96	1.00		0.96	1.00		0.97
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	1702	1758	1786	1786	1786	1786	1772	1744	1786	1786	1772	1744
Adj Flow Rate, veh/h	72	178	119	56	130	85	134	838	36	222	688	52
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	7	3	1	1	1	1	2	4	1	1	2	4
Cap, veh/h	186	222	184	150	203	166	156	900	39	603	1609	122
Arrive On Green	0.05	0.13	0.13	0.04	0.11	0.11	0.09	0.32	0.32	0.35	0.58	0.58
Sat Flow, veh/h	1621	1758	1459	1701	1786	1455	1688	2833	122	1701	2775	210
Grp Volume(v), veh/h	72	178	119	56	130	85	134	366	508	222	312	428
Grp Sat Flow(s),veh/h/ln	1621	1758	1459	1701	1786	1455	1688	1238	1717	1701	1258	1727
Q Serve(g_s), s	4.7	11.8	9.3	3.5	8.3	3.4	9.4	34.4	34.4	11.6	16.6	16.6
Cycle Q Clear(g_c), s	4.7	11.8	9.3	3.5	8.3	3.4	9.4	34.4	34.4	11.6	16.6	16.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.07	1.00		0.12
Lane Grp Cap(c), veh/h	186	222	184	150	203	166	156	393	545	603	730	1001
V/C Ratio(X)	0.39	0.80	0.65	0.37	0.64	0.51	0.86	0.93	0.93	0.37	0.43	0.43
Avail Cap(c_a), veh/h	320	337	280	311	342	279	323	444	615	603	730	1001
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	44.5	51.0	49.9	45.4	50.8	13.3	53.7	39.7	39.7	28.8	14.1	14.1
Incr Delay (d2), s/veh	1.3	7.9	3.8	1.5	3.3	2.5	12.8	30.9	24.8	0.4	1.8	1.3
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(95%),veh/ln	3.5	9.6	6.5	2.8	7.1	4.4	7.9	19.5	24.6	8.3	8.4	10.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	45.8	58.9	53.7	47.0	54.1	15.7	66.5	70.6	64.5	29.1	15.9	15.4
LnGrp LOS	D	E	D	D	D	B	E	E	E	C	B	B
Approach Vol, veh/h	369			271			1008			962		
Approach Delay, s/veh	54.7			40.6			67.0			18.7		
Approach LOS	D			D			E			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	47.5	43.1	9.2	20.1	16.1	74.6	10.7	18.7				
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	18.9	43.5	16.1	23.5	23.5	38.9	16.1	23.5				
Max Q Clear Time (g_c+I1), s	13.6	36.4	5.5	13.8	11.4	18.6	6.7	10.3				
Green Ext Time (p_c), s	0.4	2.2	0.1	0.8	0.3	2.9	0.1	0.7				
Intersection Summary												
HCM 7th Control Delay, s/veh	44.7											
HCM 7th LOS	D											

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	824	936	5	1	3
Future Vol, veh/h	6	824	936	5	1	3
Conflicting Peds, #/hr	1	0	0	1	1	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	105	-	-	55	60	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	10	2	3	1	10	1
Mvmt Flow	6	886	1006	5	1	3
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1013	0	-	0	1907	1008
Stage 1	-	-	-	-	1007	-
Stage 2	-	-	-	-	900	-
Critical Hdwy	4.2	-	-	-	6.5	6.21
Critical Hdwy Stg 1	-	-	-	-	5.5	-
Critical Hdwy Stg 2	-	-	-	-	5.5	-
Follow-up Hdwy	2.29	-	-	-	3.59	3.309
Pot Cap-1 Maneuver	654	-	-	-	72	293
Stage 1	-	-	-	-	341	-
Stage 2	-	-	-	-	384	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	654	-	-	-	71	293
Mov Cap-2 Maneuver	-	-	-	-	71	-
Stage 1	-	-	-	-	337	-
Stage 2	-	-	-	-	384	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0.08	0		27.24		
HCM LOS	D					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	654	-	-	-	71	293
HCM Lane V/C Ratio	0.01	-	-	-	0.015	0.011
HCM Ctrl Dly (s/v)	10.6	-	-	-	56.6	17.4
HCM Lane LOS	B	-	-	-	F	C
HCM 95th %tile Q(veh)	0	-	-	-	0	0

MOVEMENT SUMMARY

 **Site: [99 (6)] SR 305 & Johnson Rd - Forecast 2032 PM With**
(PM Peak Hour)

Output produced by SIDRA INTERSECTION Version: 10.0.9.250

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: Johnson Way															
3u	U	All MCs	1	1.0	1	1.0	0.057	15.0	LOS B	0.2	5.7	0.58	0.75	0.58	31.0
3	L2	All MCs	23	6.0	23	6.0	0.057	12.0	LOS B	0.2	5.7	0.58	0.75	0.58	32.2
8	T1	All MCs	6	1.0	6	1.0	0.057	6.0	LOS A	0.2	5.7	0.58	0.75	0.58	30.2
18	R2	All MCs	9	1.0	9	1.0	0.057	8.2	LOS A	0.2	5.7	0.58	0.75	0.58	33.2
Approach			39	3.9	39	3.9	0.057	10.3	LOS B	0.2	5.7	0.58	0.75	0.58	32.0
East: SR 305															
1u	U	All MCs	3	1.0	3	1.0	0.504	12.3	LOS B	3.9	99.3	0.32	0.47	0.32	37.2
1	L2	All MCs	12	1.0	12	1.0	0.504	11.7	LOS B	3.9	99.3	0.32	0.47	0.32	35.3
6	T1	All MCs	949	3.0	949	3.0	0.504	6.7	LOS A	3.9	99.3	0.31	0.47	0.31	40.7
16	R2	All MCs	61	10.0	61	10.0	0.229	6.3	LOS A	1.3	32.5	0.27	0.49	0.27	35.6
Approach			1026	3.4	1026	3.4	0.504	6.7	LOS A	3.9	99.3	0.30	0.47	0.30	40.3
North: Johnson Rd															
7u	U	All MCs	1	1.0	1	1.0	0.147	15.7	LOS B	0.6	15.7	0.63	0.78	0.63	30.7
7	L2	All MCs	53	6.0	53	6.0	0.147	12.8	LOS B	0.6	15.7	0.63	0.78	0.63	31.9
4	T1	All MCs	3	1.0	3	1.0	0.147	6.6	LOS A	0.6	15.7	0.63	0.78	0.63	30.0
14	R2	All MCs	38	1.0	38	1.0	0.147	9.8	LOS A	0.6	15.7	0.63	0.78	0.63	33.0
Approach			95	3.8	95	3.8	0.147	11.5	LOS B	0.6	15.7	0.63	0.78	0.63	32.3
West: SR 305															
5u	U	All MCs	1	1.0	1	1.0	0.431	12.2	LOS B	3.3	83.6	0.30	0.48	0.30	37.1
5	L2	All MCs	49	1.0	49	1.0	0.431	11.6	LOS B	3.3	83.6	0.30	0.48	0.30	35.2
2	T1	All MCs	817	2.0	817	2.0	0.431	6.4	LOS A	3.3	83.6	0.29	0.48	0.29	40.8
12	R2	All MCs	23	1.0	23	1.0	0.196	6.0	LOS A	1.1	28.2	0.26	0.47	0.26	35.9
Approach			890	1.9	890	1.9	0.431	6.7	LOS A	3.3	83.6	0.29	0.48	0.29	40.3
All Vehicles			2049	2.8	2049	2.8	0.504	7.0	LOS A	3.9	99.3	0.32	0.49	0.32	39.6

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

 **Site: [99 (6)] SR 305 & Johnson Rd - Forecast 2032 PM With**
(PM Peak Hour)

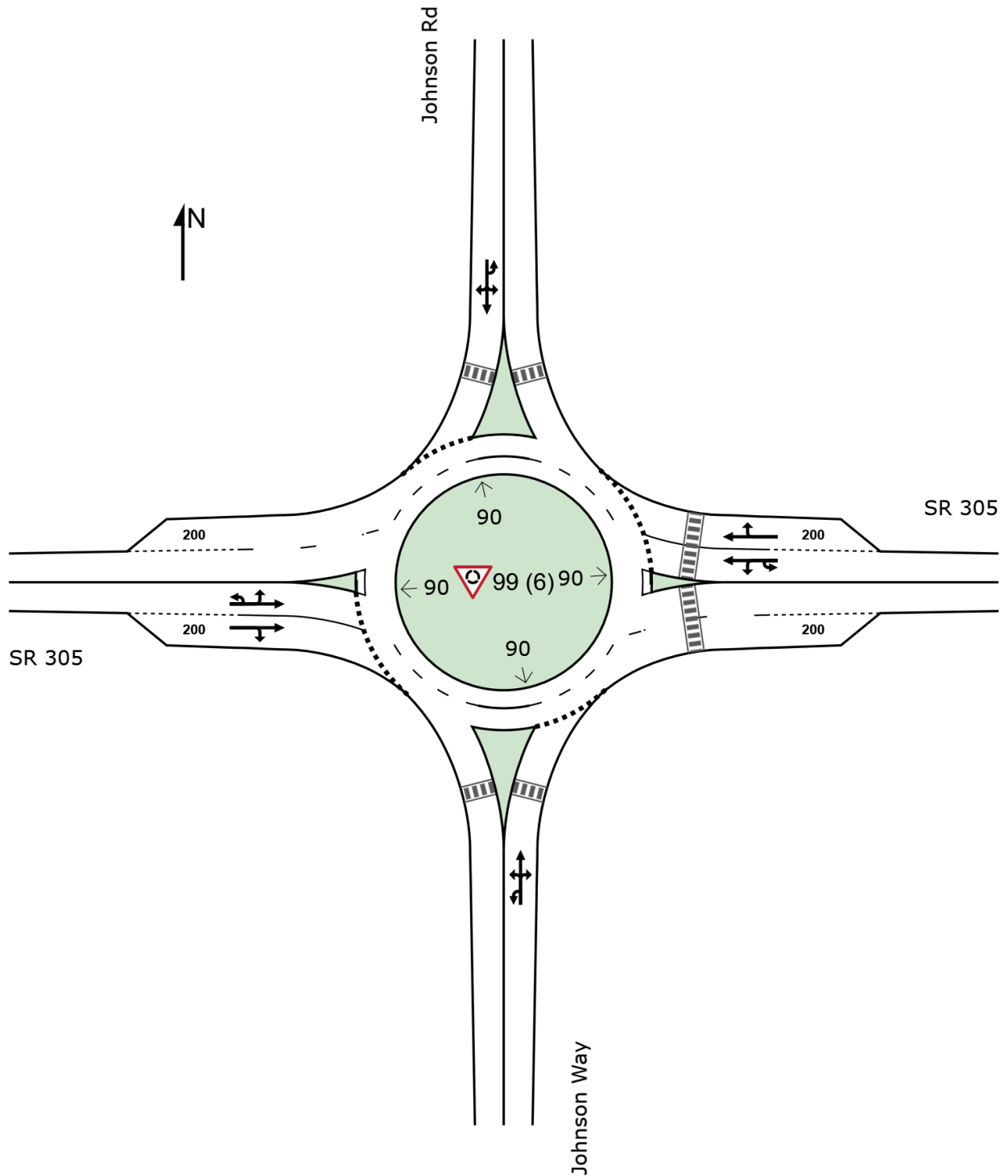
New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

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



MOVEMENT SUMMARY

 **Site: [1 (6)] Johnson & Sunrise Ridge - 2032 PM With (Folder1)**

Output produced by SIDRA INTERSECTION Version: 10.0.9.250

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: NE Midnight Sun Loop															
3u	U	All MCs	1	3.0	1	3.0	0.006	7.5	LOS A	0.0	0.6	0.25	0.43	0.25	23.6
3	L2	All MCs	1	3.0	1	3.0	0.006	6.1	LOS A	0.0	0.6	0.25	0.43	0.25	23.6
8	T1	All MCs	1	3.0	1	3.0	0.006	2.3	LOS A	0.0	0.6	0.25	0.43	0.25	23.8
18	R2	All MCs	3	3.0	3	3.0	0.006	2.6	LOS A	0.0	0.6	0.25	0.43	0.25	23.7
Approach			7	3.0	7	3.0	0.006	4.0	LOS A	0.0	0.6	0.25	0.43	0.25	23.6
East: Johnson Rd NE															
1u	U	All MCs	1	3.0	1	3.0	0.050	11.2	LOS B	0.2	5.3	0.23	0.50	0.23	34.3
1	L2	All MCs	3	3.0	3	3.0	0.050	9.3	LOS A	0.2	5.3	0.23	0.50	0.23	34.3
6	T1	All MCs	40	3.0	40	3.0	0.050	5.3	LOS A	0.2	5.3	0.23	0.50	0.23	34.9
16	R2	All MCs	17	3.0	17	3.0	0.050	5.0	LOS A	0.2	5.3	0.23	0.50	0.23	34.6
Approach			61	3.0	61	3.0	0.050	5.5	LOS A	0.2	5.3	0.23	0.50	0.23	34.8
North: Sunrise Ridge Ave NE															
7u	U	All MCs	1	3.0	1	3.0	0.070	11.0	LOS B	0.3	7.8	0.16	0.54	0.16	34.4
7	L2	All MCs	10	3.0	10	3.0	0.070	9.1	LOS A	0.3	7.8	0.16	0.54	0.16	34.4
4	T1	All MCs	1	3.0	1	3.0	0.070	5.0	LOS A	0.3	7.8	0.16	0.54	0.16	35.1
14	R2	All MCs	73	3.0	73	3.0	0.070	4.8	LOS A	0.3	7.8	0.16	0.54	0.16	34.8
Approach			85	3.0	85	3.0	0.070	5.4	LOS A	0.3	7.8	0.16	0.54	0.16	34.7
West: Johnson Rd NE															
5u	U	All MCs	1	3.0	1	3.0	0.101	10.9	LOS B	0.4	11.3	0.09	0.63	0.09	33.1
5	L2	All MCs	107	3.0	107	3.0	0.101	8.9	LOS A	0.4	11.3	0.09	0.63	0.09	33.1
2	T1	All MCs	20	3.0	20	3.0	0.101	4.9	LOS A	0.4	11.3	0.09	0.63	0.09	33.7
12	R2	All MCs	1	3.0	1	3.0	0.101	4.7	LOS A	0.4	11.3	0.09	0.63	0.09	33.4
Approach			130	3.0	130	3.0	0.101	8.3	LOS A	0.4	11.3	0.09	0.63	0.09	33.2
All Vehicles			283	3.0	283	3.0	0.101	6.7	LOS A	0.4	11.3	0.14	0.57	0.14	33.7

