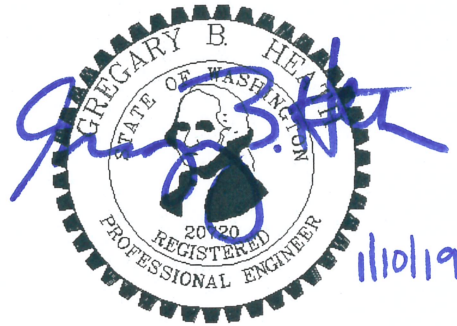




OLYMPIA HIGH SCHOOL
TRAFFIC IMPACT ANALYSIS

City of Olympia, WA



Prepared for: Ron Harpel, AIA
BLRB Architects
1250 Pacific Avenue
Tacoma, WA 98402

January 2019

January 10, 2019

Subject: Response Comments for Olympia High School Addition TIA dated 12/26/2018

File: 18-4309

The following is a response to Item 8.c Public Comments

Based on discussion with the district, the practice field use is not expected to change substantially under the new design with traffic impacts not expected to change. The school district has responded in detail as to the intended use of the practice areas.

The following are in response to comments from section 9 Transportation / Frontage Improvements.

1. Two-hour average LOS were performed for the intersections of Henderson Ave & Carlyon Ave and Henderson Ave & North St. Tables 4 & 7 reflect two-hour average calculated delays. Additional LOS sheets have been included in the appendix.
2. LOS total intersection was reported using City of Olympia's weighted average methodology for the intersection of Henderson Ave & Carlyon Ave in addition to the critical approach delay (see Tables 4 & 7). Calculation sheets have been included in the appendix.
3. Statements acknowledging that two-hour average LOS delays would have similar or better results for the school accesses as little school traffic would emanate to/from the site during off-peak times.
4. Henderson Blvd & Carlyon Ave was shown to operate at LOS F (52.8 sec) using the two-hour average delay with no mitigation or LOS C (20.3 sec) with the use of a TWLTL on Henderson Blvd.
5. Left turn warrants were revised using Figure 6: Left Turn Warrant from the Engineering Design and Development Standards (EDDS) Chapter 4. A left turn lane was found to be warranted at the West Parking 2 on Carlyon Ave and not the North Street entrances. The major influence of school related traffic creates a reduced speed lessening safety concerns. In addition, the reopening of the gate will create rebalancing of traffic between North Street and Carlyon Avenue which should redistribute some of the traffic off of Carlyon. Major widening along Carlyon to accommodate this short term, AM timeframe congestion is not proposed.

6. This has been discussed with the district. The previously closed gate on the west side of the camp which didn't allow cross circulation is now proposed to remain open which will create a balancing in traffic to the site.
7. With the provided volumes, a traffic signal is not warranted at the intersection of Henderson Blvd & Carlyon Ave.
8. The site has been revised to remove the street access in question.
9. A signal warrant analysis, based on MUTCD Warrant 3, shows a signal is not warranted at the School Loop entrance on North Street. Applicable warrant sheet is included in the appendix.

OLYMPIA HIGH SCHOOL
TRAFFIC IMPACT ANALYSIS

TABLE OF CONTENTS

1.	Introduction.....	3
2.	Project Description	3
3.	Existing Conditions	5
4.	Future Traffic Demand.....	12
5.	Conclusions and Mitigation.....	23

LIST OF TABLES

1.	Roadway Network	5
2.	Accident History.....	9
3.	Existing Level of Service – School Accesses	11
4.	Existing Level of Service – Adjacent Street Intersections.....	11
5.	Project Trip Generation	12
6.	2021 Level of Service with Project – School Accesses	19
7.	2021 Level of Service with project – Adjacent Street Intersections	19

LIST OF FIGURES

1.	Aerial View.....	3
2.	Site Plan	4
3.	Existing School AM Peak Hour Volumes.....	6
4.	Existing School PM Peak Hour Volumes.....	7
5.	Existing Adjacent Street PM Peak Hour Volumes	8
6.	Trip Distribution – School AM Peak Hour	13
7.	Trip Distribution – School PM Peak Hour	14
8.	Trip Distribution – Adjacent Street PM Peak Hour.....	15
9.	2021 School AM Peak Hour with Project.....	16
10.	2021 School PM Peak Hour with Project.....	17
11.	2021 Adjacent Street PM Peak Hour with Project	18

OLYMPIA HIGH SCHOOL TRAFFIC IMPACT ANALYSIS

1. INTRODUCTION

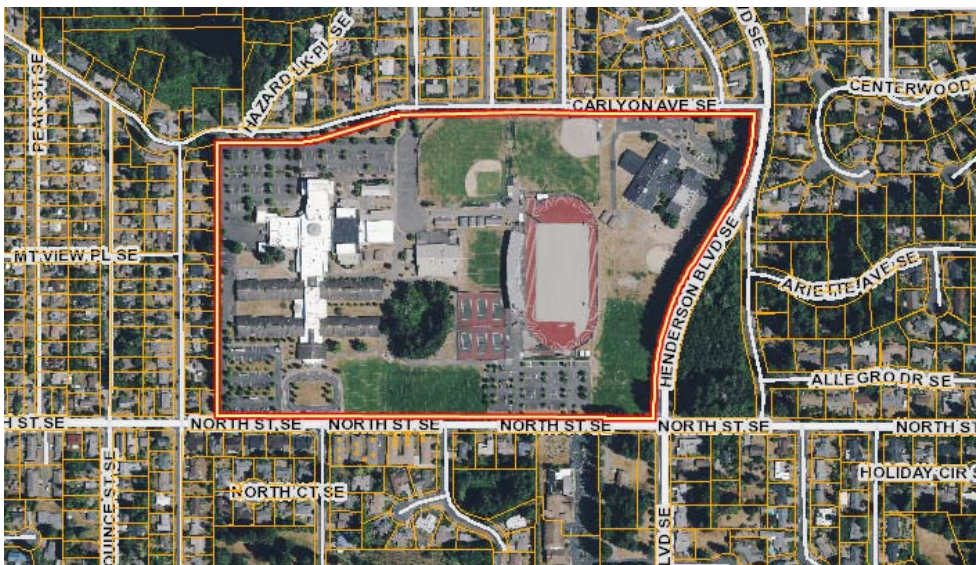
The main goals of this study focus on the assessment of existing roadway conditions and forecasts of newly generated project traffic. The first task includes the review of general roadway information on the roadways serving the site, baseline conditions, and entering sight distance data. Forecasts of future traffic and dispersion patterns on the street system are then determined using established trip generation and distribution techniques. As a final step, appropriate conclusions and mitigation measures are defined if needed.

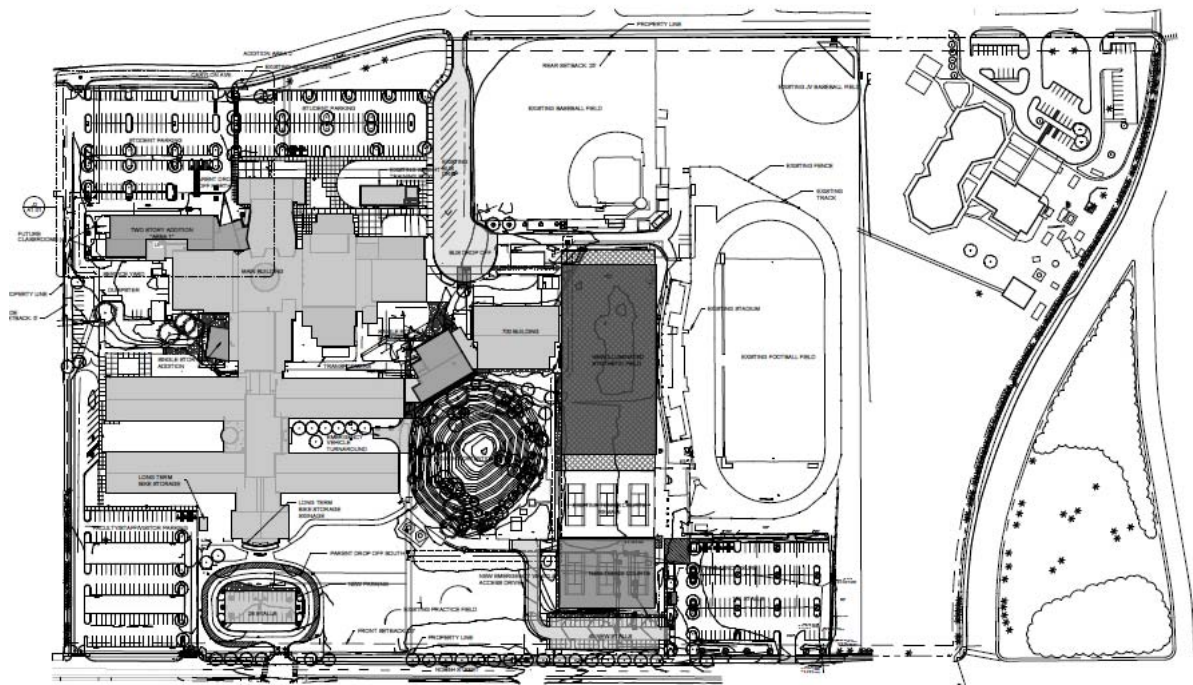
2. PROJECT DESCRIPTION

The Olympia School district proposes to modernize and build approximately 41,000 square feet of additions to the existing Olympia High School. The high school was originally opened in 1961 and last had updates in 1999-2000. The proposed additions would include 25 new classrooms in three separate areas, new parking configurations, and new playing fields. The school will remain at its current location bordered by Carlyon Avenue SE to the north, North Street SE to the south, and Henderson Blvd SE to the east. The 52-acre campus is situated on parcel 09890050000 at 1113 Legion Way SE. Existing student capacity/enrollment at the high school is 1850 students. The new school will eliminate portables and increase student capacity to 2105.

A site plan illustrating the overall configuration of the proposed additions is presented in Figure 2. The project has an anticipated completion date of 2021. For conservative purposes, this analysis assumes the school to operate at full-capacity for the 2021 horizon year.

Figure 1: Aerial View





HEATH & ASSOCIATES
TRAFFIC AND CIVIL ENGINEERING

OLYMPIA HIGH SCHOOL

SITE PLAN
FIGURE 2

3. EXISTING CONDITIONS

3.1 Surrounding Roadway System

The street network serving the high school consists of a variety of roadways. The roadways and arterials surrounding the site are listed and described below.

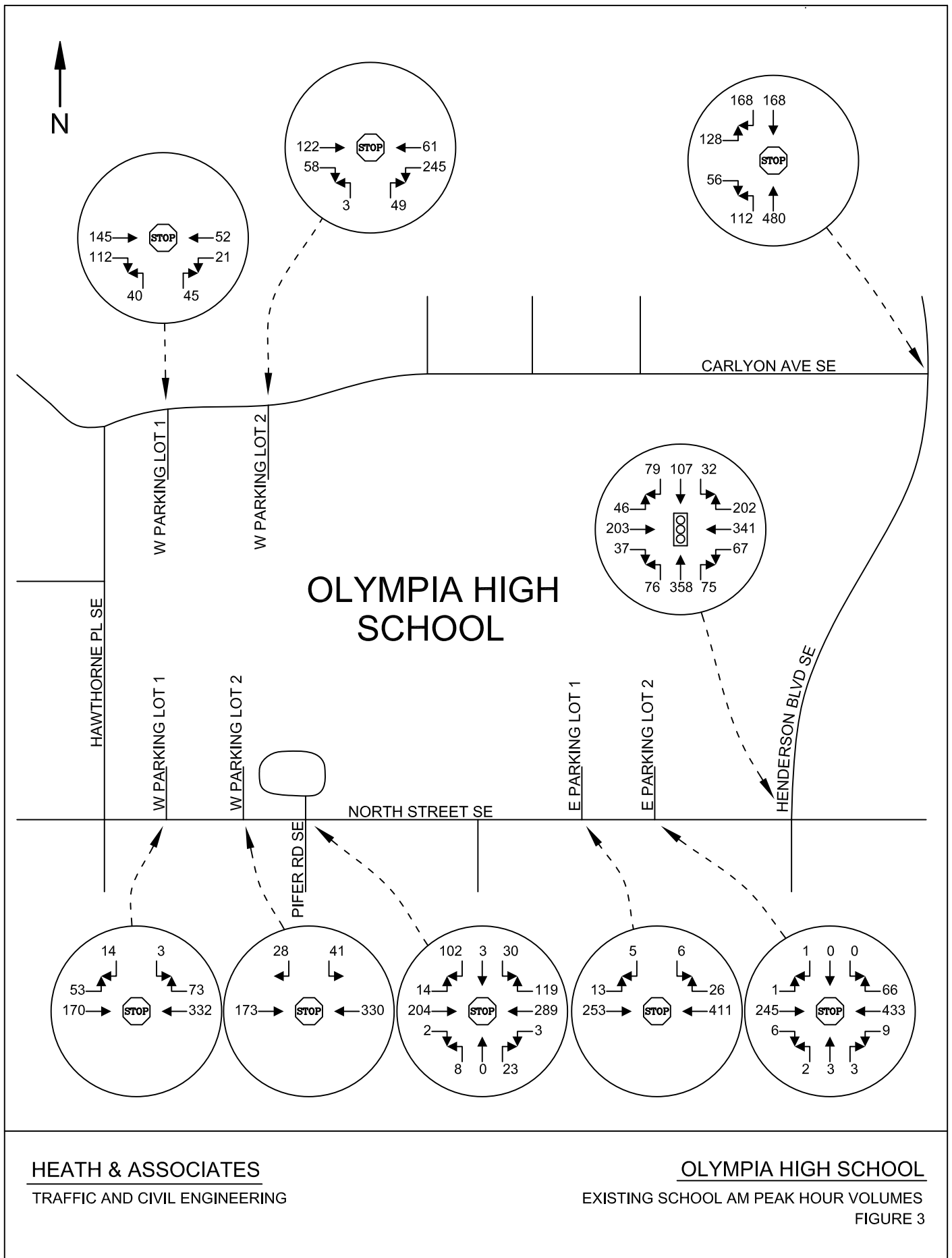
Table 1
Roadway Network

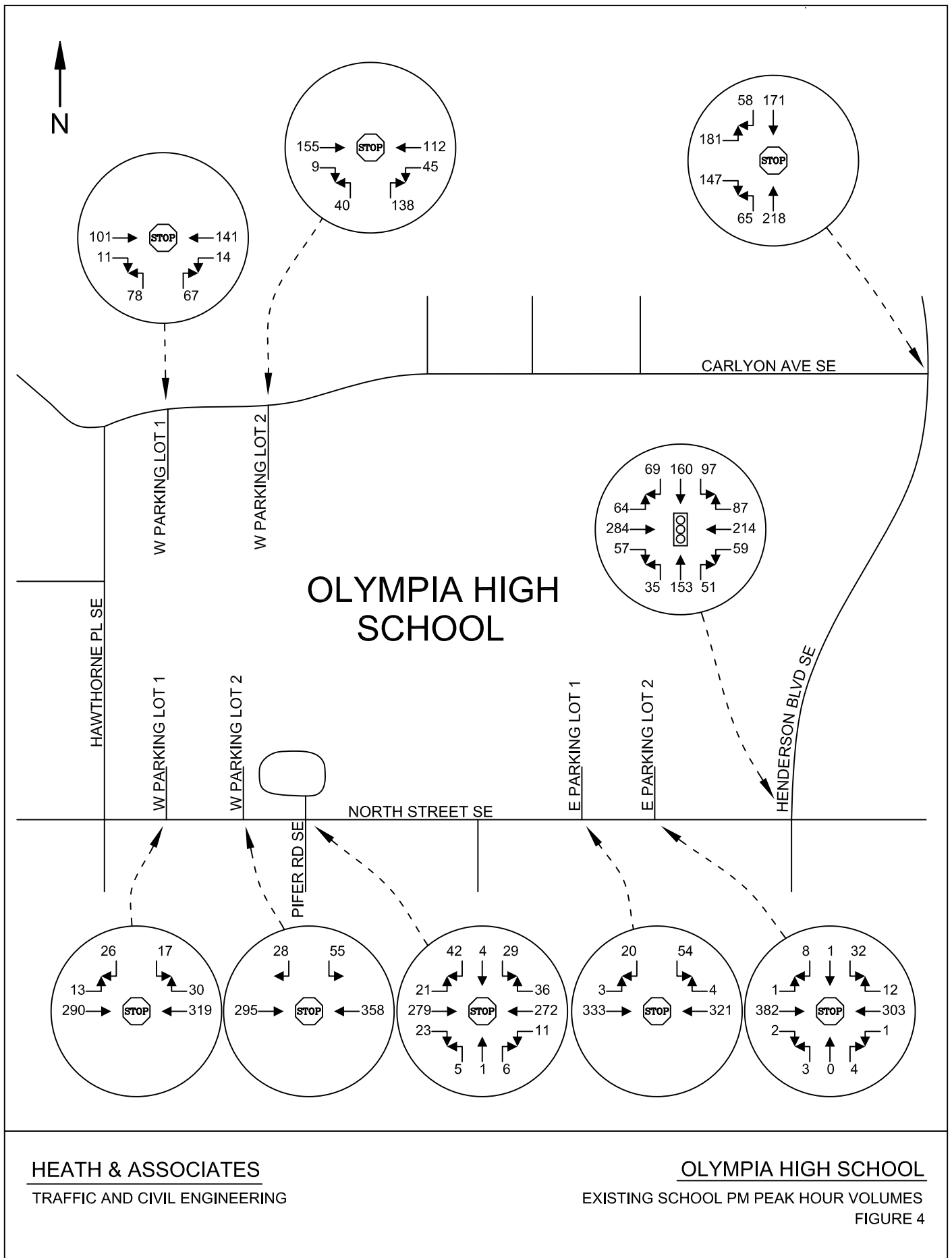
Roadway	Functional Classification	Speed Limit	Travel Lanes	Sidewalk	Bike Facilities
Henderson Blvd	Arterial (Plum St to North St) Major Collector (North St to Yelm Hwy)	20-35 mph	2/3	S/O Eskridge Blvd	Yes
Carlyon Ave	Major Collector	20-25 mph	2	Yes	Yes
North St	Major Collector	20-25 mph	2	Yes	Yes
Hawthorne Pl SE	Local	25 mph	2	Yes	No

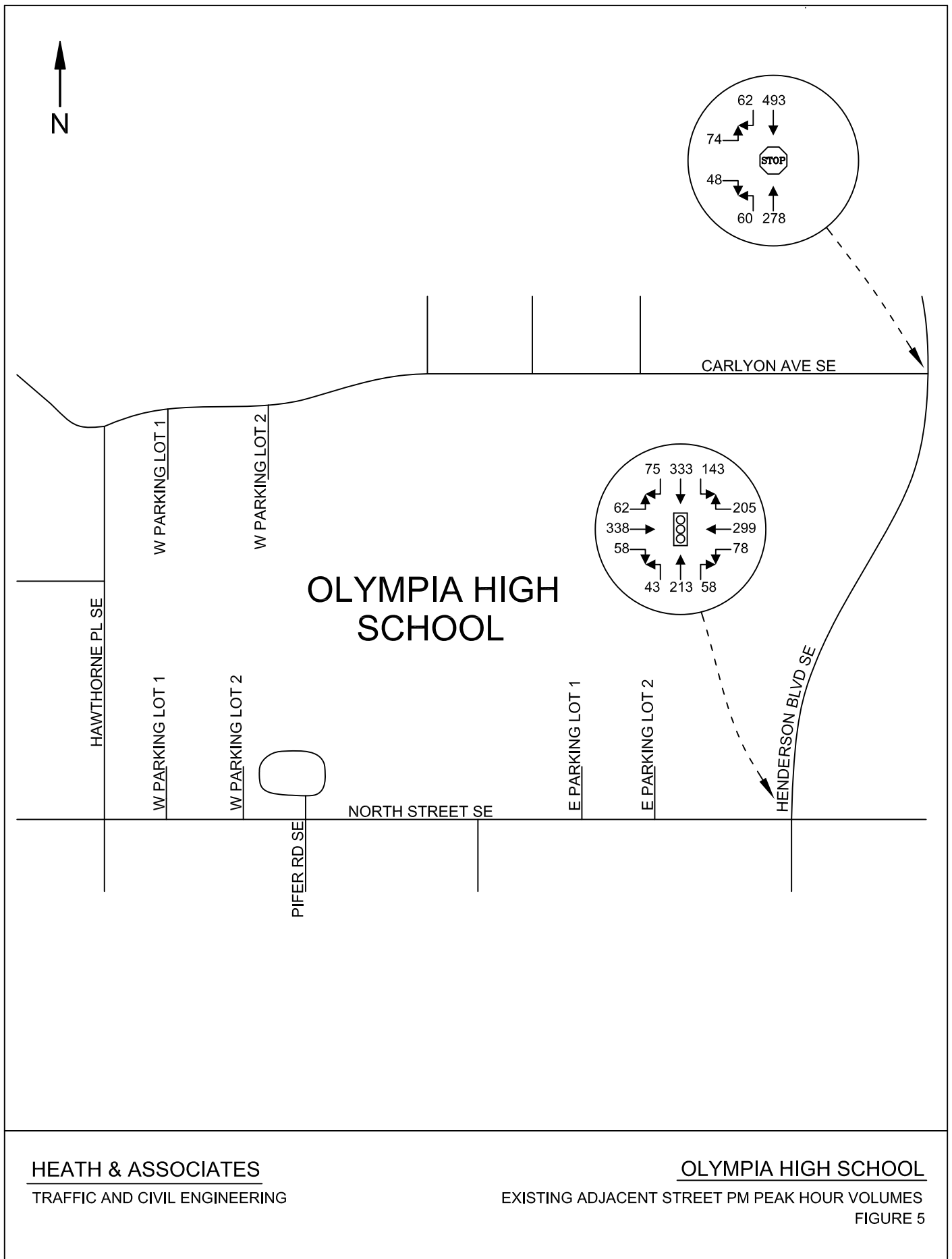
3.2 Existing Peak Hour Volumes and Patterns

Field data for this study was collected in June of 2018 while school was still in session to capture existing travel patterns associated with the current Olympia High School. Counts were taken to coincide with the school's peak travel demands defined by set bell schedules. Olympia High School's typical bell schedule is from 7:45-2:22 PM with one-hour early release on Wednesdays. Field counts were performed from 6:45-8:45 AM and from 1:45-3:45 PM (non-Wednesday) and were taken at all seven of the school's primary access points. In addition, the City of Olympia has provided turning movement data for the two nearby intersections: Henderson Blvd SE & Carlyon Avenue SE and Henderson Blvd SE & North Street SE. Data for these intersections consisted of the school's peak AM and PM travel times as well as the adjacent streets peak from 4-6PM.

