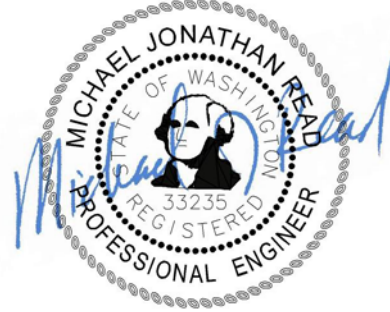


# **EXHIBIT I**

**Traffic Impact Analysis Prepared by  
Transportation Engineering NorthWest**

## MEMORANDUM

**DATE:** February 29, 2020  
**TO:** Matt Hough, PE, CPH Consultants  
**FROM:** Michael Read, PE, Principal, TENW  
**SUBJECT:** Traffic Impact Analysis – Johnson Ridge  
 TENW Project No. 3704



EXPIRES	2 / 28 / 2021
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This memorandum summarizes a traffic impact analysis of the *Johnson Ridge*, a proposed residential development located in Poulsbo, WA. This memo includes a summary of the project, a description of existing transportation conditions within the immediate site vicinity, methodology used to derive the trip generation estimate, traffic operational impact analysis at key study intersections, and identification of any transportation mitigation measures to offset traffic impacts. Given the expected full buildout of the proposed project, the latest background forecasts and roadway geometry consistent with recent studies and transportation improvements currently under construction by the City of Poulsbo were considered.

### Project Description

The proposed *Johnson Ridge* project would construct 61 new single-family homes in Poulsbo, WA. A project site vicinity map is shown in **Figure 1**. A conceptual site plan is illustrated in **Figure 2**. Vehicular site access is proposed via a two new site access roadways: one onto the Noll Road extension and one at a new future intersection planned as part of the Noll Road extension at Johnson Road. Internal roadways within the site will be built to residential access standards. Both segments of these new roadways would be built entirely within the property boundaries of the project. No frontage improvements are required due to the City's pending Stage 1 South Noll Road Corridor (NRC1) capital improvements project to be constructed concurrent with this project. Full build-out of the *Johnson Ridge* project is anticipated by 2023.

### Existing Transportation Conditions

This section includes an inventory of existing roadway conditions, traffic volumes, levels of service, public transportation services and planned roadway improvements.

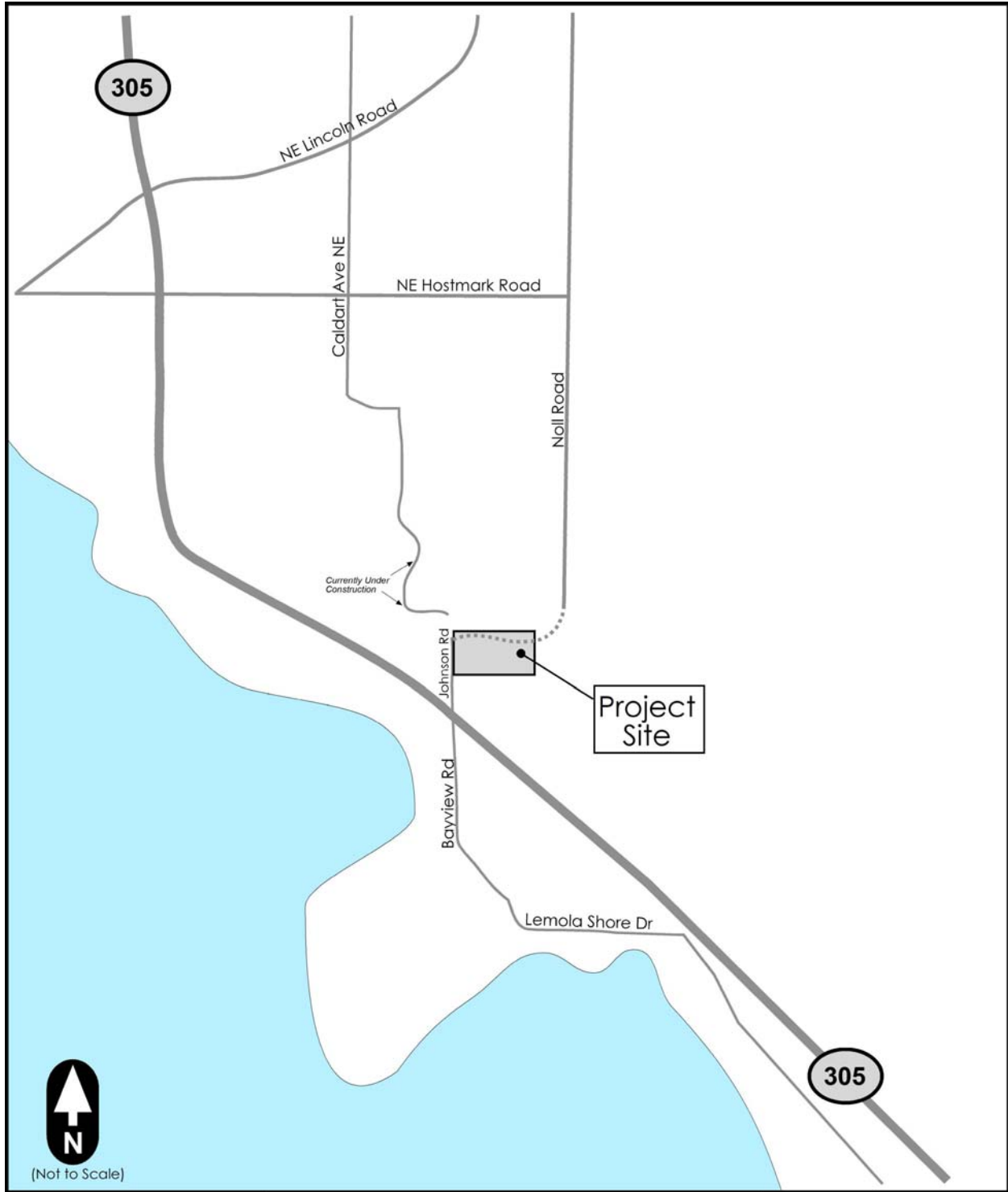
### Roadway Conditions

The following paragraphs describe existing arterial roadways that would be used for site access. Roadway characteristics are described in terms of number of lanes, speed limits, shoulder types and widths.

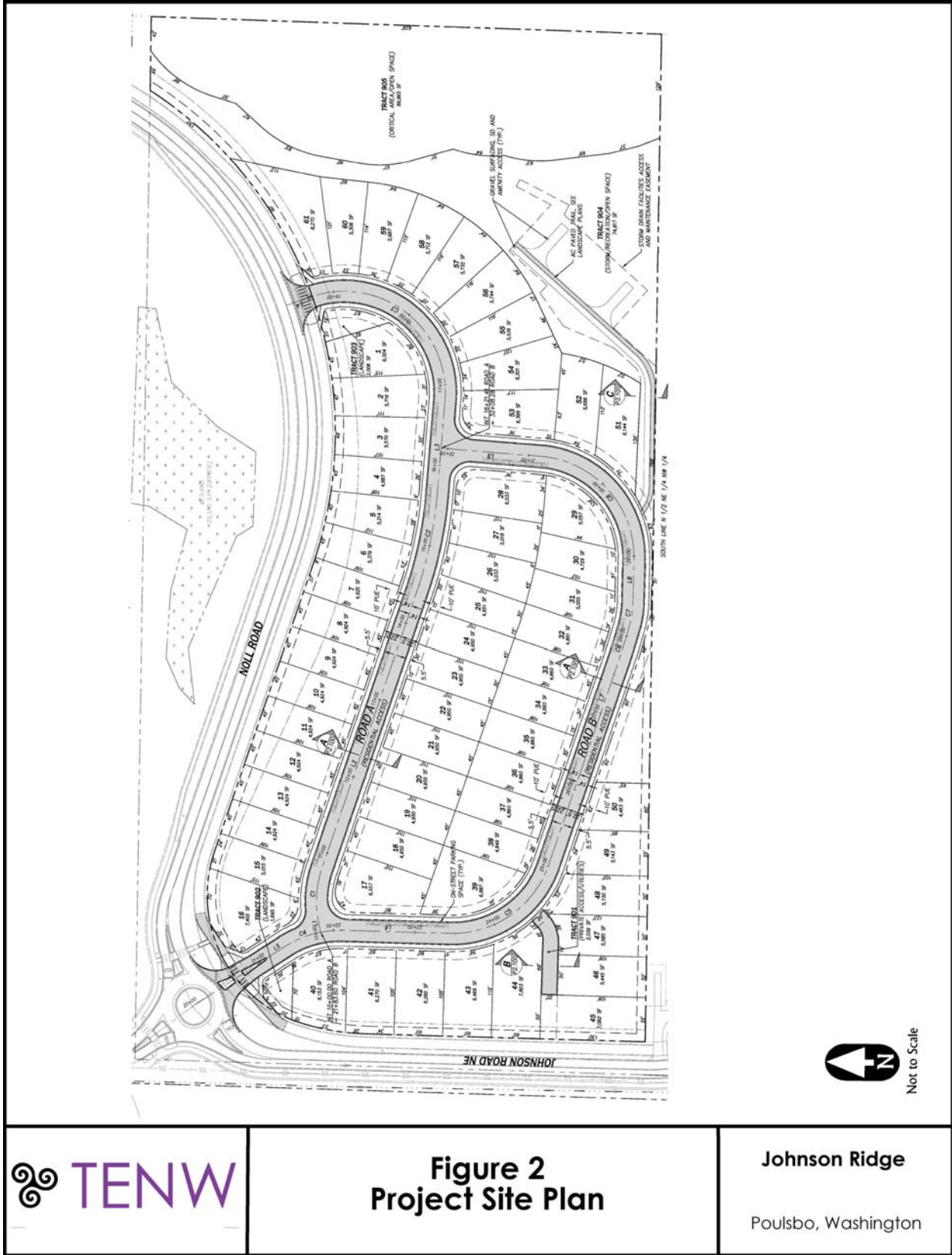
**SR 305** in the immediate site vicinity is a 2-lane principal rural highway with 6-foot paved shoulders and a posted speed limit of 25 mph. In 2017, WSDOT reported approximately 23,000 average daily vehicles travel this 2-lane roadway.

**Johnson Road** is currently a local roadway ranging from approximately 20 to 26 feet in paved width. No existing pedestrian facilities are provided. The speed limit is posted at 25 mph and it is currently a dead-end street, but by the end of 2019 will be connected with Sunrise Ridge Avenue NE to the north.

**Noll Road Avenue** is a two lane minor arterial. Segments of raised sidewalks and a striped bike lane are provided on portions of the street south of NE Hostmark Road. The posted speed limit is 25 mph.



	<p><b>Figure 1</b> <b>Project Vicinity</b></p>	<p><b>Johnson Ridge</b> Poulsbo, Washington</p>
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**Figure 2**  
**Project Site Plan**

**Johnson Ridge**  
Poulso, Washington

**NE Hostmark Road** is a 2-lane collector arterial with raised sidewalks and a continuous bike land. The posted speed limit is 25 mph. On-street parking along its southern frontage is provided east of its intersection with Caldart Avenue NE. At its intersection with SR 305, additional turn only lanes are provided at its signalized intersection.