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

 **Site: [1 (6)] Johnson & Sunrise Ridge - 2032 PM With (Folder1)**

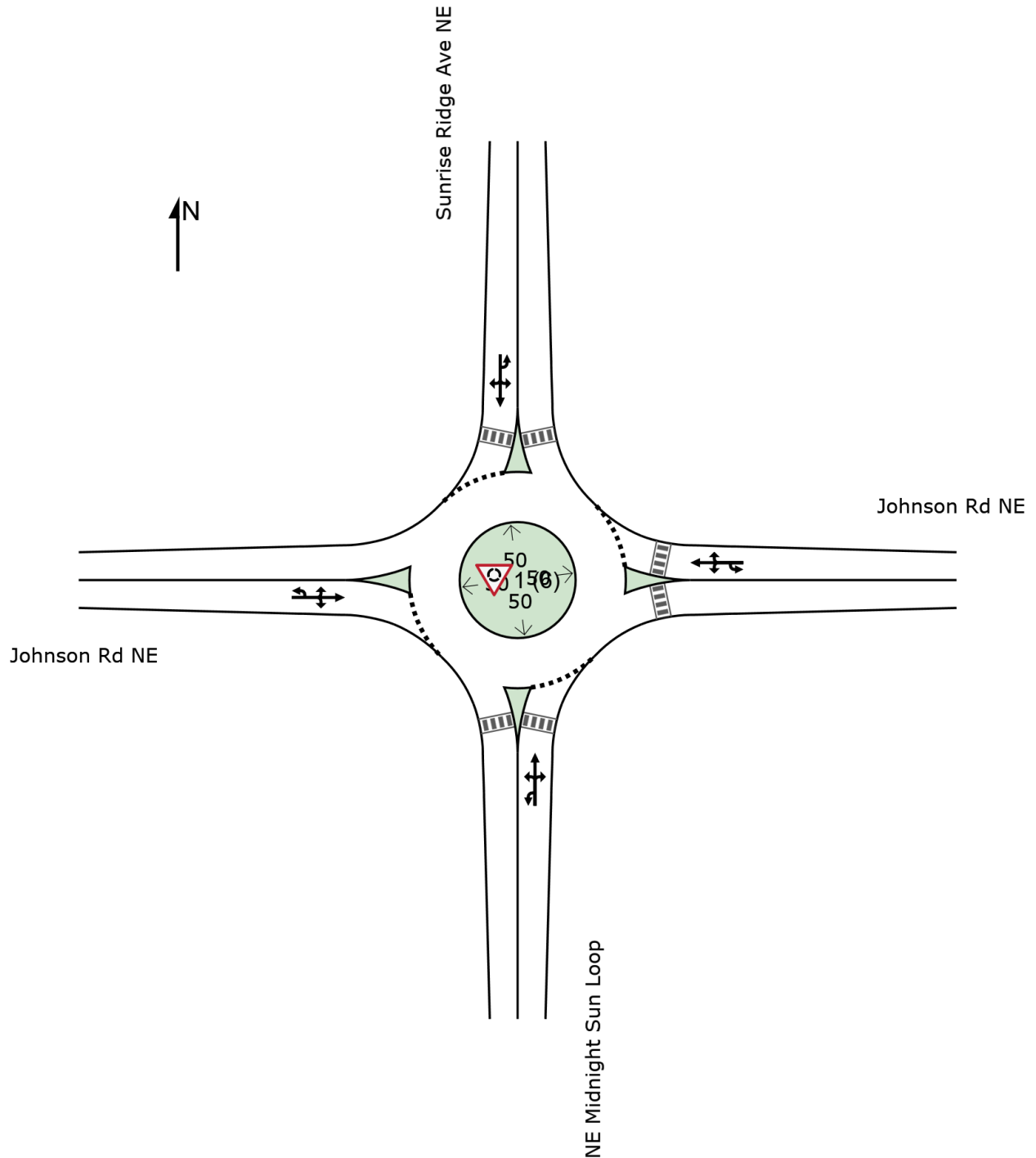
New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

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



Intersection						
Int Delay, s/veh	6.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	43	72	7	12	8
Future Vol, veh/h	5	43	72	7	12	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	47	78	8	13	9
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	182	17	22	0	-	0
Stage 1	17	-	-	-	-	-
Stage 2	164	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	808	1061	1594	-	-	-
Stage 1	1005	-	-	-	-	-
Stage 2	865	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	768	1061	1594	-	-	-
Mov Cap-2 Maneuver	768	-	-	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	865	-	-	-	-	-
Approach	EB	NB		SB		
HCM Ctrl Dly, s/v	8.72	6.72		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1587	-	1021	-	-	
HCM Lane V/C Ratio	0.049	-	0.051	-	-	
HCM Ctrl Dly (s/v)	7.4	0	8.7	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0.2	-	0.2	-	-	

Intersection	
Intersection Delay, s/veh	15.1
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	89	219	72	14	137	50	65	52	6	92	67	65
Future Vol, veh/h	89	219	72	14	137	50	65	52	6	92	67	65
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	3	1	1	1	1	2	1	1	1	1	1	4
Mvmt Flow	102	252	83	16	157	57	75	60	7	106	77	75
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay, s/veh	19.3	12.3	11.9	12.4
HCM LOS	C	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	53%	23%	7%	58%	0%
Vol Thru, %	42%	58%	68%	42%	0%
Vol Right, %	5%	19%	25%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	123	380	201	159	65
LT Vol	65	89	14	92	0
Through Vol	52	219	137	67	0
RT Vol	6	72	50	0	65
Lane Flow Rate	141	437	231	183	75
Geometry Grp	4a	2	2	5	5
Degree of Util (X)	0.257	0.672	0.372	0.353	0.123
Departure Headway (Hd)	6.547	5.541	5.796	6.957	5.948
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	544	646	615	514	598
Service Time	4.646	3.613	3.884	4.743	3.733
HCM Lane V/C Ratio	0.259	0.676	0.376	0.356	0.125
HCM Control Delay, s/veh	11.9	19.3	12.3	13.5	9.6
HCM Lane LOS	B	C	B	B	A
HCM 95th-tile Q	1	5.1	1.7	1.6	0.4

Intersection						
Int Delay, s/veh	3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	57	71	23	57	46	17
Future Vol, veh/h	57	71	23	57	46	17
Conflicting Peds, #/hr	0	10	10	0	10	10
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	62	77	25	62	50	18
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	149	0	233	121
Stage 1	-	-	-	-	111	-
Stage 2	-	-	-	-	122	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1432	-	756	931
Stage 1	-	-	-	-	914	-
Stage 2	-	-	-	-	903	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1420	-	730	915
Mov Cap-2 Maneuver	-	-	-	-	730	-
Stage 1	-	-	-	-	906	-
Stage 2	-	-	-	-	880	-
Approach	EB	WB		NB		
HCM Ctrl Dly, s/v	0	2.18		10.12		
HCM LOS				B		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	772	-	-	517	-	
HCM Lane V/C Ratio	0.089	-	-	0.018	-	
HCM Ctrl Dly (s/v)	10.1	-	-	7.6	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-	

THE PINNACLE AT LIBERTY BAY TRAFFIC IMPACT ANALYSIS

APPENDIX

Forecast 2037 Level of Service



HCM 7th Signalized Intersection Summary
1: SR305 & NE Hostmark St

Forecast 2037 AM Peak Hour
Without Project

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	131	79	65	107	181	57	519	26	252	932	25
Future Volume (veh/h)	47	131	79	65	107	181	57	519	26	252	932	25
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)	0.99		0.98	0.99		0.98	1.00		0.98	1.00		0.99
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	1716	1730	1744	1744	1744	1716	1730	1716	1716	1730	1716	1646
Adj Flow Rate, veh/h	47	131	79	65	107	121	57	519	26	252	932	25
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	6	5	4	4	4	6	5	6	6	5	6	11
Cap, veh/h	178	187	156	169	210	171	66	585	29	778	1829	49
Arrive On Green	0.03	0.11	0.11	0.04	0.12	0.12	0.04	0.21	0.21	0.47	0.64	0.64
Sat Flow, veh/h	1634	1730	1445	1661	1744	1425	1647	2767	138	1647	2843	76
Grp Volume(v), veh/h	47	131	79	65	107	121	57	228	317	252	399	558
Grp Sat Flow(s),veh/h/ln	1634	1730	1445	1661	1744	1425	1647	1218	1688	1647	1218	1701
Q Serve(g_s), s	3.1	8.8	6.2	4.2	6.9	3.7	4.1	21.8	21.9	11.4	20.9	20.9
Cycle Q Clear(g_c), s	3.1	8.8	6.2	4.2	6.9	3.7	4.1	21.8	21.9	11.4	20.9	20.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		0.04
Lane Grp Cap(c), veh/h	178	187	156	169	210	171	66	258	357	778	784	1095
V/C Ratio(X)	0.26	0.70	0.51	0.38	0.51	0.71	0.86	0.89	0.89	0.32	0.51	0.51
Avail Cap(c_a), veh/h	341	332	277	316	334	273	316	437	605	778	784	1095
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	46.1	51.7	50.5	45.5	49.5	7.3	57.3	45.9	45.9	19.7	11.4	11.4
Incr Delay (d2), s/veh	0.8	4.7	2.5	1.4	1.9	5.3	26.1	33.0	26.3	0.2	2.4	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(95%),veh/ln	2.3	7.3	4.2	3.2	5.6	6.4	3.9	13.7	17.2	7.7	9.5	12.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	46.9	56.4	53.1	46.9	51.4	12.5	83.3	78.9	72.3	20.0	13.7	13.0
LnGrp LOS	D	E	D	D	D	B	F	E	E	B	B	B
Approach Vol, veh/h	257			293			602			1209		
Approach Delay, s/veh	53.6			34.3			75.8			14.7		
Approach LOS	D			C			E			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	61.6	30.4	10.0	17.9	9.8	82.2	8.6	19.4				
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	18.9	43.5	16.1	23.5	23.5	38.9	16.1	23.5				
Max Q Clear Time (g_c+I1), s	13.4	23.9	6.2	10.8	6.1	22.9	5.1	8.9				
Green Ext Time (p_c), s	0.4	2.0	0.1	0.6	0.1	3.7	0.1	0.8				
Intersection Summary												
HCM 7th Control Delay, s/veh	37.0											
HCM 7th LOS	D											

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1027	545	1	2	4
Future Vol, veh/h	0	1027	545	1	2	4
Conflicting Peds, #/hr	4	0	0	4	4	4
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	105	-	-	55	60	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	1	8	6	1	1	1
Mvmt Flow	0	1027	545	1	2	4
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	550	0	-	0	1580	553
Stage 1	-	-	-	-	549	-
Stage 2	-	-	-	-	1031	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1025	-	-	-	121	535
Stage 1	-	-	-	-	581	-
Stage 2	-	-	-	-	345	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1021	-	-	-	120	531
Mov Cap-2 Maneuver	-	-	-	-	120	-
Stage 1	-	-	-	-	579	-
Stage 2	-	-	-	-	344	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0	0		19.73		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1021	-	-	-	120	531
HCM Lane V/C Ratio	-	-	-	-	0.017	0.008
HCM Ctrl Dly (s/v)	0	-	-	-	35.5	11.8
HCM Lane LOS	A	-	-	-	E	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0

SITE LAYOUT

 **Site: [99 (7)] SR 305 & Johnson Rd - Forecast 2037 AM**
Without (AM Peak Hour)

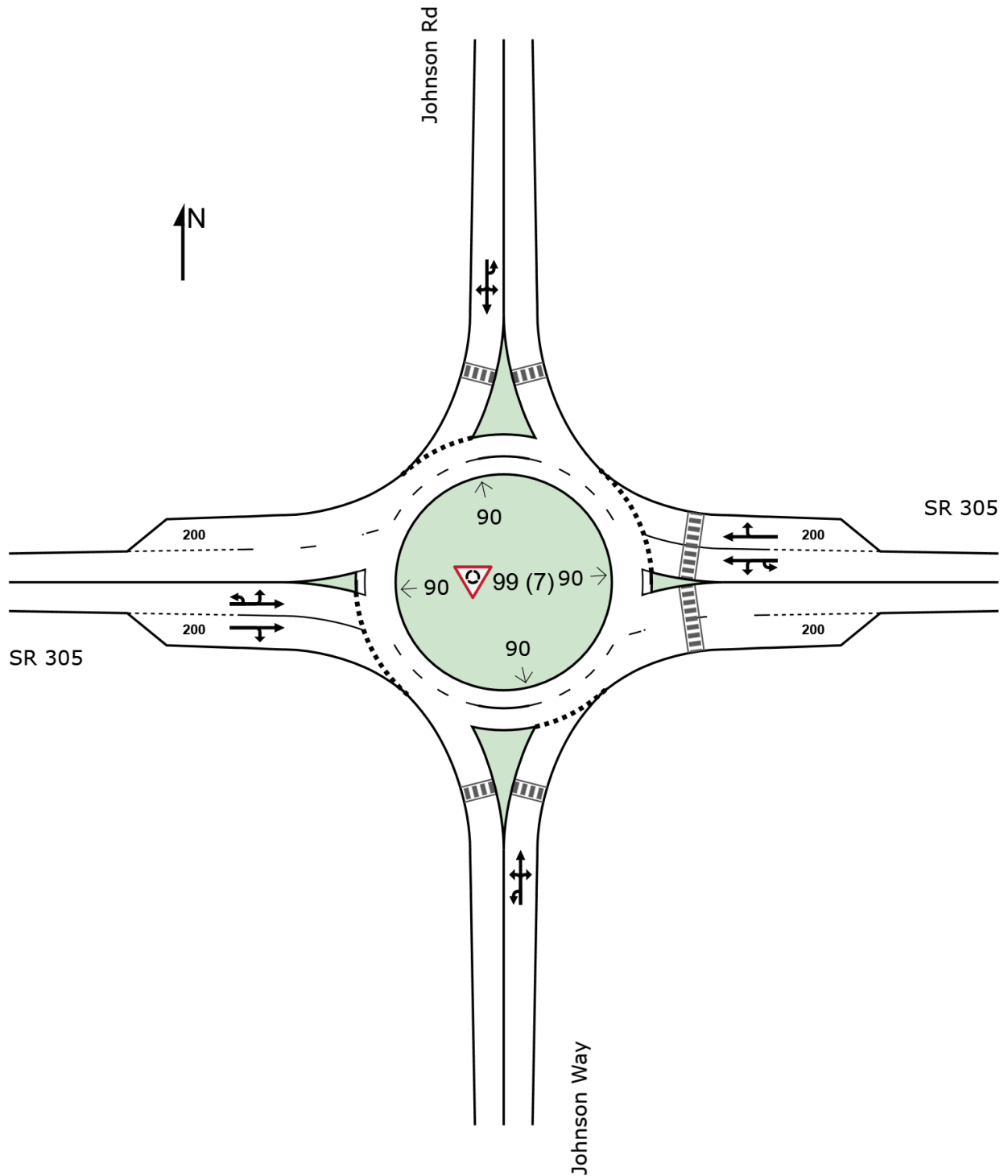
New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

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



MOVEMENT SUMMARY

 **Site: [99 (7)] SR 305 & Johnson Rd - Forecast 2037 AM**
Without (AM Peak Hour)

Output produced by SIDRA INTERSECTION Version: 10.0.9.250

New Site
 Site Category: (None)
 Roundabout
Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: Johnson Way															
3u	U	All MCs	1	1.0	1	1.0	0.050	16.0	LOS B	0.2	5.3	0.65	0.78	0.65	30.7
3	L2	All MCs	19	1.0	19	1.0	0.050	12.5	LOS B	0.2	5.3	0.65	0.78	0.65	32.4
8	T1	All MCs	7	1.0	7	1.0	0.050	6.9	LOS A	0.2	5.3	0.65	0.78	0.65	29.9
18	R2	All MCs	4	1.0	4	1.0	0.050	11.8	LOS B	0.2	5.3	0.65	0.78	0.65	32.8
Approach			31	1.0	31	1.0	0.050	11.3	LOS B	0.2	5.3	0.65	0.78	0.65	31.8
East: SR 305															
1u	U	All MCs	1	1.0	1	1.0	0.254	12.0	LOS B	1.5	40.5	0.18	0.46	0.18	37.7
1	L2	All MCs	7	1.0	7	1.0	0.254	11.4	LOS B	1.5	40.5	0.18	0.46	0.18	35.8
6	T1	All MCs	497	6.0	497	6.0	0.254	6.0	LOS A	1.5	40.5	0.17	0.46	0.17	40.7
16	R2	All MCs	16	1.0	16	1.0	0.116	5.8	LOS A	0.6	15.7	0.17	0.47	0.17	36.2
Approach			521	5.8	521	5.8	0.254	6.1	LOS A	1.5	40.5	0.17	0.46	0.17	40.5
North: Johnson Rd															
7u	U	All MCs	1	1.0	1	1.0	0.128	13.8	LOS B	0.5	12.2	0.47	0.70	0.47	31.0
7	L2	All MCs	91	3.0	91	3.0	0.128	10.5	LOS B	0.5	12.2	0.47	0.70	0.47	32.6
4	T1	All MCs	2	1.0	2	1.0	0.128	4.7	LOS A	0.5	12.2	0.47	0.70	0.47	30.3
14	R2	All MCs	17	1.0	17	1.0	0.128	6.1	LOS A	0.5	12.2	0.47	0.70	0.47	33.3
Approach			111	2.6	111	2.6	0.128	9.8	LOS A	0.5	12.2	0.47	0.70	0.47	32.7
West: SR 305															
5u	U	All MCs	1	1.0	1	1.0	0.527	12.5	LOS B	4.4	116.4	0.40	0.48	0.40	36.9
5	L2	All MCs	11	17.0	11	17.0	0.527	12.4	LOS B	4.4	116.4	0.40	0.48	0.40	34.5
2	T1	All MCs	966	8.0	966	8.0	0.527	7.5	LOS A	4.4	116.4	0.38	0.48	0.38	39.6
12	R2	All MCs	21	12.0	21	12.0	0.239	6.5	LOS A	1.4	36.9	0.32	0.49	0.32	35.5
Approach			999	8.2	999	8.2	0.527	7.5	LOS A	4.4	116.4	0.38	0.48	0.38	39.4
All Vehicles			1662	6.9	1662	6.9	0.527	7.3	LOS A	4.4	116.4	0.33	0.50	0.33	39.0