The one hour exhibiting the highest overall vehicular volumes (peak hour) at each access and intersection is then used for capacity and delay analysis. Figure 3-5 illustrates peak hour volumes captured at each respective location for all time period scenarios. Full-count data sheets have been attached to the appendix for reference.







HEATH & ASSOCIATES
TRAFFIC AND CIVIL ENGINEERING

OLYMPIA HIGH SCHOOL
EXISTING ADJACENT STREET PM PEAK HOUR VOLUMES
FIGURE 5

3.3 Non-Motorist Traffic & Safety

The surrounding area has a robust network of non-motorist facilities in the form of complete sidewalk networks, marked crosswalks, and bike lanes. Moreover, adequate school zone signage was identified on the adjacent arterials with reduced speed limits when flashing to reduce potential conflicts between motorist and non-motorist traffic. A rapid flashing beacon (RFB) was installed at the intersection of Henderson Blvd SE & Carlyon Avenue SE along with additional crosswalk signage at Henderson Blvd SE & North Street SE to enhance driver awareness. Additional information with respect to pedestrian and cyclist safety is discussed in Accident History.

3.4 Accident History

A list of the recorded accident history from 2014 through 2016 for the study intersections and corridors was requested and obtained from the City of Olympia. A summary of the accident totals per year and estimated collisions per million entering vehicles (MEV) at the intersections is provided in Table 2 below.

Table 2
Accident History

Location	2014	2015	2016	Avg/yr	Crash Rate (per MEV)
<u>Henderson Blvd SE</u>					
at: Carlyon Ave SE	4	0	1	1.67	0.44
between: Carlyon Ave SE & North Street SE	1	1	0	0.67	--
at: North Street SE	6	7	4	5.67	0.81
<u>Carlyon Avenue SE</u>					
between: Hawthorne PI SE & Henderson Blvd SE	2	2	1	1.67	--
<u>North Street SE</u>					
between: Hawthorne PI SE & Henderson Blvd SE	2	1	1	1.33	--

A review of the crash data indicates the most common accident occurrences were in the form of turning approach (9), rear-end collisions (8), pedestrian/cyclist (6), right-angle (6), and other (4). No fatalities were recorded. Crash rates were determined at the major intersections for safety analysis. A common threshold when determining the need for potential additional safety analyses are crash rates above 1.0 MEV. As shown, rates fall below this threshold. However, it should be noted that all turning approach collisions occurred at the intersection of Henderson Blvd SE & North Street SE. It should also be

noted that each of the accidents involving a non-motorist took place at or near the intersections of Henderson Blvd SE & Carylton Ave SE and Henderson Blvd SE & North Street. The trend, however, has been declining (2014-3; 2015-2; 2016-1) though more data may be needed. Two pedestrian accidents occurred outside school hours. The City may want to further investigate intersection conditions if trends continue and/or increase.

3.5 School Access

North Street SE is a relatively flat roadway with no sight distance impediments. The seven existing entrances as illustrated in Figure 3 will continue serving the high school subsequent to the proposed additions. No sight distance deficiencies are identified.

3.6 Existing Level of Service

Existing peak hour delays were determined through the use of the *Highway Capacity Manual* 6th Edition. Capacity analysis is used to determine level of service (LOS) which is an established measure of congestion for transportation facilities. The range¹ for intersection level of service is LOS A to LOS F with the former indicating the best operating conditions with low control delays and the latter indicating the worst conditions with heavy control delays. Detailed descriptions of intersection LOS are given in the 2016 Highway Capacity Manual. Level of service calculations were made through the use of the Synchro 10 analysis program. Table 3 on the following page summarizes existing access delays at Olympia High School; Table 4 summarizes existing intersection delays.

¹ *Signalized Intersections - Level of Service*

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

Highway Capacity Manual, 6th Edition

Stop Controlled Intersections – Level of Service

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

Table 3
Existing Level of Service – School Accesses
Delays given in seconds per vehicle

		<i>School AM Peak Hour</i>		<i>School PM Peak Hour</i>	
Access	Control	LOS	Delay	LOS	Delay
North Street SE					
West Parking 1	Stop	B	14.4	B	13.1
West Parking 2	Stop	C	17.1	B	13.9
Loop & Pifer Rd SE	Stop	D	32.9	B	13.9
East Parking 1	Stop	C	18.4	C	15.0
East Parking 2	Stop	C	22.2	C	16.3
Carlyon Ave SE					
West Parking 1	Stop	C	16.0	B	11.5
West Parking 2	Stop	B	13.3	B	12.4

Existing delays at the school's entrances are shown to operate at LOS C or better with the exception of the student loop at North Street SE which is shown to operate at LOS D for the AM peak hour. This access was shown to support a significant amount of school-related traffic in a relatively short time period. No delay deficiencies at this access are observed outside of the school AM peak hour. All two-hour average delays would be significantly lower as school driveways support little vehicular activity outside school peak times.

Table 4
Existing Level of Service – Adjacent Street Intersections
Delays given in seconds per vehicle

				<i>School AM Peak Period</i>	<i>School PM Peak Period</i>	<i>Adjacent Street PM Peak Period</i>		
Intersection	Control	Approach	LOS	Delay	LOS	Delay	LOS	Delay
Henderson Blvd SE & Carlyon Ave SE	Stop	Overall	A	7.0	A	5.6	A	2.8
		EB	E	36.6	C	16.6	C	17.7
Henderson Blvd SE & North Street SE	Signal	Overall	B	18.0	A	9.3	B	15.4

Two-hour average delays were calculated for the adjacent intersections summarized in Table 4. Existing delays are shown to operate at LOS E at the intersection of Henderson Blvd SE & Carlyon Avenue SE for the existing AM peak period. The influx of school-related traffic causes said intersection to operate with substandard LOS for a short duration while parents and students arrive and depart. Other peak hour time periods are shown to operate with acceptable LOS C.

4. FUTURE TRAFFIC DEMAND

4.1 School Traffic Generation

The current student capacity/enrollment of Olympia High School is approximately 1,850 students with the updated campus supporting not more than 2,105 students. To determine new trips associated with the potential increase in students, data from the Institute of Transportation Engineer's (ITE) publication *Trip Generation* was used for trip rate derivations. Consistent with the City's current Transportation Impact Fee Rate, ITE's 9th Edition manual rates were applied. The independent variable "students" was used for trip generation determination and consisted of the high school at full-capacity, or 255 new students. Table 5 below summarizes anticipated trips for the average weekday daily trips (AWDT), the school's AM and PM peak hours and the adjacent street (4-6 PM) peak hour timeframes. Refer to the appendix for trip generation output.

Table 5
Project Trip Generation

Land Use (530)	Net Increase	AWDT	School Peak Hour						Adjacent St PM Peak Hour		
			AM			PM			PM		
			In	Out	Total	In	Out	Total	In	Out	Total
High School	255 students	436	75	35	110	24	50	74	16	17	33

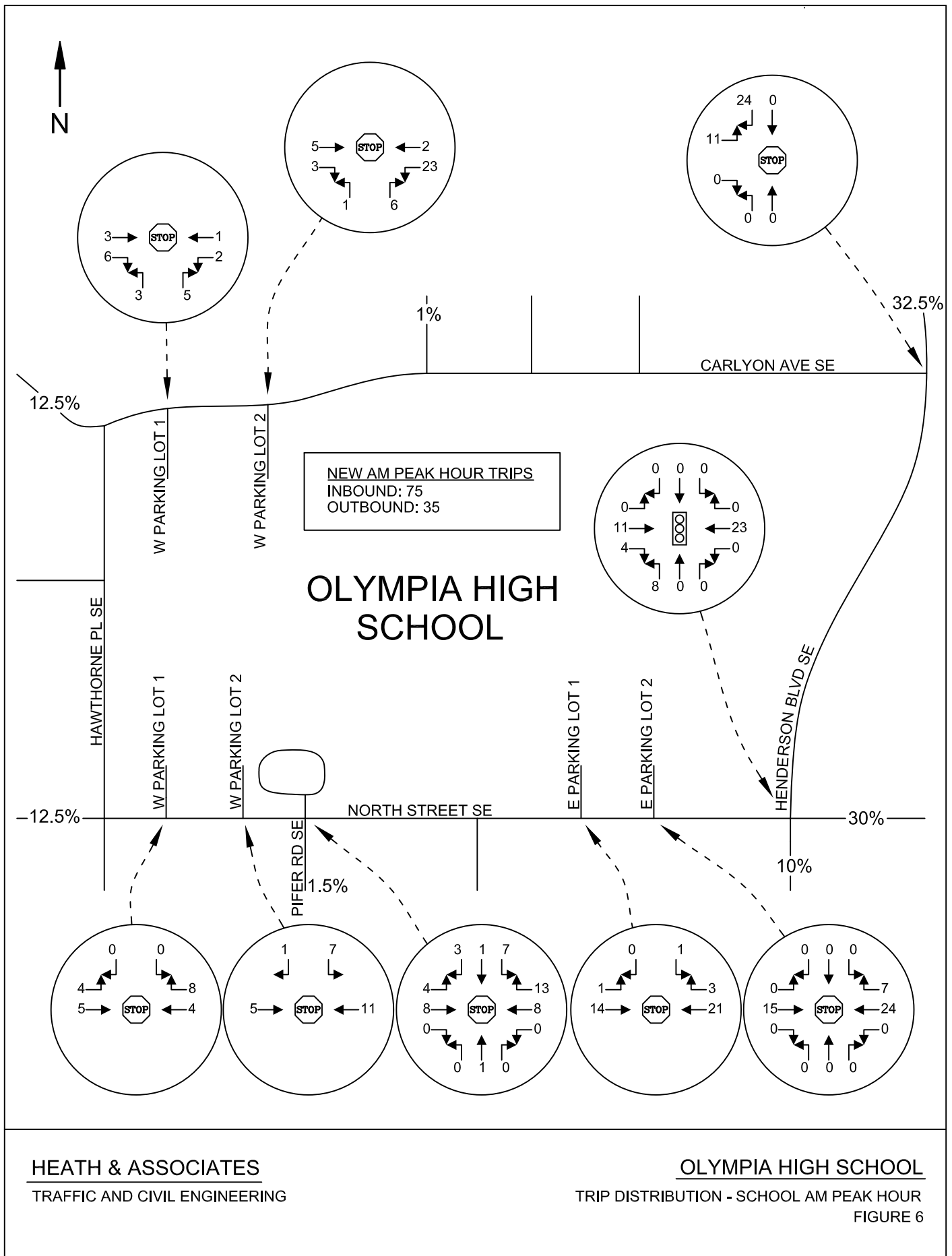
Table 3 above indicates an increase of 110 AM and 74 PM school peak hour trips would be estimated with Olympia High School at full student capacity.

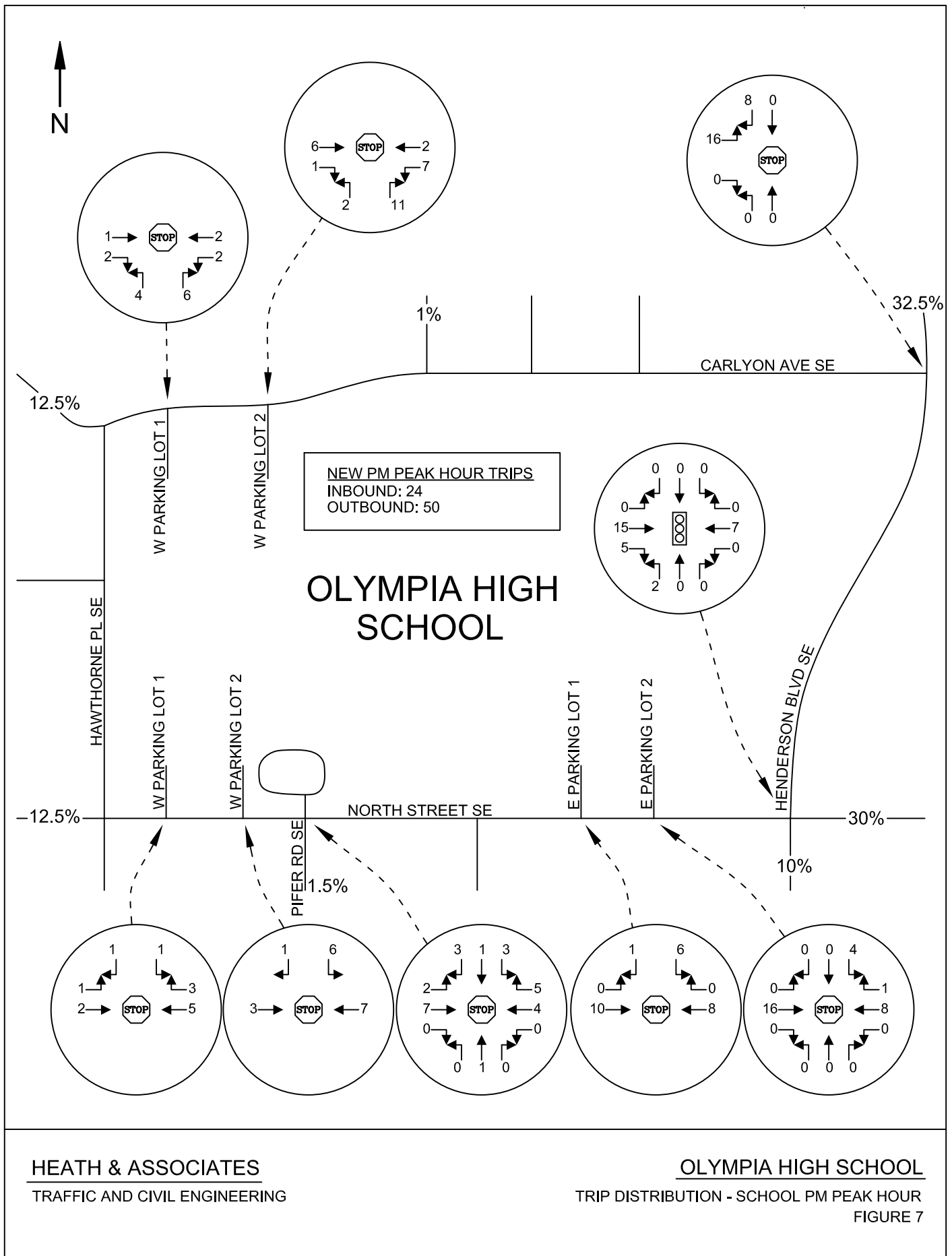
4.2 Distribution & Assignment

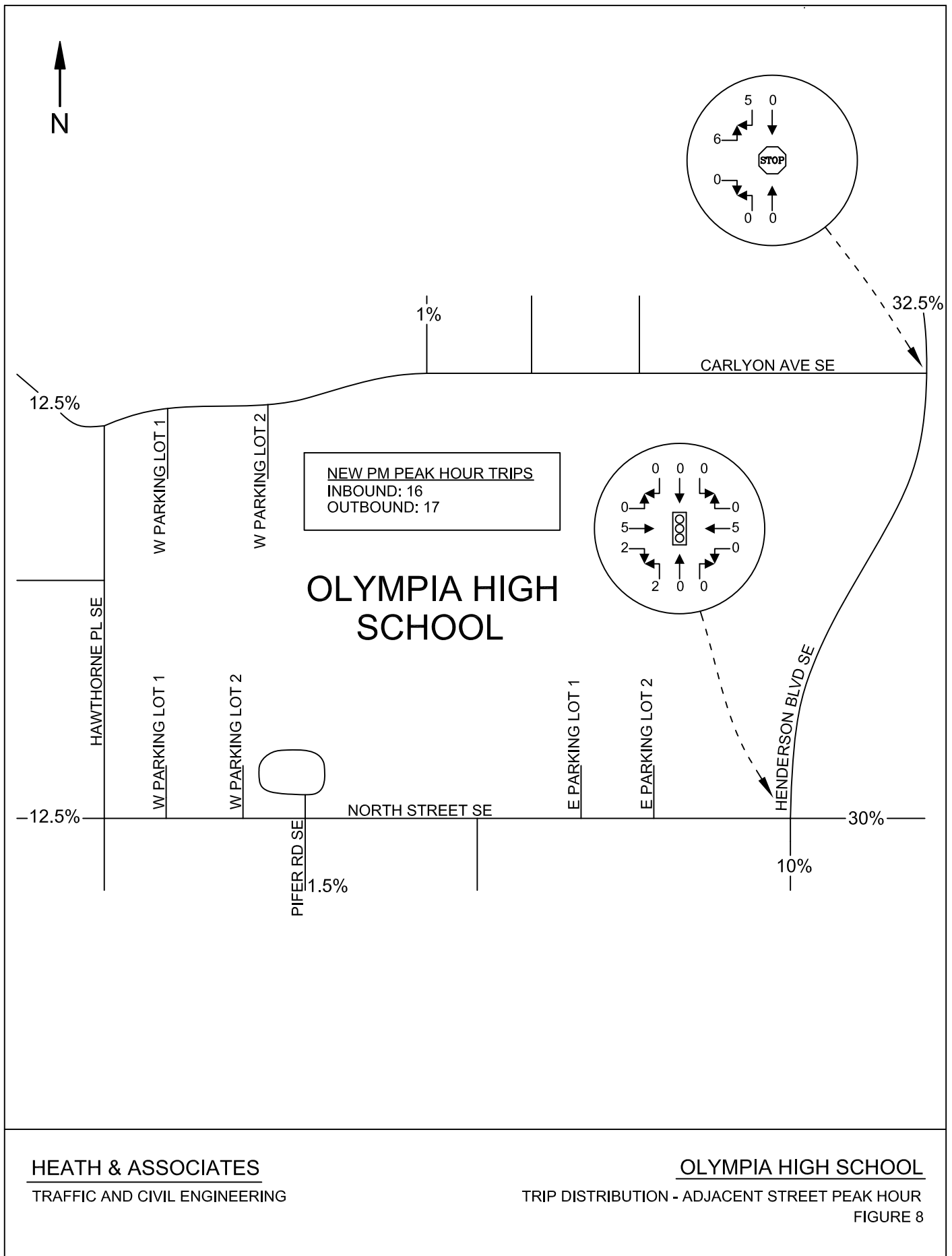
Trip distribution percentages were obtained from Thurston County Regional Planning Council and were derived from the TAZ-323 distribution map. Percentages and new trip routes are illustrated on the following figures (Figures 6-8) for each time period scenario. New trips taken to/from Olympia High School's accesses are based on existing patterns identified from field data and coordinated with the new site plan.