## Traffic Counts

Peak hour traffic volumes represent the highest hourly volume of vehicles passing through an intersection during a typical 4-6 p.m. weekday peak period. PM Peak period turning movement counts at study intersections were conducted by IDax in 2019. **Figure 3** summarizes the existing p.m. peak period turning movements at all off-site study intersections determined per the City of Poulsbo scoping criterion.

## Intersection Levels of Service

Intersection level of service (LOS) analyses were conducted at the study intersections during the weekday p.m. peak hour of existing conditions and with and without project traffic generated by the proposed development. LOS refers to the degree of congestion on a roadway or intersection. It is a measure of vehicle operating speed, travel time, travel delays, and driving comfort. A letter scale from A to F generally describes LOS. At signalized intersections, LOS A represents free-flow conditions-motorists experience little or no delays, and LOS F represents forced-flow conditions-motorists experience an average delay in excess of 80 seconds per vehicle. The LOS reported for signalized intersections represents the average control delay per vehicle entering the intersection. The LOS reported at stop-controlled intersections is also based on the average control delay (sec/veh) and is reported for each movement. Therefore, the reported LOS at unsignalized intersections does not represent a measure of the overall operations of the intersection.

LOS calculations for both signalized and stop-controlled intersections were calculated using the methodologies and procedures outlined in the 2016 *Highway Capacity Manual, Sixth Edition (HCM)*, Special Report 209, Transportation Research Board (TRB). **Table 1** outlines the LOS criteria for signalized and unsignalized intersections based on these methodologies. The City of Poulsbo maintains a level of service standard of LOS E for development review.

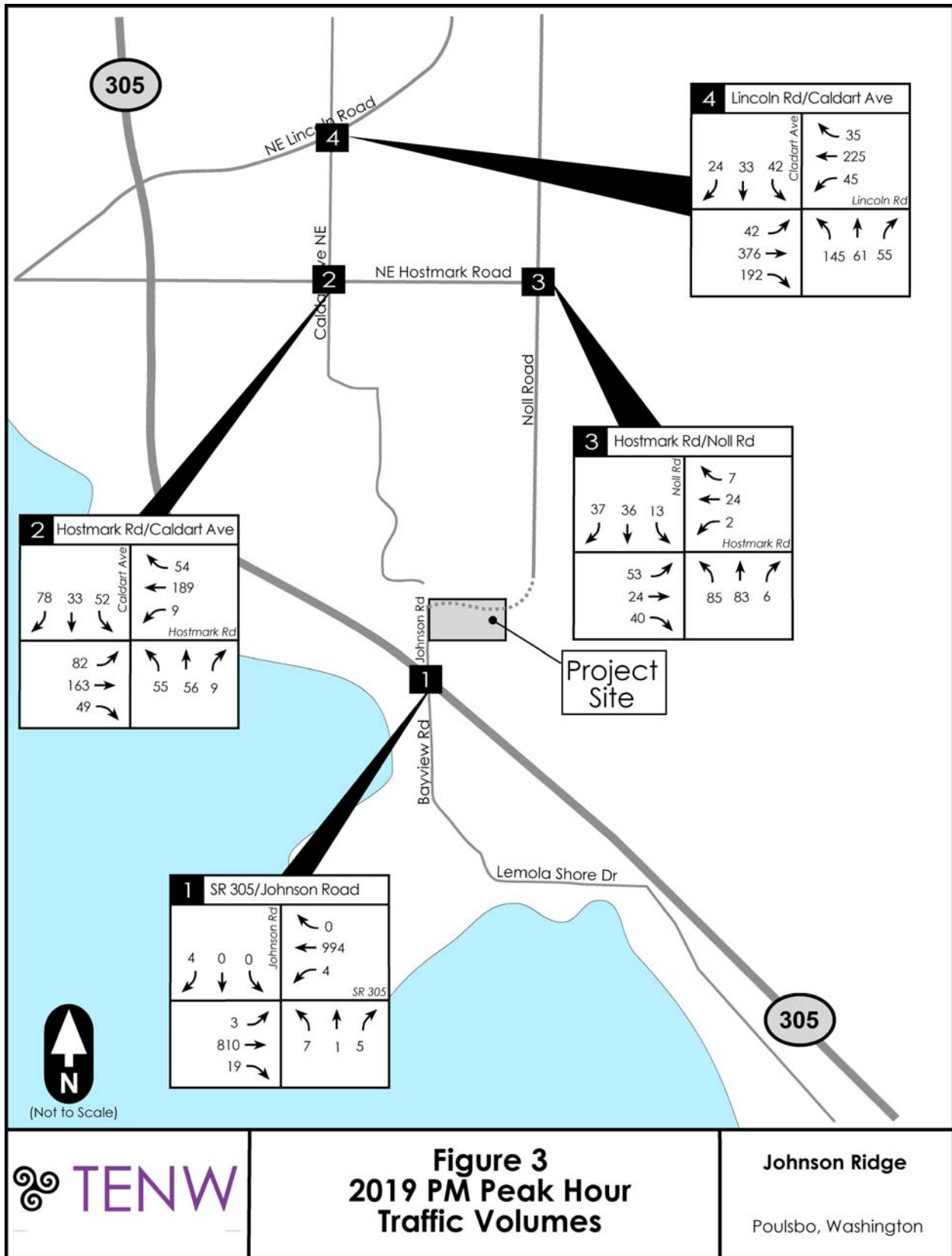
**Table 1 - Level of Service Criteria for Signalized and Unsignalized Intersections**

Level of Service	Signalized Intersection Average Delay Range (sec)	Unsignalized Intersection Delay Range (sec)
A	≤ 10	≤ 10
B	> 10 to ≤ 20	> 10 to ≤ 15
C	> 20 to ≤ 35	> 15 to ≤ 25
D	> 35 to ≤ 55	> 25 to ≤ 35
E	> 55 to ≤ 80	> 35 to ≤ 50
F	> 80	> 50

Source: "Highway Capacity Manual", Special Report 209, Transportation Research Board, 2016.

Existing p.m. peak hour LOS analyses are summarized in **Table 2**. As shown, all intersections or critical movements operate at LOS C or better under existing conditions except for the northbound stop controlled approach at the intersection of SR 305 at Johnson Road which currently operates at LOS F.

Detailed LOS summary worksheets are included in **Attachment 1**.



**Table 2 - Existing PM Peak Hour Intersection Levels of Service**

Study Intersection	LOS	PM Peak Hour Delay (sec)	V/C Ratio	
<i>Signalized Intersections</i>				
#4. Lincoln Road/Caldart Avenue	B	10.6	0.58	
<i>Stop Controlled Intersections</i>				
#1. SR 305/Johnson Road	(NB - Stop)	F	65.5	0.19
	(SB - Stop)	C	18.4	0.02
#2. Hostmark Road/Caldart Ave	(AWS)	C	15.2	0.48
#3. Hostmark Road/Noll Road	(AWS)	A	9.2	0.21

Source: TENW using Synchro 8.0. AWS – All-way stop controlled intersection.

## Existing Public Transportation Services

Existing fixed route transit service is provided along the SR 305 corridor via routes 33 and 90. Route 33 is a peak directional route from Bainbridge Island to Silverdale, while route 90 is a bi-directional route with headways ranging from 30-60 minutes on weekdays and Saturday. Route 44 is a local circulator route within Poulsbo that serves the Hostmark Street corridor every 30 minutes.

## Planned Transportation Improvements

The City of Poulsbo’s 2019-2024 *Transportation Improvement Program* were reviewed for planned transportation improvements within the immediate vicinity of the site. The capacity improvement that extends Noll Road to SR 305 at Johnson Road includes:

- TIP Priority #1 – Noll Road Corridor Improvements. Construct new roadway alignment from SR 305 to Lincoln Road. This improvement is anticipated for completion by 2021 with a cost of \$22,545,000 and includes both new roadway and reconstruction of existing roadway segments, a new roundabout at Johnson Road, and pedestrian/bicycle improvements. The first phase of this City capital improvement project—Stage 1 South (NRC1) is in final design and scheduled for construction starting in 2020.
- WSDOT Connecting Washington Funds: A new roundabout at SR 305 and Johnson Road would be built by WSDOT at this existing intersection and would be built concurrent with the City’s NRC1 project described above.

## Traffic Impact Analysis

The following section describes projected future baseline traffic growth, new trips generated by the proposed development, distribution and assignment of new project trips, intersection level of service impacts, site access, safety and circulation issues, and identification of transportation mitigation to offset impacts.

### 2028 Baseline Traffic Volumes

To evaluate project traffic impacts at full buildout, future baseline traffic volumes were estimated in 2023 using a conservative 2.0 percent per year background growth rate applied to other existing traffic counts as

well as known pipeline development with approved applications in the vicinity provided by the City of Poulsbo. This evaluation year reflects the completion or buildout year of the proposed project. Additional pipeline developments include: Blue Heron, Noll-Mesford, Crystal View, Languanet, Mountain Aire, Lone Pine, and the Christiansen Plat. As these projects are assumed complete, their supporting roadway network systems are also assumed complete. For the purposes of this analysis, the City requested that direct connection via Caldart Avenue via the new roundabout from the site was not available. An additional horizon year was evaluated as requested by the City of Poulsbo that is 5 years beyond the year of completion or 2028. An additional 1 percent per year background growth rate was applied between 2023 and 2028 to estimated baseline traffic volumes.

**Attachment 2** provides a detailed summary of overall growth at study intersections with additional pipeline project trip assumptions which were assumed for evaluation of cumulative impacts for both the 2023 Buildout and 2028 Horizon years. As both the Noll Road extension and the SR 305/Johnson Road roundabout were assumed as part of background transportation improvements, additional traffic diversion of existing trips were also applied using findings consistent with the *Noll Road Corridor Plan, 2008*.

## Project Trip Generation

Documented trip rate equations compiled by the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10<sup>th</sup> Edition, 2017*, were used to estimate daily, a.m. peak hour and p.m. peak hour traffic that would be generated by the proposed single family homes residential development of the *Johnson Ridge* project. **Attachment 3** provides a detailed breakdown of trip generation estimates.

As shown in **Table 3**, total site trip generation of the proposed *Johnson Ridge* project is estimated to generate approximately 573 weekday daily trips, 45 a.m. peak hour trips (11 entering and 34 exiting), and 60 p.m. peak hour trips (38 entering and 22 exiting).

**Table 3 – Johnson Ridge Net Trip Generation**

Time Period	In	Out	Total
Weekday Daily	288	288	576
Weekday AM Peak Hour	11	34	45
Weekday PM Peak Hour	38	22	60

Source: Trip Generation Manual, 10<sup>th</sup> Edition, ITE, 2017.