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

 **Site: [1 (7)] Johnson & Sunrise Ridge - 2037 AM Without**
(Folder1)

Output produced by SIDRA INTERSECTION Version: 10.0.9.250

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: NE Midnight Sun Loop															
3u	U	All MCs	1	3.0	1	3.0	0.004	7.2	LOS A	0.0	0.4	0.16	0.45	0.16	23.5
3	L2	All MCs	1	3.0	1	3.0	0.004	5.8	LOS A	0.0	0.4	0.16	0.45	0.16	23.5
8	T1	All MCs	1	3.0	1	3.0	0.004	2.0	LOS A	0.0	0.4	0.16	0.45	0.16	23.7
18	R2	All MCs	1	3.0	1	3.0	0.004	2.3	LOS A	0.0	0.4	0.16	0.45	0.16	23.6
Approach			5	3.0	5	3.0	0.004	4.3	LOS A	0.0	0.4	0.16	0.45	0.16	23.6
East: Johnson Rd NE															
1u	U	All MCs	1	3.0	1	3.0	0.078	10.9	LOS B	0.3	8.3	0.09	0.46	0.09	34.7
1	L2	All MCs	1	3.0	1	3.0	0.078	8.9	LOS A	0.3	8.3	0.09	0.46	0.09	34.7
6	T1	All MCs	96	3.0	96	3.0	0.078	4.9	LOS A	0.3	8.3	0.09	0.46	0.09	35.3
16	R2	All MCs	5	3.0	5	3.0	0.078	4.7	LOS A	0.3	8.3	0.09	0.46	0.09	35.0
Approach			104	3.0	104	3.0	0.078	5.0	LOS A	0.3	8.3	0.09	0.46	0.09	35.3
North: Sunrise Ridge Ave NE															
7u	U	All MCs	1	3.0	1	3.0	0.051	11.2	LOS B	0.2	5.4	0.23	0.56	0.23	34.0
7	L2	All MCs	14	3.0	14	3.0	0.051	9.3	LOS A	0.2	5.4	0.23	0.56	0.23	34.0
4	T1	All MCs	1	3.0	1	3.0	0.051	5.3	LOS A	0.2	5.4	0.23	0.56	0.23	34.7
14	R2	All MCs	43	3.0	43	3.0	0.051	5.0	LOS A	0.2	5.4	0.23	0.56	0.23	34.4
Approach			60	3.0	60	3.0	0.051	6.2	LOS A	0.2	5.4	0.23	0.56	0.23	34.3
West: Johnson Rd NE															
5u	U	All MCs	1	3.0	1	3.0	0.044	10.9	LOS B	0.2	4.8	0.09	0.53	0.09	34.2
5	L2	All MCs	14	3.0	14	3.0	0.044	9.0	LOS A	0.2	4.8	0.09	0.53	0.09	34.2
2	T1	All MCs	30	3.0	30	3.0	0.044	4.9	LOS A	0.2	4.8	0.09	0.53	0.09	34.8
12	R2	All MCs	11	3.0	11	3.0	0.044	4.7	LOS A	0.2	4.8	0.09	0.53	0.09	34.5
Approach			56	3.0	56	3.0	0.044	6.0	LOS A	0.2	4.8	0.09	0.53	0.09	34.6
All Vehicles			224	3.0	224	3.0	0.078	5.6	LOS A	0.3	8.3	0.13	0.51	0.13	34.5

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

 **Site: [1 (7)] Johnson & Sunrise Ridge - 2037 AM Without**
(Folder1)

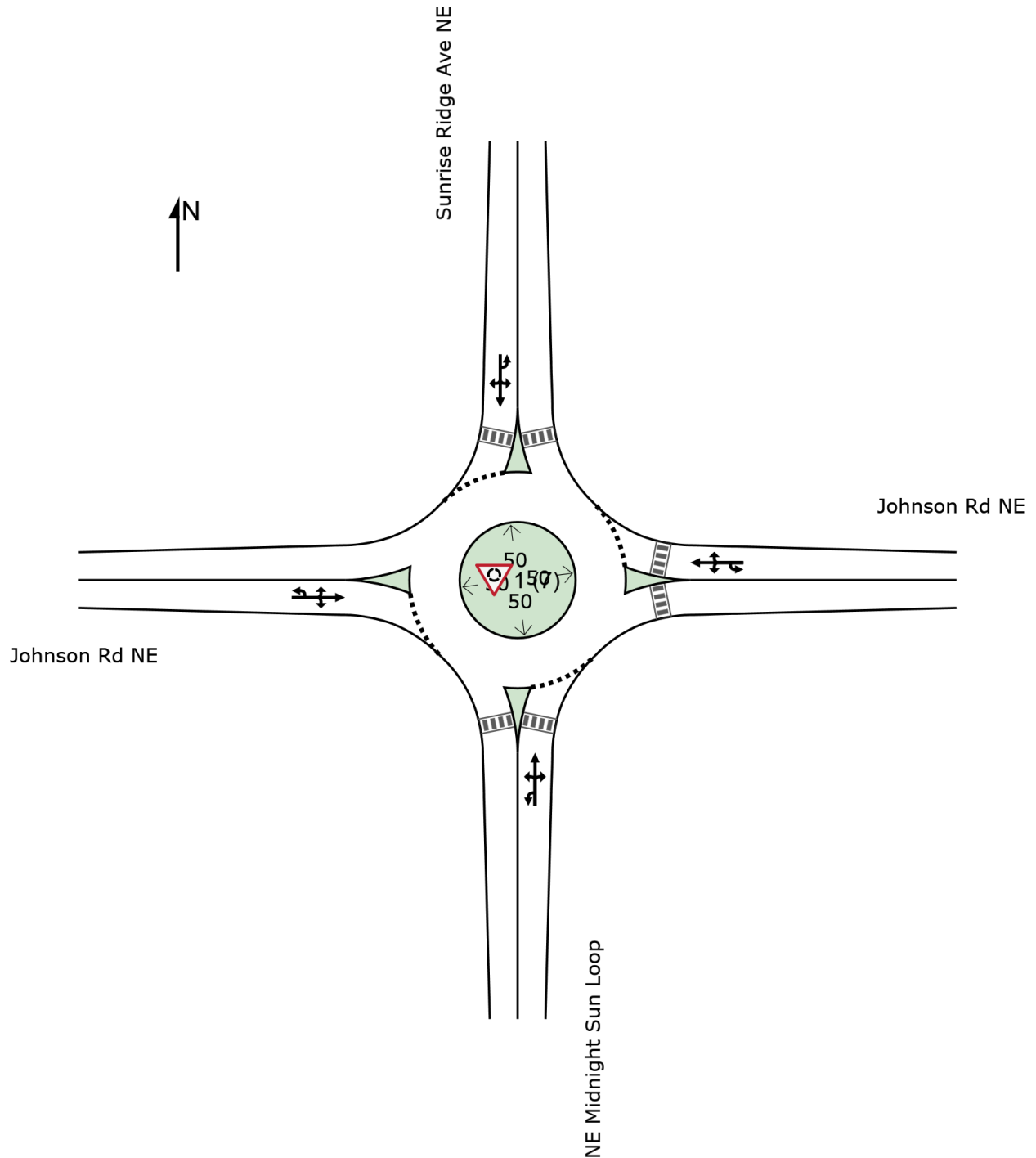
New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

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



Intersection	
Intersection Delay, s/veh	61.9
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	58	285	28	25	257	97	73	45	49	157	31	73
Future Vol, veh/h	58	285	28	25	257	97	73	45	49	157	31	73
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.87	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles, %	1	6	5	1	7	1	1	3	6	7	1	4
Mvmt Flow	77	380	37	33	343	129	84	60	65	209	41	97
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay, s/veh	80.8	86.4	21.8	23.7
HCM LOS	F	F	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	44%	16%	7%	84%	0%
Vol Thru, %	27%	77%	68%	16%	0%
Vol Right, %	29%	8%	26%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	167	371	379	188	73
LT Vol	73	58	25	157	0
Through Vol	45	285	257	31	0
RT Vol	49	28	97	0	73
Lane Flow Rate	209	495	505	251	97
Geometry Grp	4a	2	2	5	5
Degree of Util (X)	0.514	1.038	1.06	0.639	0.215
Departure Headway (Hd)	9.321	7.891	7.722	9.592	8.321
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	389	465	475	379	434
Service Time	7.321	5.891	5.722	7.292	6.021
HCM Lane V/C Ratio	0.537	1.065	1.063	0.662	0.224
HCM Control Delay, s/veh	21.8	80.8	86.4	27.8	13.3
HCM Lane LOS	C	F	F	D	B
HCM 95th-tile Q	2.8	14.5	15.5	4.2	0.8

HCM 7th TWSC
7: Sunrise Ridge Ave NE & Caldart Ave NE

Forecast 2037 AM Peak Hour
Without Project

Intersection						
Int Delay, s/veh	4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	41	40	7	69	70	28
Future Vol, veh/h	41	40	7	69	70	28
Conflicting Peds, #/hr	0	10	10	0	10	10
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	45	43	8	75	76	30
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	98	0	177	86
Stage 1	-	-	-	-	76	-
Stage 2	-	-	-	-	100	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1495	-	813	972
Stage 1	-	-	-	-	947	-
Stage 2	-	-	-	-	924	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1483	-	795	956
Mov Cap-2 Maneuver	-	-	-	-	795	-
Stage 1	-	-	-	-	939	-
Stage 2	-	-	-	-	911	-
Approach	EB	WB		NB		
HCM Ctrl Dly, s/v	0	0.69		9.94		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	836	-	-	166	-	
HCM Lane V/C Ratio	0.127	-	-	0.005	-	
HCM Ctrl Dly (s/v)	9.9	-	-	7.4	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.4	-	-	0	-	

HCM 7th Signalized Intersection Summary
1: SR305 & NE Hostmark St

Forecast 2037 PM Peak Hour
Without Project

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	212	123	66	156	277	149	865	43	266	699	62
Future Volume (veh/h)	86	212	123	66	156	277	149	865	43	266	699	62
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)	0.99		0.97	0.99		0.96	1.00		0.96	1.00		0.97
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	1702	1758	1786	1786	1786	1786	1772	1744	1786	1786	1772	1744
Adj Flow Rate, veh/h	86	212	123	66	156	132	149	865	43	266	699	62
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	3	1	1	1	1	2	4	1	1	2	4
Cap, veh/h	196	249	207	155	227	185	171	922	46	548	1501	133
Arrive On Green	0.06	0.14	0.14	0.04	0.13	0.13	0.10	0.33	0.33	0.32	0.55	0.55
Sat Flow, veh/h	1621	1758	1463	1701	1786	1459	1688	2811	140	1701	2735	242
Grp Volume(v), veh/h	86	212	123	66	156	132	149	381	527	266	321	440
Grp Sat Flow(s),veh/h/ln	1621	1758	1463	1701	1786	1459	1688	1238	1713	1701	1258	1720
Q Serve(g_s), s	5.5	14.1	9.5	4.0	10.0	5.7	10.4	35.8	35.9	15.1	18.6	18.6
Cycle Q Clear(g_c), s	5.5	14.1	9.5	4.0	10.0	5.7	10.4	35.8	35.9	15.1	18.6	18.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		0.14
Lane Grp Cap(c), veh/h	196	249	207	155	227	185	171	406	562	548	690	944
V/C Ratio(X)	0.44	0.85	0.59	0.42	0.69	0.71	0.87	0.94	0.94	0.48	0.47	0.47
Avail Cap(c_a), veh/h	316	337	280	306	342	280	323	444	614	548	690	944
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	42.8	50.3	48.3	43.8	50.1	14.9	53.1	39.1	39.2	32.7	16.4	16.4
Incr Delay (d2), s/veh	1.5	14.3	2.7	1.8	3.7	5.0	12.4	31.6	25.5	0.7	2.2	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(95%),veh/ln	4.1	11.6	6.5	3.2	8.3	7.0	8.6	20.2	25.5	10.3	9.3	11.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	44.3	64.5	51.0	45.7	53.8	19.9	65.6	70.7	64.6	33.3	18.7	18.1
LnGrp LOS	D	E	D	D	D	B	E	E	E	C	B	B
Approach Vol, veh/h	421			354			1057			1027		
Approach Delay, s/veh	56.4			39.6			67.0			22.2		
Approach LOS	E			D			E			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	43.7	44.3	10.0	22.0	17.2	70.9	11.7	20.3				
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	18.9	43.5	16.1	23.5	23.5	38.9	16.1	23.5				
Max Q Clear Time (g_c+I1), s	17.1	37.9	6.0	16.1	12.4	20.6	7.5	12.0				
Green Ext Time (p_c), s	0.2	2.0	0.1	0.8	0.3	2.9	0.1	0.9				
Intersection Summary												
HCM 7th Control Delay, s/veh	45.9											
HCM 7th LOS	D											

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	833	966	6	1	4
Future Vol, veh/h	7	833	966	6	1	4
Conflicting Peds, #/hr	1	0	0	1	1	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	105	-	-	55	60	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	10	2	3	1	10	1
Mvmt Flow	7	833	966	6	1	4
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	973	0	-	0	1815	968
Stage 1	-	-	-	-	967	-
Stage 2	-	-	-	-	848	-
Critical Hdwy	4.2	-	-	-	6.5	6.21
Critical Hdwy Stg 1	-	-	-	-	5.5	-
Critical Hdwy Stg 2	-	-	-	-	5.5	-
Follow-up Hdwy	2.29	-	-	-	3.59	3.309
Pot Cap-1 Maneuver	678	-	-	-	82	309
Stage 1	-	-	-	-	357	-
Stage 2	-	-	-	-	407	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	677	-	-	-	81	309
Mov Cap-2 Maneuver	-	-	-	-	81	-
Stage 1	-	-	-	-	353	-
Stage 2	-	-	-	-	406	-
Approach	EB	WB		SB		
HCM Ctrl Dly, s/v	0.09	0		23.46		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	677	-	-	-	81	309
HCM Lane V/C Ratio	0.01	-	-	-	0.012	0.013
HCM Ctrl Dly (s/v)	10.4	-	-	-	50	16.8
HCM Lane LOS	B	-	-	-	F	C
HCM 95th %tile Q(veh)	0	-	-	-	0	0