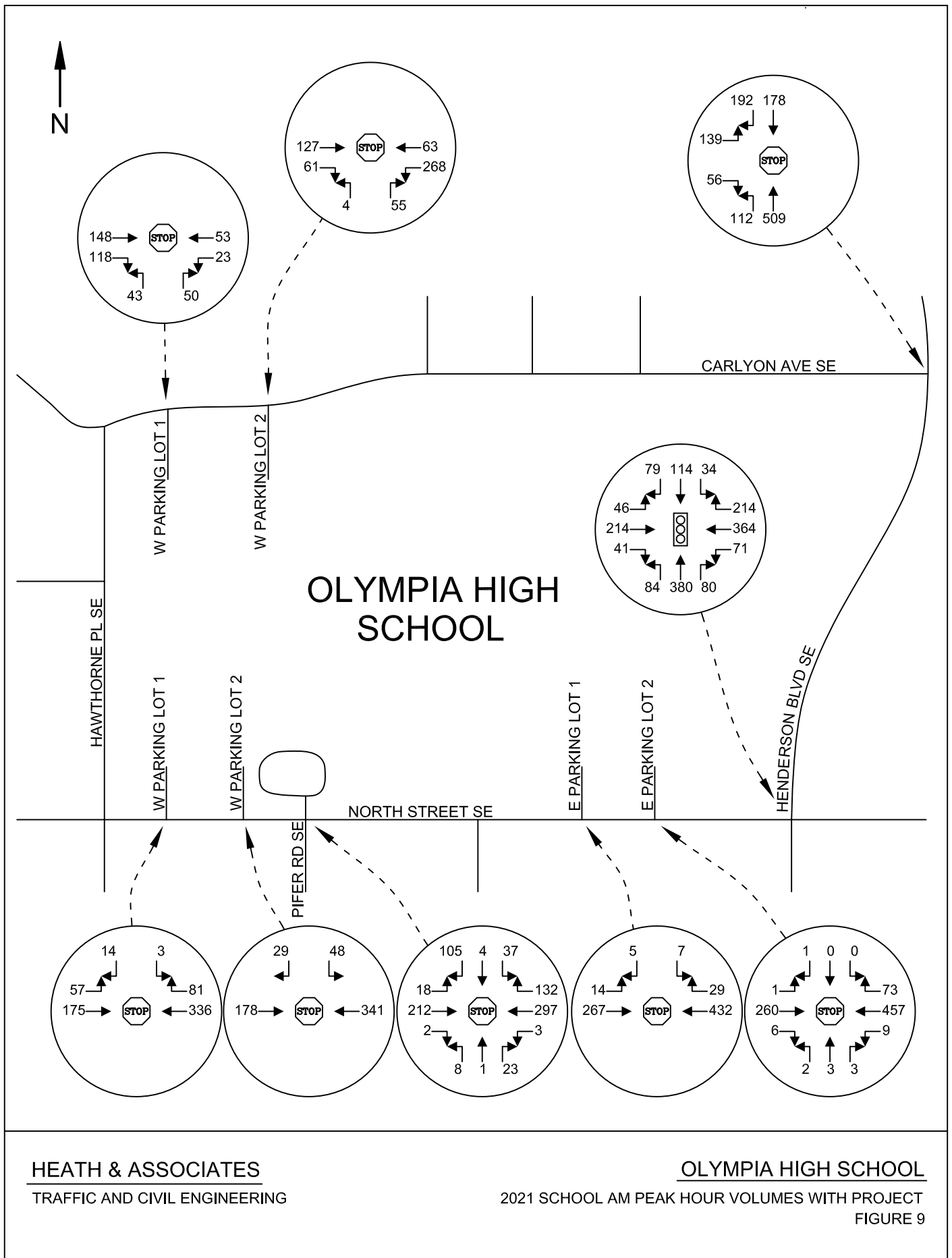
4.3 Forecast Traffic Volumes

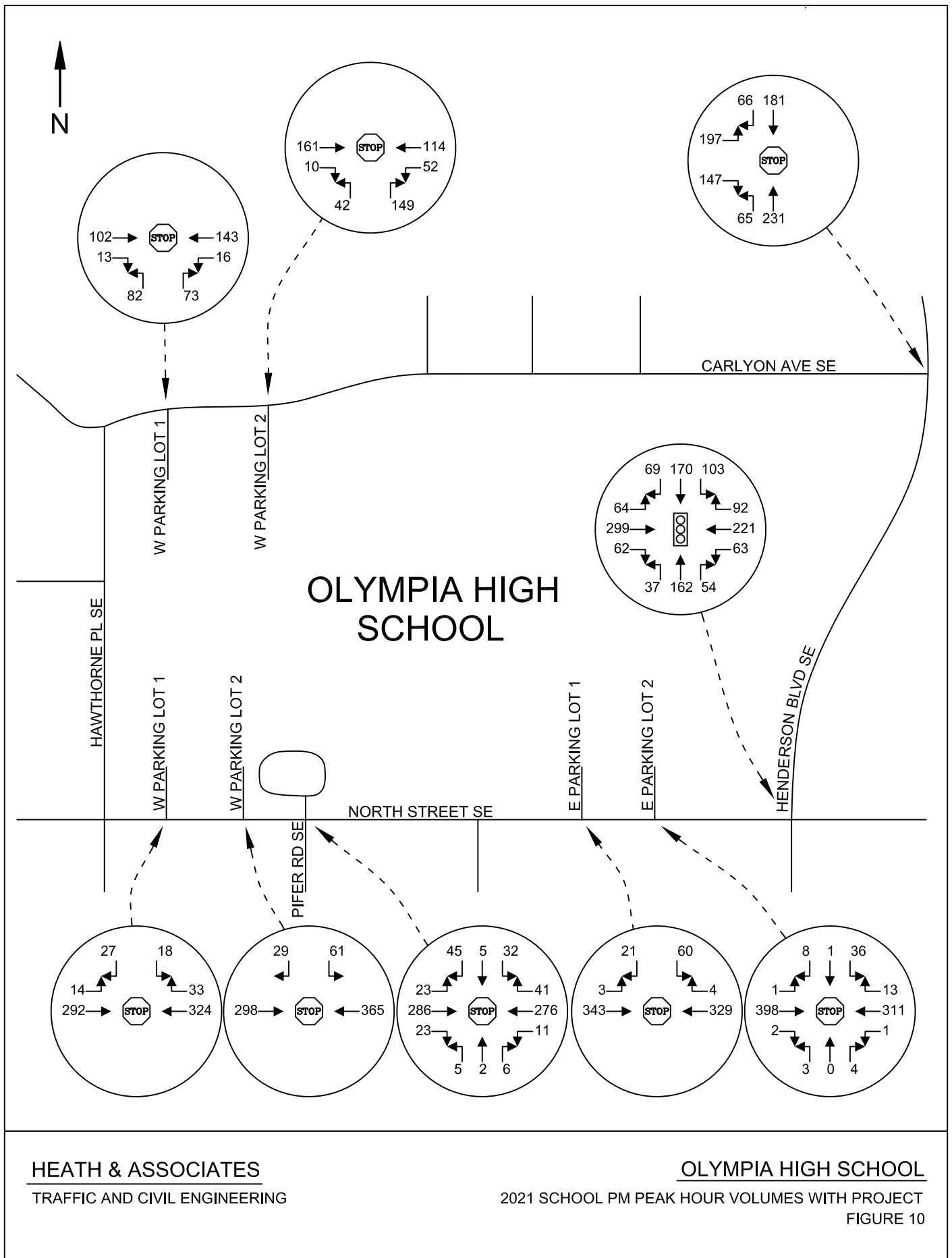
A 3-year horizon of 2021 was used to assess forecast conditions at the time of anticipated project buildout. Growth was accounted by assuming the school to operate at full student capacity of 2,105 for the school peak hours. Furthermore, a 2 percent ambient annual growth rate was applied to all intersection movements not receiving school-related traffic. Similarly, the 2 percent ambient growth rate was applied to all movements for the 4-6 PM scenario. Forecast 2021 peak hour volumes are illustrated in Figures 9-11.

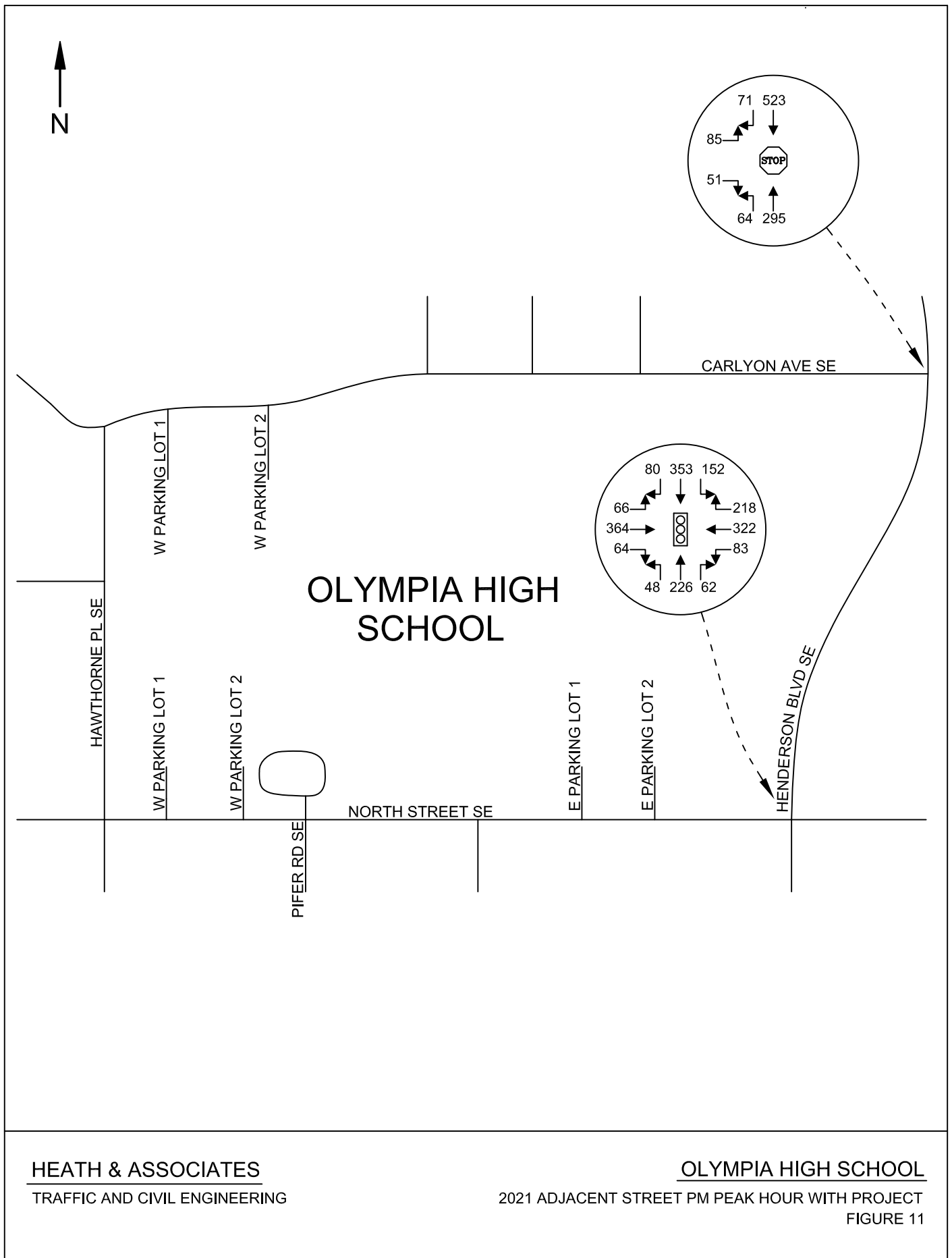












4.4 Future Level of Service

Level of service analyses were made of the future school AM and PM peak hour volumes at the key roadways and intersections using the *Synchro 10* analysis program. Delays for the school accesses and adjacent intersections under future conditions are shown below in Table 6 and Table 7, respectively.

Table 6
2021 Level of Service with Project – School Accesses
Delays given in seconds per vehicle

		<i>School AM Peak Hour</i>		<i>School PM Peak Hour</i>	
Access	Control	LOS	Delay	LOS	Delay
North Street SE					
West Parking 1	Stop	B	14.7	B	13.3
West Parking 2	Stop	C	18.4	B	14.3
Loop & Pifer Rd SE	Stop	E	45.6	B	14.4
East Parking 1	Stop	C	20.1	C	15.7
East Parking 2	Stop	C	24.3	C	17.2
Carlyon Ave SE					
West Parking 1	Stop	C	17.2	B	11.7
West Parking 2	Stop	C	15.5	B	13.0

The student loop at North Street SE is shown to operate at LOS E for the AM peak hour. As previously mentioned, this entrance supports a significant amount of vehicular activity for a short duration. Minimal delays are observed outside the school's AM peak hour. All other entrances are shown to operate with acceptable LOS. Again, all two-hour average delays would be significantly lower as school driveways support little vehicular activity outside school peak times.

Table 7
2021 Level of Service with Project – Adjacent Street Intersections
Delays given in seconds per vehicle

			<i>School AM Peak Period</i>		<i>School PM Peak Period</i>		<i>Adjacent Street PM Peak Period</i>	
Intersection	Control	Approach	LOS	Delay	LOS	Delay	LOS	Delay
Henderson Blvd SE & Carlyon Ave SE	Stop	Overall	A	9.6	A	6.1	A	3.1
		EB	F	52.8	C	18.4	C	19.5
		<i>EB</i>	<i>C</i>	<i>20.3</i>	<i>B</i>	<i>14.6</i>	<i>B</i>	<i>14.8</i>
Henderson Blvd SE & North Street SE	Signal	Overall	C	20.6	A	10.0	B	17.8

As summarized in Table 7, forecast 2021 AM two-hour average delays at the intersection of Henderson Blvd SE & Carlyon Avenue SE are shown to operate at LOS F. These delays reflect the school with an additional 255 students and ambient growth. The influx of school-related traffic paired with high northbound volumes on Henderson Blvd SE heading to I-5 result in momentary substandard LOS. The intersection is shown to operate satisfactorily under remaining scenarios. A potential mitigating action of striping to accommodate a two-way left turn lane (TWLTL) on the north leg of Henderson Blvd SE would allow outbound Carlyon Avenue SE traffic to enter the roadway using a two-step maneuver. Delays reflecting the use of TWLTL may be reduced by up over half (52.8 seconds to 20.3 seconds for the AM period).

4.4 Left Turn Warrants

Left turn warrants were analyzed at the school's existing entrances along Carlyon Avenue SE and North Street SE under 2021 peak hour conditions. Left turn warrant calculations were based on Chapter 4 of the City of Olympia's Engineering Design and Development Standards using *Figure 6: Left Turn Warrant*. Two critical accesses receiving the majority of left turns were analyzed: West Parking 2 & Carlyon Avenue SE and West Parking 1 & North Street SE. Based on 2021 school AM peak hour conditions, a left turn lane was found to be warranted at only the Carlyon Entrance. However, the low travel speeds (20 mph for school zones) generally reduces the need to safely remove turning vehicles from the through lane.

In addition, the school is proposing to open the previously closed gate on the west side of the campus to allow for more internal circulation. The opened gate may also relieve left turn traffic at the West Parking 2 entrance by redistributing and balancing routes with other accesses. PM peak and off-peak hours do not require the need for left turn storage on Carlyon Avenue SE. Due to geometrical roadway constraints with low travel speeds and the need for only a short duration of a 24-hour period, left turn channelization may not be required.

4.5 Signal Warrants

A signal warrant was analyzed at the School's Loop entrance opposite Pifer Rd SE on North Street SE. Warrant criteria used the *Manual on Uniform Traffic Control Devices* (MUTCD) Warrant 3 (Peak Hour). Results show that a signal is not warranted based on 2021 AM peak hour volumes with the increased student count. A warrant calculation sheet has been included in the appendix for reference.

In addition, the City of Olympia has performed a signal analysis at the intersection of Henderson Blvd SE & Carlyon Ave SE and found a signal was *not* warranted.

4.6 Practice Field Use

Based on discussions with the Olympia School District, the following narrative regarding practice field use is provided. Overall, traffic will be similar to what is now occurring.

The district is proposing to install a new full size (76,000sf) synthetic turf practice field, to replace the existing grass practice field on the Olympia High School campus, between the 700 (Allied Arts) Building, and Ingersoll Stadium. The Practice Field will not be scheduled for non-district use when Ingersoll is scheduled for event use. The Practice Field can be used for warm ups for the Ingersoll event, or where there is a short overlap (less than one half hour) as a district use or non-district use is ending its use and the Ingersoll event is beginning.)

With this practice field being centrally located on this campus, it helps mitigate light from spilling onto neighboring properties. The light fixtures being proposed for the project are designed to direct light onto the field area, and minimize glare to adjacent properties to the greatest extent possible. Fully shielded LED luminaires focus light only on the field to provide an average of 30 foot-candles of coverage. This is the minimum level of lighting needed for recreational use. The lighting will allow extended use into times with low street traffic volumes but no change in intensity.

There are no bleachers, or public address systems with this proposal. We do not expect large crowds, and anticipate minimal traffic impact as a result of this field being used by the school, or public. Noise makers (Air horns, cowbells, sirens and similar noisemakers) will be prohibited.

Hours of operation for the use of field lights will comply with Olympia School District's Ingersoll Stadium Policy No. 4260P(C) as shown below. Lighting would occur during sporting practices, games, and events as needed. The following hours are proposed.

District Use:

Monday – Friday 8:00 am – 10:00 pm

Saturday 9:00 am – 10:00 pm

Sunday N/A

Non-District Use:

Monday – Friday 5:00 pm – 9:00 pm

Saturday 9:00 am – 9:00 pm

Sunday 12:00 pm – 6:00 pm

5. CONCLUSIONS AND MITIGATION

The Olympia School District proposes for approximately 41,000 square feet of additions to Olympia High School located at 1113 Legion Way SE. The project would eliminate on-site portables and increase the campus student capacity from 1850 students to 2105. All seven existing accesses to the school will continue to support ingress/egress. A site plan illustrating the proposed areas for addition and parking configurations is presented in Figure 2. A total of 609 parking stalls would be provided and meet the City's parking requirements. Existing level of service (LOS) at the school access points are summarized in Table 3 and operate at LOS D or better for the school AM and LOS C or better for the school PM peak hours. The intersections of Carylton Avenue SE & Henderson Blvd SE and North Street SE & Henderson Blvd SE were analyzed in terms of two-hour average LOS and are summarized in Table 4. Carylton Avenue SE is shown to operate at LOS E (36.6 sec) for the AM peak hour.

A three-year horizon of 2021 was used in order to assess future impacts to the surrounding roadway network. To perform worst case conditions, the school was assumed to be operating at full-capacity, or a net increase of 255 students. ITE data suggests this would result in an additional 110 AM and 74 PM trips for the school's peak hour travel times and 33 PM peak hour trips for the 4-6 PM adjacent street peak time period. The 2021 AM peak hour level of service analysis shows the student loop driveway on North Street SE operating at LOS E though the two-hour average would be significantly lower once school traffic subsides. Moreover, the intersection of Carylton Avenue SE & Henderson Blvd SE is shown to operate at LOS F (52.8 sec) or LOS C (20.3 sec) if a two-way left turn lane were implemented on the north leg of Henderson Blvd SE. Delays are shown to remain mild at LOS C or better for all locations under forecast 2021 PM peak hour conditions.

A Left turn lane is warranted under forecast 2021 AM peak hour conditions at the West Parking 2 entrance on Carylton Avenue SE. Turn lanes are not warranted at any other access under all time periods. The urban setting and low travel speeds paired with a momentary influx of turning movements may not result in the requirement of a left turn lane. The brief demand of high left turn percentages would require significant storage length to avoid spillover to the adjacent lane and are thus not feasible in this application. Capacity and delays are sufficient throughout the remainder of the day. In addition, the school has proposed to open the gate connecting the north and south parking areas on the west side of the campus. This would allow for opportunities to rebalance and redistribute traffic to other on-site entrances.

Based on the above, recommended mitigation is as follows:

1. Restripe the north leg of Henderson Blvd SE at Caryl Avenue SE to provide a two-way left turn lane (TWLTL). This mitigating action reduces delays and allows outbound traffic to perform a two-step maneuver onto Henderson Blvd SE. Forecast 2021 AM peak hour delays with TWLTL (LOS C 20.3 sec) improves existing conditions (LOS E 36.6 sec) using two-hour average LOS.
2. Pay Traffic Impact Fees as required by the City of Olympia. The City recognizes a 20 percent pass-by reduction on new trips for the high school use. Exact fees and calculations will be determined by the City.

No other mitigation is identified at this time.

OLYMPIA HIGH SCHOOL
TRAFFIC IMPACT ANALYSIS

APPENDIX

LEVEL OF SERVICE

The following are excerpts from the *2016 Highway Capacity Manual - Transportation Research Board Special Report 209*.

Quality of service requires quantitative measures to characterize operational conditions within a traffic stream. Level of service (LOS) is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience.

Six LOS are defined for each type of facility that has analysis procedures available. Letters designate each level, from A to F, with LOS A representing the best operating conditions and LOS F the worst. Each level of service represents a range of operating conditions and the driver's perception of those conditions.

Level-of-Service definitions

The following definitions generally define the various levels of service for arterials.

Level of service A represents primarily free-flow operations at average travel speeds, usually about 90 percent of the free-flow speed for the arterial classification. Vehicles are seldom impeded in their ability to maneuver in the traffic stream. Delay at signalized intersections is minimal.

Level of service B represents reasonably unimpeded operations at average travel speeds, usually about 70 percent of the free-flow speed for the arterial classification. The ability to maneuver in the traffic stream is only slightly restricted and delays are not bothersome.

Level of service C represents stable operations; however, ability to maneuver and change lanes in midblock locations may be more restricted than in LOS B, and longer queues, adverse signal coordination, or both may contribute to lower average travel speeds of about 50 percent of the average free-flow speed for the arterial classification.

Level of service D borders on a range in which small increases in flow may cause substantial increases in approach delay and hence decreases in arterial speed. LOS D may be due to adverse signal progression, inappropriate signal timing, high volumes, or some combination of these. Average travel speeds are about 40 percent of free-flow speed.

Level of service E is characterized by significant delays and average travel speeds of one-third the free-flow speed or less. Such operations are caused by some combination of

adverse progression, high signal density, high volumes, extensive delays at critical intersections, and inappropriate signal timing.

Level of service F characterizes arterial flow at extremely low speeds, from less than one-third to one-quarter of the free-flow speed. Intersection congestion is likely at critical signalized locations, with long delays and extensive queuing.

These definitions are general and conceptual in nature, and they apply primarily to uninterrupted flow. Levels of service for interrupted flow facilities vary widely in terms of both the user's perception of service quality and the operational variables used to describe them.

For each type of facility, levels of service are defined based on one or more operational parameters that best describe operating quality for the subject facility type. While the concept of level of service attempts to address a wide range of operating conditions, limitations on data collection and availability make it impractical to treat the full range of operational parameters for every type of facility. The parameters selected to define levels of service for each facility type are called "measures of effectiveness" or "MOE's", and represent available measures that best describe the quality of operation on the subject facility type.

Each level of service represents a range of conditions, as defined by a range in the parameters given. Thus, a level of service is not a discrete condition, but rather a range of conditions for which boundaries are established.

The following tables describe levels of service for signalized and unsignalized intersections. Level of service for signalized intersections is defined in terms of average control delay. Delay is a measure of driver discomfort, frustration, fuel consumption and lost travel time, as well as time from movements at slower speeds and stops on intersection approaches as vehicles move up in queue position or slow down upstream of an intersection. Level of service for unsignalized intersections is determined by the computed or measured control delay and is determined for each minor movement.