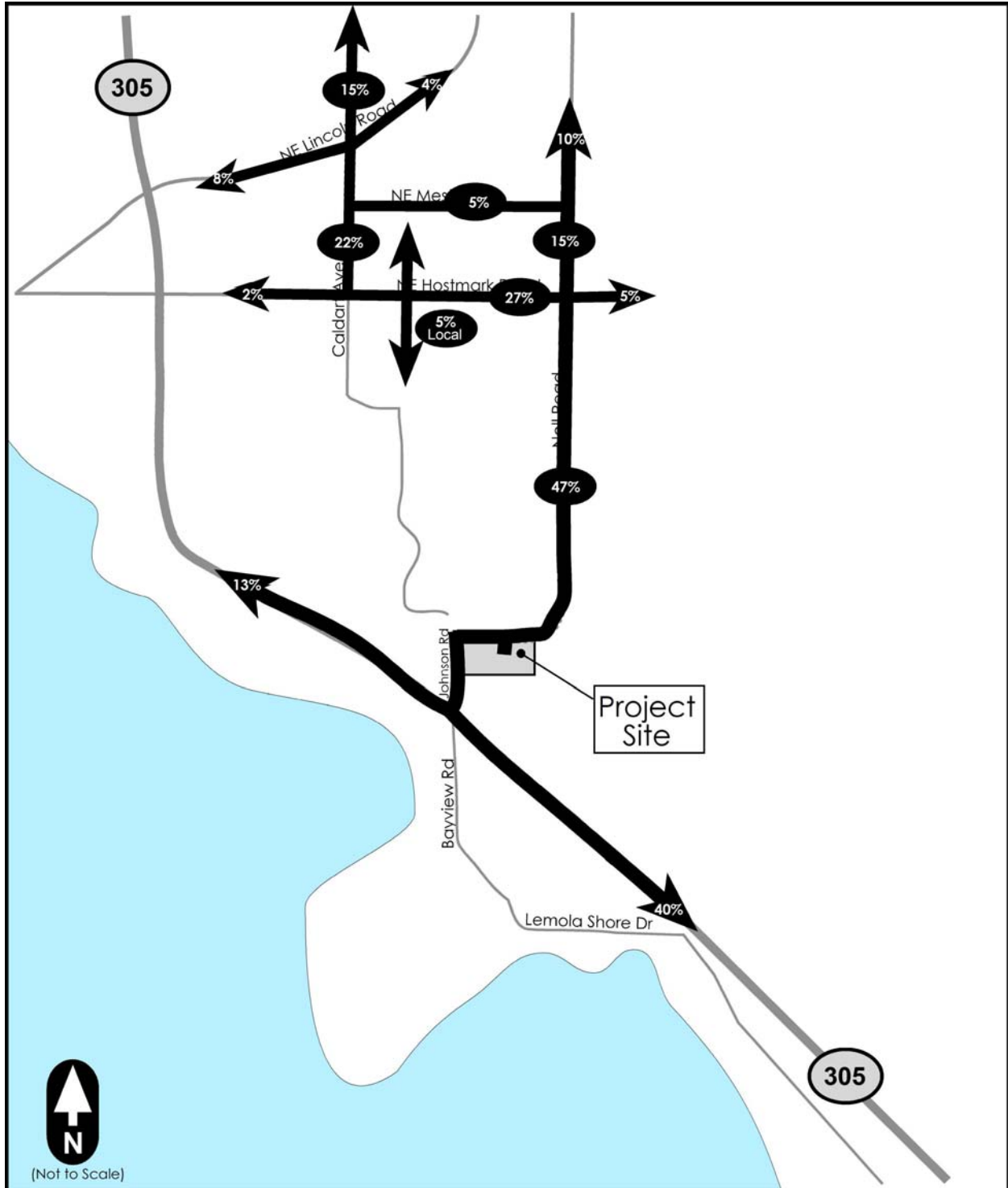
## Trip Distribution and Assignment


To distribute trips onto the vicinity-street and arterial network, trip distribution patterns were determined based on review of existing travel patterns, past traffic studies completed, and the relative distribution of growth and residential density in the vicinity. Generally, average distribution and assignment of project trips were assumed as:

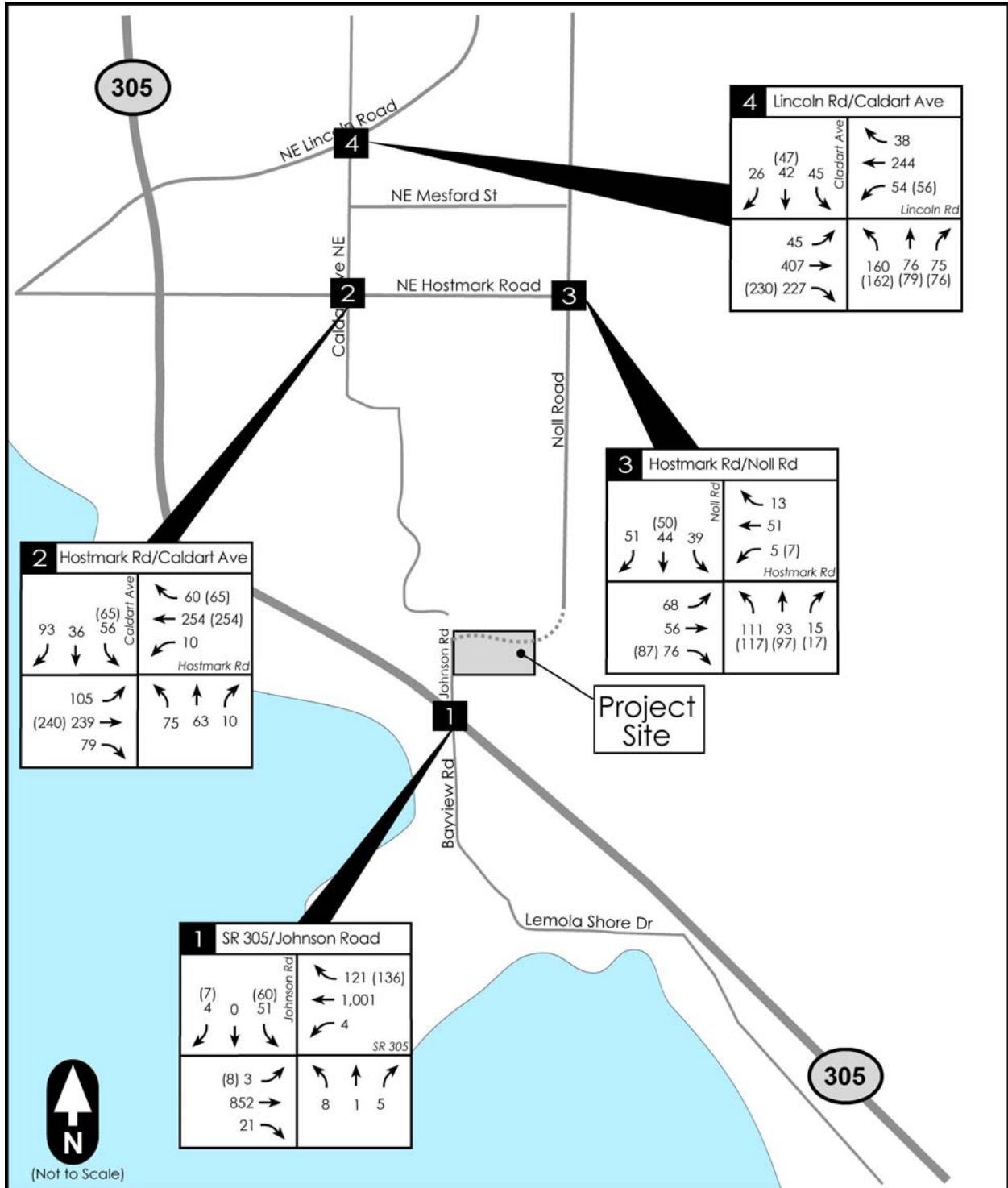
- 60 percent northwest and north via SR 305, Caldart Avenue, and Noll Road; and
- 40 southeast via SR 305.

**Figure 4** illustrates trip distribution and p.m. peak hour trip assignment while **Figure 5** summarizes traffic volume impacts of the proposed *Johnson Ridge* project during the p.m. peak hour for the 2023 buildout year.





	<p><b>Figure 4</b> <b>Project Trip Distribution</b></p>	<p><b>Johnson Ridge</b> Poulsbo, Washington</p>
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**Figure 5**  
2023 PM Peak Hour  
Traffic Volume Impacts

Johnson Ridge  
Poulsbo, Washington

## Intersection Level of Service Impacts

**Table 4** summarizes level of service impacts in 2023 with and without completion of the proposed *Johnson Ridge* project. With installation of a roundabout treatment at the SR 305 and Johnson Road intersection, all intersections would operate at LOS E or better with or without the project in 2023. It should be noted, that will extension of Noll Road to the Johnson Road intersection with SR 305, a slip lane to serve right turning movements off of SR 305 is recommended to adequately serve PM peak hour traffic flows entering the proposed single-lane roundabout.

Detailed LOS summary worksheets are included in **Attachment 1**.

**Table 4: 2023 Buildout PM Intersection Level of Service Impacts**

Study Intersection	PM Peak Hour Without Project			PM Peak Hour With Project		
	LOS	Delay (sec)	V/C Ratio	LOS	Delay (sec)	V/C Ratio
<u>Signalized Intersections</u>						
#4. Lincoln Rd/Caldart Ave	B	11.5	0.61	B	11.6	0.62
<u>Stop Controlled Intersections</u>						
#1. SR 305/Johnson Road (Roundabout)	D	32.3	0.86	D	33.5	0.87
#2. Hostmark Rd/Caldart Ave (AWS)	E	41.3	0.70	E	42.5	0.72
#3. Hostmark Road/Noll Road (AWS)	B	11.9	0.31	B	12.5	0.32
#5. Noll Road/Johnson Road (Roundabout)	A	4.1	0.10	A	4.0	0.10
#6. Noll Road/Site Access Rd (NB – Stop)	--	--	--	A	9.0	0.02

Source: TENW using Synchro 8.0. AWS – All-way stop controlled intersection.

**Table 5** summarizes level of service impacts in the 2028 horizon year. Traffic volumes with and without the project in 2028 are provided in **Attachment 2**. Detailed LOS summary worksheets are included in **Attachment 1**. As shown, all intersections remain at LOS E or better with the project, meeting the City's adopted level of service/concurrency standards.

**Table 5: 2028 Horizon PM Intersection Level of Service Impacts**

Study Intersection	PM Peak Hour Without Project			PM Peak Hour With Project		
	LOS	Delay (sec)	V/C Ratio	LOS	Delay (sec)	V/C Ratio
<u>Signalized Intersections</u>						
#4. Lincoln Rd/Caldart Ave	B	11.9	0.63	B	12.1	0.65
<u>Stop Controlled Intersections</u>						
#1. SR 305/Johnson Road (Roundabout)	E	41.7	0.91	E	43.4	0.91
#2. Hostmark Rd/Caldart Ave (AWS)	E	42.3	0.83	E	43.5	0.84
#3. Hostmark Road/Noll Road (AWS)	B	12.4	0.40	B	13.0	0.43
#5. Noll Road/Johnson Road (Roundabout)	A	4.1	0.10	A	3.9	0.11
#6. Noll Road/Site Access Rd (NB – Stop)	--	--	--	A	9.0	0.02

Source: TENW using Synchro 8.0. AWS – All-way stop controlled intersection.

## Site Access, Safety, and Circulation

Vehicular site access is proposed via two new site access roadways onto the Noll Road extension. Internal roadways within the site will be built to urban local access standards. The onsite local access roads will connect to the new NRC1 improvements with two new intersections. These will include a full-access "T" intersection near the northeast portion of the site and a southeast leg of the new compact roundabout at the northwest corner of the project. No additional frontage improvements are required as those are being completed by the City as part of the NRC1 project.