MOVEMENT SUMMARY

 **Site: [99 (9)] SR 305 & Johnson Rd - Forecast 2037 Without**
(PM Peak Hour)

Output produced by SIDRA INTERSECTION Version: 10.0.9.250

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: Johnson Way															
3u	U	All MCs	1	1.0	1	1.0	0.052	14.6	LOS B	0.2	5.0	0.54	0.73	0.54	31.2
3	L2	All MCs	22	6.0	22	6.0	0.052	11.6	LOS B	0.2	5.0	0.54	0.73	0.54	32.4
8	T1	All MCs	6	1.0	6	1.0	0.052	5.5	LOS A	0.2	5.0	0.54	0.73	0.54	30.4
18	R2	All MCs	9	1.0	9	1.0	0.052	7.6	LOS A	0.2	5.0	0.54	0.73	0.54	33.4
Approach			38	3.9	38	3.9	0.052	9.8	LOS A	0.2	5.0	0.54	0.73	0.54	32.3
East: SR 305															
1u	U	All MCs	3	1.0	3	1.0	0.450	12.1	LOS B	3.5	88.5	0.22	0.46	0.22	37.5
1	L2	All MCs	12	1.0	12	1.0	0.450	11.5	LOS B	3.5	88.5	0.22	0.46	0.22	35.6
6	T1	All MCs	904	3.0	904	3.0	0.450	6.4	LOS A	3.5	88.5	0.21	0.46	0.21	41.1
16	R2	All MCs	26	10.0	26	10.0	0.205	6.0	LOS A	1.1	29.6	0.19	0.46	0.19	35.9
Approach			945	3.2	945	3.2	0.450	6.4	LOS A	3.5	88.5	0.21	0.46	0.21	40.8
North: Johnson Rd															
7u	U	All MCs	1	1.0	1	1.0	0.073	15.2	LOS B	0.3	7.2	0.58	0.76	0.58	30.8
7	L2	All MCs	31	6.0	31	6.0	0.073	12.3	LOS B	0.3	7.2	0.58	0.76	0.58	32.0
4	T1	All MCs	4	1.0	4	1.0	0.073	6.1	LOS A	0.3	7.2	0.58	0.76	0.58	30.1
14	R2	All MCs	14	1.0	14	1.0	0.073	8.8	LOS A	0.3	7.2	0.58	0.76	0.58	33.1
Approach			50	4.1	50	4.1	0.073	10.9	LOS B	0.3	7.2	0.58	0.76	0.58	32.1
West: SR 305															
5u	U	All MCs	1	1.0	1	1.0	0.385	12.1	LOS B	2.7	69.3	0.23	0.46	0.23	37.5
5	L2	All MCs	11	1.0	11	1.0	0.385	11.5	LOS B	2.7	69.3	0.23	0.46	0.23	35.6
2	T1	All MCs	778	2.0	778	2.0	0.385	6.2	LOS A	2.7	69.3	0.22	0.46	0.22	41.2
12	R2	All MCs	22	1.0	22	1.0	0.175	5.9	LOS A	1.0	24.3	0.21	0.47	0.21	36.1
Approach			812	2.0	812	2.0	0.385	6.3	LOS A	2.7	69.3	0.22	0.46	0.22	41.0
All Vehicles			1845	2.7	1845	2.7	0.450	6.6	LOS A	3.5	88.5	0.23	0.47	0.23	40.4

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

 **Site: [99 (9)] SR 305 & Johnson Rd - Forecast 2037 Without**
(PM Peak Hour)

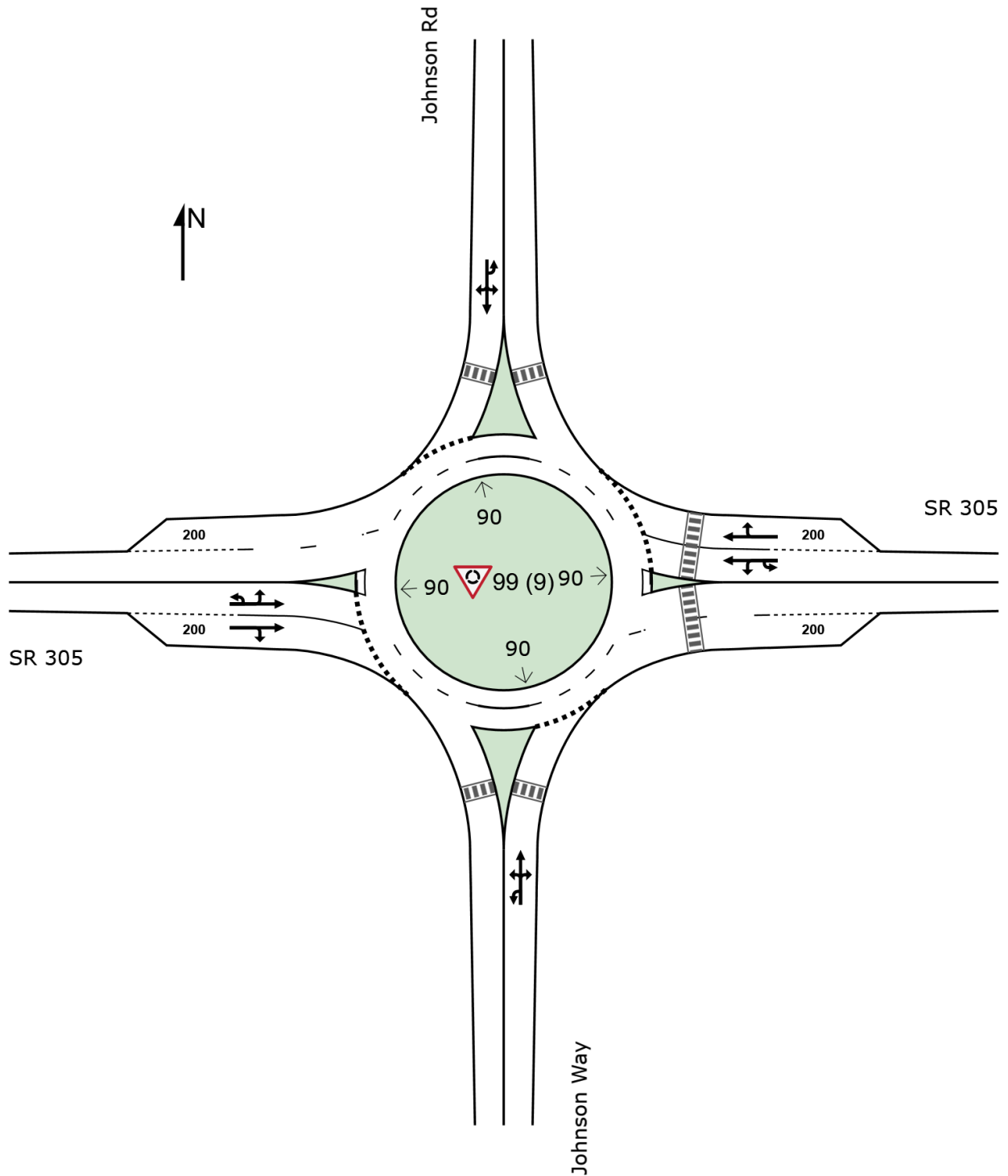
New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

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



MOVEMENT SUMMARY

 **Site: [1 (9)] Johnson & Sunrise Ridge - 2037 PM Without (Folder1)**

Output produced by SIDRA INTERSECTION Version: 10.0.9.250

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: NE Midnight Sun Loop															
3u	U	All MCs	1	3.0	1	3.0	0.006	7.2	LOS A	0.0	0.6	0.16	0.41	0.16	23.7
3	L2	All MCs	1	3.0	1	3.0	0.006	5.8	LOS A	0.0	0.6	0.16	0.41	0.16	23.7
8	T1	All MCs	1	3.0	1	3.0	0.006	2.0	LOS A	0.0	0.6	0.16	0.41	0.16	23.9
18	R2	All MCs	5	3.0	5	3.0	0.006	2.3	LOS A	0.0	0.6	0.16	0.41	0.16	23.8
Approach			8	3.0	8	3.0	0.006	3.5	LOS A	0.0	0.6	0.16	0.41	0.16	23.8
East: Johnson Rd NE															
1u	U	All MCs	1	3.0	1	3.0	0.048	10.9	LOS B	0.2	5.0	0.12	0.49	0.12	34.5
1	L2	All MCs	5	3.0	5	3.0	0.048	9.0	LOS A	0.2	5.0	0.12	0.49	0.12	34.5
6	T1	All MCs	44	3.0	44	3.0	0.048	5.0	LOS A	0.2	5.0	0.12	0.49	0.12	35.1
16	R2	All MCs	12	3.0	12	3.0	0.048	4.7	LOS A	0.2	5.0	0.12	0.49	0.12	34.8
Approach			63	3.0	62	3.0	0.048	5.3	LOS A	0.2	5.0	0.12	0.49	0.12	35.0
North: Sunrise Ridge Ave NE															
7u	U	All MCs	1	3.0	1	3.0	0.029	11.0	LOS B	0.1	3.0	0.16	0.55	0.16	34.2
7	L2	All MCs	7	3.0	7	3.0	0.029	9.1	LOS A	0.1	3.0	0.16	0.55	0.16	34.2
4	T1	All MCs	1	3.0	1	3.0	0.029	5.0	LOS A	0.1	3.0	0.16	0.55	0.16	34.9
14	R2	All MCs	26	3.0	26	3.0	0.029	4.8	LOS A	0.1	3.0	0.16	0.55	0.16	34.6
Approach			35	3.0	35	3.0	0.029	5.8	LOS A	0.1	3.0	0.16	0.55	0.16	34.5
West: Johnson Rd NE															
5u	U	All MCs	1	3.0	1	3.0	0.043	10.9	LOS B	0.2	4.5	0.08	0.59	0.08	33.7
5	L2	All MCs	30	3.0	30	3.0	0.043	8.9	LOS A	0.2	4.5	0.08	0.59	0.08	33.7
2	T1	All MCs	23	3.0	23	3.0	0.043	4.9	LOS A	0.2	4.5	0.08	0.59	0.08	34.3
12	R2	All MCs	1	3.0	1	3.0	0.043	4.6	LOS A	0.2	4.5	0.08	0.59	0.08	34.0
Approach			55	3.0	55	3.0	0.043	7.2	LOS A	0.2	4.5	0.08	0.59	0.08	33.9
All Vehicles			160	3.0	160	3.0	0.048	6.0	LOS A	0.2	5.0	0.11	0.53	0.11	33.7

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

 **Site: [1 (9)] Johnson & Sunrise Ridge - 2037 PM Without**
(Folder1)

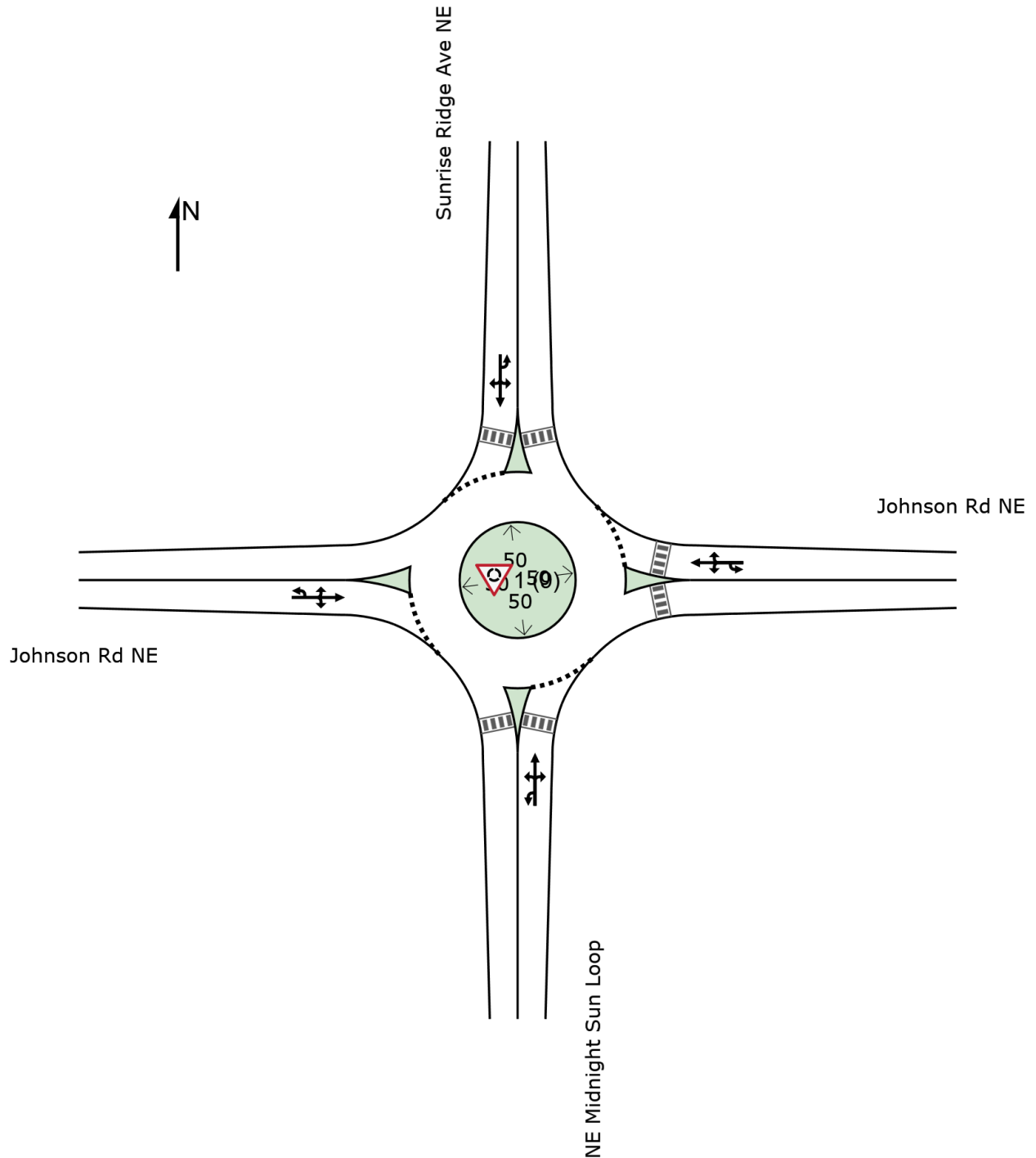
New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

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



Intersection	
Intersection Delay, s/veh	26.1
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	108	264	87	11	166	60	78	60	3	111	75	79
Future Vol, veh/h	108	264	87	11	166	60	78	60	3	111	75	79
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	3	1	1	1	1	2	1	1	1	1	1	4
Mvmt Flow	124	303	100	13	191	69	90	69	3	128	86	91
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay, s/veh	41.3	16	14.4	15.2
HCM LOS	E	C	B	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	55%	24%	5%	60%	0%
Vol Thru, %	43%	58%	70%	40%	0%
Vol Right, %	2%	19%	25%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	141	459	237	186	79
LT Vol	78	108	11	111	0
Through Vol	60	264	166	75	0
RT Vol	3	87	60	0	79
Lane Flow Rate	162	528	272	214	91
Geometry Grp	4a	2	2	5	5
Degree of ∇ til (∇)	0.338	0.898	0.497	0.46	0.169
Departure Headway (Hd)	7.505	6.127	6.565	7.74	6.714
Convergence, ∇ /N	∇ es	∇ es	∇ es	∇ es	∇ es
Cap	476	591	545	464	531
Service Time	5.598	4.187	4.641	5.518	4.491
HCM Lane V/C Ratio	0.34	0.893	0.499	0.461	0.171
HCM Control Delay, s/veh	14.4	41.3	16	17	10.9
HCM Lane LOS	B	E	C	C	B
HCM 95th-tile Q	1.5	10.8	2.7	2.4	0.6