OLYMPIA HIGH SCHOOL
TRAFFIC IMPACT ANALYSIS

APPENDIX

TRIP GENERATION

Detailed Land Use Data
For 255 Students of SCHOOLHIGH 1
(530) High School

Project: OHS

Open Date: 9/24/2018
Analysis Date: 9/24/2018

Day / Period	Total Trips	Pass-By Trips	Avg Rate	Min Rate	Max Rate	Std Dev	Avg Size	% Enter	% Exit	Use Eq.	Equation	R2
Weekday Average Daily Trips Source : Trip Generation Manual 9th Edition	436	0	1.71	0.71	3.96	1.49	1382	50	50	False	$\ln(T) = 0.81 \ln(X) + 1.86$	0.54
Weekday AM Peak Hour of Adjacent Street Traffic Source : Trip Generation Manual 9th Edition	110	0	0.43	0.14	1.15	0.69	1231	68	32	False		
Weekday PM Peak Hour of Generator Source : Trip Generation Manual 9th Edition	74	0	0.29	0.1	0.74	0.55	1235	33	67	False	$\ln(T) = 0.61 \ln(X) + 1.52$	0.51
Weekday PM Peak Hour of Adjacent Street Traffic Source : Trip Generation Manual 9th Edition	33	0	0.13	0.03	0.38	0.37	1352	47	53	False		
Saturday Average Daily Trips Source : Trip Generation Manual 9th Edition	156	0	0.61	0.08	1.62	0.88	1523	50	50	False		
Saturday Peak Hour of Generator Source : Trip Generation Manual 9th Edition	28	0	0.11	0.02	0.24	0.34	1523	64	36	False		
Sunday Average Daily Trips Source : Trip Generation Manual 9th Edition	64	0	0.25	0.04	0.92	0.54	1523	50	50	False		
Sunday Peak Hour of Generator Source : Trip Generation Manual 9th Edition	10	0	0.04	0.01	0.2	0.22	1523	41	59	False		

Source: Institute of Transportation Engineers, Trip Generation Manual 9th Edition, 2012

TRIP GENERATION 10, TRAFFICWARE, LLC

OLYMPIA HIGH SCHOOL
TRAFFIC IMPACT ANALYSIS

APPENDIX

TURNING MOVEMENT COUNTS

Heath & Associates, Inc.
2214 Tacoma Road
Puyallup, WA 98371

Project Name: Olympia HS

Intersection: W Parking Lot Drwy & North St SE

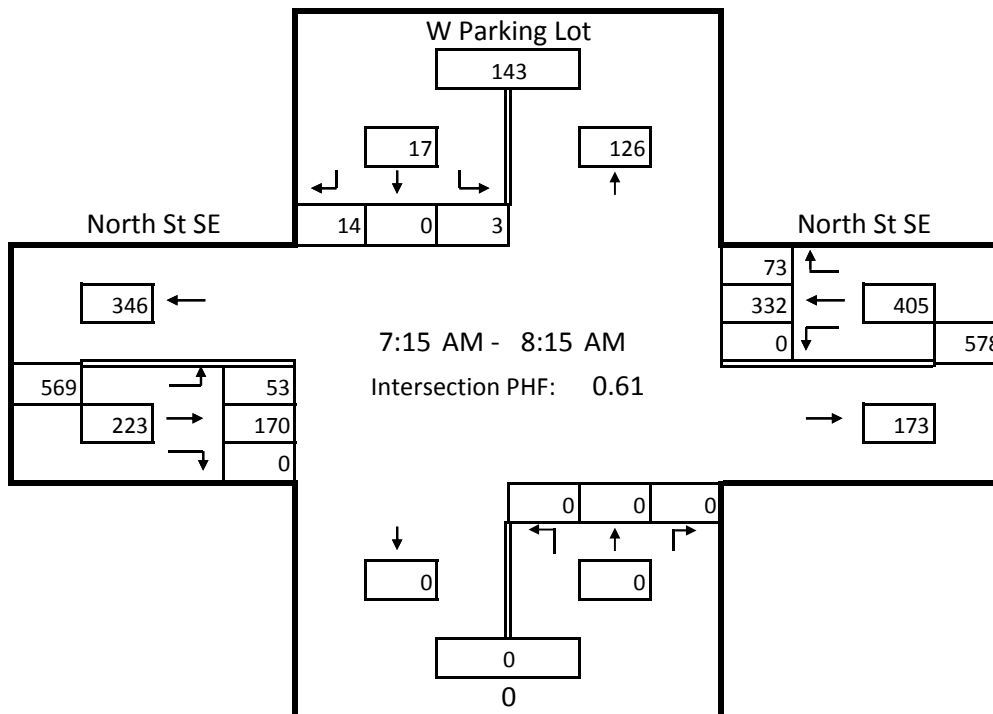
Jurisdiction: City of Olympia

Date of Count: 6/11/2018

Project Number: 4090

Time Period	Southbound W Parking Lot				Westbound North St SE				Northbound				Eastbound North St SE				Total
	HV	R	T	L	HV	R	T	L	HV	R	T	L	HV	R	T	L	
6:45 AM	0	0		0	3	8	44						0		26	4	81
7:00 AM	0	0		1	0	22	36						1		23	8	83
7:15 AM	0	1		0	1	38	81						0		33	18	154
7:30 AM	0	12		1	1	30	149						1		52	32	246
7:45 AM	0	1		2	1	5	57						1		39	2	106
8:00 AM	0	0		0	1	0	45						0		46	1	92
8:15 AM	0	1		0	1	1	62						0		44	0	109
8:30 AM	0	0		0	0	3	51						1		41	1	96
Total	0	15		4	8	107	525						4		304	66	1,021

Peak Hour	7:15 AM to 8:15 AM																Total
Peak Total	0	14		3	4	73	332						2		170	53	645
Heavy Veh.	0.0%				1.3%								1.1%				
PHF	0.33				0.57								0.66				



Heath & Associates, Inc.
2214 Tacoma Road
Puyallup, WA 98371

Project Name: Olypmia HS

Intersection: W Parking Lot Drwy & North St SE

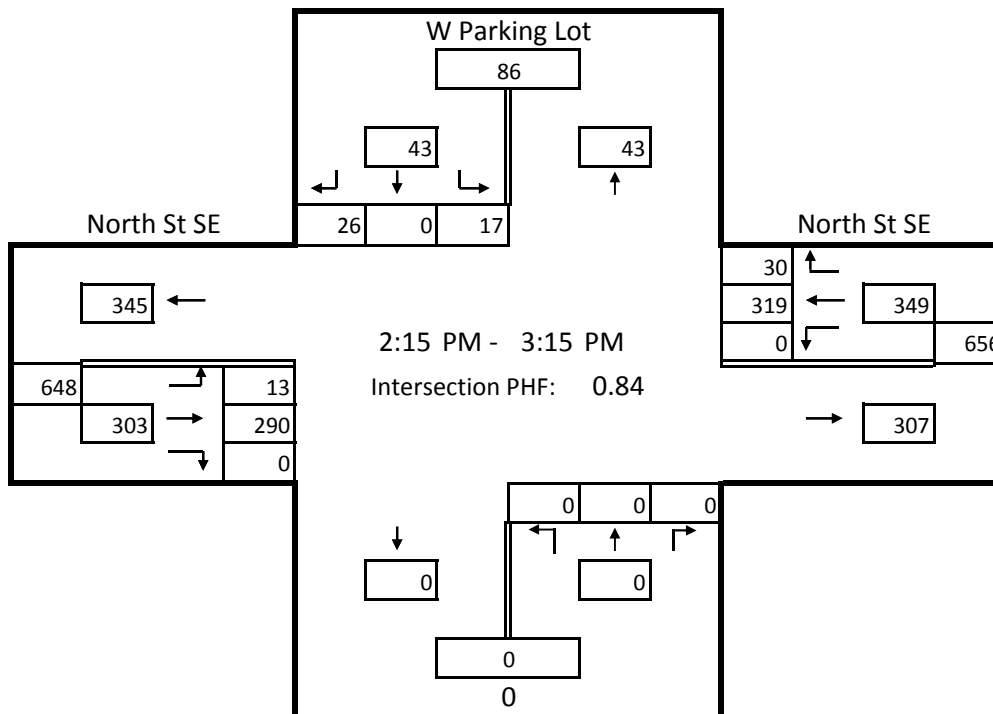
Jurisdiction: City of Olympia

Date of Count: 6/11/2018

Project Number: 4090

Time Period	Southbound W Parking Lot				Westbound North St SE				Northbound				Eastbound North St SE				Total
	HV	R	T	L	HV	R	T	L	HV	R	T	L	HV	R	T	L	
1:45 PM	0	0		2	1	1	46						0		53	3	103
2:00 PM	0	1		2	1	4	42						1		75	9	126
2:15 PM	0	9		8	0	22	92						0		74	7	205
2:30 PM	0	5		4	0	6	81						1		75	3	172
2:45 PM	0	6		3	2	2	77						0		70	2	160
3:00 PM	0	6		2	0	0	69						2		71	1	150
3:15 PM	0	3		1	0	0	54						0		71	0	129
3:30 PM	0	1		1	1	0	58						1		56	0	118
Total	0	31		23	5	35	519						5		545	25	1,178

Peak Hour	2:15 PM to 3:15 PM																Total
Peak Total	0	26		17	2	30	319						3		290	13	695
Heavy Veh.	0.0%				0.9%								0.9%				
PHF	0.63				0.77								0.94				



Heath & Associates, Inc.
2214 Tacoma Road
Puyallup, WA 98371

Project Name: Olympia HS

Intersection: E Parking Lot Drwy & North St SE

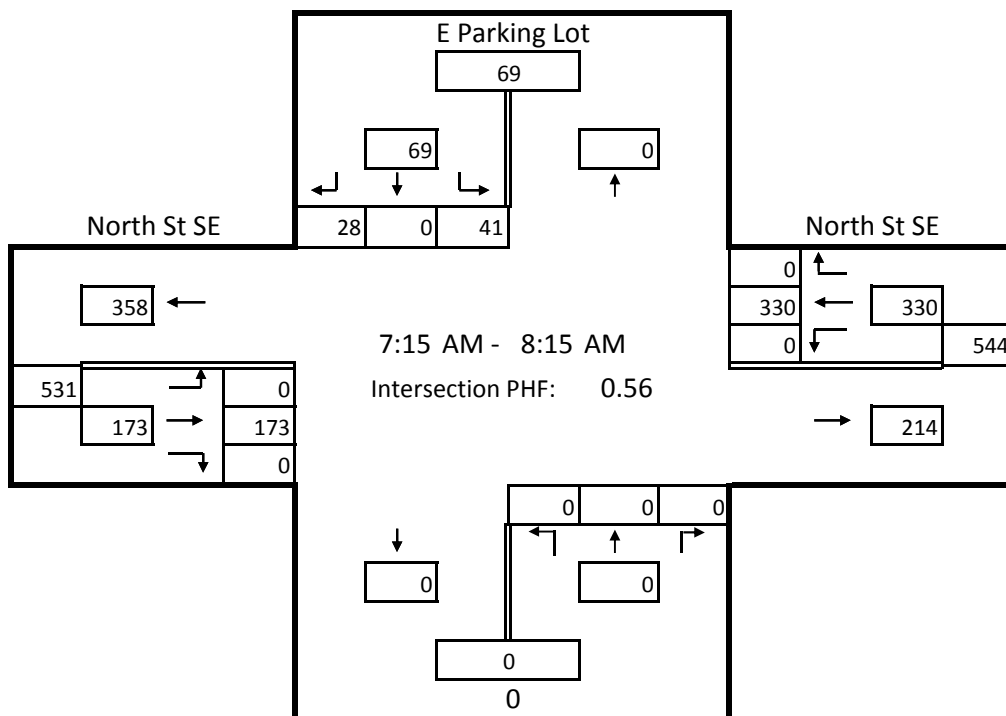
Jurisdiction: City of Olympia

Date of Count: 6/11/2018

Project Number: 4090

Time Period	Southbound E Parking Lot				Westbound North St SE				Northbound				Eastbound North St SE				Total
	HV	R	T	L	HV	R	T	L	HV	R	T	L	HV	R	T	L	
6:45 AM	0	0		0	3	2	42						0		26	0	73
7:00 AM	0	0		2	0	1	34						1		23	0	61
7:15 AM	0	7		12	1	0	81						0		33	0	134
7:30 AM	0	21		29	1	0	150						1		54	0	256
7:45 AM	0	0		0	1	0	54						1		40	0	96
8:00 AM	0	0		0	1	0	45						0		46	0	92
8:15 AM	0	0		0	1	0	62						0		42	0	105
8:30 AM	0	0		0	0	0	55						1		43	0	99
Total	0	28		43	8	3	523						4		307	0	904

Peak Hour	7:15 AM to 8:15 AM																Total
Peak Total	0	28		41	4	0	330		0	0	0	0	2		173	0	572
Heavy Veh.	0.0%				1.5%				0.0%				1.3%				
PHF	0.35				0.55				0.00				0.80				



Heath & Associates, Inc.
2214 Tacoma Road
Puyallup, WA 98371

Project Name: Olypmia HS

Intersection: E Parking Lot Drwy & North St SE

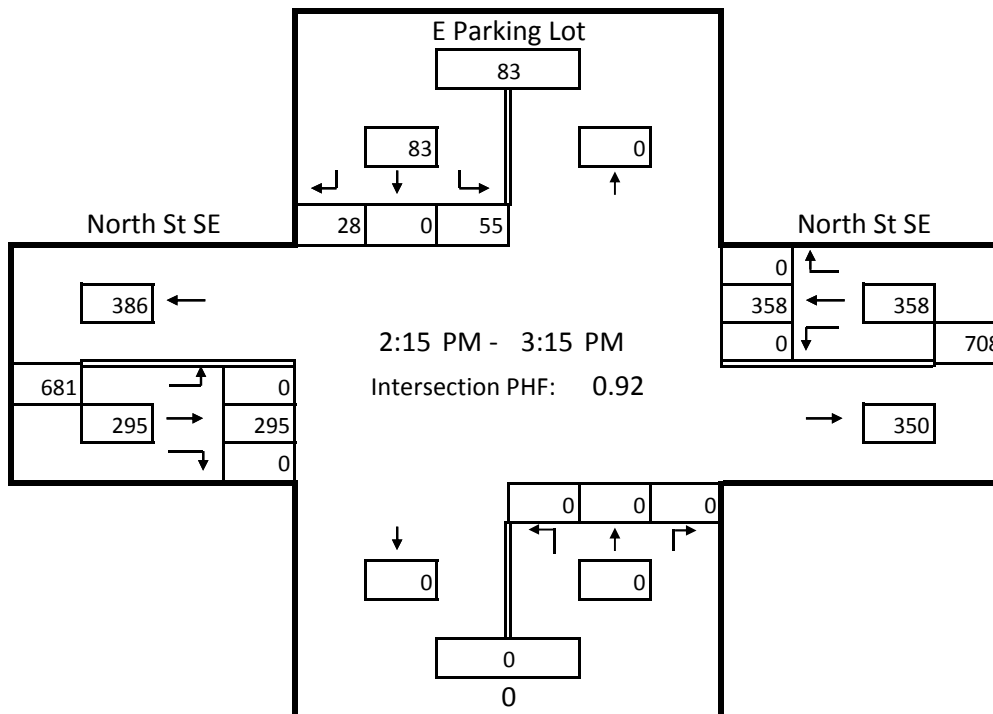
Jurisdiction: City of Olympia

Date of Count: 6/11/2018

Project Number: 4090

Time Period	Southbound E Parking Lot				Westbound North St SE				Northbound				Eastbound North St SE				Total
	HV	R	T	L	HV	R	T	L	HV	R	T	L	HV	R	T	L	
1:45 PM	0	0		0	0		48						1		55	0	104
2:00 PM	0	1		1	0		42						0		78	1	122
2:15 PM	0	9		11	0		104						0		71	0	195
2:30 PM	0	15		25	1		80						1		75	0	197
2:45 PM	0	3		14	0		104						0		81	0	202
3:00 PM	0	1		5	1		70						1		68	0	146
3:15 PM	0	2		10	0		53						1		77	1	143
3:30 PM	0	2		12	0		67						0		65	0	146
Total	0	33		78	2		568						4		570	2	1,251

Peak Hour	2:15 PM to 3:15 PM																Total
Peak Total	0	28		55	2		358						2		295	0	736
Heavy Veh.	0.0%				0.4%				0.0%				0.7%				
PHF	0.52				0.86				0.00				0.91				



Heath & Associates, Inc.
2214 Tacoma Road
Puyallup, WA 98371

Project Name: Olympia HS

Intersection: Bus Loop/Pifer Rd SE & North St SE

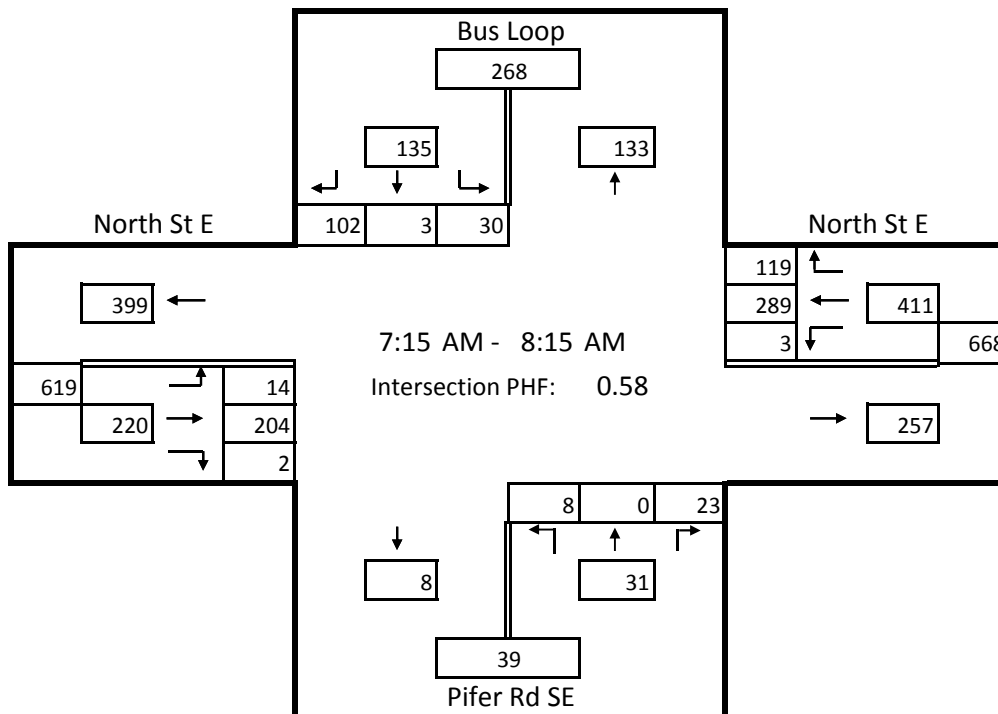
Jurisdiction: City of Olympia

Date of Count: 6/11/2018

Project Number: 4090

Time Period	Southbound Bus Loop				Westbound North St E				Northbound Pifer Rd SE				Eastbound North St E				Total
	HV	R	T	L	HV	R	T	L	HV	R	T	L	HV	R	T	L	
6:45 AM	0	0	0	2	3	1	41	0	0	1	0	6	0	1	28	2	83
7:00 AM	0	3	0	8	0	12	58	1	0	3	0	4	1	0	25	0	115
7:15 AM	0	18	1	11	1	44	85	1	0	1	0	3	0	0	34	4	199
7:30 AM	0	77	2	7	1	60	101	2	0	15	0	0	1	1	76	8	343
7:45 AM	0	6	0	8	1	10	50	0	0	5	0	0	0	1	46	2	127
8:00 AM	0	1	0	4	1	5	53	0	0	2	0	5	1	0	48	0	120
8:15 AM	0	0	1	2	1	1	54	1	0	2	0	5	0	1	45	0	113
8:30 AM	0	3	1	3	0	5	55	0	0	0	0	0	1	2	31	1	101
Total	0	108	5	45	8	138	497	5	0	29	0	23	4	6	333	17	1,206

Peak Hour	7:15 AM to 8:15 AM																Total
Peak Total	0	102	3	30	4	119	289	3	0	23	0	8	2	2	204	14	797
Heavy Veh.	0.0%				1.3%				0.0%				1.1%				
PHF	0.39				0.63				0.52				0.65				



Heath & Associates, Inc.
2214 Tacoma Road
Puyallup, WA 98371

Project Name: Olypmia HS

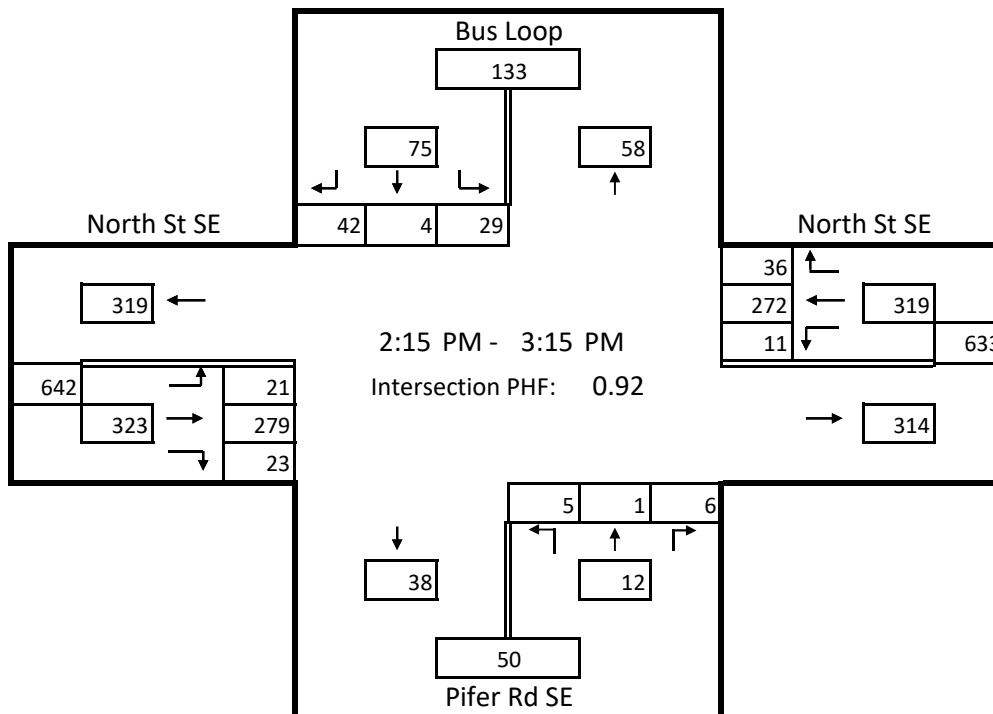
Intersection: Bus Loop/Pifer Rd SE & North St SE