As both site access roadways proposed onto Johnson Road and the Noll Road extension are not currently built, no existing entering sight distance field measurements could be performed and are assumed to be designed and built to current City/AASHTO standards as part of development review and design of the new roadway extensions by the City of Poulsbo.

## Collision History

Historical collision records for the most recent 3-year period were obtained from WSDOT in February 2020 for the primary study intersection and SR 305 vicinity (**Attachment 4**). As shown, the primary intersection serving the site (Johnson Road/SR 305) averaged 2.33 collisions per year from 2017 to 2019. Given the total entering volume of over 23,000 vehicles per day, this is considered a lower than typical experience. One collision resulted in an injury, while all others resulted in property damage only.

At the Noll Road/SR 305 intersection a much higher collision experience was documented (an average of 5 collisions per year). A majority of collisions involved rear-end types due to vehicles stopped for traffic (turning or otherwise) in the northbound direction. While the proposed project would increase traffic on vicinity streets, given historical collision experience, the planned roundabout treatment at SR 305/Johnson Road and new Noll Road extension project, and the relative increase in traffic levels as a result of the project, no measurable increase in collision history or impact to existing safety levels are expected.

## Short-Term Construction Traffic Impacts

Short-term construction impacts would be generated by the project, beginning with site grading and utility infrastructure elements. During these initial periods, between 40 and 60 daily trips are expected to be generated and would include material/equipment hauling, on-site employees, and other miscellaneous trips. Construction access, truck haul routing, and other vehicle access would need to be coordinated directly with the City's planned Noll Road extension project, with varying haul routes and general vehicle access adjusting as needed to ensure vehicular accessibility is maintained for construction of the roadway and subdivision. Once the site preparation is completed, home construction is expected to occur using several different builders and are estimated to generate up to 100 vehicle trips per day by general contractors, subcontractors, and supply deliveries. As such, construction traffic impacts would be short-term in nature and significantly less than the overall project levels that would be generated at full buildout.

## Subdivision and Concurrency Requirements

Based on review of traffic and transportation-related project impacts, the project conforms to the Poulsbo Municipal Code 17.60.040 by providing an adequate streets system that is safe, orderly and efficient for traffic circulation. As the results of the Traffic Impact Analysis conclude that all intersections and roadways would meet the City's adopted level of service standards and that all transportation facilities will be funded and completed by the completion of development, per PMC 14.04, the proposed Johnson Ridge subdivision meets the City's Transportation Concurrency requirements.

## Project Mitigation

A review of traffic impacts to intersection levels of service, site access, and circulation issues was conducted in association with the *Johnson Ridge*, a proposed residential development that would be located in Poulsbo, WA. The following mitigation measures are recommended to reduce or eliminate project impacts:

- The project would be responsible for constructing all internal roadways within the site to meet residential access standards (per Figure 2.04 of the City's Construction Standards).
- All required frontage improvements for the project will be satisfied with the completion of the City's NRC1 roadway project.
- The applicant will be required to coordinate directly with the City and their contractor during construction of the Noll Road extension project to ensure adequate construction vehicle accessibility is maintained/provided.
- Traffic impact fees are assessed as part of new development. The traffic impact fee for new developed is currently assessed at \$564 per daily trip, or for 576 daily trips, a total fee of \$324,864 would be due a building permit issues at current impact fee rates.

If you have any questions regarding the information presented in this memo, please call me at (206) 361-7333 x 101 or mikeread@tenw.com.

- Attachments:
1. Level of Service Summary Sheets
  2. 2023 and 2028 Traffic Volume Forecasts with and without Johnson Ridge project
  3. Trip Generation Estimates
  4. 2017-2019 Collision History

## ATTACHMENTS

Attachment 1  
Intersection LOS Summary Sheets

Intersection												
Int Delay, s/veh	0.5											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	3	810	19	4	994	0	7	1	5	0	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	862	20	4	1057	0	7	1	5	0	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1057	0	0	882	0	0	1946	1944	872	1947	1954	1057
Stage 1	-	-	-	-	-	-	878	878	-	1066	1066	-
Stage 2	-	-	-	-	-	-	1068	1066	-	881	888	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	659	-	-	767	-	-	49	65	350	49	64	273
Stage 1	-	-	-	-	-	-	343	366	-	269	299	-
Stage 2	-	-	-	-	-	-	268	299	-	341	362	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	659	-	-	767	-	-	47	64	350	47	63	273
Mov Cap-2 Maneuver	-	-	-	-	-	-	47	64	-	47	63	-
Stage 1	-	-	-	-	-	-	340	363	-	267	295	-
Stage 2	-	-	-	-	-	-	260	295	-	332	359	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	65.5	18.4
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	73	659	-	-	767	-	-	273
HCM Lane V/C Ratio	0.189	0.005	-	-	0.006	-	-	0.016
HCM Control Delay (s)	65.5	10.5	0	-	9.7	0	-	18.4
HCM Lane LOS	F	B	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0



**Intersection**

Intersection Delay, s/veh	15.2
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	82	163	49	0	9	189	54	0	55	56	9
Peak Hour Factor	0.92	0.75	0.75	0.75	0.92	0.75	0.75	0.75	0.92	0.75	0.75	0.75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	109	217	65	0	12	252	72	0	73	75	12
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	17.6	15.2	12.4
HCM LOS	C	C	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	46%	28%	4%	32%
Vol Thru, %	47%	55%	75%	20%
Vol Right, %	7%	17%	21%	48%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	120	294	252	163
LT Vol	55	82	9	52
Through Vol	56	163	189	33
RT Vol	9	49	54	78
Lane Flow Rate	160	392	336	217
Geometry Grp	1	1	1	1
Degree of Util (X)	0.294	0.616	0.53	0.374
Departure Headway (Hd)	6.609	5.775	5.802	6.201
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	546	631	625	582
Service Time	4.619	3.775	3.802	4.211
HCM Lane V/C Ratio	0.293	0.621	0.538	0.373
HCM Control Delay	12.4	17.6	15.2	12.9
HCM Lane LOS	B	C	C	B
HCM 95th-tile Q	1.2	4.2	3.1	1.7

**Intersection**

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	52	33	78
Peak Hour Factor	0.92	0.75	0.75	0.75
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	69	44	104
Number of Lanes	0	0	1	0

**Approach** SB

Opposing Approach NB

Opposing Lanes 1

Conflicting Approach Left WB

Conflicting Lanes Left 1

Conflicting Approach Right EB

Conflicting Lanes Right 1

HCM Control Delay 12.9

HCM LOS B

**Lane**

Intersection																
Intersection Delay, s/veh	9.2															
Intersection LOS	A															
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Vol, veh/h	0	53	24	40	0	2	24	7	0	85	83	6	0	13	36	37
Peak Hour Factor	0.92	0.70	0.70	0.70	0.92	0.70	0.70	0.70	0.92	0.70	0.70	0.70	0.92	0.70	0.70	0.70
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	76	34	57	0	3	34	10	0	121	119	9	0	19	51	53
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	9.1	8.3	9.9	8.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	49%	45%	6%	15%
Vol Thru, %	48%	21%	73%	42%
Vol Right, %	3%	34%	21%	43%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	174	117	33	86
LT Vol	85	53	2	13
Through Vol	83	24	24	36
RT Vol	6	40	7	37
Lane Flow Rate	249	167	47	123
Geometry Grp	1	1	1	1
Degree of Util (X)	0.323	0.22	0.064	0.154
Departure Headway (Hd)	4.671	4.744	4.903	4.52
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	768	754	727	790
Service Time	2.708	2.789	2.958	2.565
HCM Lane V/C Ratio	0.324	0.221	0.065	0.156
HCM Control Delay	9.9	9.1	8.3	8.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1.4	0.8	0.2	0.5

HCM 2010 Signalized Intersection Summary  
 4: Caldart Avenue & Lincoln Road

5/28/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	42	376	192	45	225	35	145	61	55	42	33	24
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	46	409	209	49	245	38	158	66	60	46	36	26
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	74	661	562	78	562	87	495	210	191	439	235	170
Arrive On Green	0.04	0.35	0.35	0.04	0.36	0.36	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1774	1863	1583	1774	1575	244	1335	900	818	1260	1007	727
Grp Volume(v), veh/h	46	409	209	49	0	283	158	0	126	46	0	62
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1820	1335	0	1718	1260	0	1734
Q Serve(g_s), s	0.8	5.9	3.2	0.9	0.0	3.9	3.5	0.0	2.0	1.0	0.0	0.9
Cycle Q Clear(g_c), s	0.8	5.9	3.2	0.9	0.0	3.9	4.4	0.0	2.0	3.0	0.0	0.9
Prop In Lane	1.00		1.00	1.00		0.13	1.00		0.48	1.00		0.42
Lane Grp Cap(c), veh/h	74	661	562	78	0	650	495	0	402	439	0	405
V/C Ratio(X)	0.62	0.62	0.37	0.63	0.00	0.44	0.32	0.00	0.31	0.10	0.00	0.15
Avail Cap(c_a), veh/h	272	1027	873	217	0	947	837	0	842	761	0	850
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	15.4	8.7	7.8	15.3	0.0	8.0	11.7	0.0	10.3	11.6	0.0	9.9
Incr Delay (d2), s/veh	8.2	1.0	0.4	8.0	0.0	0.5	0.4	0.0	0.4	0.1	0.0	0.2
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(50%),veh/ln	0.6	3.1	1.5	0.6	0.0	2.0	1.3	0.0	1.0	0.4	0.0	0.5
LnGrp Delay(d),s/veh	23.6	9.7	8.2	23.4	0.0	8.5	12.1	0.0	10.8	11.7	0.0	10.1
LnGrp LOS	C	A	A	C		A	B		B	B		B
Approach Vol, veh/h		664			332			284			108	
Approach Delay, s/veh		10.2			10.7			11.5			10.8	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		11.6	5.4	15.6		11.6	5.4	15.7				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	4.0	18.0		16.0	5.0	17.0				
Max Q Clear Time (g_c+I1), s		6.4	2.9	7.9		5.0	2.8	5.9				
Green Ext Time (p_c), s		1.2	0.0	3.7		1.3	0.0	3.9				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			10.6									
HCM 2010 LOS			B									

HCM 2010 Roundabout  
1: Johnson Road & SR 305

5/29/2019

Intersection					
Intersection Delay, s/veh	32.3				
Intersection LOS	D				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	931	1198	15	58	
Demand Flow Rate, veh/h	949	1222	15	59	
Vehicles Circulating, veh/h	59	13	982	1099	
Vehicles Exiting, veh/h	1099	984	26	4	
Follow-Up Headway, s	3.186	3.186	3.186	3.186	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	27.9	37.0	9.0	12.3	
Approach LOS	D	E	A	B	
Lane	Left	Left	Bypass	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT	R	LTR	LTR
RT Channelized	Free				
Lane Util	1.000	1.000		1.000	1.000
Critical Headway, s	5.193	5.193		5.193	5.193
Entry Flow, veh/h	949	1090	132	15	59
Cap Entry Lane, veh/h	1065	1115	1938	423	377
Entry HV Adj Factor	0.981	0.980	0.980	0.999	0.983
Flow Entry, veh/h	931	1069	129	15	58
Cap Entry, veh/h	1045	1094	1900	423	370
V/C Ratio	0.891	0.977	0.068	0.035	0.157
Control Delay, s/veh	27.9	41.5	0.0	9.0	12.3
LOS	D	E	A	A	B
95th %tile Queue, veh	13	19	0	0	1