HCM 7th TWSC
7: Sunrise Ridge Ave NE & Caldart Ave NE

Forecast 2037 PM Peak Hour
Without Project

Intersection						
Int Delay, s/veh	3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	69	74	28	69	48	21
Future Vol, veh/h	69	74	28	69	48	21
Conflicting Peds, #/hr	0	10	10	0	10	10
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	75	80	30	75	52	23
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	165	0	271	135
Stage 1	-	-	-	-	125	-
Stage 2	-	-	-	-	146	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1413	-	718	914
Stage 1	-	-	-	-	900	-
Stage 2	-	-	-	-	881	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1401	-	690	898
Mov Cap-2 Maneuver	-	-	-	-	690	-
Stage 1	-	-	-	-	893	-
Stage 2	-	-	-	-	854	-
Approach	EB	WB		NB		
HCM Ctrl Dly, s/v	0	2.2		10.39		
HCM LOS				B		
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	743	-	-	520	-	
HCM Lane V/C Ratio	0.101	-	-	0.022	-	
HCM Ctrl Dly (s/v)	10.4	-	-	7.6	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-	

HCM 7th Signalized Intersection Summary
1: SR305 & NE Hostmark St

Forecast 2037 AM Peak Hour
With Project

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	131	84	65	107	181	71	537	26	252	939	25
Future Volume (veh/h)	47	131	84	65	107	181	71	537	26	252	939	25
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)	0.99		0.98	0.99		0.98	1.00		0.98	1.00		0.99
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	1716	1730	1744	1744	1744	1716	1730	1716	1716	1730	1716	1646
Adj Flow Rate, veh/h	47	131	84	65	107	121	71	537	26	252	939	25
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	6	5	4	4	4	6	5	6	6	5	6	11
Cap, veh/h	178	187	156	169	210	171	84	604	29	767	1799	48
Arrive On Green	0.03	0.11	0.11	0.04	0.12	0.12	0.05	0.22	0.22	0.47	0.63	0.63
Sat Flow, veh/h	1634	1730	1445	1661	1744	1425	1647	2773	134	1647	2844	76
Grp Volume(v), veh/h	47	131	84	65	107	121	71	236	327	252	402	562
Grp Sat Flow(s),veh/h/ln	1634	1730	1445	1661	1744	1425	1647	1218	1689	1647	1218	1702
Q Serve(g_s), s	3.1	8.8	6.6	4.2	6.9	3.8	5.1	22.5	22.6	11.6	21.7	21.7
Cycle Q Clear(g_c), s	3.1	8.8	6.6	4.2	6.9	3.8	5.1	22.5	22.6	11.6	21.7	21.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		0.04
Lane Grp Cap(c), veh/h	178	187	156	169	210	171	84	265	368	767	771	1076
V/C Ratio(X)	0.26	0.70	0.54	0.38	0.51	0.71	0.85	0.89	0.89	0.33	0.52	0.52
Avail Cap(c_a), veh/h	342	332	277	316	334	273	316	437	605	767	771	1076
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	46.1	51.7	50.7	45.5	49.5	7.5	56.5	45.5	45.5	20.2	12.1	12.1
Incr Delay (d2), s/veh	0.8	4.7	2.9	1.4	1.9	5.2	20.0	32.7	26.1	0.2	2.5	1.8
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(95%),veh/ln	2.3	7.3	4.5	3.2	5.6	6.4	4.6	14.0	17.6	7.8	9.9	12.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	46.9	56.4	53.6	46.9	51.4	12.8	76.5	78.2	71.6	20.5	14.6	13.9
LnGrp LOS	D	E	D	D	D	B	E	E	E	C	B	B
Approach Vol, veh/h	262			293			634			1216		
Approach Delay, s/veh	53.8			34.4			74.6			15.5		
Approach LOS	D			C			E			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	60.9	31.1	10.0	18.0	11.1	80.9	8.6	19.4				
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	18.9	43.5	16.1	23.5	23.5	38.9	16.1	23.5				
Max Q Clear Time (g_c+I1), s	13.6	24.6	6.2	10.8	7.1	23.7	5.1	8.9				
Green Ext Time (p_c), s	0.4	2.0	0.1	0.6	0.2	3.7	0.1	0.8				
Intersection Summary												
HCM 7th Control Delay, s/veh	37.6											
HCM 7th LOS	D											

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1039	577	1	2	4
Future Vol, veh/h	0	1039	577	1	2	4
Conflicting Peds, #/hr	4	0	0	4	4	4
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	105	-	-	55	60	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	1	8	6	1	1	1
Mvmt Flow	0	1039	577	1	2	4

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	582	0	0 1624 585
Stage 1	-	-	- 581 -
Stage 2	-	-	- 1043 -
Critical Hdwy	4.11	-	- 6.41 6.21
Critical Hdwy Stg 1	-	-	- 5.41 -
Critical Hdwy Stg 2	-	-	- 5.41 -
Follow-up Hdwy	2.209	-	- 3.509 3.309
Pot Cap-1 Maneuver	997	-	- 113 513
Stage 1	-	-	- 561 -
Stage 2	-	-	- 341 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	994	-	- 113 509
Mov Cap-2 Maneuver	-	-	- 113 -
Stage 1	-	-	- 559 -
Stage 2	-	-	- 340 -

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0	0	20.59
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	994	-	-	-	113	509
HCM Lane V/C Ratio	-	-	-	-	0.018	0.008
HCM Ctrl Dly (s/v)	0	-	-	-	37.5	12.1
HCM Lane LOS	A	-	-	-	E	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0

MOVEMENT SUMMARY

 **Site: [99 (8)] SR 305 & Johnson Rd - Forecast 2037 AM With**
(AM Peak Hour)

Output produced by SIDRA INTERSECTION Version: 10.0.9.250

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: Johnson Way															
3u	U	All MCs	1	1.0	1	1.0	0.052	16.3	LOS B	0.2	5.8	0.67	0.80	0.67	30.5
3	L2	All MCs	19	1.0	19	1.0	0.052	12.8	LOS B	0.2	5.8	0.67	0.80	0.67	32.3
8	T1	All MCs	7	1.0	7	1.0	0.052	7.2	LOS A	0.2	5.8	0.67	0.80	0.67	29.8
18	R2	All MCs	4	1.0	4	1.0	0.052	12.5	LOS B	0.2	5.8	0.67	0.80	0.67	32.7
Approach			31	1.0	31	1.0	0.052	11.6	LOS B	0.2	5.8	0.67	0.80	0.67	31.7
East: SR 305															
1u	U	All MCs	1	1.0	1	1.0	0.262	12.1	LOS B	1.6	40.7	0.20	0.46	0.20	37.6
1	L2	All MCs	7	1.0	7	1.0	0.262	11.5	LOS B	1.6	40.7	0.20	0.46	0.20	35.7
6	T1	All MCs	497	6.0	497	6.0	0.262	6.1	LOS A	1.6	40.7	0.20	0.46	0.20	40.6
16	R2	All MCs	26	1.0	26	1.0	0.119	5.9	LOS A	0.6	15.7	0.20	0.47	0.20	36.1
Approach			531	5.7	531	5.7	0.262	6.2	LOS A	1.6	40.7	0.20	0.46	0.20	40.3
North: Johnson Rd															
7u	U	All MCs	1	1.0	1	1.0	0.197	14.0	LOS B	0.8	19.9	0.49	0.69	0.49	31.2
7	L2	All MCs	119	3.0	119	3.0	0.197	10.7	LOS B	0.8	19.9	0.49	0.69	0.49	32.9
4	T1	All MCs	2	1.0	2	1.0	0.197	4.9	LOS A	0.8	19.9	0.49	0.69	0.49	30.5
14	R2	All MCs	49	1.0	49	1.0	0.197	6.3	LOS A	0.8	19.9	0.49	0.69	0.49	33.5
Approach			171	2.4	171	2.4	0.197	9.4	LOS A	0.8	19.9	0.49	0.69	0.49	33.0
West: SR 305															
5u	U	All MCs	1	1.0	1	1.0	0.548	12.6	LOS B	4.6	123.5	0.46	0.50	0.46	36.7
5	L2	All MCs	23	17.0	23	17.0	0.548	12.7	LOS B	4.6	123.5	0.46	0.50	0.46	34.3
2	T1	All MCs	966	8.0	966	8.0	0.548	7.8	LOS A	4.6	123.5	0.44	0.50	0.44	39.3
12	R2	All MCs	21	12.0	21	12.0	0.249	6.7	LOS A	1.4	38.6	0.37	0.50	0.37	35.4
Approach			1011	8.3	1011	8.3	0.548	7.9	LOS A	4.6	123.5	0.44	0.50	0.44	39.1
All Vehicles			1744	6.8	1744	6.8	0.548	7.6	LOS A	4.6	123.5	0.38	0.51	0.38	38.6

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

 **Site: [99 (8)] SR 305 & Johnson Rd - Forecast 2037 AM With**
(AM Peak Hour)

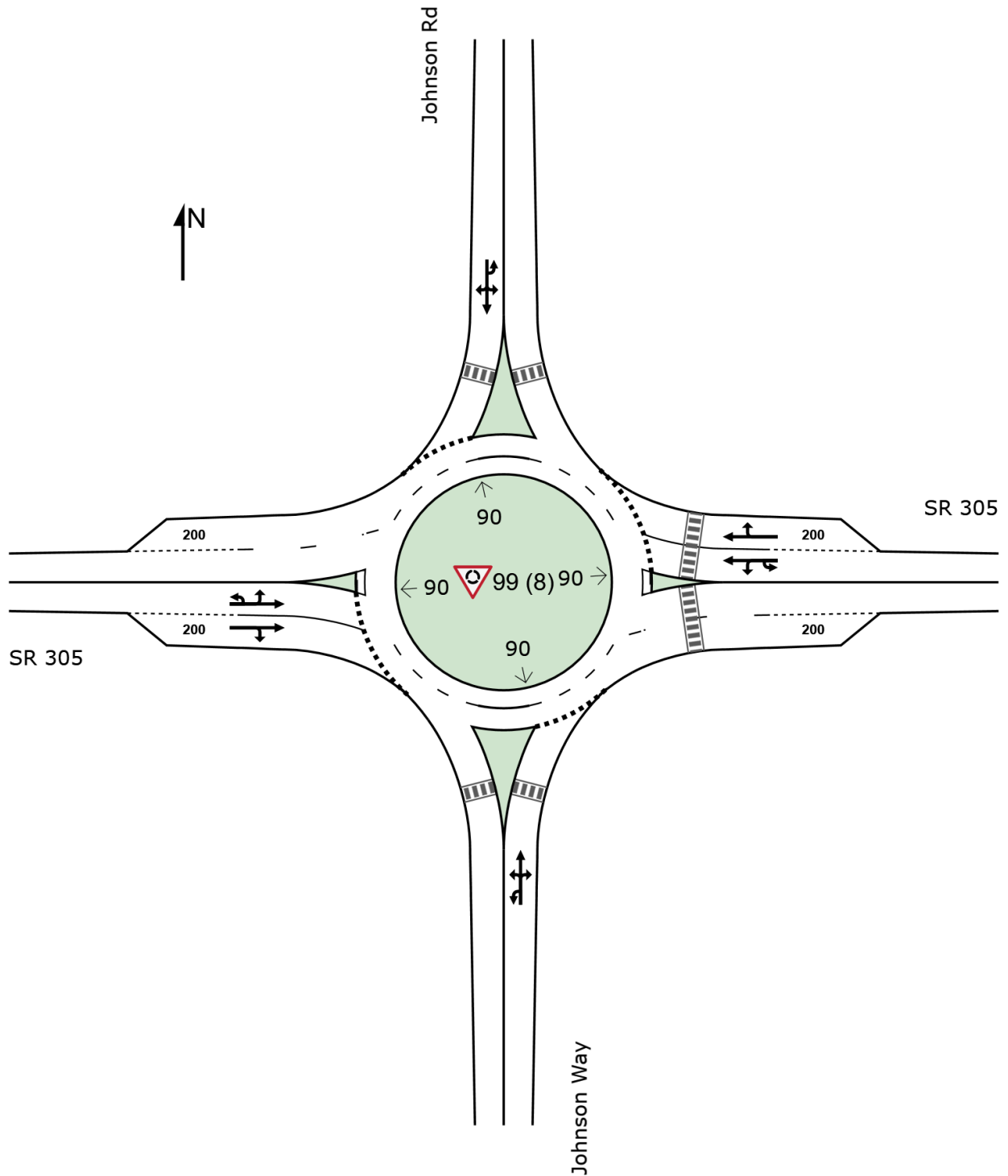
New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

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



MOVEMENT SUMMARY

 **Site: [1 (8)] Johnson & Sunrise Ridge - 2037 AM With (Folder1)**

Output produced by SIDRA INTERSECTION Version: 10.0.9.250

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: NE Midnight Sun Loop															
3u	U	All MCs	1	3.0	1	3.0	0.004	7.3	LOS A	0.0	0.4	0.20	0.45	0.20	23.5
3	L2	All MCs	1	3.0	1	3.0	0.004	5.9	LOS A	0.0	0.4	0.20	0.45	0.20	23.5
8	T1	All MCs	1	3.0	1	3.0	0.004	2.1	LOS A	0.0	0.4	0.20	0.45	0.20	23.7
18	R2	All MCs	1	3.0	1	3.0	0.004	2.5	LOS A	0.0	0.4	0.20	0.45	0.20	23.6
Approach			5	3.0	5	3.0	0.004	4.4	LOS A	0.0	0.4	0.20	0.45	0.20	23.5
East: Johnson Rd NE															
1u	U	All MCs	1	3.0	1	3.0	0.081	11.0	LOS B	0.3	8.8	0.14	0.46	0.14	34.5
1	L2	All MCs	1	3.0	1	3.0	0.081	9.1	LOS A	0.3	8.8	0.14	0.46	0.14	34.5
6	T1	All MCs	96	3.0	96	3.0	0.081	5.0	LOS A	0.3	8.8	0.14	0.46	0.14	35.2
16	R2	All MCs	7	3.0	7	3.0	0.081	4.8	LOS A	0.3	8.8	0.14	0.46	0.14	34.9
Approach			106	3.0	106	3.0	0.081	5.1	LOS A	0.3	8.8	0.14	0.46	0.14	35.1
North: Sunrise Ridge Ave NE															
7u	U	All MCs	1	3.0	1	3.0	0.115	11.3	LOS B	0.5	13.2	0.24	0.55	0.24	34.3
7	L2	All MCs	18	3.0	18	3.0	0.115	9.4	LOS A	0.5	13.2	0.24	0.55	0.24	34.3
4	T1	All MCs	1	3.0	1	3.0	0.115	5.3	LOS A	0.5	13.2	0.24	0.55	0.24	34.9
14	R2	All MCs	114	3.0	114	3.0	0.115	5.1	LOS A	0.5	13.2	0.24	0.55	0.24	34.6
Approach			135	3.0	135	3.0	0.115	5.7	LOS A	0.5	13.2	0.24	0.55	0.24	34.5
West: Johnson Rd NE															
5u	U	All MCs	1	3.0	1	3.0	0.065	10.9	LOS B	0.3	7.2	0.10	0.58	0.10	33.7
5	L2	All MCs	40	3.0	40	3.0	0.065	9.0	LOS A	0.3	7.2	0.10	0.58	0.10	33.7
2	T1	All MCs	30	3.0	30	3.0	0.065	4.9	LOS A	0.3	7.2	0.10	0.58	0.10	34.3
12	R2	All MCs	11	3.0	11	3.0	0.065	4.7	LOS A	0.3	7.2	0.10	0.58	0.10	34.0
Approach			82	3.0	82	3.0	0.065	7.0	LOS A	0.3	7.2	0.10	0.58	0.10	34.0
All Vehicles			327	3.0	327	3.0	0.115	5.8	LOS A	0.5	13.2	0.17	0.52	0.17	34.4