Jurisdiction: City of Olympia

Date of Count: 6/11/2018

Project Number: 4090

Time Period	Southbound Bus Loop				Westbound North St SE				Northbound Pifer Rd SE				Eastbound North St SE				Total
	HV	R	T	L	HV	R	T	L	HV	R	T	L	HV	R	T	L	
1:45 PM	0	3	0	0	1	5	41	0	0	3	0	5	0	3	53	1	114
2:00 PM	0	3	0	5	1	12	40	1	0	3	1	2	1	3	69	5	144
2:15 PM	0	20	1	6	0	16	81	1	0	1	0	2	0	4	58	8	198
2:30 PM	0	10	2	14	0	9	63	1	0	3	1	1	1	8	69	8	189
2:45 PM	0	7	0	3	2	3	60	3	0	1	0	2	0	6	85	4	174
3:00 PM	0	5	1	6	0	8	68	6	0	1	0	0	2	5	67	1	168
3:15 PM	0	3	0	5	0	7	50	1	0	3	0	0	0	1	78	2	150
3:30 PM	0	3	1	4	1	5	67	2	0	2	0	1	1	6	56	3	150
Total	0	54	5	43	5	65	470	15	0	17	2	13	5	36	535	32	1,287
Peak Hour	2:15 PM to 3:15 PM																Total
Peak Total	0	42	4	29	2	36	272	11	0	6	1	5	3	23	279	21	729
Heavy Veh.	0.0%				0.9%				0.0%				0.8%				
PHF	0.69				0.81				0.60				0.85				



Heath & Associates, Inc.
2214 Tacoma Road
Puyallup, WA 98371

Project Name: Olympia HS

Intersection: W Student Parking Lot & North St SE

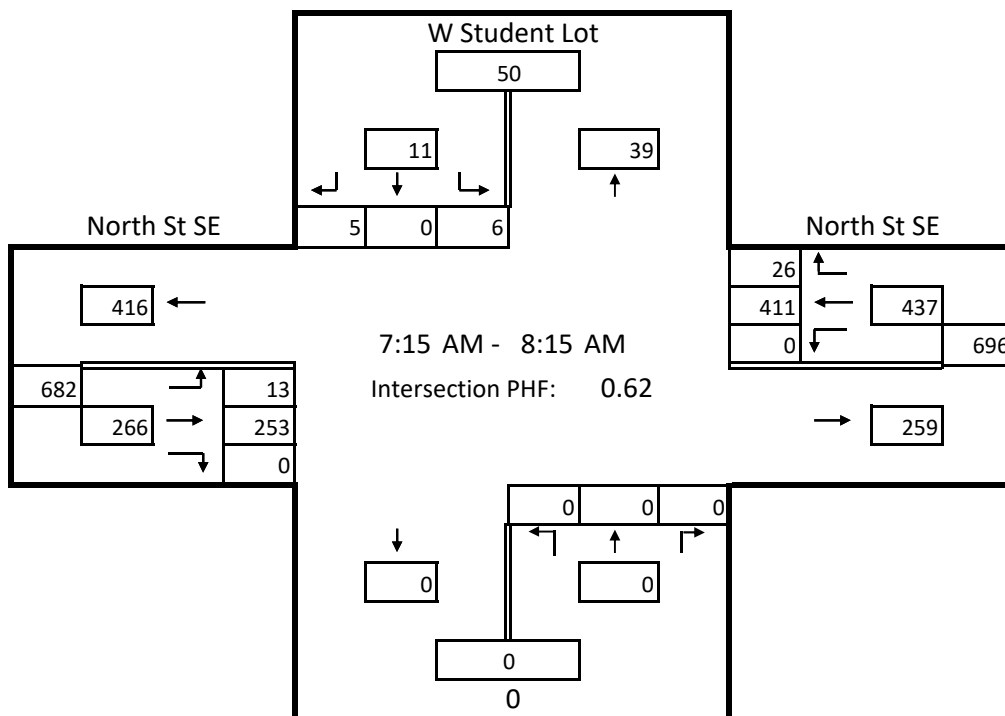
Date of Count: 6/11/2018

Jurisdiction: City of Olympia

Project Number: 4090

Time Period	Southbound W Student Lot				Westbound North St SE				Northbound				Eastbound North St SE				Total
	HV	R	T	L	HV	R	T	L	HV	R	T	L	HV	R	T	L	
6:45 AM	0	0		2	2	2	48						0		28	0	82
7:00 AM	0	0		0	0	5	67						1		33	1	106
7:15 AM	0	3		3	1	11	132						0		40	7	190
7:30 AM	0	2		3	2	13	163						0		101	2	284
7:45 AM	0	0		0	1	2	63						1		59	1	126
8:00 AM	0	0		0	0	0	53						1		53	3	107
8:15 AM	0	0		1	1	1	64						0		44	2	111
8:30 AM	0	1		0	0	2	55						1		35	1	94
Total	0	6		9	7	36	645						4		393	17	1,106

Peak Hour	7:15 AM to 8:15 AM																Total
Peak Total	0	5		6	4	26	411						2		253	13	714
Heavy Veh.	0.0%				1.0%				0.0%				1.0%				
PHF	0.46				0.62				0.00				0.65				



Heath & Associates, Inc.
2214 Tacoma Road
Puyallup, WA 98371

Project Name: Olypmia HS

Intersection: W Student Parking Lot & North St SE

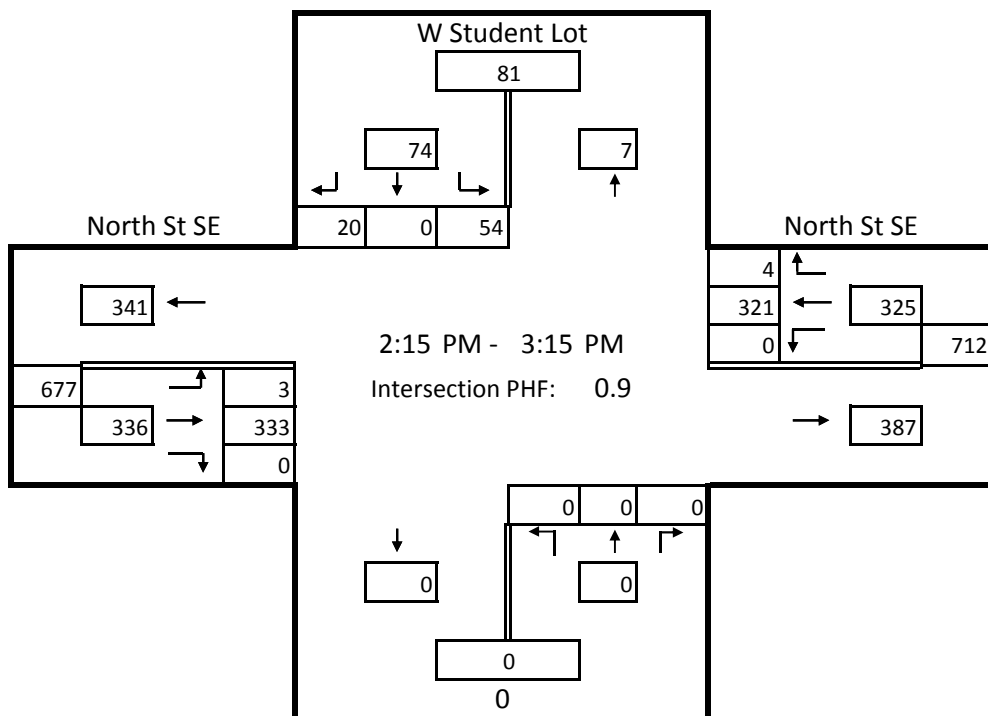
Date of Count: 6/11/2018

Jurisdiction: City of Olympia

Project Number: 4090

Time Period	Southbound W Student Lot				Westbound North St SE				Northbound				Eastbound North St SE				Total
	HV	R	T	L	HV	R	T	L	HV	R	T	L	HV	R	T	L	
1:45 PM	0	1		1	1	1	45						0		52	2	101
2:00 PM	0	1		1	1	1	56						0		79	0	139
2:15 PM	0	5		17	0	2	100						1		80	1	205
2:30 PM	0	14		28	0	0	67						0		91	2	200
2:45 PM	0	0		5	2	2	73						0		88	0	170
3:00 PM	0	1		4	0	0	81						3		74	0	163
3:15 PM	0	0		5	0	1	62						0		89	0	157
3:30 PM	0	0		2	1	1	70						0		60	3	134
Total	0	22		63	5	8	554						4		613	8	1,268

Peak Hour	2:15 PM to 3:15 PM																Total
Peak Total	0	20		54	2	4	321						4		333	3	735
Heavy Veh.	0.0%				0.9%				0.0%				0.6%				
PHF	0.44				0.80				0.00				0.90				



Heath & Associates, Inc.
2214 Tacoma Road
Puyallup, WA 98371

Project Name: Olympia HS

Intersection: E Student Parking Lot & North St SE

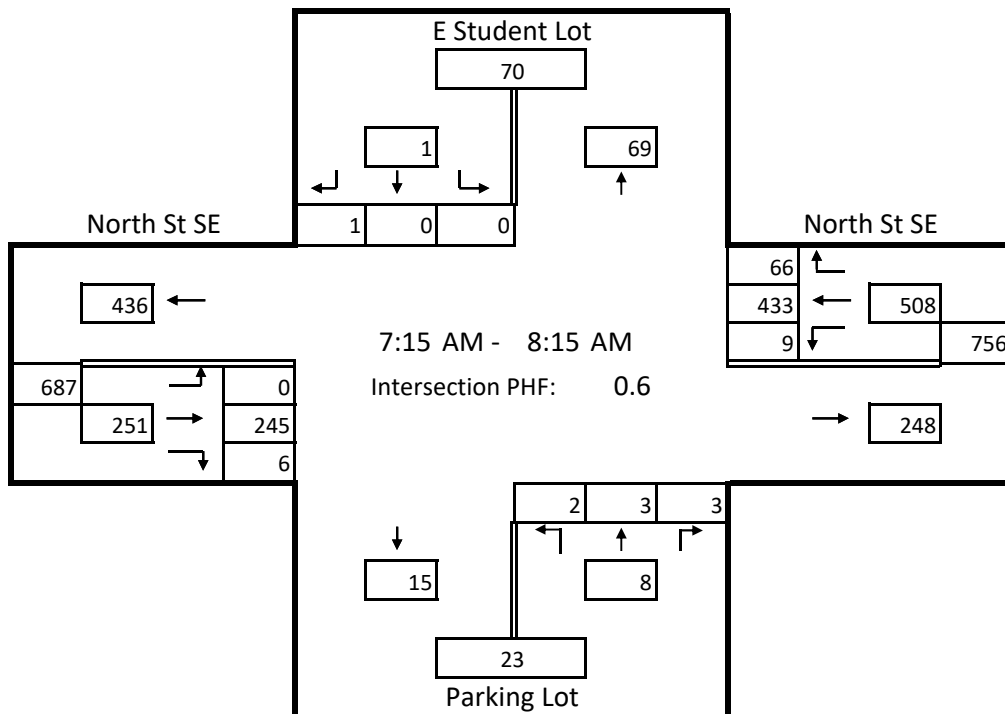
Jurisdiction: City of Olympia

Date of Count: 6/11/2018

Project Number: 4090

Time Period	Southbound E Student Lot				Westbound North St SE				Northbound Parking Lot				Eastbound North St SE				Total
	HV	R	T	L	HV	R	T	L	HV	R	T	L	HV	R	T	L	
6:45 AM	0	0	0	0	2	0	48	0	0	0	0	1	0	0	30	0	81
7:00 AM	0	0	0	0	0	3	74	0	0	0	0	0	1	0	35	0	113
7:15 AM	0	0	0	0	1	24	141	1	0	0	1	1	0	0	40	0	209
7:30 AM	0	1	0	0	1	41	172	1	0	0	2	1	1	1	101	0	322
7:45 AM	0	0	0	0	1	1	65	3	0	0	0	0	0	1	54	0	125
8:00 AM	0	0	0	0	1	0	55	4	0	3	0	0	1	4	50	0	118
8:15 AM	0	0	0	0	1	0	62	2	0	0	0	2	0	4	41	0	112
8:30 AM	0	0	0	1	1	4	58	3	0	1	0	0	1	1	34	0	104
Total	0	1	0	1	8	73	675	14	0	4	3	5	4	11	385	0	1,172

Peak Hour	7:15 AM to 8:15 AM																Total
Peak Total	0	1	0	0	4	66	433	9	0	3	3	2	2	6	245	0	768
Heavy Veh.	0.0%				1.0%				0.0%				1.0%				
PHF	0.25				0.59				0.67				0.62				



Heath & Associates, Inc.
2214 Tacoma Road
Puyallup, WA 98371

Project Name: Olypmia HS

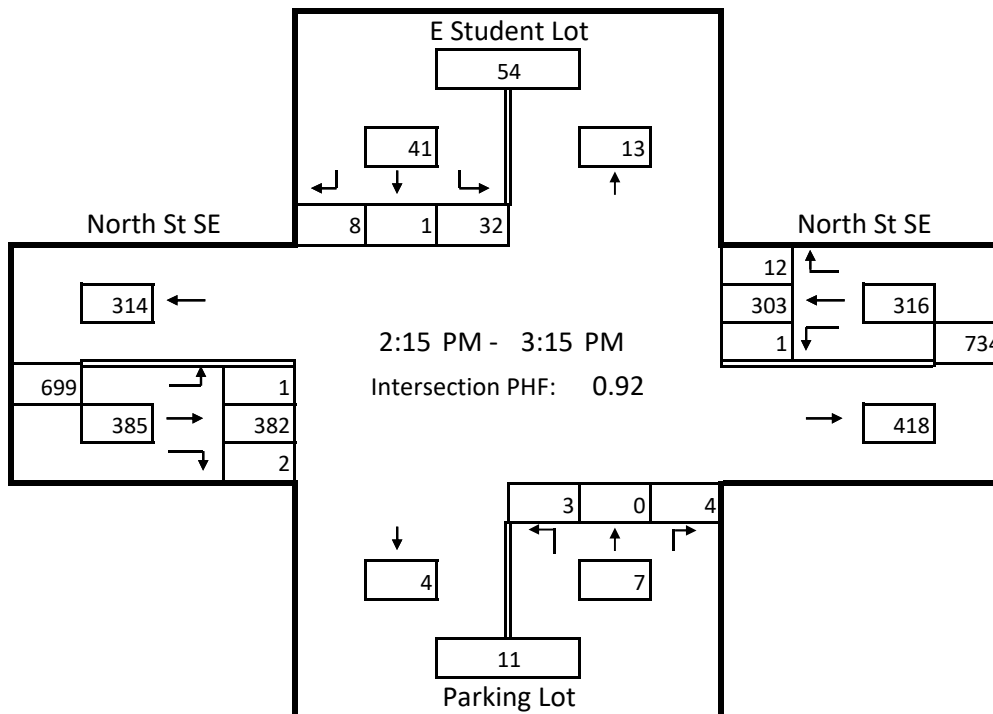
Intersection: E Student Parking Lot & North St SE

Jurisdiction: City of Olympia

Date of Count: 6/11/2018

Project Number: 4090

Time Period	Southbound E Student Lot				Westbound North St SE				Northbound Parking Lot				Eastbound North St SE				Total	
	HV	R	T	L	HV	R	T	L	HV	R	T	L	HV	R	T	L		
1:45 PM	0	0	0	1	0	0	43	1	0	1	0	3	0	3	50	0	102	
2:00 PM	0	0	0	0	1	1	55	1	0	1	0	1	0	2	78	0	140	
2:15 PM	0	4	0	14	0	4	89	0	0	0	0	1	1	0	93	0	206	
2:30 PM	0	4	0	15	2	1	62	1	0	2	0	0	1	0	118	1	206	
2:45 PM	0	0	0	2	0	3	72	0	0	1	0	0	0	2	93	0	173	
3:00 PM	0	0	1	1	1	4	80	0	0	1	0	2	2	0	78	0	170	
3:15 PM	0	1	0	0	0	3	60	0	0	0	0	1	0	0	93	1	158	
3:30 PM	0	0	0	1	1	0	71	0	0	0	0	1	1	1	60	0	136	
Total	0	9	1	34	5	16	532	3	0	6	0	9	5	8	663	2	1,283	
Peak Hour	2:15 PM to 3:15 PM																	Total
Peak Total	0	8	1	32	3	12	303	1	0	4	0	3	4	2	382	1	749	
Heavy Veh.	0.0%				0.9%				0.0%				0.7%					
PHF	0.54				0.85				0.58				0.81					



Heath & Associates, Inc.
2214 Tacoma Road
Puyallup, WA 98371

Project Name: Olympia HS

Intersection: E North Parking Lot & Carlyon Ave SE

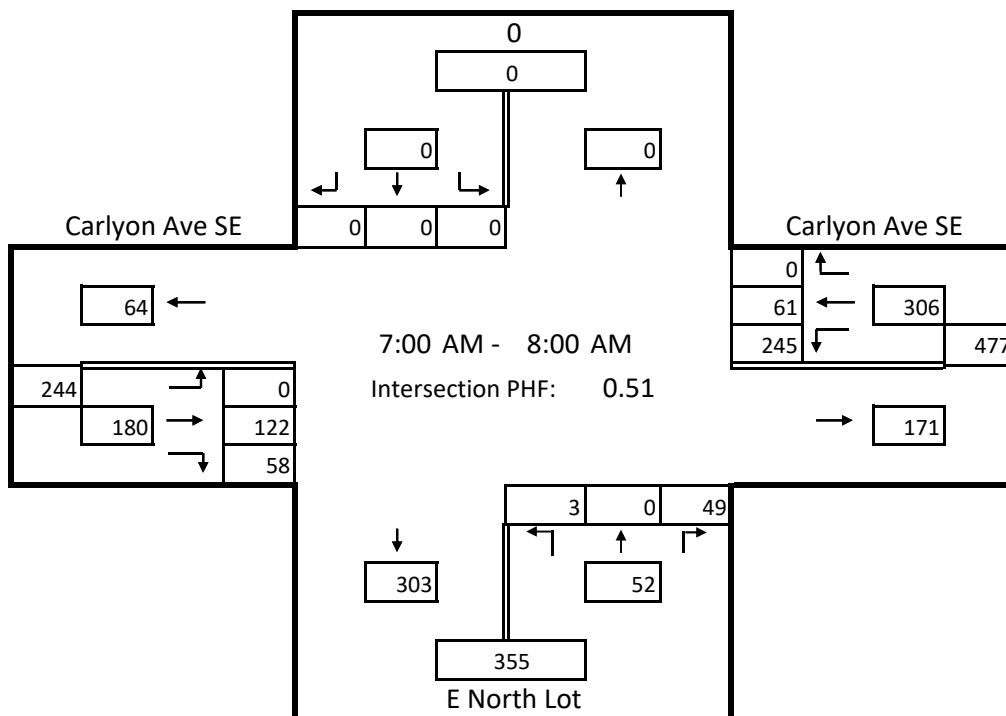
Date of Count: 6/11/2018

Jurisdiction: City of Olympia

Project Number: 4090

Time Period	Southbound				Westbound Carlyon Ave SE				Northbound E North Lot				Eastbound Carlyon Ave SE				Total
	HV	R	T	L	HV	R	T	L	HV	R	T	L	HV	R	T	L	
6:45 AM					0		8	4	0	3		0	0	0	6		21
7:00 AM					0		12	26	0	7		1	0	2	11		59
7:15 AM					1		14	105	0	9		1	0	15	22		167
7:30 AM					0		20	109	0	29		1	0	41	67		267
7:45 AM					0		15	5	0	4		0	1	0	22		47
8:00 AM					0		17	4	0	0		0	0	1	28		50
8:15 AM					0		31	3	0	0		0	0	1	37		72
8:30 AM					0		16	8	0	2		0	0	2	12		40
Total					1		133	264	0	54		3	1	62	205		721

Peak Hour	7:00 AM to 8:00 AM																Total
Peak Total					1		61	245	0	49		3	1	58	122		538
Heavy Veh.	0.0%				0.3%				0.0%				0.4%				
PHF	0.00				0.59				0.43				0.42				