HCM 2010 AWSC  
2: Caldart Avenue & Hostmark Street

5/29/2019

Intersection																
Intersection Delay, s/veh41.3																
Intersection LOS E																
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Vol, veh/h	0	105	239	79	0	10	254	60	0	75	63	10	0	56	36	93
Peak Hour Factor	0.92	0.75	0.75	0.75	0.92	0.75	0.75	0.75	0.92	0.75	0.75	0.75	0.92	0.75	0.75	0.75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	140	319	105	0	13	339	80	0	100	84	13	0	75	48	124
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	65.1	34.2	17.3	18.5
HCM LOS	F	D	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	51%	25%	3%	30%
Vol Thru, %	43%	57%	78%	19%
Vol Right, %	7%	19%	19%	50%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	148	423	324	185
LT Vol	75	105	10	56
Through Vol	63	239	254	36
RT Vol	10	79	60	93
Lane Flow Rate	197	564	432	247
Geometry Grp	1	1	1	1
Degree of Util (X)	0.44	1	0.821	0.517
Departure Headway (Hd)	8.019	6.7	6.841	7.542
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	448	536	527	476
Service Time	6.096	4.795	4.905	5.612
HCM Lane V/C Ratio	0.44	1.052	0.82	0.519
HCM Control Delay	17.3	65.1	34.2	18.5
HCM Lane LOS	C	F	D	C
HCM 95th-tile Q	2.2	14.1	8.1	2.9

HCM 2010 AWSC  
3: Noll Road & Hostmark Street

5/29/2019

Intersection																
Intersection Delay, s/veh11.9																
Intersection LOS B																
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Vol, veh/h	0	68	56	76	0	5	51	13	0	111	93	15	0	39	44	51
Peak Hour Factor	0.92	0.70	0.70	0.70	0.92	0.70	0.70	0.70	0.92	0.70	0.70	0.70	0.92	0.70	0.70	0.70
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	97	80	109	0	7	73	19	0	159	133	21	0	56	63	73
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.2	9.8	13.1	10.5
HCM LOS	B	A	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	51%	34%	7%	29%
Vol Thru, %	42%	28%	74%	33%
Vol Right, %	7%	38%	19%	38%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	219	200	69	134
LT Vol	111	68	5	39
Through Vol	93	56	51	44
RT Vol	15	76	13	51
Lane Flow Rate	313	286	99	191
Geometry Grp	1	1	1	1
Degree of Util (X)	0.467	0.421	0.156	0.284
Departure Headway (Hd)	5.368	5.31	5.703	5.338
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	670	677	627	672
Service Time	3.407	3.353	3.757	3.383
HCM Lane V/C Ratio	0.467	0.422	0.158	0.284
HCM Control Delay	13.1	12.2	9.8	10.5
HCM Lane LOS	B	B	A	B
HCM 95th-tile Q	2.5	2.1	0.5	1.2

HCM 2010 Signalized Intersection Summary  
 4: Caldart Avenue & Lincoln Road

5/29/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	407	227	54	244	38	160	76	75	45	42	26
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	49	442	247	59	265	41	174	83	82	49	46	28
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	77	663	564	88	571	88	495	217	215	415	274	167
Arrive On Green	0.04	0.36	0.36	0.05	0.36	0.36	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1774	1863	1583	1774	1576	244	1320	861	851	1216	1085	661
Grp Volume(v), veh/h	49	442	247	59	0	306	174	0	165	49	0	74
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1820	1320	0	1713	1216	0	1746
Q Serve(g_s), s	1.0	7.0	4.2	1.1	0.0	4.5	4.2	0.0	2.8	1.2	0.0	1.2
Cycle Q Clear(g_c), s	1.0	7.0	4.2	1.1	0.0	4.5	5.3	0.0	2.8	4.0	0.0	1.2
Prop In Lane	1.00		1.00	1.00		0.13	1.00		0.50	1.00		0.38
Lane Grp Cap(c), veh/h	77	663	564	88	0	660	495	0	432	415	0	441
V/C Ratio(X)	0.64	0.67	0.44	0.67	0.00	0.46	0.35	0.00	0.38	0.12	0.00	0.17
Avail Cap(c_a), veh/h	253	902	767	202	0	829	801	0	829	697	0	846
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.5	9.5	8.6	16.4	0.0	8.6	12.3	0.0	10.9	12.5	0.0	10.2
Incr Delay (d2), s/veh	8.5	1.2	0.5	8.4	0.0	0.5	0.4	0.0	0.6	0.1	0.0	0.2
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(50%),veh/ln	0.6	3.8	1.9	0.8	0.0	2.3	1.6	0.0	1.3	0.4	0.0	0.6
LnGrp Delay(d),s/veh	25.0	10.7	9.2	24.7	0.0	9.1	12.7	0.0	11.4	12.6	0.0	10.4
LnGrp LOS	C	B	A	C		A	B		B	B		B
Approach Vol, veh/h		738			365			339			123	
Approach Delay, s/veh		11.1			11.6			12.1			11.3	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		12.9	5.7	16.5		12.9	5.5	16.7				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	4.0	17.0		17.0	5.0	16.0				
Max Q Clear Time (g_c+I1), s		7.3	3.1	9.0		6.0	3.0	6.5				
Green Ext Time (p_c), s		1.5	0.0	3.5		1.6	0.0	3.9				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				11.5								
HCM 2010 LOS				B								



Intersection			
Intersection Delay, s/veh	4.1		
Intersection LOS	A		
Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	45	135	15
Demand Flow Rate, veh/h	46	138	15
Vehicles Circulating, veh/h	37	0	46
Vehicles Exiting, veh/h	101	61	37
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.7	4.3	3.5
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	46	138	15
Cap Entry Lane, veh/h	1089	1130	1079
Entry HV Adj Factor	0.978	0.980	0.980
Flow Entry, veh/h	45	135	15
Cap Entry, veh/h	1065	1108	1058
V/C Ratio	0.042	0.122	0.014
Control Delay, s/veh	3.7	4.3	3.5
LOS	A	A	A
95th %tile Queue, veh	0	0	0

HCM 2010 Roundabout  
1: Johnson Road & SR 305

11/24/2019

Intersection					
Intersection Delay, s/veh	33.5				
Intersection LOS	D				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	937	1214	15	71	
Demand Flow Rate, veh/h	955	1238	15	72	
Vehicles Circulating, veh/h	69	19	998	1099	
Vehicles Exiting, veh/h	1102	994	26	10	
Follow-Up Headway, s	3.186	3.186	3.186	3.186	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	30.0	37.8	9.2	12.9	
Approach LOS	D	E	A	B	
Lane	Left	Left	Bypass	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT	R	LTR	LTR
RT Channelized	Free				
Lane Util	1.000	1.000		1.000	1.000
Critical Headway, s	5.193	5.193		5.193	5.193
Entry Flow, veh/h	955	1090	148	15	72
Cap Entry Lane, veh/h	1055	1109	1938	417	377
Entry HV Adj Factor	0.981	0.980	0.980	0.999	0.986
Flow Entry, veh/h	937	1069	145	15	71
Cap Entry, veh/h	1035	1087	1900	416	371
V/C Ratio	0.906	0.983	0.076	0.036	0.191
Control Delay, s/veh	30.0	42.9	0.0	9.2	12.9
LOS	D	E	A	A	B
95th %tile Queue, veh	14	19	0	0	1

HCM 2010 AWSC  
 2: Caldart Avenue & Hostmark Street

11/24/2019

Intersection																
Intersection Delay, s/veh42.5																
Intersection LOS E																
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Vol, veh/h	0	105	240	79	0	10	254	65	0	75	63	10	0	65	36	93
Peak Hour Factor	0.92	0.75	0.75	0.75	0.92	0.75	0.75	0.75	0.92	0.75	0.75	0.75	0.92	0.75	0.75	0.75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	140	320	105	0	13	339	87	0	100	84	13	0	87	48	124
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	65.7	37.2	17.7	19.6
HCM LOS	F	E	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	51%	25%	3%	34%
Vol Thru, %	43%	57%	77%	19%
Vol Right, %	7%	19%	20%	48%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	148	424	329	194
LT Vol	75	105	10	65
Through Vol	63	240	254	36
RT Vol	10	79	65	93
Lane Flow Rate	197	565	439	259
Geometry Grp	1	1	1	1
Degree of Util (X)	0.446	1	0.844	0.547
Departure Headway (Hd)	8.134	6.82	6.924	7.617
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	442	531	522	473
Service Time	6.212	4.915	4.985	5.689
HCM Lane V/C Ratio	0.446	1.064	0.841	0.548
HCM Control Delay	17.7	65.7	37.2	19.6
HCM Lane LOS	C	F	E	C
HCM 95th-tile Q	2.2	14	8.7	3.2

Intersection																
Intersection Delay, s/veh12.5																
Intersection LOS B																
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Vol, veh/h	0	68	56	87	0	7	51	13	0	117	97	17	0	39	50	51
Peak Hour Factor	0.92	0.70	0.70	0.70	0.92	0.70	0.70	0.70	0.92	0.70	0.70	0.70	0.92	0.70	0.70	0.70
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	97	80	124	0	10	73	19	0	167	139	24	0	56	71	73
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.8	10.1	13.9	10.9
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	51%	32%	10%	28%
Vol Thru, %	42%	27%	72%	36%
Vol Right, %	7%	41%	18%	36%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	231	211	71	140
LT Vol	117	68	7	39
Through Vol	97	56	51	50
RT Vol	17	87	13	51
Lane Flow Rate	330	301	101	200
Geometry Grp	1	1	1	1
Degree of Util (X)	0.5	0.451	0.165	0.303
Departure Headway (Hd)	5.454	5.385	5.845	5.455
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	660	666	611	656
Service Time	3.504	3.437	3.911	3.511
HCM Lane V/C Ratio	0.5	0.452	0.165	0.305
HCM Control Delay	13.9	12.8	10.1	10.9
HCM Lane LOS	B	B	B	B
HCM 95th-tile Q	2.8	2.3	0.6	1.3