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

 **Site: [1 (8)] Johnson & Sunrise Ridge - 2037 AM With**
(Folder1)

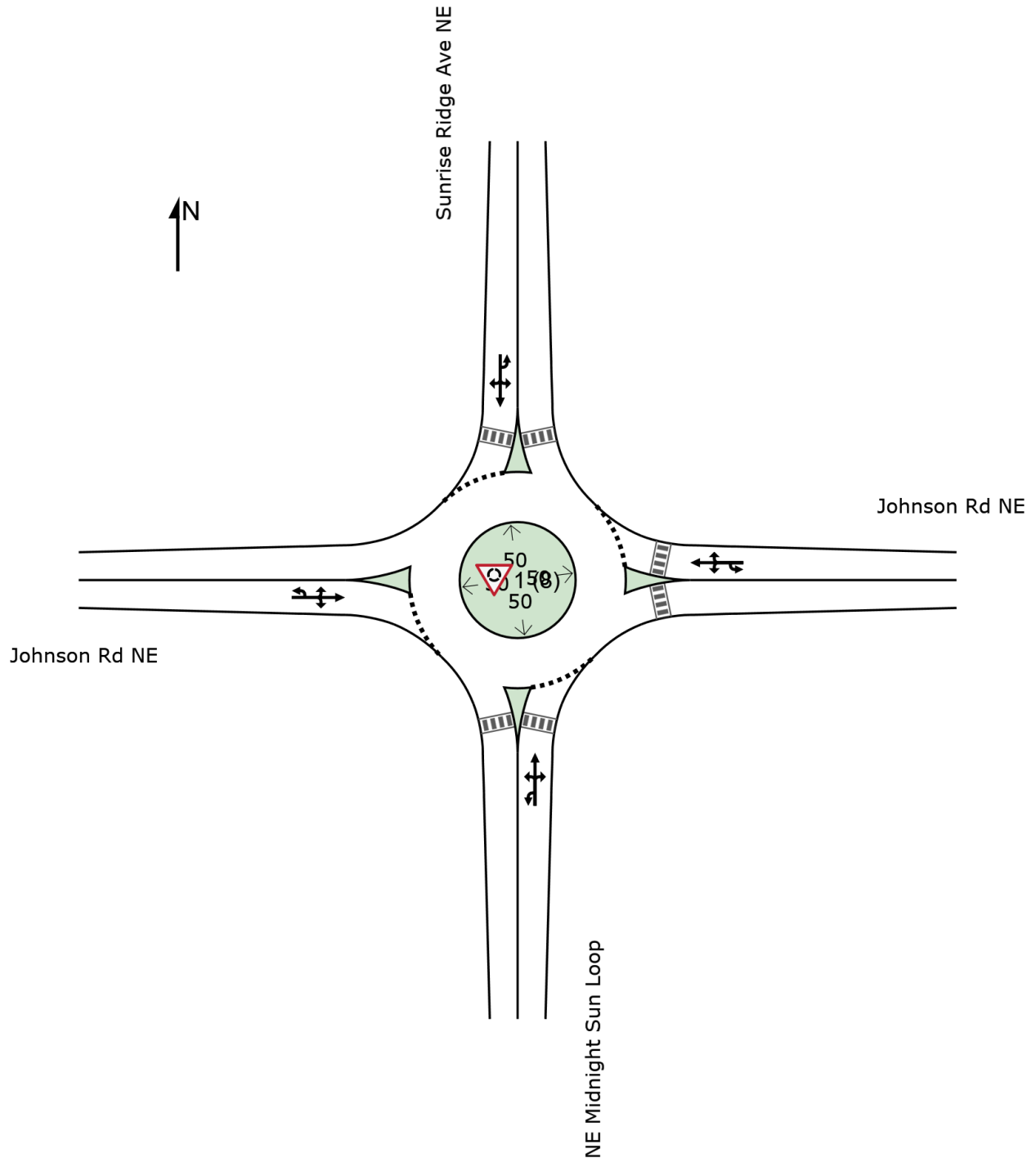
New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

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



HCM 7th TWSC
5: Sunrise Ridge Ave & Crystallia Ct

Forecast 2037 AM Peak Hour
With Project

Intersection						
Int Delay, s/veh	6.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	64	23	8	19	3
Future Vol, veh/h	7	64	23	8	19	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	70	25	9	21	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	81	22	24	0	-	0
Stage 1	22	-	-	-	-	-
Stage 2	59	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	921	1055	1591	-	-	-
Stage 1	1000	-	-	-	-	-
Stage 2	964	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	907	1055	1591	-	-	-
Mov Cap-2 Maneuver	907	-	-	-	-	-
Stage 1	985	-	-	-	-	-
Stage 2	964	-	-	-	-	-
Approach	EB	NB		SB		
HCM Ctrl Dly, s/v	8.75	5.42		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1335	-	1038	-	-	
HCM Lane V/C Ratio	0.016	-	0.074	-	-	
HCM Ctrl Dly (s/v)	7.3	0	8.7	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0.2	-	-	

Intersection	
Intersection Delay, s/veh	63.2
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	58	285	28	27	257	97	73	48	53	157	32	73
Future Vol, veh/h	58	285	28	27	257	97	73	48	53	157	32	73
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.87	0.75	0.75	0.75	0.75	0.75
Heavy Vehicles, %	1	6	5	1	7	1	1	3	6	7	1	4
Mvmt Flow	77	380	37	36	343	129	84	64	71	209	43	97
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay, s/veh	84.3	86.9	22.7	24.1
HCM LOS	F	F	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	42%	16%	7%	83%	0%
Vol Thru, %	28%	77%	67%	17%	0%
Vol Right, %	30%	8%	25%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	174	371	381	189	73
LT Vol	73	58	27	157	0
Through Vol	48	285	257	32	0
RT Vol	53	28	97	0	73
Lane Flow Rate	219	495	508	252	97
Geometry Grp	4a	2	2	5	5
Degree of Util (X)	0.537	1.049	1.06	0.645	0.216
Departure Headway (Hd)	9.35	7.965	7.817	9.661	8.392
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	389	460	467	375	430
Service Time	7.35	5.965	5.817	7.361	6.092
HCM Lane V/C Ratio	0.563	1.076	1.088	0.672	0.226
HCM Control Delay, s/veh	22.7	84.3	86.9	28.3	13.4
HCM Lane LOS	C	F	F	D	B
HCM 95th-tile Q	3.1	14.8	15.4	4.3	0.8

Intersection						
Int Delay, s/veh	4.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	41	43	7	69	77	28
Future Vol, veh/h	41	43	7	69	77	28
Conflicting Peds, #/hr	0	10	10	0	10	10
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	45	47	8	75	84	30
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	101	0	178	88
Stage 1	-	-	-	-	78	-
Stage 2	-	-	-	-	100	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1491	-	811	970
Stage 1	-	-	-	-	945	-
Stage 2	-	-	-	-	924	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1479	-	794	954
Mov Cap-2 Maneuver	-	-	-	-	794	-
Stage 1	-	-	-	-	937	-
Stage 2	-	-	-	-	911	-
Approach	EB		WB		NB	
HCM Ctrl Dly, s/v	0		0.69		10.02	
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	831	-	-	166	-	
HCM Lane V/C Ratio	0.137	-	-	0.005	-	
HCM Ctrl Dly (s/v)	10	-	-	7.4	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.5	-	-	0	-	

HCM 7th Signalized Intersection Summary
1: SR305 & NE Hostmark St

Forecast 2037 PM Peak Hour
With Project

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	212	139	66	156	277	159	877	43	266	719	62
Future Volume (veh/h)	86	212	139	66	156	277	159	877	43	266	719	62
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)	0.99		0.97	0.99		0.96	1.00		0.96	1.00		0.97
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	1702	1758	1786	1786	1786	1786	1772	1744	1786	1786	1772	1744
Adj Flow Rate, veh/h	86	212	139	66	156	132	159	877	43	266	719	62
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	7	3	1	1	1	1	2	4	1	1	2	4
Cap, veh/h	196	250	208	155	228	186	182	932	46	542	1487	128
Arrive On Green	0.06	0.14	0.14	0.04	0.13	0.13	0.11	0.33	0.33	0.32	0.54	0.54
Sat Flow, veh/h	1621	1758	1463	1701	1786	1459	1688	2813	138	1701	2743	236
Grp Volume(v), veh/h	86	212	139	66	156	132	159	386	534	266	330	451
Grp Sat Flow(s),veh/h/ln	1621	1758	1463	1701	1786	1459	1688	1238	1713	1701	1258	1721
Q Serve(g_s), s	5.5	14.1	10.8	4.0	10.0	5.7	11.1	36.3	36.4	15.2	19.5	19.5
Cycle Q Clear(g_c), s	5.5	14.1	10.8	4.0	10.0	5.7	11.1	36.3	36.4	15.2	19.5	19.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		0.14
Lane Grp Cap(c), veh/h	196	250	208	155	228	186	182	410	567	542	682	933
V/C Ratio(X)	0.44	0.85	0.67	0.42	0.69	0.71	0.87	0.94	0.94	0.49	0.48	0.48
Avail Cap(c_a), veh/h	316	337	280	306	342	280	323	444	614	542	682	933
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	42.7	50.2	48.8	43.8	50.0	15.1	52.7	39.0	39.0	33.0	17.0	17.0
Incr Delay (d2), s/veh	1.5	14.1	3.7	1.8	3.6	4.9	12.3	31.9	25.7	0.7	2.4	1.8
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(95%),veh/ln	4.1	11.6	7.5	3.2	8.3	7.0	9.0	20.4	25.9	10.3	9.7	12.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	44.3	64.3	52.5	45.7	53.7	20.0	65.0	70.8	64.7	33.7	19.5	18.8
LnGrp LOS	D	E	D	D	D	C	E	E	E	C	B	B
Approach Vol, veh/h	437				354				1079			
Approach Delay, s/veh	56.6				39.6				67.0			
Approach LOS	E				D				E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	43.3	44.7	10.0	22.0	17.9	70.1	11.7	20.3				
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	18.9	43.5	16.1	23.5	23.5	38.9	16.1	23.5				
Max Q Clear Time (g_c+I1), s	17.2	38.4	6.0	16.1	13.1	21.5	7.5	12.0				
Green Ext Time (p_c), s	0.2	1.9	0.1	0.9	0.4	3.0	0.1	0.9				
Intersection Summary												
HCM 7th Control Delay, s/veh	46.2											
HCM 7th LOS	D											

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	869	988	6	1	4
Future Vol, veh/h	7	869	988	6	1	4
Conflicting Peds, #/hr	1	0	0	1	1	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	105	-	-	55	60	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	10	2	3	1	10	1
Mvmt Flow	7	869	988	6	1	4

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	995	0	-	0	1873
Stage 1	-	-	-	-	989
Stage 2	-	-	-	-	884
Critical Hdwy	4.2	-	-	-	6.5
Critical Hdwy Stg 1	-	-	-	-	5.5
Critical Hdwy Stg 2	-	-	-	-	5.5
Follow-up Hdwy	2.29	-	-	-	3.59
Pot Cap-1 Maneuver	665	-	-	-	75
Stage 1	-	-	-	-	348
Stage 2	-	-	-	-	391
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	664	-	-	-	74
Mov Cap-2 Maneuver	-	-	-	-	74
Stage 1	-	-	-	-	344
Stage 2	-	-	-	-	391

Approach	EB	WB	SB
HCM Ctrl Dly, s/v	0.08	0	24.55
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	664	-	-	-	74	300
HCM Lane V/C Ratio	0.011	-	-	-	0.013	0.013
HCM Ctrl Dly (s/v)	10.5	-	-	-	54.1	17.2
HCM Lane LOS	B	-	-	-	F	C
HCM 95th %tile Q(veh)	0	-	-	-	0	0

MOVEMENT SUMMARY

 **Site: [99 (10)] SR 305 & Johnson Rd - Forecast 2037 With**
(PM Peak Hour)

Output produced by SIDRA INTERSECTION Version: 10.0.9.250

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop Rate	Number of Cycles to Depart	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.]	[Dist]				
			veh/h	%	veh/h	%	v/c	sec		veh	ft				mph
South: Johnson Way															
3u	U	All MCs	1	1.0	1	1.0	0.054	14.8	LOS B	0.2	5.3	0.57	0.74	0.57	31.1
3	L2	All MCs	22	6.0	22	6.0	0.054	11.8	LOS B	0.2	5.3	0.57	0.74	0.57	32.3
8	T1	All MCs	6	1.0	6	1.0	0.054	5.8	LOS A	0.2	5.3	0.57	0.74	0.57	30.3
18	R2	All MCs	9	1.0	9	1.0	0.054	7.9	LOS A	0.2	5.3	0.57	0.74	0.57	33.3
Approach			38	3.9	38	3.9	0.054	10.0	LOS B	0.2	5.3	0.57	0.74	0.57	32.2
East: SR 305															
1u	U	All MCs	3	1.0	3	1.0	0.478	12.3	LOS B	3.6	91.0	0.30	0.47	0.30	37.2
1	L2	All MCs	12	1.0	12	1.0	0.478	11.7	LOS B	3.6	91.0	0.30	0.47	0.30	35.4
6	T1	All MCs	904	3.0	904	3.0	0.478	6.5	LOS A	3.6	91.0	0.29	0.47	0.29	40.8
16	R2	All MCs	58	10.0	58	10.0	0.218	6.2	LOS A	1.2	30.5	0.26	0.48	0.26	35.7
Approach			977	3.4	977	3.4	0.478	6.6	LOS A	3.6	91.0	0.29	0.47	0.29	40.3
North: Johnson Rd															
7u	U	All MCs	1	1.0	1	1.0	0.136	15.5	LOS B	0.6	14.4	0.62	0.76	0.62	30.8
7	L2	All MCs	50	6.0	50	6.0	0.136	12.6	LOS B	0.6	14.4	0.62	0.76	0.62	32.1
4	T1	All MCs	4	1.0	4	1.0	0.136	6.4	LOS A	0.6	14.4	0.62	0.76	0.62	30.1
14	R2	All MCs	36	1.0	36	1.0	0.136	9.2	LOS A	0.6	14.4	0.62	0.76	0.62	33.1
Approach			91	3.7	91	3.7	0.136	11.0	LOS B	0.6	14.4	0.62	0.76	0.62	32.4
West: SR 305															
5u	U	All MCs	1	1.0	1	1.0	0.409	12.2	LOS B	3.0	77.0	0.28	0.48	0.28	37.2
5	L2	All MCs	47	1.0	47	1.0	0.409	11.6	LOS B	3.0	77.0	0.28	0.48	0.28	35.3
2	T1	All MCs	778	2.0	778	2.0	0.409	6.4	LOS A	3.0	77.0	0.28	0.48	0.28	40.9
12	R2	All MCs	22	1.0	22	1.0	0.186	6.0	LOS A	1.0	26.5	0.25	0.47	0.25	35.9
Approach			848	1.9	848	1.9	0.409	6.7	LOS A	3.0	77.0	0.28	0.48	0.28	40.4
All Vehicles			1954	2.8	1954	2.8	0.478	6.9	LOS A	3.6	91.0	0.30	0.49	0.30	39.7