Heath & Associates, Inc.
2214 Tacoma Road
Puyallup, WA 98371

Project Name: Olypmia HS

Intersection: E North Parking Lot & Carlyon Ave SE

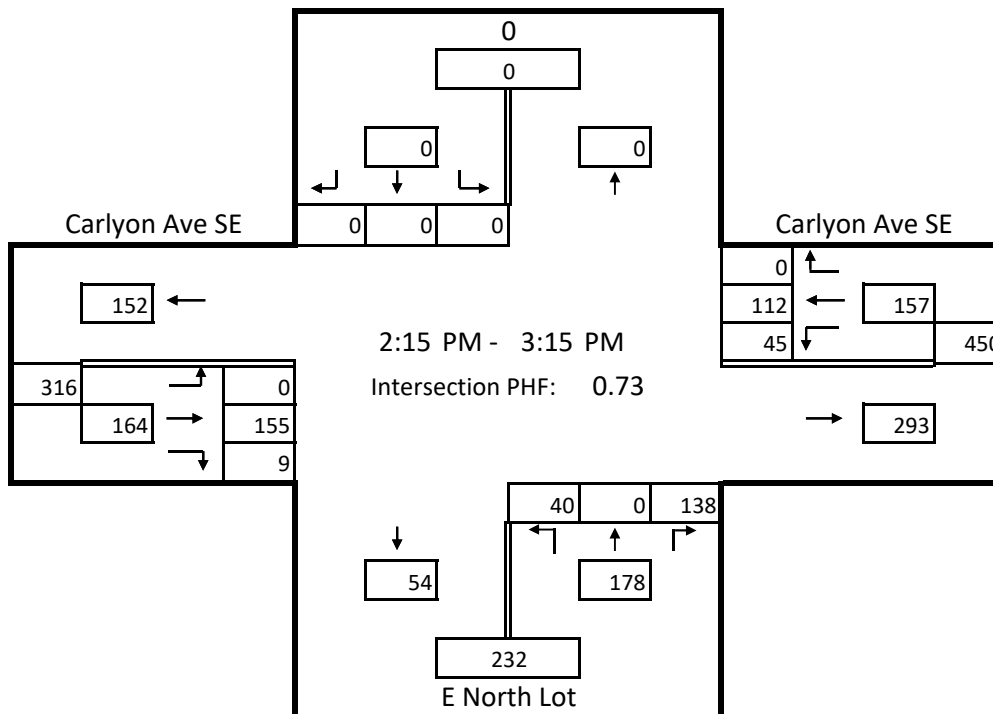
Date of Count: 6/11/2018

Jurisdiction: City of Olympia

Project Number: 4090

Time Period	Southbound				Westbound Carlyon Ave SE				Northbound E North Lot				Eastbound Carlyon Ave SE				Total
	HV	R	T	L	HV	R	T	L	HV	R	T	L	HV	R	T	L	
1:45 PM					1		9	2	0	1		1	0	0	22		36
2:00 PM					2		19	4	0	4		1	0	2	25		57
2:15 PM					0		23	21	0	47		18	1	5	57		172
2:30 PM					1		16	8	0	72		19	0	0	47		163
2:45 PM					3		49	9	0	9		1	0	2	33		106
3:00 PM					0		24	7	0	10		2	0	2	18		63
3:15 PM					5		21	4	0	17		2	0	1	28		78
3:30 PM					0		14	1	0	2		2	1	0	16		36
Total					12		175	56	0	162		46	2	12	246		697

Peak Hour	2:15 PM to 3:15 PM																Total
Peak Total					4		112	45	0	138		40	1	9	155		499
Heavy Veh.	0.0%				5.2%				0.0%				0.8%				
PHF	0.00				0.68				0.49				0.66				



Heath & Associates, Inc.
2214 Tacoma Road
Puyallup, WA 98371

Project Name: Olympia HS

Intersection: W North Parking Lot & Carlyon Ave SE

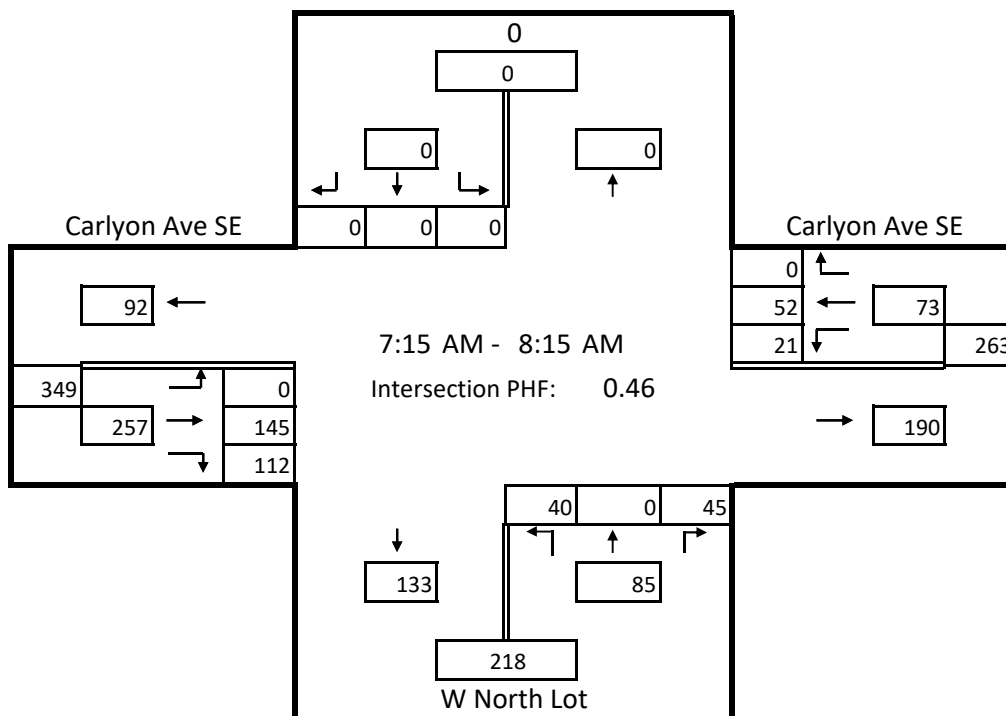
Date of Count: 6/11/2018

Jurisdiction: City of Olympia

Project Number: 4090

Time Period	Southbound				Westbound Carlyon Ave SE				Northbound W North Lot				Eastbound Carlyon Ave SE				Total
	HV	R	T	L	HV	R	T	L	HV	R	T	L	HV	R	T	L	
6:45 AM					0		7	1	0	1		1	0	3	5		18
7:00 AM					0		7	6	0	7		3	0	4	7		34
7:15 AM					1		4	12	0	11		13	0	30	22		93
7:30 AM					0		14	8	0	30		26	0	76	75		229
7:45 AM					1		17	1	0	3		0	0	4	19		45
8:00 AM					0		17	0	0	1		1	0	2	29		50
8:15 AM					0		32	1	0	0		2	0	0	37		72
8:30 AM					0		15	1	0	4		1	0	7	10		38
Total					2		113	30	0	57		47	0	126	204		577

Peak Hour	7:15 AM to 8:15 AM																Total
Peak Total					2		52	21	0	45		40	0	112	145		415
Heavy Veh.	0.0%				1.4%				0.0%				0.0%				
PHF	0.00				0.83				0.38				0.43				



Heath & Associates, Inc.
2214 Tacoma Road
Puyallup, WA 98371

Project Name: Olypmia HS

Intersection: W North Parking Lot & Carlyon Ave SE

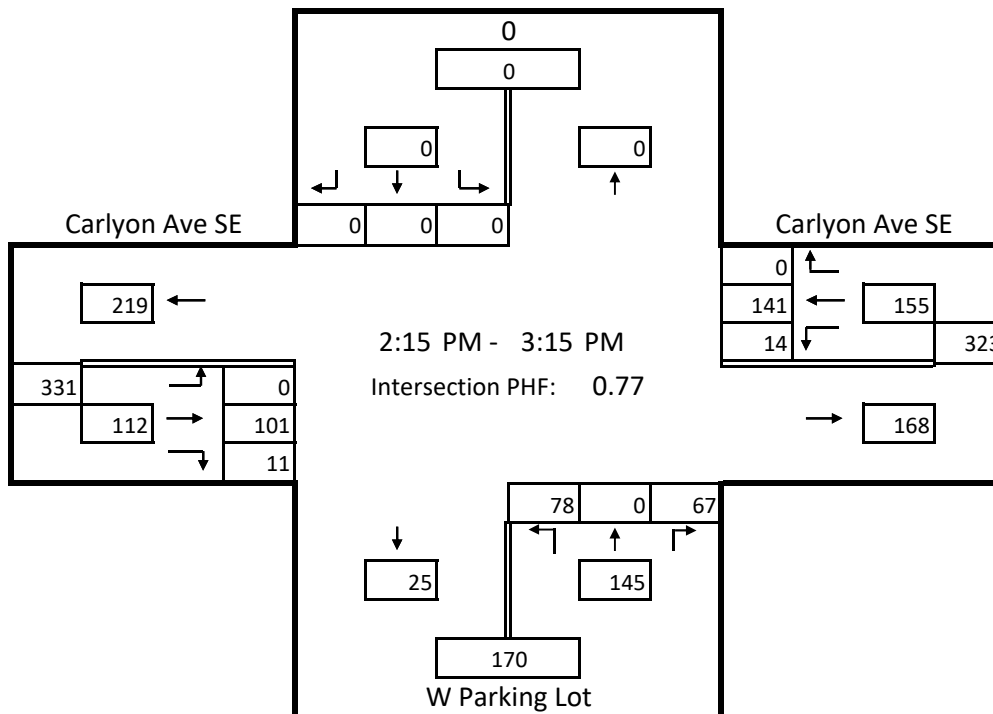
Jurisdiction: City of Olympia

Date of Count: 6/11/2018

Project Number: 4090

Time Period	Southbound				Westbound Carlyon Ave SE				Northbound W Parking Lot				Eastbound Carlyon Ave SE				Total
	HV	R	T	L	HV	R	T	L	HV	R	T	L	HV	R	T	L	
1:45 PM					0		7	3	0	1		0	0	3	21		35
2:00 PM					0		13	6	0	4		1	0	3	23		50
2:15 PM					0		27	12	0	29		33	0	6	26		133
2:30 PM					0		36	1	0	31		36	0	1	23		128
2:45 PM					0		48	1	0	6		2	0	2	30		89
3:00 PM					0		30	0	0	1		7	0	2	22		62
3:15 PM					0		23	0	0	3		1	0	0	26		53
3:30 PM					0		17	0	0	2		0	0	0	15		34
Total					0		201	23	0	77		80	0	17	186		584

Peak Hour	2:15 PM to 3:15 PM																Total
Peak Total					0		141	14	0	67		78	0	11	101		412
Heavy Veh.	0.0%				0.0%				0.0%				0.0%				
PHF	0.00				0.79				0.54				0.88				



City of Olympia

Public Works Department
Transportation Engineering

Henderson Boulevard
Carlyon Avenue
Weather: Clear, Warm
Counted by: John L

File Name : Carlyon-Henderson
Site Code : 00000568
Start Date : 5/9/2017
Page No : 1

Groups Printed- Cars - Bikes - Trucks Buses

	Henderson Boulevard From North					Pedestrian / Bicycle Path From East					Henderson Boulevard From South					Carlyon Avenue From West							
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	22	31	0	0	53	0	0	0	3	0	0	89	18	7	107	8	0	10	1	18	11	178	189
07:15 AM	62	46	0	0	108	0	0	0	1	0	0	116	39	17	155	7	0	35	0	42	18	305	323
07:30 AM	66	56	0	0	122	0	0	0	0	0	0	127	33	20	160	21	0	44	1	65	21	347	368
07:45 AM	15	38	0	0	53	0	0	0	0	0	0	136	15	13	151	14	0	33	2	47	15	251	266
Total	165	171	0	0	336	0	0	0	4	0	0	468	105	57	573	50	0	122	4	172	65	1081	1146
08:00 AM	26	29	0	0	55	0	0	0	0	0	0	103	25	36	128	15	0	16	2	31	38	214	252
08:15 AM	22	22	0	1	44	0	0	0	0	0	0	86	38	94	124	32	0	42	1	74	96	242	338
08:30 AM	7	29	0	0	36	0	0	0	0	0	0	73	14	3	87	13	0	10	0	23	3	146	149
08:45 AM	8	28	0	0	36	0	0	0	0	0	0	92	7	1	99	8	0	12	0	20	1	155	156
Total	63	108	0	1	171	0	0	0	0	0	0	354	84	134	438	68	0	80	3	148	138	757	895
11:00 AM	7	36	0	0	43	0	0	0	0	0	0	48	5	1	53	5	0	10	0	15	1	111	112
11:15 AM	8	32	0	0	40	0	0	0	1	0	0	45	9	6	54	6	0	7	0	13	7	107	114
11:30 AM	3	53	0	0	56	0	0	0	0	0	0	58	4	5	62	4	0	13	0	17	5	135	140
11:45 AM	3	53	0	0	56	0	0	0	2	0	0	48	4	9	52	6	0	8	0	14	11	122	133
Total	21	174	0	0	195	0	0	0	3	0	0	199	22	21	221	21	0	38	0	59	24	475	499
12:00 PM	7	46	0	0	53	0	0	0	0	0	0	40	8	0	48	5	0	3	0	8	0	109	109
12:15 PM	9	45	0	0	54	0	1	0	1	1	0	65	7	1	72	8	0	7	0	15	2	142	144
12:30 PM	3	45	0	0	48	0	0	0	0	0	0	44	5	0	49	10	0	6	0	16	0	113	113
12:45 PM	2	34	0	0	36	0	0	0	1	0	0	74	3	3	77	6	0	10	0	16	4	129	133
Total	21	170	0	0	191	0	1	0	2	1	0	223	23	4	246	29	0	26	0	55	6	493	499
02:00 PM	19	49	0	0	68	0	0	0	0	0	0	28	10	0	38	3	0	10	0	13	0	119	119
02:15 PM	18	43	0	0	61	0	0	0	0	0	0	53	28	15	81	37	0	44	1	81	16	223	239
02:30 PM	20	44	0	0	64	0	0	0	1	0	0	57	14	51	71	59	0	64	0	123	52	258	310
02:45 PM	11	38	0	0	49	0	0	0	3	0	0	59	15	127	74	25	0	33	2	58	132	181	313
Total	68	174	0	0	242	0	0	0	4	0	0	197	67	193	264	124	0	151	3	275	200	781	981
03:00 PM	9	47	0	1	56	0	0	0	0	0	0	50	9	58	59	26	0	40	3	66	62	181	243
03:15 PM	7	63	0	0	70	0	0	0	3	0	0	49	5	73	54	14	0	14	0	28	76	152	228
03:30 PM	19	80	0	0	99	0	0	0	0	0	0	65	7	10	72	19	0	30	0	49	10	220	230
03:45 PM	25	62	0	0	87	0	0	0	0	0	0	52	19	3	71	15	0	25	5	40	8	198	206
Total	60	252	0	1	312	0	0	0	3	0	0	216	40	144	256	74	0	109	8	183	156	751	907
04:00 PM	25	95	0	0	120	0	0	0	0	0	0	50	17	17	67	15	0	18	1	33	18	220	238
04:15 PM	11	89	0	0	100	0	0	0	0	0	0	79	11	56	90	10	0	11	1	21	57	211	268
04:30 PM	16	119	0	0	135	0	0	0	0	0	0	70	12	7	82	7	0	12	1	19	8	236	244
04:45 PM	18	107	0	0	125	0	0	0	4	0	0	76	15	6	91	11	0	28	1	39	11	255	266
Total	70	410	0	0	480	0	0	0	4	0	0	275	55	86	330	43	0	69	4	112	94	922	1016
05:00 PM	11	135	0	0	146	0	0	0	0	0	0	62	17	5	79	17	0	19	0	36	5	261	266
05:15 PM	18	133	0	0	151	0	0	0	2	0	0	75	19	13	94	13	0	18	0	31	15	276	291
05:30 PM	13	88	0	0	101	0	0	0	0	0	0	72	15	8	87	13	0	19	0	32	8	220	228
05:45 PM	20	72	0	0	92	0	0	0	1	0	0	66	11	3	77	8	0	12	0	20	4	189	193
Total	62	428	0	0	490	0	0	0	3	0	0	275	62	29	337	51	0	68	0	119	32	946	978

City of Olympia

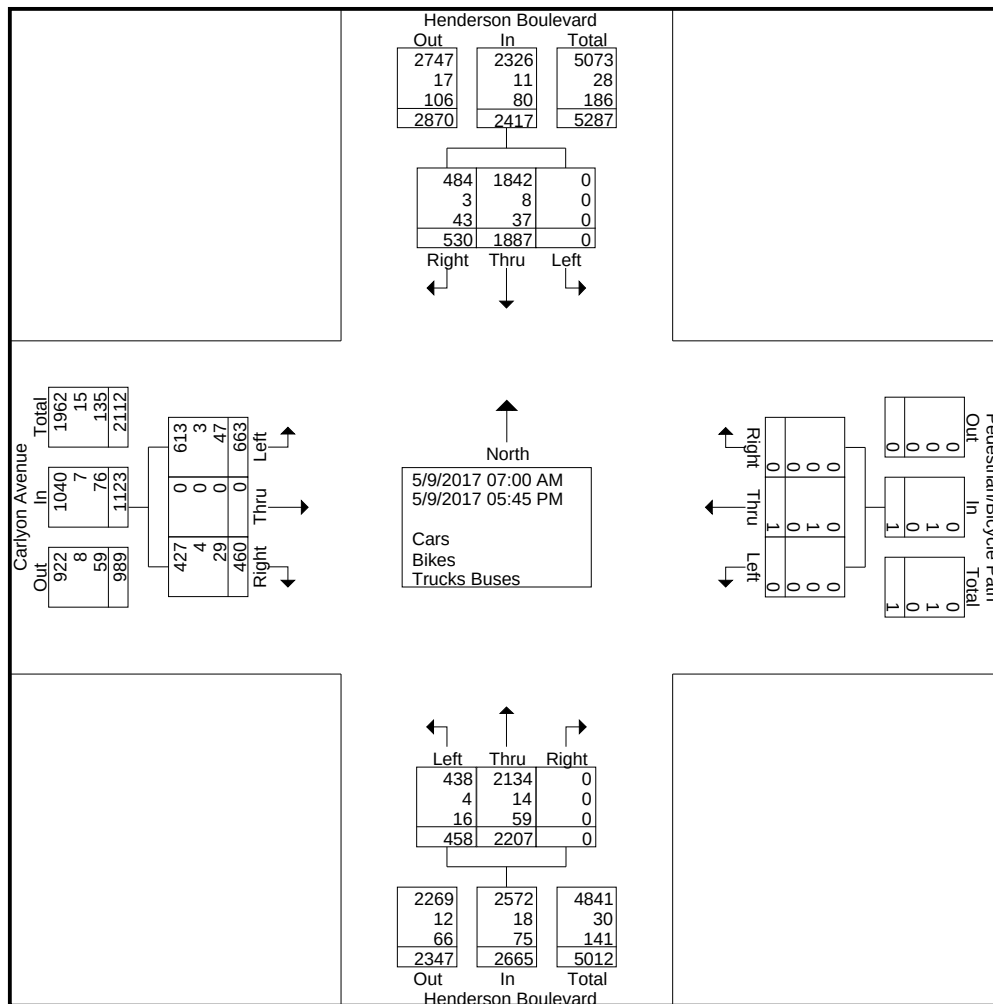
Public Works Department
Transportation Engineering

Henderson Boulevard
Carlyon Avenue
Weather: Clear, Warm
Counted by: John L

File Name : Carlyon-Henderson
Site Code : 00000568
Start Date : 5/9/2017
Page No : 2

Groups Printed- Cars - Bikes - Trucks Buses

	Henderson Boulevard From North					Pedestrian / Bicycle Path From East					Henderson Boulevard From South					Carlyon Avenue From West					Exclu. Total	Inclu. Total	Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total			
Grand Total	530	1887	0	2	2417	0	1	0	23	1	0	2207	458	668	2665	460	0	663	22	1123	715	6206	6921
Apprch %	21.9	78.1	0			0	100	0			0	82.8	17.2			41	0	59					
Total %	8.5	30.4	0		38.9	0	0	0		0	0	35.6	7.4		42.9	7.4	0	10.7		18.1	10.3	89.7	
Cars	484	1842	0		2327	0	0	0		20	0	2134	438		3177	427	0	613		1060	0	0	6584
% Cars	91.3	97.6	0	50	96.2	0	0	0	87	83.3	0	96.7	95.6	90.6	95.3	92.8	0	92.5	90.9	92.6	0	0	95.1
Bikes	3	8	0		12	0	1	0		4	0	14	4		81	4	0	3		9	0	0	106
% Bikes	0.6	0.4	0	50	0.5	0	100	0	13	16.7	0	0.6	0.9	9.4	2.4	0.9	0	0.5	9.1	0.8	0	0	1.5
Trucks Buses	43	37	0		80	0	0	0		0	0	59	16		75	29	0	47		76	0	0	231
% Trucks Buses	8.1	2	0	0	3.3	0	0	0	0	0	0	2.7	3.5	0	2.3	6.3	0	7.1	0	6.6	0	0	3.3



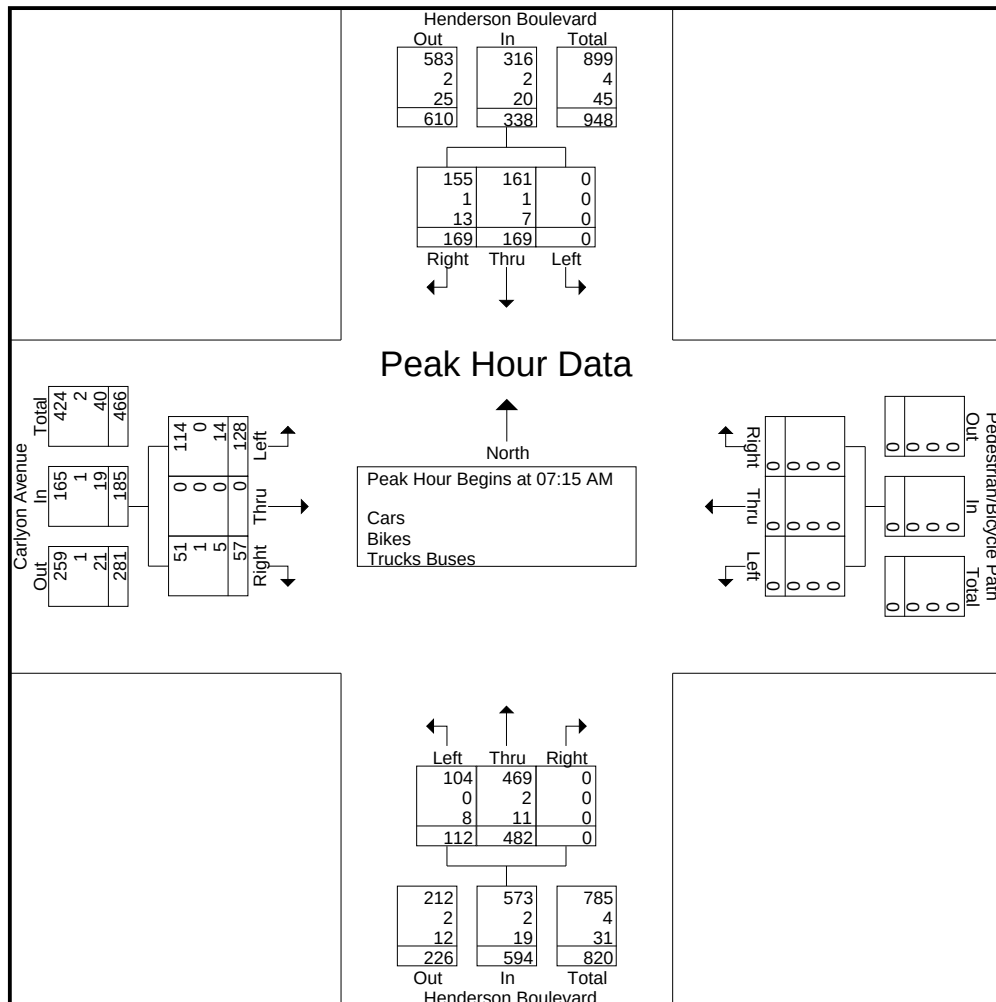
City of Olympia

Public Works Department
Transportation Engineering

Henderson Boulevard
Carlyon Avenue
Weather: Clear, Warm
Counted by: John L

File Name : Carlyon-Henderson
Site Code : 00000568
Start Date : 5/9/2017
Page No : 3