HCM 2010 Signalized Intersection Summary  
 4: Caldart Avenue & Lincoln Road

11/24/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	407	230	56	244	38	162	79	75	45	47	26
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	49	442	250	61	265	41	176	86	82	49	51	28
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	77	660	561	90	571	88	494	225	214	416	290	159
Arrive On Green	0.04	0.35	0.35	0.05	0.36	0.36	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1774	1863	1583	1774	1576	244	1314	878	837	1212	1132	621
Grp Volume(v), veh/h	49	442	250	61	0	306	176	0	168	49	0	79
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1820	1314	0	1715	1212	0	1753
Q Serve(g_s), s	1.0	7.1	4.3	1.2	0.0	4.6	4.3	0.0	2.9	1.2	0.0	1.2
Cycle Q Clear(g_c), s	1.0	7.1	4.3	1.2	0.0	4.6	5.5	0.0	2.9	4.1	0.0	1.2
Prop In Lane	1.00		1.00	1.00		0.13	1.00		0.49	1.00		0.35
Lane Grp Cap(c), veh/h	77	660	561	90	0	659	494	0	439	416	0	449
V/C Ratio(X)	0.64	0.67	0.45	0.67	0.00	0.46	0.36	0.00	0.38	0.12	0.00	0.18
Avail Cap(c_a), veh/h	250	893	759	200	0	821	787	0	822	687	0	841
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.7	9.7	8.8	16.5	0.0	8.7	12.4	0.0	10.9	12.6	0.0	10.3
Incr Delay (d2), s/veh	8.6	1.2	0.6	8.4	0.0	0.5	0.4	0.0	0.5	0.1	0.0	0.2
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(50%),veh/ln	0.6	3.8	2.0	0.8	0.0	2.4	1.6	0.0	1.4	0.4	0.0	0.6
LnGrp Delay(d),s/veh	25.2	10.9	9.3	25.0	0.0	9.2	12.9	0.0	11.4	12.7	0.0	10.5
LnGrp LOS	C	B	A	C		A	B		B	B		B
Approach Vol, veh/h		741			367			344			128	
Approach Delay, s/veh		11.3			11.8			12.2			11.3	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		13.1	5.8	16.6		13.1	5.5	16.8				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	4.0	17.0		17.0	5.0	16.0				
Max Q Clear Time (g_c+I1), s		7.5	3.2	9.1		6.1	3.0	6.6				
Green Ext Time (p_c), s		1.6	0.0	3.4		1.7	0.0	3.9				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			11.6									
HCM 2010 LOS			B									

**Intersection**

Int Delay, s/veh 1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	91	5	24	45	3	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	99	5	26	49	3	14

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	104
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1488
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1488
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.6	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	913	-	-	1488	-
HCM Lane V/C Ratio	0.019	-	-	0.018	-
HCM Control Delay (s)	9	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

HCM 2010 Roundabout  
 19: Johnson Road & Site Drive & Noll Road

11/24/2019

Intersection				
Intersection Delay, s/veh	4.0			
Intersection LOS	A			
Approach	WB	NB	SB	NW
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	48	113	0	17
Demand Flow Rate, veh/h	49	115	0	17
Vehicles Circulating, veh/h	17	0	64	105
Vehicles Exiting, veh/h	105	64	2	10
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.7	4.1	0.0	3.7
Approach LOS	A	A	-	A
Lane	Left	Left	Left	Left
Designated Moves	LR	TR	T	LR
Assumed Moves	LR	TR	T	LR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	49	115	0	17
Cap Entry Lane, veh/h	1111	1130	1060	1017
Entry HV Adj Factor	0.980	0.982	1.000	1.000
Flow Entry, veh/h	48	113	0	17
Cap Entry, veh/h	1088	1110	1060	1017
V/C Ratio	0.044	0.102	0.000	0.017
Control Delay, s/veh	3.7	4.1	3.4	3.7
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0

HCM 2010 Roundabout  
1: Johnson Road & SR 305

3/1/2020

Intersection					
Intersection Delay, s/veh	41.7				
Intersection LOS	E				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	979	1255	15	58	
Demand Flow Rate, veh/h	998	1280	15	59	
Vehicles Circulating, veh/h	59	13	1030	1157	
Vehicles Exiting, veh/h	1157	1032	27	4	
Follow-Up Headway, s	3.186	3.186	3.186	3.186	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	34.6	48.9	9.5	13.2	
Approach LOS	D	E	A	B	
Lane	Left	Left	Bypass	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT	R	LTR	LTR
RT Channelized	Free				
Lane Util	1.000	1.000		1.000	1.000
Critical Headway, s	5.193	5.193		5.193	5.193
Entry Flow, veh/h	998	1148	132	15	59
Cap Entry Lane, veh/h	1065	1115	1938	403	355
Entry HV Adj Factor	0.981	0.980	0.980	0.999	0.983
Flow Entry, veh/h	979	1126	129	15	58
Cap Entry, veh/h	1045	1094	1900	403	349
V/C Ratio	0.937	1.029	0.068	0.037	0.166
Control Delay, s/veh	34.6	54.5	0.0	9.5	13.2
LOS	D	F	A	A	B
95th %tile Queue, veh	15	23	0	0	1



HCM 2010 AWSC  
2: Caldart Avenue & Hostmark Street

3/1/2020

Intersection

Intersection Delay, s/veh42.3

Intersection LOS E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Vol, veh/h	0	109	248	82	0	10	264	63	0	78	66	10	0	59	38	98
Peak Hour Factor	0.92	0.77	0.77	0.77	0.92	0.77	0.77	0.77	0.92	0.77	0.77	0.77	0.92	0.77	0.77	0.77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	142	322	106	0	13	343	82	0	101	86	13	0	77	49	127
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	65.6	36.7	17.7	19.2
HCM LOS	F	E	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	51%	25%	3%	30%
Vol Thru, %	43%	56%	78%	19%
Vol Right, %	6%	19%	19%	50%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	154	439	337	195
LT Vol	78	109	10	59
Through Vol	66	248	264	38
RT Vol	10	82	63	98
Lane Flow Rate	200	570	438	253
Geometry Grp	1	1	1	1
Degree of Util (X)	0.45	1	0.84	0.535
Departure Headway (Hd)	8.105	6.801	6.913	7.606
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	444	530	521	474
Service Time	6.177	4.889	4.972	5.671
HCM Lane V/C Ratio	0.45	1.075	0.841	0.534
HCM Control Delay	17.7	65.6	36.7	19.2
HCM Lane LOS	C	F	E	C
HCM 95th-tile Q	2.3	14	8.6	3.1

HCM 2010 AWSC  
3: Noll Road & Hostmark Street

3/1/2020

Intersection																
Intersection Delay, s/veh12.4																
Intersection LOS B																
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Vol, veh/h	0	71	57	78	0	5	52	13	0	116	97	16	0	40	46	53
Peak Hour Factor	0.92	0.70	0.70	0.70	0.92	0.70	0.70	0.70	0.92	0.70	0.70	0.70	0.92	0.70	0.70	0.70
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	101	81	111	0	7	74	19	0	166	139	23	0	57	66	76
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	12.7	10	13.7	10.8
HCM LOS	B	A	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	51%	34%	7%	29%
Vol Thru, %	42%	28%	74%	33%
Vol Right, %	7%	38%	19%	38%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	229	206	70	139
LT Vol	116	71	5	40
Through Vol	97	57	52	46
RT Vol	16	78	13	53
Lane Flow Rate	327	294	100	199
Geometry Grp	1	1	1	1
Degree of Util (X)	0.493	0.441	0.161	0.299
Departure Headway (Hd)	5.429	5.39	5.807	5.414
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	664	665	615	661
Service Time	3.473	3.437	3.868	3.465
HCM Lane V/C Ratio	0.492	0.442	0.163	0.301
HCM Control Delay	13.7	12.7	10	10.8
HCM Lane LOS	B	B	A	B
HCM 95th-tile Q	2.7	2.3	0.6	1.3

# HCM 2010 Signalized Intersection Summary

## 4: Caldart Avenue & Lincoln Road

3/1/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	48	427	237	56	256	40	168	79	78	48	44	27
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	52	464	258	61	278	43	183	86	85	52	48	29
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	80	673	572	90	578	89	493	222	220	411	281	170
Arrive On Green	0.04	0.36	0.36	0.05	0.37	0.37	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1774	1863	1583	1774	1576	244	1317	861	851	1209	1089	658
Grp Volume(v), veh/h	52	464	258	61	0	321	183	0	171	52	0	77
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1820	1317	0	1713	1209	0	1747
Q Serve(g_s), s	1.0	7.7	4.5	1.2	0.0	4.9	4.6	0.0	3.0	1.3	0.0	1.2
Cycle Q Clear(g_c), s	1.0	7.7	4.5	1.2	0.0	4.9	5.8	0.0	3.0	4.3	0.0	1.2
Prop In Lane	1.00		1.00	1.00		0.13	1.00		0.50	1.00		0.38
Lane Grp Cap(c), veh/h	80	673	572	90	0	667	493	0	442	411	0	450
V/C Ratio(X)	0.65	0.69	0.45	0.68	0.00	0.48	0.37	0.00	0.39	0.13	0.00	0.17
Avail Cap(c_a), veh/h	244	872	741	195	0	802	770	0	802	665	0	818
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.1	9.9	8.9	17.0	0.0	8.8	12.7	0.0	11.1	12.9	0.0	10.5
Incr Delay (d2), s/veh	8.7	1.6	0.6	8.7	0.0	0.5	0.5	0.0	0.6	0.1	0.0	0.2
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(50%),veh/ln	0.7	4.2	2.0	0.8	0.0	2.5	1.7	0.0	1.4	0.5	0.0	0.6
LnGrp Delay(d),s/veh	25.7	11.4	9.4	25.6	0.0	9.4	13.2	0.0	11.7	13.0	0.0	10.6
LnGrp LOS	C	B	A	C		A	B		B	B		B
Approach Vol, veh/h		774			382			354			129	
Approach Delay, s/veh		11.7			12.0			12.4			11.6	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		13.4	5.8	17.1		13.4	5.6	17.3				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	4.0	17.0		17.0	5.0	16.0				
Max Q Clear Time (g_c+I1), s		7.8	3.2	9.7		6.3	3.0	6.9				
Green Ext Time (p_c), s		1.6	0.0	3.4		1.7	0.0	4.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay				11.9								
HCM 2010 LOS				B								

Intersection			
Intersection Delay, s/veh	4.1		
Intersection LOS	A		
Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	45	135	15
Demand Flow Rate, veh/h	46	138	15
Vehicles Circulating, veh/h	37	0	46
Vehicles Exiting, veh/h	101	61	37
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.7	4.3	3.5
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	46	138	15
Cap Entry Lane, veh/h	1089	1130	1079
Entry HV Adj Factor	0.978	0.980	0.980
Flow Entry, veh/h	45	135	15
Cap Entry, veh/h	1065	1108	1058
V/C Ratio	0.042	0.122	0.014
Control Delay, s/veh	3.7	4.3	3.5
LOS	A	A	A
95th %tile Queue, veh	0	0	0

HCM 2010 Roundabout  
1: Johnson Road & SR 305

3/1/2020

Intersection					
Intersection Delay, s/veh	43.4				
Intersection LOS	E				
Approach	EB	WB	NB	SB	
Entry Lanes	1	1	1	1	
Conflicting Circle Lanes	1	1	1	1	
Adj Approach Flow, veh/h	985	1271	15	71	
Demand Flow Rate, veh/h	1004	1296	15	72	
Vehicles Circulating, veh/h	69	19	1046	1157	
Vehicles Exiting, veh/h	1160	1042	27	10	
Follow-Up Headway, s	3.186	3.186	3.186	3.186	
Ped Vol Crossing Leg, #/h	0	0	0	0	
Ped Cap Adj	1.000	1.000	1.000	1.000	
Approach Delay, s/veh	37.5	49.9	9.6	13.9	
Approach LOS	E	E	A	B	
Lane	Left	Left	Bypass	Left	Left
Designated Moves	LTR	LT	R	LTR	LTR
Assumed Moves	LTR	LT	R	LTR	LTR
RT Channelized	Free				
Lane Util	1.000	1.000		1.000	1.000
Critical Headway, s	5.193	5.193		5.193	5.193
Entry Flow, veh/h	1004	1148	148	15	72
Cap Entry Lane, veh/h	1055	1109	1938	397	355
Entry HV Adj Factor	0.981	0.980	0.980	0.999	0.986
Flow Entry, veh/h	985	1126	145	15	71
Cap Entry, veh/h	1035	1087	1900	396	350
V/C Ratio	0.952	1.035	0.076	0.038	0.203
Control Delay, s/veh	37.5	56.4	0.0	9.6	13.9
LOS	E	F	A	A	B
95th %tile Queue, veh	16	23	0	0	1