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

 **Site: [99 (10)] SR 305 & Johnson Rd - Forecast 2037 With**
(PM Peak Hour)

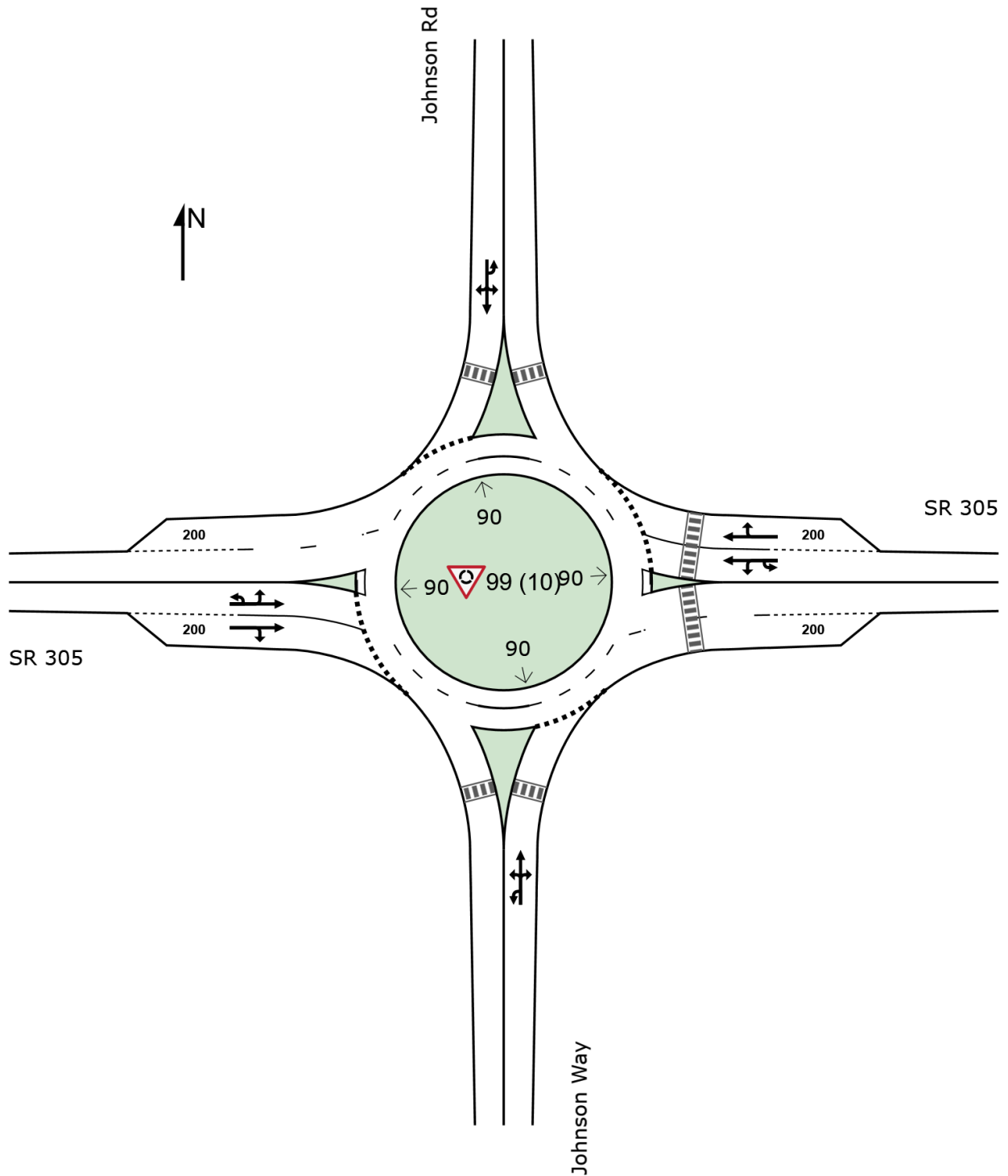
New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

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



MOVEMENT SUMMARY

 **Site: [1 (10)] Johnson & Sunrise Ridge - 2037 PM With (Folder1)**

Output produced by SIDRA INTERSECTION Version: 10.0.9.250

New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Qued	Eff. Stop of Cycles	Number of Cycles	Aver. Speed
			[Total HV]	[Total HV]	[Total HV]	[Total HV]				[Veh.	Dist]		Rate to Depart		mph
			veh/h	%	veh/h	%	v/c	sec		veh	ft				
South: NE Midnight Sun Loop															
3u	U	All MCs	1	3.0	1	3.0	0.007	7.5	LOS A	0.0	0.7	0.26	0.42	0.26	23.6
3	L2	All MCs	1	3.0	1	3.0	0.007	6.1	LOS A	0.0	0.7	0.26	0.42	0.26	23.6
8	T1	All MCs	1	3.0	1	3.0	0.007	2.3	LOS A	0.0	0.7	0.26	0.42	0.26	23.8
18	R2	All MCs	5	3.0	5	3.0	0.007	2.7	LOS A	0.0	0.7	0.26	0.42	0.26	23.7
Approach			8	3.0	8	3.0	0.007	3.8	LOS A	0.0	0.7	0.26	0.42	0.26	23.7
East: Johnson Rd NE															
1u	U	All MCs	1	3.0	1	3.0	0.054	11.2	LOS B	0.2	5.8	0.23	0.50	0.23	34.2
1	L2	All MCs	5	3.0	5	3.0	0.054	9.3	LOS A	0.2	5.8	0.23	0.50	0.23	34.2
6	T1	All MCs	44	3.0	44	3.0	0.054	5.3	LOS A	0.2	5.8	0.23	0.50	0.23	34.9
16	R2	All MCs	17	3.0	17	3.0	0.054	5.0	LOS A	0.2	5.8	0.23	0.50	0.23	34.6
Approach			67	3.0	67	3.0	0.054	5.6	LOS A	0.2	5.8	0.23	0.50	0.23	34.7
North: Sunrise Ridge Ave NE															
7u	U	All MCs	1	3.0	1	3.0	0.070	11.0	LOS B	0.3	7.9	0.17	0.54	0.17	34.4
7	L2	All MCs	10	3.0	10	3.0	0.070	9.1	LOS A	0.3	7.9	0.17	0.54	0.17	34.4
4	T1	All MCs	1	3.0	1	3.0	0.070	5.1	LOS A	0.3	7.9	0.17	0.54	0.17	35.1
14	R2	All MCs	73	3.0	73	3.0	0.070	4.8	LOS A	0.3	7.9	0.17	0.54	0.17	34.7
Approach			85	3.0	85	3.0	0.070	5.4	LOS A	0.3	7.9	0.17	0.54	0.17	34.7
West: Johnson Rd NE															
5u	U	All MCs	1	3.0	1	3.0	0.103	10.9	LOS B	0.4	11.5	0.09	0.62	0.09	33.2
5	L2	All MCs	107	3.0	107	3.0	0.103	9.0	LOS A	0.4	11.5	0.09	0.62	0.09	33.2
2	T1	All MCs	23	3.0	23	3.0	0.103	4.9	LOS A	0.4	11.5	0.09	0.62	0.09	33.7
12	R2	All MCs	1	3.0	1	3.0	0.103	4.7	LOS A	0.4	11.5	0.09	0.62	0.09	33.5
Approach			132	3.0	132	3.0	0.103	8.2	LOS A	0.4	11.5	0.09	0.62	0.09	33.3
All Vehicles			292	3.0	292	3.0	0.103	6.7	LOS A	0.4	11.5	0.15	0.56	0.15	33.6

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

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

SITE LAYOUT

 **Site: [1 (10)] Johnson & Sunrise Ridge - 2037 PM With**
(Folder1)

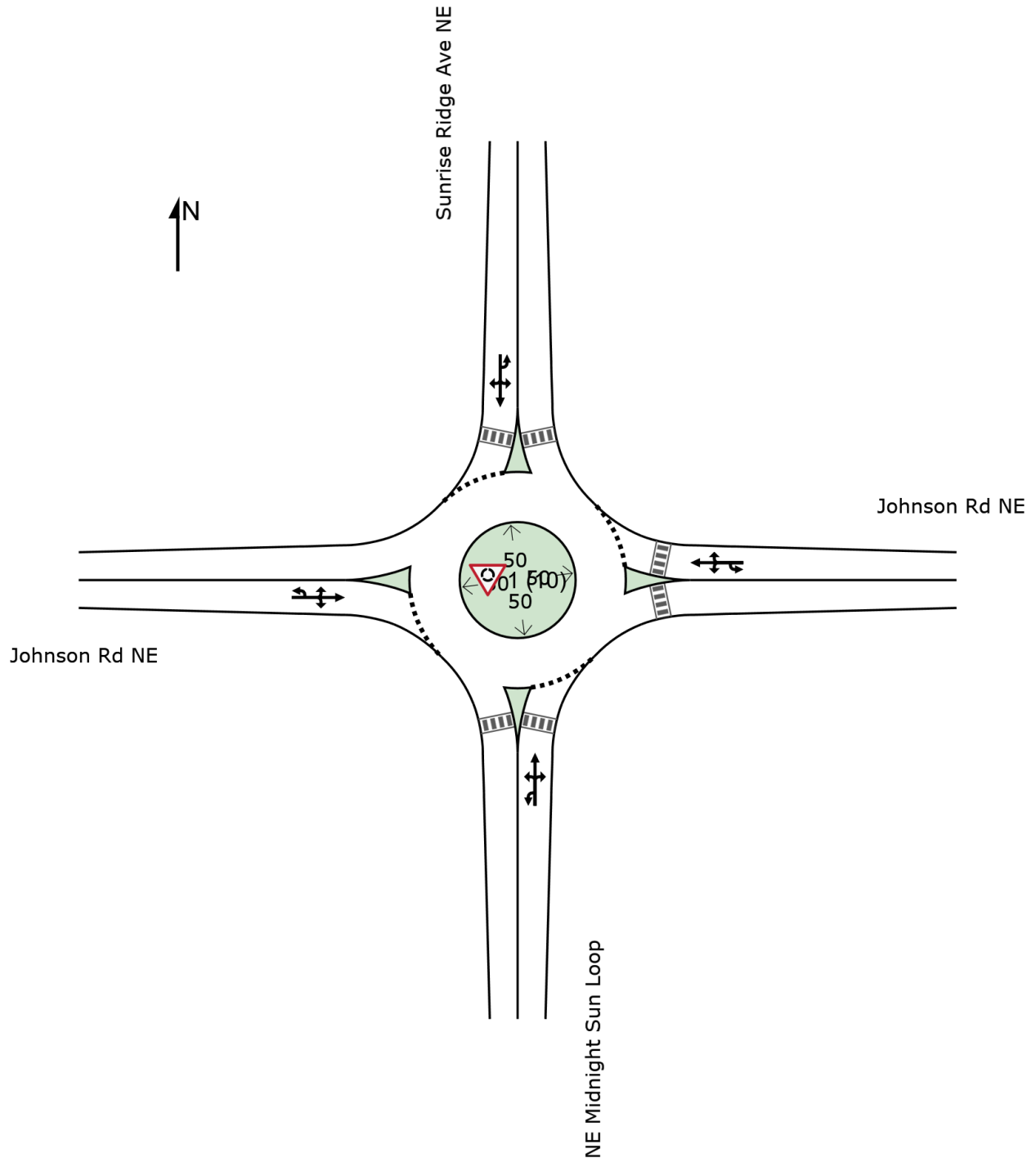
New Site

Site Category: (None)

Roundabout

Site Scenario: 1 | Local Volumes

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



Intersection						
Int Delay, s/veh	6.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	43	72	7	12	8
Future Vol, veh/h	5	43	72	7	12	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	47	78	8	13	9
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	182	17	22	0	-	0
Stage 1	17	-	-	-	-	-
Stage 2	164	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	808	1061	1594	-	-	-
Stage 1	1005	-	-	-	-	-
Stage 2	865	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	768	1061	1594	-	-	-
Mov Cap-2 Maneuver	768	-	-	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	865	-	-	-	-	-
Approach	EB	NB		SB		
HCM Ctrl Dly, s/v	8.72	6.72		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1587	-	1021	-	-	
HCM Lane V/C Ratio	0.049	-	0.051	-	-	
HCM Ctrl Dly (s/v)	7.4	0	8.7	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0.2	-	0.2	-	-	

Intersection	
Intersection Delay, s/veh	27.1
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	108	264	87	15	166	60	78	62	6	111	79	79
Future Vol, veh/h	108	264	87	15	166	60	78	62	6	111	79	79
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles, %	3	1	1	1	1	2	1	1	1	1	1	4
Mvmt Flow	124	303	100	17	191	69	90	71	7	128	91	91
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	1	1
HCM Control Delay, s/veh	43.3	16.6	14.8	15.6
HCM LOS	E	C	B	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1	SBLn2
Vol Left, %	53%	24%	6%	58%	0%
Vol Thru, %	42%	58%	69%	42%	0%
Vol Right, %	4%	19%	25%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	146	459	241	190	79
LT Vol	78	108	15	111	0
Through Vol	62	264	166	79	0
RT Vol	6	87	60	0	79
Lane Flow Rate	168	528	277	218	91
Geometry Grp	4a	2	2	5	5
Degree of Util (X)	0.357	0.908	0.511	0.473	0.171
Departure Headway (Hd)	7.655	6.194	6.64	7.793	6.773
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	473	580	537	461	526
Service Time	5.655	4.272	4.737	5.585	4.564
HCM Lane V/C Ratio	0.355	0.91	0.516	0.473	0.173
HCM Control Delay, s/veh	14.8	43.3	16.6	17.5	11
HCM Lane LOS	B	E	C	C	B
HCM 95th-tile Q	1.6	11.1	2.9	2.5	0.6

Intersection						
Int Delay, s/veh	3.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	69	82	28	69	53	21
Future Vol, veh/h	69	82	28	69	53	21
Conflicting Peds, #/hr	0	10	10	0	10	10
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	75	89	30	75	58	23
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	174	0	275	140
Stage 1	-	-	-	-	130	-
Stage 2	-	-	-	-	146	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1402	-	714	909
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	881	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1391	-	686	893
Mov Cap-2 Maneuver	-	-	-	-	686	-
Stage 1	-	-	-	-	889	-
Stage 2	-	-	-	-	854	-
Approach	EB		WB		NB	
HCM Ctrl Dly, s/v	0		2.21		10.5	
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	735	-	-	520	-	
HCM Lane V/C Ratio	0.109	-	-	0.022	-	
HCM Ctrl Dly (s/v)	10.5	-	-	7.6	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.4	-	-	0.1	-	

THE PINNACLE AT LIBERTY BAY TRAFFIC IMPACT ANALYSIS

APPENDIX Site Plan



THE PINNACLE AT LIBERTY BAY TRAFFIC IMPACT ANALYSIS

APPENDIX

Previous Review Comment Letters



Date: March 26, 2026

To: Michael Bateman, City of Poulsbo

From: Andrew L. Bratlien, P.E., PTOE
Heath & Associates

Subject: The Pinnacle at Liberty Bay TIA Comment Response

This memorandum provides responses to the comments provided by the City of Poulsbo and Parametrix as identified in the September 8, 2025 memorandum "Review for The Pinnacle at Liberty Bay Traffic Impact Analysis (TIA)." The enclosed TIA has been updated based on the March 2026 site plan, including a revised layout consisting of 138 dwelling units

1. COMMENT RESPONSES

Parametrix numbered comments and associated responses are provided below.

Comment #1: Page 8: SR 305 speed is 40 mph north of ~Baywatch Court and 50 mph south of that location.

Response #1: TIA Table 1 has been updated.

Comment #2: Page 10: AM and PM peaks are noted as generally occurring between 7-8 AM and 5-6 PM. Do any of the study intersections have local peaks that are substantially (>30 minutes) outside of the system peaks?

Response #2: TIA language has been refined and a table has been added to identify AM and PM peak hour for each intersection.

Comment #3: Page 10: Verify how the AM school traffic was accounted for. Was there a decrease in PHF to account for the 15-minute spike or some other method?

Response #3: AM peak hour traffic counts captured school peaking effects via PHF which was applied to the existing and future conditions intersection operations analysis. Existing PHFs are documented in the traffic count sheets.



Comment #4: ~Pages 10-16: Clarify which study intersections are reporting performance metrics. There appears to be variability in what is reported for study intersections, for example:

- Section 3.4 lists out 5 intersections where counts were collected and mentions 2 other intersections where counts were estimated.
- Figures 3-4 show 6 of the 7 intersections mentioned, Figures 5-6 show 5 of the 7 intersections and Table 3 (Existing LOS) reports 6 of the 7 study intersections.