	Henderson Boulevard From North				Pedestrian / Bicycle Path From East				Henderson Boulevard From South				Carlyon Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	62	46	0	108	0	0	0	0	0	116	39	155	7	0	35	42	305
07:30 AM	66	56	0	122	0	0	0	0	0	127	33	160	21	0	44	65	347
07:45 AM	15	38	0	53	0	0	0	0	0	136	15	151	14	0	33	47	251
08:00 AM	26	29	0	55	0	0	0	0	0	103	25	128	15	0	16	31	214
Total Volume	169	169	0	338	0	0	0	0	0	482	112	594	57	0	128	185	1117
% App. Total	50	50	0		0	0	0		0	81.1	18.9		30.8	0	69.2		
PHF	.640	.754	.000	.693	.000	.000	.000	.000	.000	.886	.718	.928	.679	.000	.727	.712	.805
Cars	155	161	0	316	0	0	0	0	0	469	104	573	51	0	114	165	1054
% Cars	91.7	95.3	0	93.5	0	0	0	0	0	97.3	92.9	96.5	89.5	0	89.1	89.2	94.4
Bikes	1	1	0	2	0	0	0	0	0	2	0	2	1	0	0	1	5
% Bikes	0.6	0.6	0	0.6	0	0	0	0	0	0.4	0	0.3	1.8	0	0	0.5	0.4
Trucks Buses	13	7	0	20	0	0	0	0	0	11	8	19	5	0	14	19	58
% Trucks Buses	7.7	4.1	0	5.9	0	0	0	0	0	2.3	7.1	3.2	8.8	0	10.9	10.3	5.2



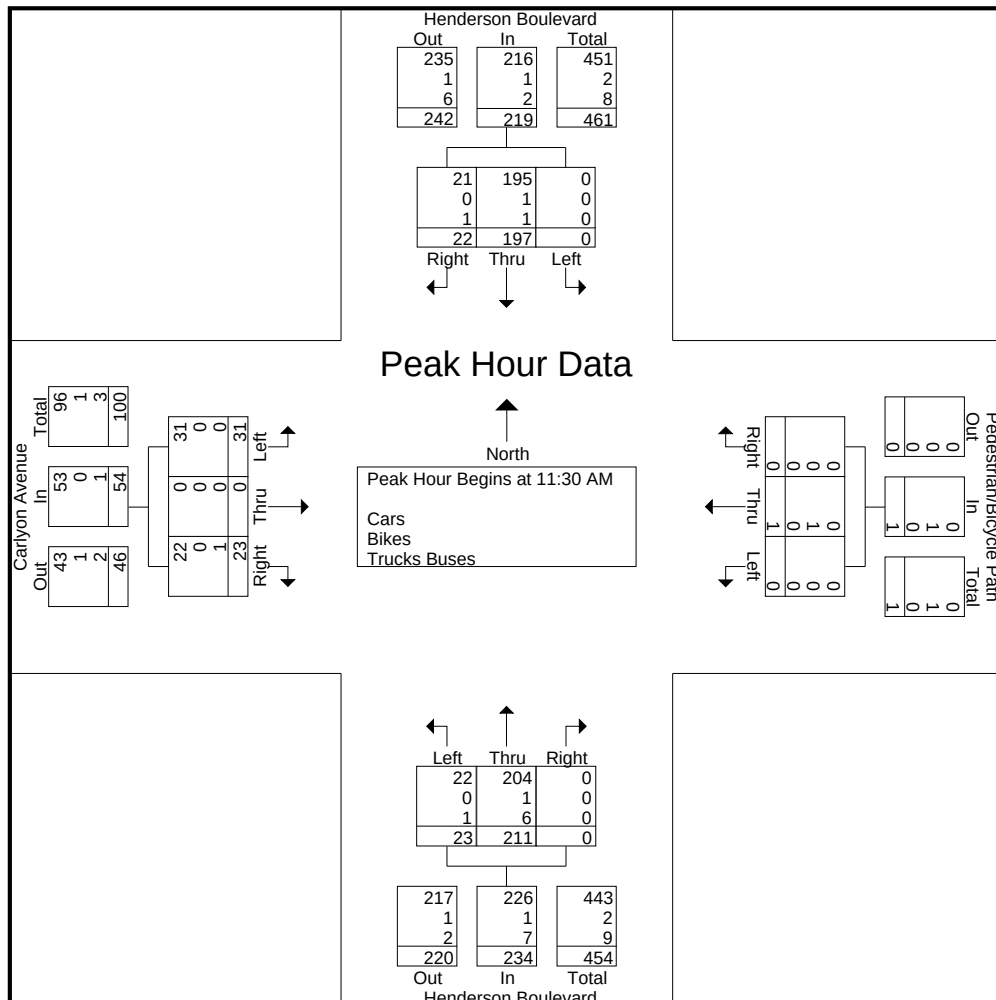
City of Olympia

Public Works Department
Transportation Engineering

Henderson Boulevard
Carlyon Avenue
Weather: Clear, Warm
Counted by: John L

File Name : Carlyon-Henderson
Site Code : 00000568
Start Date : 5/9/2017
Page No : 4

	Henderson Boulevard From North				Pedestrian/Bicycle Path From East				Henderson Boulevard From South				Carlyon Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:30 AM																	
11:30 AM	3	53	0	56	0	0	0	0	0	58	4	62	4	0	13	17	135
11:45 AM	3	53	0	56	0	0	0	0	0	48	4	52	6	0	8	14	122
12:00 PM	7	46	0	53	0	0	0	0	0	40	8	48	5	0	3	8	109
12:15 PM	9	45	0	54	0	1	0	1	0	65	7	72	8	0	7	15	142
Total Volume	22	197	0	219	0	1	0	1	0	211	23	234	23	0	31	54	508
% App. Total	10	90	0		0	100	0		0	90.2	9.8		42.6	0	57.4		
PHF	.611	.929	.000	.978	.000	.250	.000	.250	.000	.812	.719	.813	.719	.000	.596	.794	.894
Cars	21	195	0	216	0	0	0	0	0	204	22	226	22	0	31	53	495
% Cars	95.5	99.0	0	98.6	0	0	0	0	0	96.7	95.7	96.6	95.7	0	100	98.1	97.4
Bikes	0	1	0	1	0	1	0	1	0	1	0	1	0	0	0	0	3
% Bikes	0	0.5	0	0.5	0	100	0	100	0	0.5	0	0.4	0	0	0	0	0.6
Trucks Buses	1	1	0	2	0	0	0	0	0	6	1	7	1	0	0	1	10
% Trucks Buses	4.5	0.5	0	0.9	0	0	0	0	0	2.8	4.3	3.0	4.3	0	0	1.9	2.0



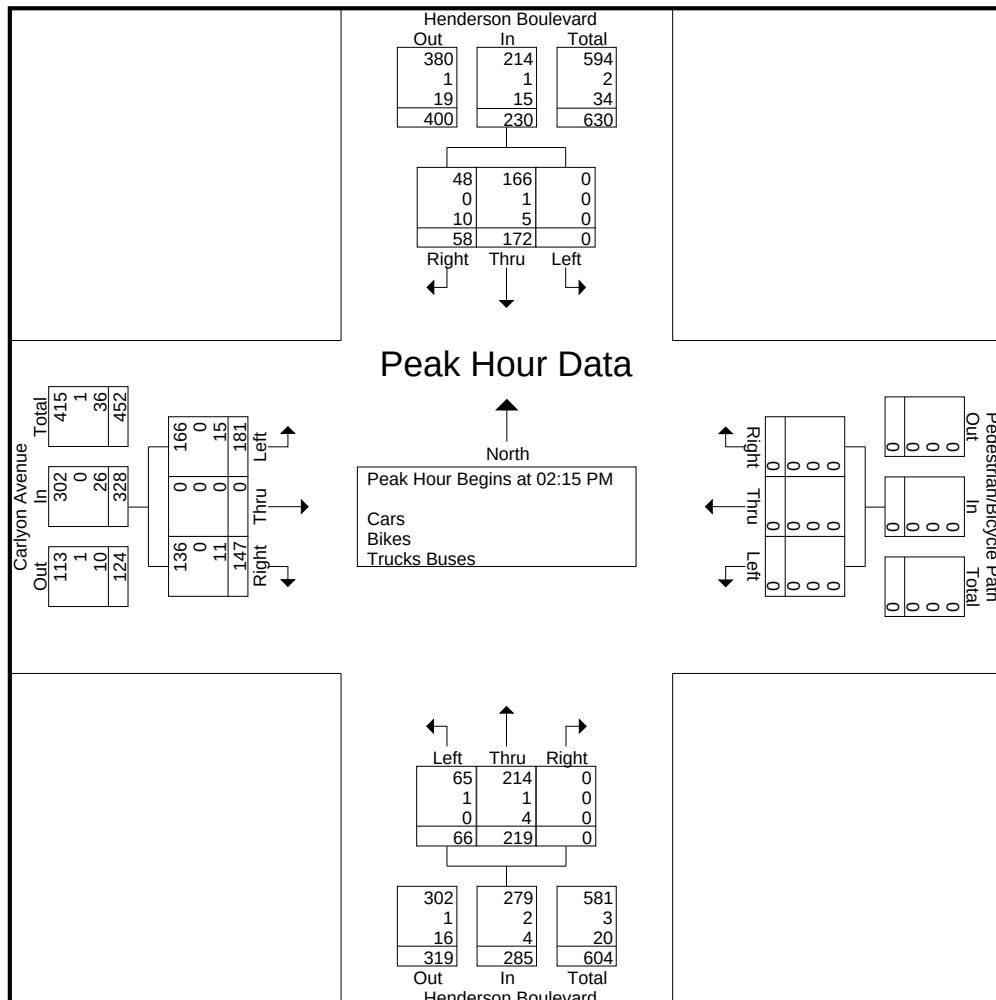
City of Olympia

Public Works Department
Transportation Engineering

Henderson Boulevard
Carlyon Avenue
Weather: Clear, Warm
Counted by: John L

File Name : Carlyon-Henderson
Site Code : 00000568
Start Date : 5/9/2017
Page No : 5

	Henderson Boulevard From North				Pedestrian/Bicycle Path From East				Henderson Boulevard From South				Carlyon Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 02:15 PM																	
02:15 PM	18	43	0	61	0	0	0	0	0	53	28	81	37	0	44	81	223
02:30 PM	20	44	0	64	0	0	0	0	0	57	14	71	59	0	64	123	258
02:45 PM	11	38	0	49	0	0	0	0	0	59	15	74	25	0	33	58	181
03:00 PM	9	47	0	56	0	0	0	0	0	50	9	59	26	0	40	66	181
Total Volume	58	172	0	230	0	0	0	0	0	219	66	285	147	0	181	328	843
% App. Total	25.2	74.8	0		0	0	0		0	76.8	23.2		44.8	0	55.2		
PHF	.725	.915	.000	.898	.000	.000	.000	.000	.000	.928	.589	.880	.623	.000	.707	.667	.817
Cars	48	166	0	214	0	0	0	0	0	214	65	279	136	0	166	302	795
% Cars	82.8	96.5	0	93.0	0	0	0	0	0	97.7	98.5	97.9	92.5	0	91.7	92.1	94.3
Bikes	0	1	0	1	0	0	0	0	0	1	1	2	0	0	0	0	3
% Bikes	0	0.6	0	0.4	0	0	0	0	0	0.5	1.5	0.7	0	0	0	0	0.4
Trucks Buses	10	5	0	15	0	0	0	0	0	4	0	4	11	0	15	26	45
% Trucks Buses	17.2	2.9	0	6.5	0	0	0	0	0	1.8	0	1.4	7.5	0	8.3	7.9	5.3



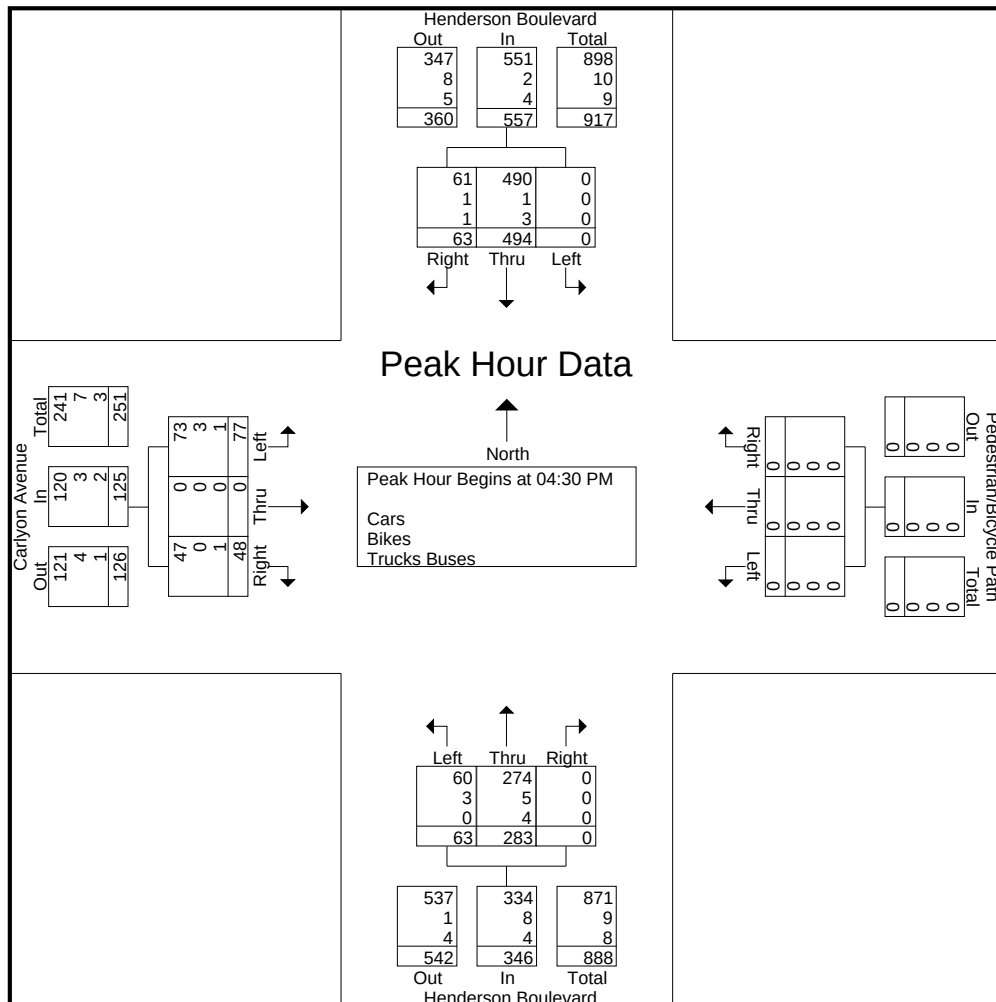
City of Olympia

Public Works Department
Transportation Engineering

Henderson Boulevard
Carlyon Avenue
Weather: Clear, Warm
Counted by: John L

File Name : Carlyon-Henderson
Site Code : 00000568
Start Date : 5/9/2017
Page No : 6

	Henderson Boulevard From North				Pedestrian/Bicycle Path From East				Henderson Boulevard From South				Carlyon Avenue From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	16	119	0	135	0	0	0	0	0	70	12	82	7	0	12	19	236
04:45 PM	18	107	0	125	0	0	0	0	0	76	15	91	11	0	28	39	255
05:00 PM	11	135	0	146	0	0	0	0	0	62	17	79	17	0	19	36	261
05:15 PM	18	133	0	151	0	0	0	0	0	75	19	94	13	0	18	31	276
Total Volume	63	494	0	557	0	0	0	0	0	283	63	346	48	0	77	125	1028
% App. Total	11.3	88.7	0		0	0	0		0	81.8	18.2		38.4	0	61.6		
PHF	.875	.915	.000	.922	.000	.000	.000	.000	.000	.931	.829	.920	.706	.000	.688	.801	.931
Cars	61	490	0	551	0	0	0	0	0	274	60	334	47	0	73	120	1005
% Cars	96.8	99.2	0	98.9	0	0	0	0	0	96.8	95.2	96.5	97.9	0	94.8	96.0	97.8
Bikes	1	1	0	2	0	0	0	0	0	5	3	8	0	0	3	3	13
% Bikes	1.6	0.2	0	0.4	0	0	0	0	0	1.8	4.8	2.3	0	0	3.9	2.4	1.3
Trucks Buses	1	3	0	4	0	0	0	0	0	4	0	4	1	0	1	2	10
% Trucks Buses	1.6	0.6	0	0.7	0	0	0	0	0	1.4	0	1.2	2.1	0	1.3	1.6	1.0



City of Olympia

Public Works Department
Transportation Engineering

Henderson Boulevard
North Street
Weather: Sun/Clouds, Cool
Counted by: John L

File Name : Henderson-North
Site Code : 00000064
Start Date : 3/22/2018
Page No : 1

Groups Printed- Cars - Bikes - Trucks Buses

	Henderson Boulevard From North					North Street From East					Henderson Boulevard From South					North Street From West								
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total	
07:00 AM	8	16	8	1	32	37	69	8	1	114	10	72	12	0	94	5	16	9	0	30	2	270	272	
07:15 AM	25	22	7	3	54	57	105	8	0	170	14	78	32	1	124	8	39	7	5	54	9	402	411	
07:30 AM	41	25	9	2	75	50	137	15	0	202	17	99	34	0	150	15	78	9	1	102	3	529	532	
07:45 AM	9	35	11	2	55	43	49	22	0	114	24	102	3	0	129	7	53	17	4	77	6	375	381	
Total	83	98	35	8	216	187	360	53	1	600	65	351	81	1	497	35	186	42	10	263	20	1576	1596	
08:00 AM	4	26	5	0	35	52	52	22	0	126	20	79	7	0	106	7	33	13	6	53	6	320	326	
08:15 AM	22	42	18	3	82	44	32	18	0	94	8	79	6	0	93	4	23	12	8	39	11	308	319	
08:30 AM	11	17	8	0	36	25	38	9	1	72	9	46	5	0	60	2	23	13	0	38	1	206	207	
08:45 AM	9	15	11	1	35	28	48	12	0	88	15	62	5	0	82	4	32	7	1	43	2	248	250	
Total	46	100	42	4	188	149	170	61	1	380	52	266	23	0	341	17	111	45	15	173	20	1082	1102	
11:00 AM	4	22	6	0	32	8	30	4	0	42	4	33	8	0	45	12	40	11	2	63	2	182	184	
11:15 AM	14	28	12	1	54	20	36	8	0	64	9	23	5	0	37	2	38	20	0	60	1	215	216	
11:30 AM	13	21	7	6	41	15	34	10	0	59	4	27	7	0	38	10	38	14	4	62	10	200	210	
11:45 AM	10	35	7	0	52	14	41	7	0	62	12	34	4	1	50	11	49	6	0	66	1	230	231	
Total	41	106	32	7	179	57	141	29	0	227	29	117	24	1	170	35	165	51	6	251	14	827	841	
12:00 PM	17	42	9	0	68	20	25	14	0	59	7	22	5	0	34	4	41	11	1	56	1	217	218	
12:15 PM	9	36	16	4	61	15	32	14	0	61	7	43	3	0	53	6	54	13	0	73	4	248	252	
12:30 PM	10	20	13	0	43	20	35	9	0	64	8	38	5	0	51	4	38	16	1	58	1	216	217	
12:45 PM	6	23	11	0	40	20	31	8	0	59	8	48	4	1	60	4	41	6	0	51	1	210	211	
Total	42	121	49	4	212	75	123	45	0	243	30	151	17	1	198	18	174	46	2	238	7	891	898	
02:00 PM	14	19	11	0	44	13	41	6	0	60	7	25	7	0	39	3	33	10	0	46	0	189	189	
02:15 PM	19	37	14	6	70	22	66	8	0	96	10	35	9	0	54	13	74	21	1	108	7	328	335	
02:30 PM	16	45	42	8	103	15	41	8	1	64	16	50	11	0	77	17	89	20	5	126	14	370	384	
02:45 PM	14	33	21	3	68	30	55	22	1	107	11	35	8	0	54	15	60	12	1	87	5	316	321	
Total	63	134	88	17	285	80	203	44	2	327	44	145	35	0	224	48	256	63	7	367	26	1203	1229	
03:00 PM	20	45	20	11	85	20	52	21	1	93	14	33	7	0	54	12	61	11	15	84	27	316	343	
03:15 PM	14	29	9	4	52	12	54	15	0	81	11	37	4	0	52	6	61	12	0	79	4	264	268	
03:30 PM	21	51	19	0	91	18	59	22	0	99	14	43	10	0	67	6	70	14	2	90	2	347	349	
03:45 PM	17	57	16	3	90	16	58	12	0	86	9	47	4	0	60	7	63	13	0	83	3	319	322	
Total	72	182	64	18	318	66	223	70	1	359	48	160	25	0	233	31	255	50	17	336	36	1246	1282	
04:00 PM	14	64	25	2	103	27	60	13	1	100	13	31	11	1	55	7	63	10	1	80	5	338	343	
04:15 PM	12	63	25	1	100	27	66	12	0	105	17	32	7	0	56	11	81	15	2	107	3	368	371	
04:30 PM	11	69	38	3	118	15	66	25	0	106	6	31	12	0	49	8	61	12	1	81	4	354	358	
04:45 PM	14	81	24	2	119	28	78	15	1	121	15	43	13	0	71	11	72	16	1	99	4	410	414	
Total	51	277	112	8	440	97	270	65	2	432	51	137	43	1	231	37	277	53	5	367	16	1470	1486	
05:00 PM	23	98	47	5	168	30	63	23	0	116	9	37	10	0	56	15	87	20	1	122	6	462	468	
05:15 PM	10	71	34	7	115	83	96	18	0	197	18	71	10	0	99	16	92	7	1	115	8	526	534	
05:30 PM	28	84	38	2	150	64	63	22	0	149	17	63	10	0	90	16	89	19	0	124	2	513	515	
05:45 PM	21	73	33	1	127	36	51	10	0	97	12	49	10	0	71	13	59	21	1	93	2	388	390	
Total	82	326	152	15	560	213	273	73	0	559	56	220	40	0	316	60	327	67	3	454	18	1889	1907	
Grand Total	480	1344	574	81	2398	924	1763	440	7	3127	375	1547	288	4	2210	281	1751	417	65	2449	157	10184	10341	
Apprch %	20	56	23.9			29.5	56.4	14.1			17	70	13			11.5	71.5	17						
Total %	4.7	13.2	5.6		23.5	9.1	17.3	4.3		30.7	3.7	15.2	2.8		21.7	2.8	17.2	4.1		24	1.5	98.5		