HCM 2010 AWSC  
 2: Caldart Avenue & Hostmark Street

3/1/2020

Intersection

Intersection Delay, s/veh43.5

Intersection LOS E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Vol, veh/h	0	109	249	82	0	10	264	68	0	78	66	10	0	67	38	98
Peak Hour Factor	0.92	0.77	0.77	0.77	0.92	0.77	0.77	0.77	0.92	0.77	0.77	0.77	0.92	0.77	0.77	0.77
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	142	323	106	0	13	343	88	0	101	86	13	0	87	49	127
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	66.1	39.8	18	20.2
HCM LOS	F	E	C	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	51%	25%	3%	33%
Vol Thru, %	43%	57%	77%	19%
Vol Right, %	6%	19%	20%	48%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	154	440	342	203
LT Vol	78	109	10	67
Through Vol	66	249	264	38
RT Vol	10	82	68	98
Lane Flow Rate	200	571	444	264
Geometry Grp	1	1	1	1
Degree of Util (X)	0.456	1	0.862	0.562
Departure Headway (Hd)	8.21	6.911	6.987	7.676
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	438	520	520	469
Service Time	6.285	5.002	5.046	5.743
HCM Lane V/C Ratio	0.457	1.098	0.854	0.563
HCM Control Delay	18	66.1	39.8	20.2
HCM Lane LOS	C	F	E	C
HCM 95th-tile Q	2.3	13.9	9.2	3.4

**Intersection**

Intersection Delay, s/veh 13  
Intersection LOS B

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Vol, veh/h	0	71	57	89	0	7	52	13	0	122	101	17	0	40	52	53
Peak Hour Factor	0.92	0.70	0.70	0.70	0.92	0.70	0.70	0.70	0.92	0.70	0.70	0.70	0.92	0.70	0.70	0.70
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	101	81	127	0	10	74	19	0	174	144	24	0	57	74	76
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	13.3	10.3	14.6	11.2
HCM LOS	B	B	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	51%	33%	10%	28%
Vol Thru, %	42%	26%	72%	36%
Vol Right, %	7%	41%	18%	37%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	240	217	72	145
LT Vol	122	71	7	40
Through Vol	101	57	52	52
RT Vol	17	89	13	53
Lane Flow Rate	343	310	103	207
Geometry Grp	1	1	1	1
Degree of Util (X)	0.526	0.471	0.17	0.318
Departure Headway (Hd)	5.519	5.464	5.948	5.531
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	651	657	600	646
Service Time	3.574	3.521	4.024	3.594
HCM Lane V/C Ratio	0.527	0.472	0.172	0.32
HCM Control Delay	14.6	13.3	10.3	11.2
HCM Lane LOS	B	B	B	B
HCM 95th-tile Q	3.1	2.5	0.6	1.4

HCM 2010 Signalized Intersection Summary  
 4: Caldart Avenue & Lincoln Road

3/1/2020



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	48	427	240	58	256	40	170	83	78	48	49	27
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	52	464	261	63	278	43	185	90	85	52	53	29
Adj No. of Lanes	1	1	1	1	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	80	670	569	92	577	89	492	231	218	411	297	162
Arrive On Green	0.04	0.36	0.36	0.05	0.37	0.37	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1774	1863	1583	1774	1576	244	1311	882	833	1205	1133	620
Grp Volume(v), veh/h	52	464	261	63	0	321	185	0	175	52	0	82
Grp Sat Flow(s),veh/h/ln	1774	1863	1583	1774	0	1820	1311	0	1716	1205	0	1753
Q Serve(g_s), s	1.1	7.8	4.6	1.3	0.0	5.0	4.7	0.0	3.1	1.4	0.0	1.3
Cycle Q Clear(g_c), s	1.1	7.8	4.6	1.3	0.0	5.0	6.0	0.0	3.1	4.4	0.0	1.3
Prop In Lane	1.00		1.00	1.00		0.13	1.00		0.49	1.00		0.35
Lane Grp Cap(c), veh/h	80	670	569	92	0	667	492	0	449	411	0	459
V/C Ratio(X)	0.65	0.69	0.46	0.69	0.00	0.48	0.38	0.00	0.39	0.13	0.00	0.18
Avail Cap(c_a), veh/h	242	863	734	193	0	794	756	0	795	654	0	813
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	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.2	10.0	9.0	17.1	0.0	8.9	12.8	0.0	11.1	13.0	0.0	10.5
Incr Delay (d2), s/veh	8.7	1.6	0.6	8.8	0.0	0.5	0.5	0.0	0.6	0.1	0.0	0.2
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(50%),veh/ln	0.7	4.2	2.0	0.8	0.0	2.6	1.8	0.0	1.5	0.5	0.0	0.7
LnGrp Delay(d),s/veh	26.0	11.7	9.6	25.9	0.0	9.5	13.3	0.0	11.7	13.1	0.0	10.7
LnGrp LOS	C	B	A	C		A	B		B	B		B
Approach Vol, veh/h		777			384			360			134	
Approach Delay, s/veh		11.9			12.2			12.5			11.6	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		13.6	5.9	17.2		13.6	5.6	17.4				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	4.0	17.0		17.0	5.0	16.0				
Max Q Clear Time (g_c+I1), s		8.0	3.3	9.8		6.4	3.1	7.0				
Green Ext Time (p_c), s		1.6	0.0	3.4		1.7	0.0	4.0				
<b>Intersection Summary</b>												
HCM 2010 Ctrl Delay			12.1									
HCM 2010 LOS			B									



HCM 2010 TWSC  
5: Site Access & Noll Road

3/1/2020

**Intersection**

Int Delay, s/veh 1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	91	5	24	45	3	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	99	5	26	49	3	14

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	104
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	1488
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1488
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.6	9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	913	-	-	1488	-
HCM Lane V/C Ratio	0.019	-	-	0.018	-
HCM Control Delay (s)	9	-	-	7.5	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-

Intersection			
Intersection Delay, s/veh	3.9		
Intersection LOS	A		
Approach	WB	NB	SB
Entry Lanes	1	1	1
Conflicting Circle Lanes	1	1	1
Adj Approach Flow, veh/h	17	116	48
Demand Flow Rate, veh/h	17	118	49
Vehicles Circulating, veh/h	2	0	15
Vehicles Exiting, veh/h	116	64	4
Follow-Up Headway, s	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0
Ped Cap Adj	1.000	1.000	1.000
Approach Delay, s/veh	3.3	4.1	3.7
Approach LOS	A	A	A
Lane	Left	Left	Left
Designated Moves	LR	TR	LT
Assumed Moves	LR	TR	LT
RT Channelized			
Lane Util	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193
Entry Flow, veh/h	17	118	49
Cap Entry Lane, veh/h	1128	1130	1113
Entry HV Adj Factor	1.000	0.983	0.980
Flow Entry, veh/h	17	116	48
Cap Entry, veh/h	1128	1110	1091
V/C Ratio	0.015	0.104	0.044
Control Delay, s/veh	3.3	4.1	3.7
LOS	A	A	A
95th %tile Queue, veh	0	0	0

Attachment 2  
2023/2028 Traffic Volume Forecasts  
with and without Johnson Ridge

# Johnson Ridge 2023 Full Buildout PM Peak Hour Turning Movement Volumes

Growth Rate = <b>2.00%</b>
Seasonality = <b>1</b>
Count Year = <b>2019</b>
Future Year = <b>2023</b>

Enter Exit  
38 22

2019 Count Year

Pipeline #1  
Noll Road Projects

Pipeline #2  
Blue Heron

Pipeline #3  
General Background

2023 Baseline

Trip Distribution

Project Trips

2023 With Project

1	1	1	1	1	1	1	1	1
SR 305/Johnson Road	SR 305/Johnson Road	SR 305/Johnson Road	SR 305/Johnson Road	SR 305/Johnson Road	SR 305/Johnson Road	SR 305/Johnson Road	SR 305/Johnson Road	SR 305/Johnson Road
				<p style="text-align: right;">% Increase = 12.1%</p>			<p style="text-align: right;">Project Share = 1.5%</p>	
2	2	2	2	2	2	2	2	2
Hostmark St/Cladart Ave	Hostmark St/Cladart Ave	Hostmark St/Cladart Ave	Hostmark St/Cladart Ave	Hostmark St/Cladart Ave	Hostmark St/Cladart Ave	Hostmark St/Cladart Ave	Hostmark St/Cladart Ave	Hostmark St/Cladart Ave
				<p style="text-align: right;">% Increase = 30.2%</p>			<p style="text-align: right;">Project Share = 1.3%</p>	
3	3	3	3	3	3	3	3	3
Hostmark/Noll Road	Hostmark/Noll Road	Hostmark/Noll Road	Hostmark/Noll Road	Hostmark/Noll Road	Hostmark/Noll Road	Hostmark/Noll Road	Hostmark/Noll Road	Hostmark/Noll Road
				<p style="text-align: right;">% Increase = 51.9%</p>			<p style="text-align: right;">Project Share = 4.3%</p>	
4	4	4	4	4	4	4	4	4
Lincoln Rd/Caldart Ave	Lincoln Rd/Caldart Ave	Lincoln Rd/Caldart Ave	Lincoln Rd/Caldart Ave	Lincoln Rd/Caldart Ave	Lincoln Rd/Caldart Ave	Lincoln Rd/Caldart Ave	Lincoln Rd/Caldart Ave	Lincoln Rd/Caldart Ave
				<p style="text-align: right;">% Increase = 12.8%</p>			<p style="text-align: right;">Project Share = 1.1%</p>	

**Johnson Ridge**  
**2023 Full Buildout PM Peak Hour Turning Movement Volumes**

Growth Rate = 2.00%
Seasonality = 1
Count Year = 2019
Future Year = 2023

Enter Exit  
 38 22

2019 Count Year	Pipeline #1 Noll Road Projects	Pipeline #2 Blue Heron	Pipeline #3 General Background	2023 Baseline	Trip Distribution	Project Trips 38 22	2023 With Project
5 Noll Road/Johnson Road (Round-Future)	5 Noll Road/Johnson Road (Round-Future)	5 Noll Road/Johnson Road (Round-Future)	5 Noll Road/Johnson Road (Round-Future)	5 Noll Road/Johnson Road (Round-Future)	5 Noll Road/Johnson Road (Round-Future)	5 Noll Road/Johnson Road (Round-Future)	5 Noll Road/Johnson Road (Round-Future)
				<p>% Increase =</p>			<p>Project Share = 15.2%</p>
6 Noll Road/Site Access (Future)	6 Noll Road/Site Access (Future)	6 Noll Road/Site Access (Future)	6 Noll Road/Site Access (Future)	6 Noll Road/Site Access (Future)	6 Noll Road/Site Access (Future)	6 Noll Road/Site Access (Future)	6 Noll Road/Site Access (Future)
				<p>% Increase =</p>			<p>Project Share = 18.7%</p>