Consider adding a section near the front of the report (e.g. Section 2 or 3) that lists all study intersections that will have metrics reported throughout the entire report. Adding them to Figure 1 for example may help with clarifying where all of the key study intersections are located.

Response #4: A new section, "Study Area," has been added to the TIA report to clarify study intersections and performance measures.

Comment #5: Page 17: For Table 4 (Collisions), Separate out and identifying each location as an intersection or a corridor. Consider using the same numbering for the intersections as what was used for the operational analysis and creating new numbering for the corridor locations. Consider adding totals for each column and row to add more clarity to the data.

Response #5: Crash summary tables have been reconfigured.

Comment #6: Page 18: Consider updating Tables 5 and 6 also with Ref # and intersection/corridor names for clarity and adding total columns/rows.

Response #6: Crash summary tables have been reconfigured.

Comment #7: Page 18: Consider expanding further on the text "Out of the 45 total collisions, one resulted in six non-incapacitating injuries, and six possible injuries". Should it say something like 6 of the 45 collisions resulted in non-incapacitating and 6 of the 45 resulted in possible injury?

Response #7: Text has been revised for clarity.

Comment #8: Page 20: For figure 8, consider adding numbering to intersections/corridors to tie back to tables easier.

Response #8: Intersection and street corridor numbering has been added to Figure 8.

Comment #9: Pages 16 & 35: Provide more details in the notes of Tables 3 and 9 related to delay and LOS for clarification – Signals, use signalized thresholds for overall intersection, AWSC/Roundabout – use stop control thresholds for overall intersection, TWSC use stop control thresholds for worst approach.

Response #9: Notes have been added to LOS tables.



Comment #10: [General comment:] Provide additional discussion on the Sunrise Ridge extension and what project or development will trigger the opening. Will the extension be completed as part of the Pinnacle at Liberty Bay development?

Response #10: The Sunrisde Ridge Avenue NE extension will be completed as part of the project's first phase. An explanatory statement has been added to the "Study Area" section of the report.

Comment #11: [General comment:] Adding the access points to the study area map or site plan would be helpful in understanding the traffic to and from the site. Consider adding labels for access points A, B, C/D, and E to the maps/figures.

Response #11: Site plan (Figure 2) has been updated to identify access locations.

Comment #12: [General comment:] The city guidelines state that intersections should be analyzed for intersections with over approximately 10 new trips added. Were additional intersections to the north or west of Hostmark Street/SR 305 considered for analysis (where >10 trips along those roadways are being generated per Figures 9 and 10).

Response #12: The TIA study area was approved by City staff via email on June 10, 2025. Minor scoping revisions provided by City staff at that time were incorporated to the TIA and are reflected in the report.



PLANS, SPECIFICATIONS AND ESTIMATE Review Comment Disposition Form

Project Title: Pinnacle at Liberty Bay		Job Charge #:																																																																																																																																													
Reviewer (name & office) Casey Chilton– Traffic Design		Responses By: Andrew L. Bratlien, PE, PTOE																																																																																																																																													
Date of Review Comments: 7/29/25		Date of Disposition: 3/26/2026																																																																																																																																													
Comment No.	Sht or Pg.	Review Comment	Designer's Response																																																																																																																																												
1.	PDF p8	SR 305 speed limit at this location is 50 MPH. The roundabout at Johnson Rd NE and SR 305 includes pedestrian and bike facilities, but they do not continue along SR 305. Can you please mark "no" for these categories? An asterisk with a note about the RAB having facilities would be a great way to document this.	Table 1 has been updated to incorporate these comments.																																																																																																																																												
2.	PDF p9	Future analysis assumes Sunrise Ridge Ave NE will be opened to through traffic, can you please add details on why this assumption was made? Did the city confirm if/when this will happen?	The Sunrise Ridge Ave NE extension will be completed as part of the project's first phase. An explanatory statement has been added to the "Study Area" section of the report.																																																																																																																																												
3.	GEN	Can you please speak to why the addition of the project traffic volumes will result in a decrease in delay at the following locations? If optimize was used, please reproduce without. Table 8: Forecast 2032 & 2037 Weekday Peak Hour Level of Service <i>Delays Given in Seconds per Vehicle</i> <table border="1"> <thead> <tr> <th rowspan="2">Intersection</th> <th rowspan="2">Control</th> <th rowspan="2">Peak-Hour</th> <th rowspan="2">Crt. Apprch</th> <th colspan="2">Without Project</th> <th colspan="2">With Project</th> </tr> <tr> <th>LOS</th> <th>Delay</th> <th>LOS</th> <th>Delay</th> </tr> </thead> <tbody> <tr> <td colspan="8">Forecast 2032 Peak Hour Analysis</td> </tr> <tr> <td>SR 305 & Hostmark</td> <td>Signal</td> <td>AM</td> <td>Overall</td> <td>D</td> <td>36.5</td> <td>D</td> <td>37.2</td> </tr> <tr> <td>SR 305 & Baywatch</td> <td>One-Way Stop</td> <td>PM</td> <td>SB</td> <td>C</td> <td>21.8</td> <td>C</td> <td>16.4</td> </tr> <tr> <td>SR 305 & Johnson</td> <td>RAB</td> <td>PM</td> <td>Overall</td> <td>A</td> <td>7.4</td> <td>A</td> <td>7.7</td> </tr> <tr> <td>Sunrise Ridge & Johnson</td> <td>RAB</td> <td>PM</td> <td>Overall</td> <td>A</td> <td>5.4</td> <td>A</td> <td>5.7</td> </tr> <tr> <td>Sunrise Ridge & Crystallia</td> <td>One-Way Stop</td> <td>PM</td> <td>EB</td> <td>--</td> <td>--</td> <td>A</td> <td>8.8</td> </tr> <tr> <td>Hostmark & Caldart</td> <td>AWSC</td> <td>PM</td> <td>Overall</td> <td>C</td> <td>22.6</td> <td>C</td> <td>24.2</td> </tr> <tr> <td>Sunrise Ridge & Caldart</td> <td>TWSC</td> <td>PM</td> <td>NB</td> <td>A</td> <td>9.7</td> <td>A</td> <td>9.8</td> </tr> <tr> <td colspan="8">Forecast 2037 Peak Hour Analysis</td> </tr> <tr> <td>SR 305 & Hostmark</td> <td>Signal</td> <td>AM</td> <td>Overall</td> <td>D</td> <td>37.0</td> <td>D</td> <td>37.6</td> </tr> <tr> <td>SR 305 & Baywatch</td> <td>One-Way Stop</td> <td>PM</td> <td>SB</td> <td>C</td> <td>19.7</td> <td>C</td> <td>16.0</td> </tr> <tr> <td>SR 305 & Johnson</td> <td>RAB</td> <td>PM</td> <td>Overall</td> <td>A</td> <td>7.5</td> <td>A</td> <td>7.7</td> </tr> <tr> <td>Sunrise Ridge & Johnson</td> <td>RAB</td> <td>PM</td> <td>Overall</td> <td>A</td> <td>5.5</td> <td>A</td> <td>6.1</td> </tr> <tr> <td>Sunrise Ridge & Crystallia</td> <td>One-Way Stop</td> <td>PM</td> <td>EB</td> <td>--</td> <td>--</td> <td>A</td> <td>8.9</td> </tr> <tr> <td>Hostmark & Caldart</td> <td>AWSC</td> <td>PM</td> <td>Overall</td> <td>F</td> <td>61.9</td> <td>F</td> <td>63.3</td> </tr> <tr> <td>Sunrise Ridge & Caldart</td> <td>TWSC</td> <td>PM</td> <td>NB</td> <td>A</td> <td>9.9</td> <td>B</td> <td>10.0</td> </tr> </tbody> </table> RAB: Roundabout SR 305 & Baywatch Court NE will operate acceptably at LOS D or better through 2037, with average delay of 26 seconds or less on the stop-controlled southbound	Intersection	Control	Peak-Hour	Crt. Apprch	Without Project		With Project		LOS	Delay	LOS	Delay	Forecast 2032 Peak Hour Analysis								SR 305 & Hostmark	Signal	AM	Overall	D	36.5	D	37.2	SR 305 & Baywatch	One-Way Stop	PM	SB	C	21.8	C	16.4	SR 305 & Johnson	RAB	PM	Overall	A	7.4	A	7.7	Sunrise Ridge & Johnson	RAB	PM	Overall	A	5.4	A	5.7	Sunrise Ridge & Crystallia	One-Way Stop	PM	EB	--	--	A	8.8	Hostmark & Caldart	AWSC	PM	Overall	C	22.6	C	24.2	Sunrise Ridge & Caldart	TWSC	PM	NB	A	9.7	A	9.8	Forecast 2037 Peak Hour Analysis								SR 305 & Hostmark	Signal	AM	Overall	D	37.0	D	37.6	SR 305 & Baywatch	One-Way Stop	PM	SB	C	19.7	C	16.0	SR 305 & Johnson	RAB	PM	Overall	A	7.5	A	7.7	Sunrise Ridge & Johnson	RAB	PM	Overall	A	5.5	A	6.1	Sunrise Ridge & Crystallia	One-Way Stop	PM	EB	--	--	A	8.9	Hostmark & Caldart	AWSC	PM	Overall	F	61.9	F	63.3	Sunrise Ridge & Caldart	TWSC	PM	NB	A	9.9	B	10.0	Intersection operations forecasts have been updated to reflect revised trip generation, distribution and assignment forecasts. The intersections in question no longer indicate delay reductions with the addition of project trips.
Intersection	Control	Peak-Hour					Crt. Apprch	Without Project		With Project																																																																																																																																					
			LOS	Delay	LOS	Delay																																																																																																																																									
Forecast 2032 Peak Hour Analysis																																																																																																																																															
SR 305 & Hostmark	Signal	AM	Overall	D	36.5	D	37.2																																																																																																																																								
SR 305 & Baywatch	One-Way Stop	PM	SB	C	21.8	C	16.4																																																																																																																																								
SR 305 & Johnson	RAB	PM	Overall	A	7.4	A	7.7																																																																																																																																								
Sunrise Ridge & Johnson	RAB	PM	Overall	A	5.4	A	5.7																																																																																																																																								
Sunrise Ridge & Crystallia	One-Way Stop	PM	EB	--	--	A	8.8																																																																																																																																								
Hostmark & Caldart	AWSC	PM	Overall	C	22.6	C	24.2																																																																																																																																								
Sunrise Ridge & Caldart	TWSC	PM	NB	A	9.7	A	9.8																																																																																																																																								
Forecast 2037 Peak Hour Analysis																																																																																																																																															
SR 305 & Hostmark	Signal	AM	Overall	D	37.0	D	37.6																																																																																																																																								
SR 305 & Baywatch	One-Way Stop	PM	SB	C	19.7	C	16.0																																																																																																																																								
SR 305 & Johnson	RAB	PM	Overall	A	7.5	A	7.7																																																																																																																																								
Sunrise Ridge & Johnson	RAB	PM	Overall	A	5.5	A	6.1																																																																																																																																								
Sunrise Ridge & Crystallia	One-Way Stop	PM	EB	--	--	A	8.9																																																																																																																																								
Hostmark & Caldart	AWSC	PM	Overall	F	61.9	F	63.3																																																																																																																																								
Sunrise Ridge & Caldart	TWSC	PM	NB	A	9.9	B	10.0																																																																																																																																								
4.																																																																																																																																															

Status Code Legend: A = Incorporated B = Open/Under Review C = Evaluated/Not Incorporated D = Beyond Scope/Not Evaluated
All "B" and "C" responses require explanatory comments.

Date: November 12, 2025

To: Michael Bateman, City of Poulsbo

From: Andrew L. Bratlien, P.E., PTOE
Heath & Associates

Subject: The Pinnacle at Liberty Bay TIA Comment Response

This memorandum provides responses to the comments provided by the City of Poulsbo and Parametrix as identified in the September 8, 2025 memorandum "Review for The Pinnacle at Liberty Bay Traffic Impact Analysis (TIA)."

1. COMMENT RESPONSES

Parametrix numbered comments and associated responses are provided below.

Comment #1: Page 8: SR 305 speed is 40 mph north of ~Baywatch Court and 50 mph south of that location.

Response #1: TIA Table 1 has been updated.

Comment #2: Page 10: AM and PM peaks are noted as generally occurring between 7-8 AM and 5-6 PM. Do any of the study intersections have local peaks that are substantially (>30 minutes) outside of the system peaks?

Response #2: TIA language has been refined and a table has been added to identify AM and PM peak hour for each intersection.

Comment #3: Page 10: Verify how the AM school traffic was accounted for. Was there a decrease in PHF to account for the 15-minute spike or some other method?

Response #3: AM peak hour traffic counts captured school peaking effects via PHF which was applied to the existing and future conditions intersection operations analysis. Existing PHFs are documented in the traffic count sheets.

Comment #4: ~Pages 10-16: Clarify which study intersections are reporting performance metrics. There appears to be variability in what is reported for study intersections, for example:

- Section 3.4 lists out 5 intersections where counts were collected and mentions 2 other intersections where counts were estimated.
- Figures 3-4 show 6 of the 7 intersections mentioned, Figures 5-6 show 5 of the 7 intersections and Table 3 (Existing LOS) reports 6 of the 7 study intersections.

The Pinnacle at Liberty Bay – TIA Comment Response

1



Consider adding a section near the front of the report (e.g. Section 2 or 3) that lists all study intersections that will have metrics reported throughout the entire report. Adding them to Figure 1 for example may help with clarifying where all of the key study intersections are located.

Response #4: A new section, "Study Area," has been added to the TIA report to clarify study intersections and performance measures.

Comment #5: Page 17: For Table 4 (Collisions), Separate out and identifying each location as an intersection or a corridor. Consider using the same numbering for the intersections as what was used for the operational analysis and creating new numbering for the corridor locations. Consider adding totals for each column and row to add more clarity to the data.

Response #5: Crash summary tables have been reconfigured.

Comment #6: Page 18: Consider updating Tables 5 and 6 also with Ref # and intersection/corridor names for clarity and adding total columns/rows.

Response #6: Crash summary tables have been reconfigured.

Comment #7: Page 18: Consider expanding further on the text "Out of the 45 total collisions, one resulted in six non-incapacitating injuries, and six possible injuries". Should it say something like 6 of the 45 collisions resulted in non-incapacitating and 6 of the 45 resulted in possible injury?

Response #7: Text has been revised for clarity.

Comment #8: Page 20: For figure 8, consider adding numbering to intersections/corridors to tie back to tables easier.

Response #8: Intersection and street corridor numbering has been added to Figure 8.

Comment #9: Pages 16 & 35: Provide more details in the notes of Tables 3 and 9 related to delay and LOS for clarification – Signals, use signalized thresholds for overall intersection, AWSC/Roundabout – use stop control thresholds for overall intersection, TWSC use stop control thresholds for worst approach.

Response #9: Notes have been added to LOS tables.

Comment #10: [General comment]: Provide additional discussion on the Sunrise Ridge extension and what project or development will trigger the opening. Will the extension be completed as part of the Pinnacle at Liberty Bay development?

Response #10: The Sunrisde Ridge Avenue NE extension will be completed as part of the project's first phase. An explanatory statement has been added to the "Study Area" section of the report.



Comment #11: [General comment:] Adding the access points to the study area map or site plan would be helpful in understanding the traffic to and from the site. Consider adding labels for access points A, B, C/D, and E to the maps/figures.

Response #11: Site plan (Figure 2) has been updated to identify access locations.

Comment #12: [General comment:] The city guidelines state that intersections should be analyzed for intersections with over approximately 10 new trips added. Were additional intersections to the north or west of Hostmark Street/SR 305 considered for analysis (where >10 trips along those roadways are being generated per Figures 9 and 10).

Response #12: The TIA study area was approved by City staff via email on June 10, 2025. Minor scoping revisions provided by City staff at that time were incorporated to the TIA and are reflected in the report.