# Johnson Ridge

## 2028 Full Buildout PM Peak Hour Turning Movement Volumes

Growth Rate =	2.00%	2019-2023
Seasonality =	1	
Count Year =	2019	
Future Year =	2023	
Growth Rate =	1.00%	2023-2028

Enter Exd  
38 22

2019 Count Year	Pipeline #1 Noll Road Projects	Pipeline #2 Blue Heron	Pipeline #3 General Background	2028 Baseline	Trip Distribution	Project Trips	2028 With Project
<p><b>SR 305/Johnson Road</b></p>	<p><b>SR 305/Johnson Road</b></p>	<p><b>SR 305/Johnson Road</b></p>	<p><b>SR 305/Johnson Road</b></p>	<p><b>SR 305/Johnson Road</b></p> <p>% Increase = 17.6%</p>	<p><b>SR 305/Johnson Road</b></p>	<p><b>SR 305/Johnson Road</b></p>	<p><b>SR 305/Johnson Road</b></p> <p>Project Share = 1.4%</p>
<p><b>Hostmark St/Cladart Ave</b></p>	<p><b>Hostmark St/Cladart Ave</b></p>	<p><b>Hostmark St/Cladart Ave</b></p>	<p><b>Hostmark St/Cladart Ave</b></p>	<p><b>Hostmark St/Cladart Ave</b></p> <p>% Increase = 35.6%</p>	<p><b>Hostmark St/Cladart Ave</b></p>	<p><b>Hostmark St/Cladart Ave</b></p>	<p><b>Hostmark St/Cladart Ave</b></p> <p>Project Share = 1.3%</p>
<p><b>Hostmark/Noll Road</b></p>	<p><b>Hostmark/Noll Road</b></p>	<p><b>Hostmark/Noll Road</b></p>	<p><b>Hostmark/Noll Road</b></p>	<p><b>Hostmark/Noll Road</b></p> <p>% Increase = 57.3%</p>	<p><b>Hostmark/Noll Road</b></p>	<p><b>Hostmark/Noll Road</b></p>	<p><b>Hostmark/Noll Road</b></p> <p>Project Share = 4.2%</p>
<p><b>Lincoln Rd/Caldart Ave</b></p>	<p><b>Lincoln Rd/Caldart Ave</b></p>	<p><b>Lincoln Rd/Caldart Ave</b></p>	<p><b>Lincoln Rd/Caldart Ave</b></p>	<p><b>Lincoln Rd/Caldart Ave</b></p> <p>% Increase = 18.2%</p>	<p><b>Lincoln Rd/Caldart Ave</b></p>	<p><b>Lincoln Rd/Caldart Ave</b></p>	<p><b>Lincoln Rd/Caldart Ave</b></p> <p>Project Share = 1.1%</p>

**Johnson Ridge**  
**2028 Full Buildout PM Peak Hour Turning Movement Volumes**

<b>Growth Rate = 2.00%</b>	<b>2019-2023</b>
<b>Seasonality = 1</b>	
<b>Count Year = 2019</b>	
<b>Future Year = 2023</b>	
<b>Growth Rate = 1.00%</b>	<b>2023-2028</b>

Enter Exit  
 38 22

2019 Count Year	Pipeline #1 Noll Road Projects	Pipeline #2 Blue Heron	Pipeline #3 General Background	2028 Baseline	Trip Distribution	Project Trips	2028 With Project
5 Noll Road/Johnson Road (Round-Future)	5 Noll Road/Johnson Road (Round-Future)	5 Noll Road/Johnson Road (Round-Future)	5 Noll Road/Johnson Road (Round-Future)	5 Noll Road/Johnson Road (Round-Future)	5 Noll Road/Johnson Road (Round-Future)	5 Noll Road/Johnson Road (Round-Future)	5 Noll Road/Johnson Road (Round-Future)
				<p style="text-align: center;">% Increase =</p>			<p style="text-align: right;">Project Share = 15.2%</p>
6 Noll Road/Site Access (Future)	6 Noll Road/Site Access (Future)	6 Noll Road/Site Access (Future)	6 Noll Road/Site Access (Future)	6 Noll Road/Site Access (Future)	6 Noll Road/Site Access (Future)	6 Noll Road/Site Access (Future)	6 Noll Road/Site Access (Future)
				<p style="text-align: center;">% Increase =</p>			<p style="text-align: right;">Project Share = 18.7%</p>

Attachment 3  
Trip Generation Estimates



**Trip Generation Summary**

Land Use	Size	Units <sup>1</sup>	ITE LUC <sup>2</sup>	Average Trip Rate	Trips Generated		
					In	Out	Total
<i><b>AM PEAK HOUR</b></i>							
Single Family Homes	61	DU	210	0.74	11	34	45
<i><b>PM PEAK HOUR</b></i>							
Single Family Homes	61	DU	210	0.99	38	22	60
<i><b>DAILY</b></i>							
Single Family Homes	61	DU	210	9.44	288	288	576

**Notes:**

<sup>1</sup> DU is Dwelling Unit.

<sup>2</sup> Institute of Transportation Engineers, Trip Generation Manual, 10th Edition, 2017 Land Use Codes.

Attachment 3  
Trip Generation Estimates

OFFICER REPORTED CRASHES THAT OCCURRED ON SR 305 MP 9.68 - 10.57 IN KITSAP COUNTY  
01/01/2017 - 12/19/2019

PRIMARY TRAFFIC WAY	MILEPOST	DATE	TIME	MOST SEVERE INJURY TYPE	# INJURED	# FATAL	# PROPERTY DAMAGE	# BIKES	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK	VEHICLE 1 ACTION	VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION FROM
305	9.68	11/20/2017	16:34	No Apparent Injury	0	0	2	0	Passenger Car	Bus or Motor Stage	Not at Intersection and Not Related	Raining	Wet	Dark-No Street Lights	From same direction - both going straight - both moving - rear-end	Going Straight Ahead	Slowing	North	North
305	9.71	02/18/2017	19:20	No Apparent Injury	0	0	1	0	Passenger Car		At Intersection and Related	Clear or Partly Cloudy	Wet	Dark-No Street Lights	Roadway Ditch	Making Left Turn		North	
305	9.71	03/14/2017	07:48	No Apparent Injury	0	0	2	0	Pickup,Panel Truck	Pickup,Panel Truck	At Intersection and Related	Raining	Wet	Daylight	Entering at angle	Making Left Turn	Going Straight Ahead	East	South
305	9.71	11/26/2017	00:47	No Apparent Injury	0	0	1	0	Pickup,Panel Truck or Vanette under 10,000 lbs		At Intersection and Not Related	Clear or Partly Cloudy	Wet	Dark-No Street Lights	Vehicle Strikes Deer	Going Straight Ahead		North	
305	9.71	11/06/2018	18:54	No Apparent Injury	0	0	2	0	Passenger Car	Pickup,Panel Truck	At Intersection and Related	Clear or Partly Cloudy	Dry	Dark-Street Lights On	Entering at angle	Making Left Turn	Going Straight Ahead	East	South
305	9.71	10/16/2019	12:45	No Apparent Injury	0	0	1	0	Truck (Flatbed, Van, etc)		At Intersection and Not Related	Overcast	Wet	Daylight	Roadway Ditch	Going Straight Ahead		North	
305	9.71	11/11/2019	17:00	Possible Injury	1	0	2	0	Passenger Car	Pickup,Panel Truck	At Intersection and Related	Clear or Partly Cloudy	Dry	Dark-Street Lights On	Entering at angle	Making Left Turn	Going Straight Ahead	East	South
305	9.72	12/11/2018	15:40	No Apparent Injury	0	0	2	0	Passenger Car	Pickup,Panel Truck	At Intersection and Not Related	Raining	Wet	Daylight	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	North	Vehicle Stop
305	9.72	12/06/2018	15:05	No Apparent Injury	0	0	3	0	Pickup,Panel Truck	Passenger Car	Intersection Related but Not at Intersection	Clear or Partly Cloudy	Dry	Dusk	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	North	Vehicle Stop
305	9.72	09/12/2019	14:55	Possible Injury	1	0	2	0	Pickup,Panel Truck	Passenger Car	Intersection Related but Not at Intersection	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - both moving - rear-end	Going Straight Ahead	Slowing	North	North
305	9.72	10/16/2019	15:45	No Apparent Injury	0	0	3	0	Pickup,Panel Truck	Passenger Car	Intersection Related but Not at Intersection	Overcast	Wet	Daylight	From same direction - both going straight - both moving - rear-end	Going Straight Ahead	Slowing	North	North
305	9.73	06/25/2018	16:45	No Apparent Injury	0	0	3	0	Pickup,Panel Truck	Passenger Car	Intersection Related but Not at Intersection	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - both moving - rear-end	Going Straight Ahead	Going Straight Ahead	North	North
305	9.73	01/18/2019	20:26	No Apparent Injury	0	0	2	0	Passenger Car	Passenger Car	Not at Intersection and Not Related	Raining	Wet	Dark-No Street Lights	From same direction - both going straight - both moving - rear-end	Going Straight Ahead	Slowing	North	North
305	9.74	11/08/2017	17:54	No Apparent Injury	0	0	3	0	Pickup,Panel Truck	Pickup,Panel Truck	Not at Intersection and Not Related	Raining	Wet	Dark-Street Lights On	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	North	North
305	9.75	07/07/2017	16:20	No Apparent Injury	0	0	2	0	Pickup,Panel Truck	Passenger Car	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	North	Vehicle Stop
305	10.07	12/15/2017	18:07	No Apparent Injury	0	0	2	0	Passenger Car	Pickup,Panel Truck	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Dark-No Street Lights	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	East	East
305	10.10	11/05/2017	11:30	No Apparent Injury	0	0	3	0	Pickup,Panel Truck	Pickup,Panel Truck	Intersection Related but Not at Intersection	Other	Wet	Daylight	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	South	Vehicle Stop
305	10.11	06/16/2017	13:40	Possible Injury	1	0	2	0	Passenger Car	Pickup,Panel Truck	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - both moving - rear-end	Going Straight Ahead	Slowing	East	East
305	10.11	11/15/2017	09:49	No Apparent Injury	0	0	1	0	Truck (Flatbed, Van, etc)		At Intersection and Related	Raining	Wet	Daylight	Over Embankment - No Guardrail Present	Making Right Turn		North	
305	10.11	02/11/2018	11:43	No Apparent Injury	0	0	2	0	Passenger Car	Pickup,Panel Truck	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	Northwest	North
305	10.11	12/12/2019	14:30	No Apparent Injury	0	0	2	0	Passenger Car	Pickup,Panel Truck	Intersection Related but Not at Intersection	Raining	Wet	Daylight	From same direction - both going straight - both moving - rear-end	Going Straight Ahead	Slowing	East	East
305	10.14	11/06/2017	14:00	No Apparent Injury	0	0	2	0	Passenger Car	Passenger Car	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - both moving - rear-end	Going Straight Ahead	Slowing	North	North