City of Olympia

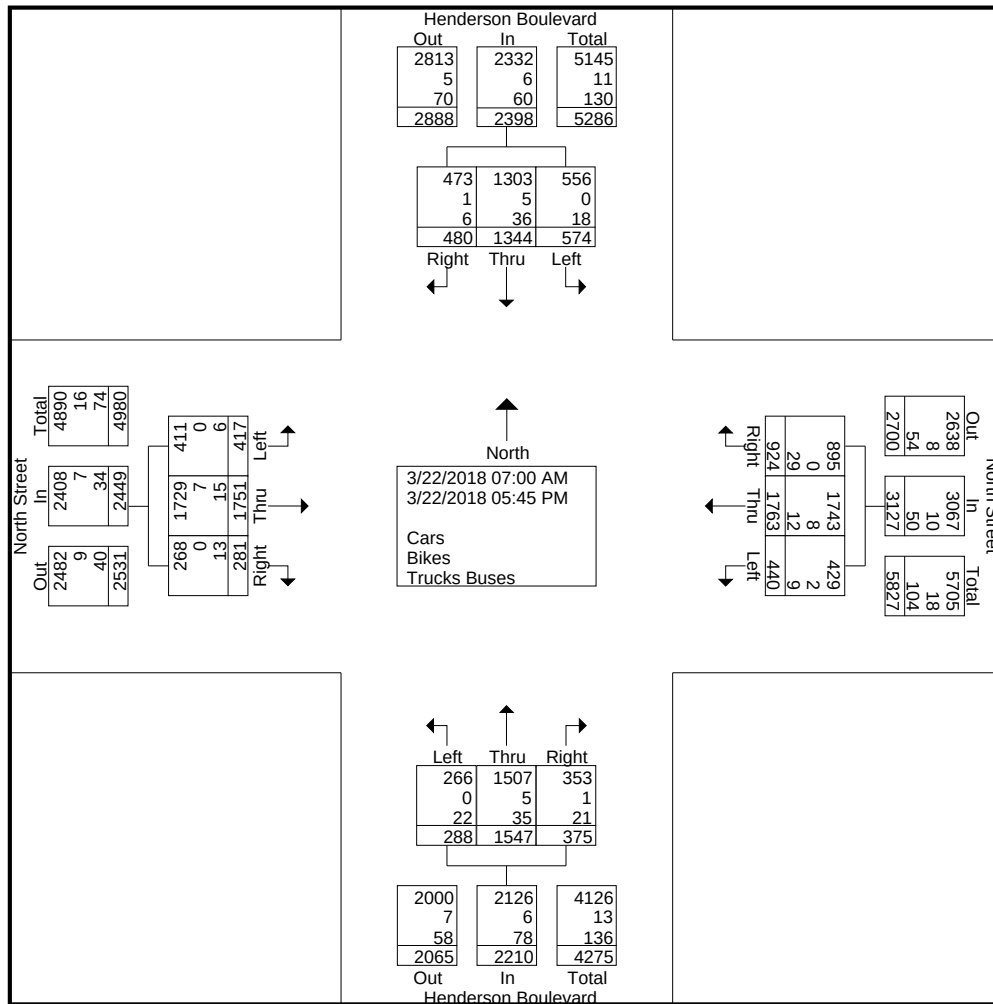
Public Works Department
Transportation Engineering

Henderson Boulevard
North Street
Weather: Sun/Clouds, Cool
Counted by: John L

File Name : Henderson-North
Site Code : 00000064
Start Date : 3/22/2018
Page No : 2

Groups Printed- Cars - Bikes - Trucks Buses

	Henderson Boulevard From North					North Street From East					Henderson Boulevard From South					North Street From West					Exclu. Total	Inclu. Total	Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total			
Cars	473	1303	556		2409	895	1743	429		3072	353	1507	266		2130	268	1729	411		2466	0	0	10077
% Cars	98.5	96.9	96.9	95.1	97.2	96.9	98.9	97.5	71.4	98	94.1	97.4	92.4	100	96.2	95.4	98.7	98.6	89.2	98.1	0	0	97.4
Bikes	1	5	0		10	0	8	2		12	1	5	0		6	0	7	0		14	0	0	42
% Bikes	0.2	0.4	0	4.9	0.4	0	0.5	0.5	28.6	0.4	0.3	0.3	0	0	0.3	0	0.4	0	10.8	0.6	0	0	0.4
Trucks Buses	6	36	18		60	29	12	9		50	21	35	22		78	13	15	6		34	0	0	222
% Trucks Buses	1.2	2.7	3.1	0	2.4	3.1	0.7	2	0	1.6	5.6	2.3	7.6	0	3.5	4.6	0.9	1.4	0	1.4	0	0	2.1



City of Olympia

Public Works Department
Transportation Engineering

Henderson Boulevard

North Street

Weather: Sun/Clouds, Cool

Counted by: John L

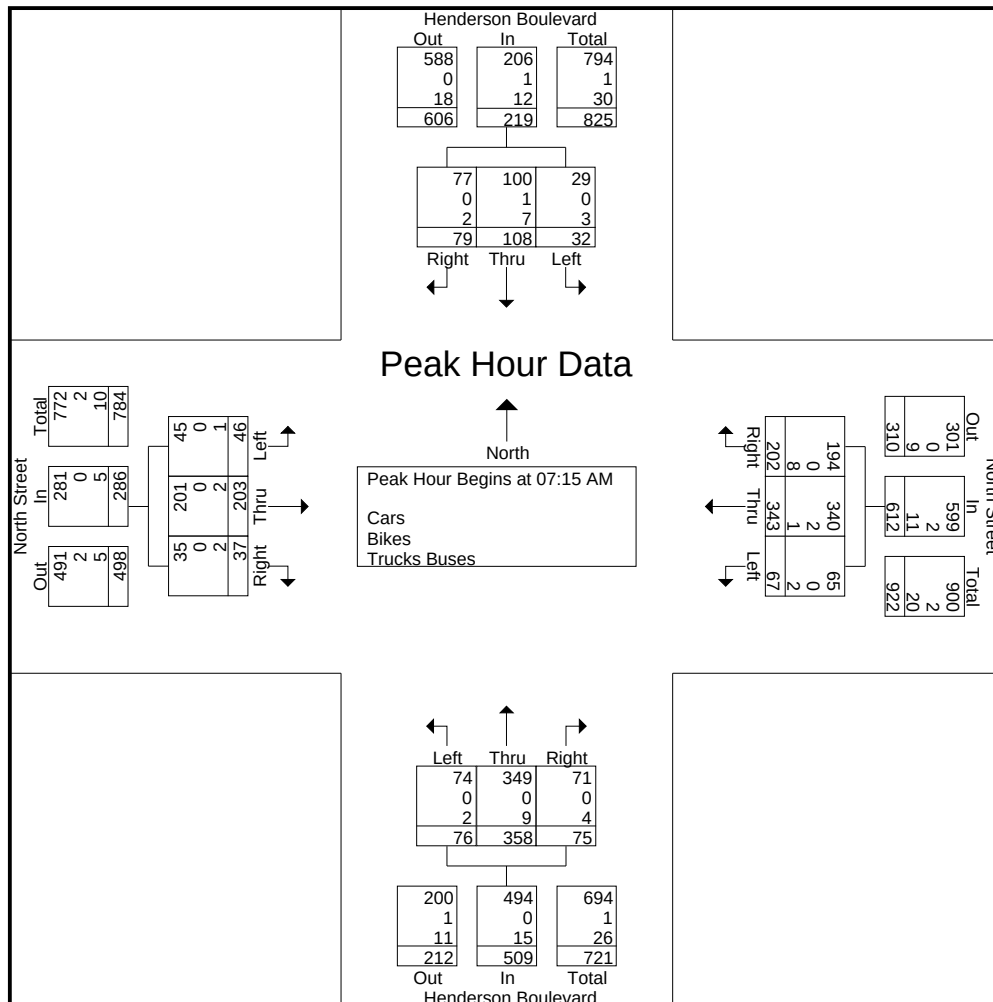
File Name : Henderson-North

Site Code : 00000064

Start Date : 3/22/2018

Page No : 3

	Henderson Boulevard From North				North Street From East				Henderson Boulevard From South				North Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	25	22	7	54	57	105	8	170	14	78	32	124	8	39	7	54	402
07:30 AM	41	25	9	75	50	137	15	202	17	99	34	150	15	78	9	102	529
07:45 AM	9	35	11	55	43	49	22	114	24	102	3	129	7	53	17	77	375
08:00 AM	4	26	5	35	52	52	22	126	20	79	7	106	7	33	13	53	320
Total Volume	79	108	32	219	202	343	67	612	75	358	76	509	37	203	46	286	1626
% App. Total	36.1	49.3	14.6		33	56	10.9		14.7	70.3	14.9		12.9	71	16.1		
PHF	.482	.771	.727	.730	.886	.626	.761	.757	.781	.877	.559	.848	.617	.651	.676	.701	.768
Cars	77	100	29	206	194	340	65	599	71	349	74	494	35	201	45	281	1580
% Cars	97.5	92.6	90.6	94.1	96.0	99.1	97.0	97.9	94.7	97.5	97.4	97.1	94.6	99.0	97.8	98.3	97.2
Bikes	0	1	0	1	0	2	0	2	0	0	0	0	0	0	0	0	3
% Bikes	0	0.9	0	0.5	0	0.6	0	0.3	0	0	0	0	0	0	0	0	0.2
Trucks Buses	2	7	3	12	8	1	2	11	4	9	2	15	2	2	1	5	43
% Trucks Buses	2.5	6.5	9.4	5.5	4.0	0.3	3.0	1.8	5.3	2.5	2.6	2.9	5.4	1.0	2.2	1.7	2.6



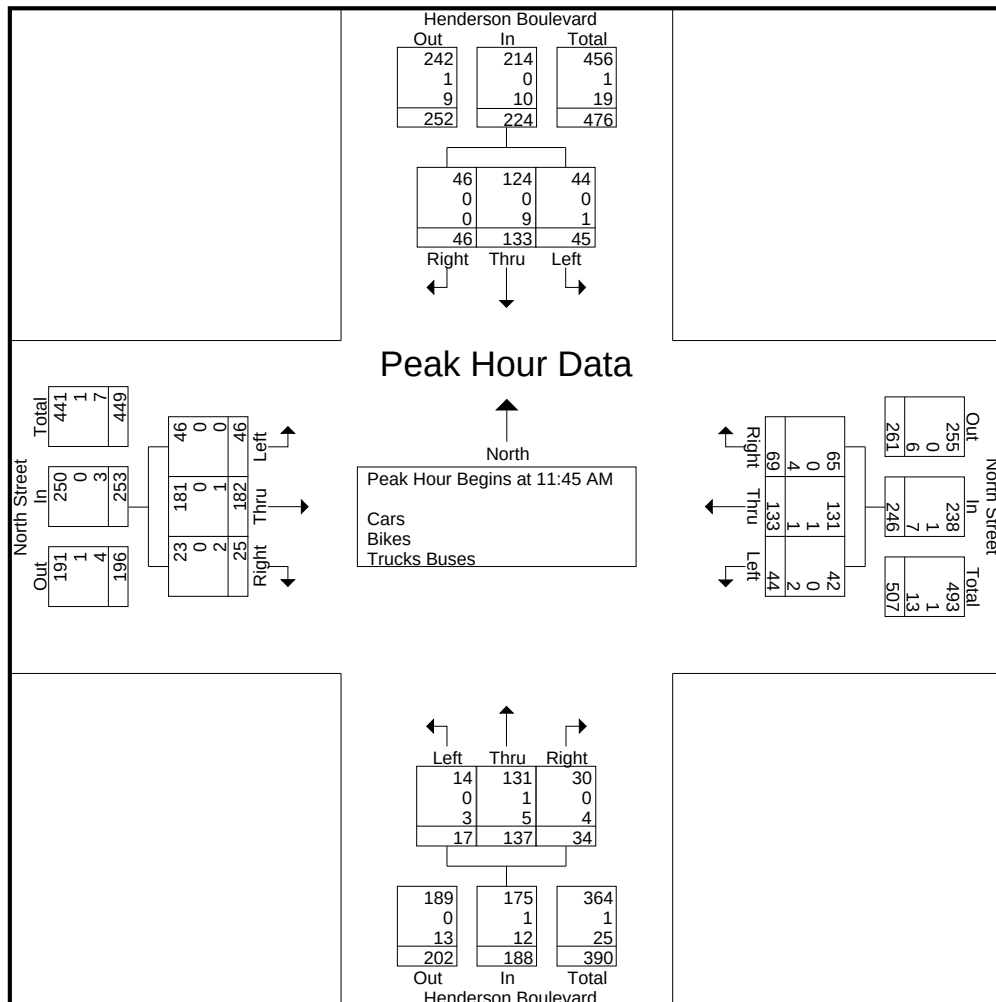
City of Olympia

Public Works Department
Transportation Engineering

Henderson Boulevard
North Street
Weather: Sun/Clouds, Cool
Counted by: John L

File Name : Henderson-North
Site Code : 00000064
Start Date : 3/22/2018
Page No : 4

	Henderson Boulevard From North				North Street From East				Henderson Boulevard From South				North Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 11:45 AM																	
11:45 AM	10	35	7	52	14	41	7	62	12	34	4	50	11	49	6	66	230
12:00 PM	17	42	9	68	20	25	14	59	7	22	5	34	4	41	11	56	217
12:15 PM	9	36	16	61	15	32	14	61	7	43	3	53	6	54	13	73	248
12:30 PM	10	20	13	43	20	35	9	64	8	38	5	51	4	38	16	58	216
Total Volume	46	133	45	224	69	133	44	246	34	137	17	188	25	182	46	253	911
% App. Total	20.5	59.4	20.1		28	54.1	17.9		18.1	72.9	9		9.9	71.9	18.2		
PHF	.676	.792	.703	.824	.863	.811	.786	.961	.708	.797	.850	.887	.568	.843	.719	.866	.918
Cars	46	124	44	214	65	131	42	238	30	131	14	175	23	181	46	250	877
% Cars	100	93.2	97.8	95.5	94.2	98.5	95.5	96.7	88.2	95.6	82.4	93.1	92.0	99.5	100	98.8	96.3
Bikes	0	0	0	0	0	1	0	1	0	1	0	1	0	0	0	0	2
% Bikes	0	0	0	0	0	0.8	0	0.4	0	0.7	0	0.5	0	0	0	0	0.2
Trucks Buses	0	9	1	10	4	1	2	7	4	5	3	12	2	1	0	3	32
% Trucks Buses	0	6.8	2.2	4.5	5.8	0.8	4.5	2.8	11.8	3.6	17.6	6.4	8.0	0.5	0	1.2	3.5



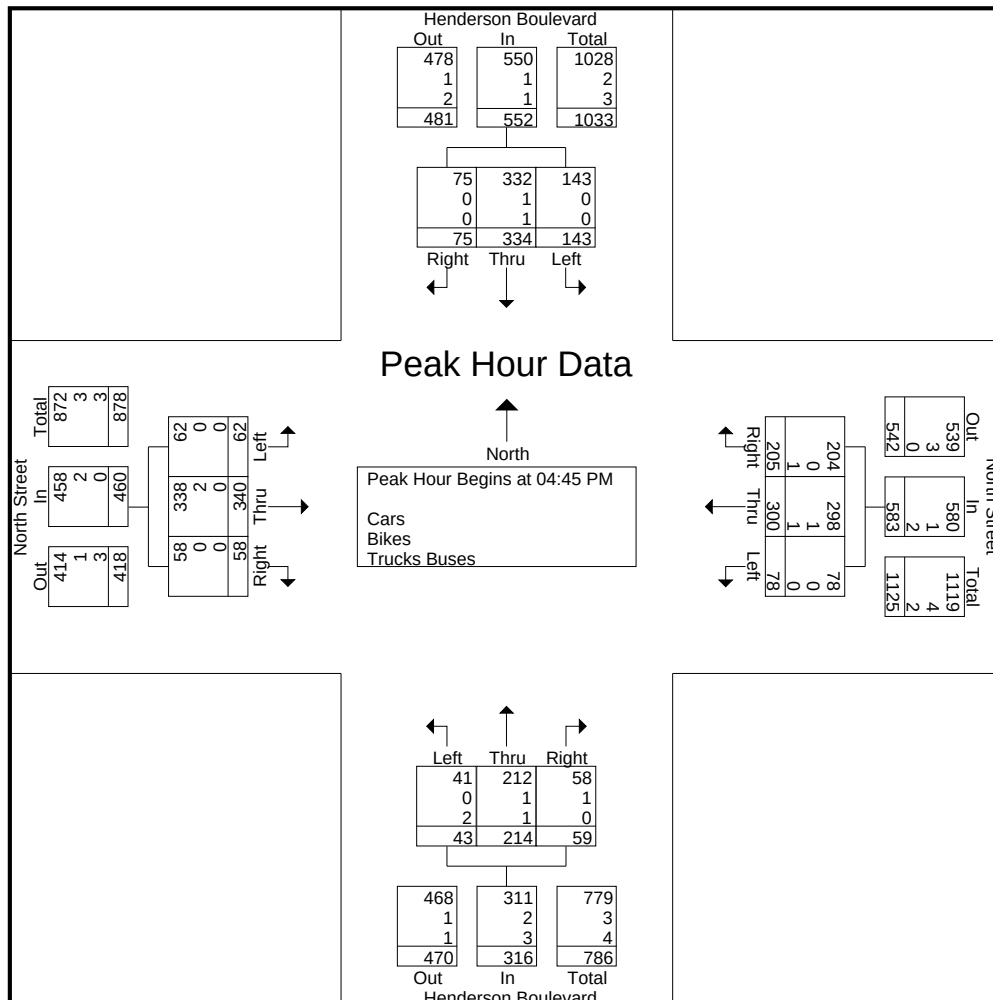
City of Olympia

Public Works Department
Transportation Engineering

Henderson Boulevard
North Street
Weather: Sun/Clouds, Cool
Counted by: John L

File Name : Henderson-North
Site Code : 00000064
Start Date : 3/22/2018
Page No : 5

	Henderson Boulevard From North				North Street From East				Henderson Boulevard From South				North Street From West				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	14	81	24	119	28	78	15	121	15	43	13	71	11	72	16	99	410
05:00 PM	23	98	47	168	30	63	23	116	9	37	10	56	15	87	20	122	462
05:15 PM	10	71	34	115	83	96	18	197	18	71	10	99	16	92	7	115	526
05:30 PM	28	84	38	150	64	63	22	149	17	63	10	90	16	89	19	124	513
Total Volume	75	334	143	552	205	300	78	583	59	214	43	316	58	340	62	460	1911
% App. Total	13.6	60.5	25.9		35.2	51.5	13.4		18.7	67.7	13.6		12.6	73.9	13.5		
PHF	.670	.852	.761	.821	.617	.781	.848	.740	.819	.754	.827	.798	.906	.924	.775	.927	.908
Cars	75	332	143	550	204	298	78	580	58	212	41	311	58	338	62	458	1899
% Cars	100	99.4	100	99.6	99.5	99.3	100	99.5	98.3	99.1	95.3	98.4	100	99.4	100	99.6	99.4
Bikes	0	1	0	1	0	1	0	1	1	1	0	2	0	2	0	2	6
% Bikes	0	0.3	0	0.2	0	0.3	0	0.2	1.7	0.5	0	0.6	0	0.6	0	0.4	0.3
Trucks Buses	0	1	0	1	1	1	0	2	0	1	2	3	0	0	0	0	6
% Trucks Buses	0	0.3	0	0.2	0.5	0.3	0	0.3	0	0.5	4.7	0.9	0	0	0	0	0.3



OLYMPIA HIGH SCHOOL
TRAFFIC IMPACT ANALYSIS

APPENDIX

ACCESS LEVEL OF SERVICE

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	53	170	332	73	3	14
Future Vol, veh/h	53	170	332	73	3	14
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	61	61	61	61	61	61
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	87	279	544	120	5	23
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	664	0	-	0	1057	604
Stage 1	-	-	-	-	604	-
Stage 2	-	-	-	-	453	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	935	-	-	-	251	502
Stage 1	-	-	-	-	550	-
Stage 2	-	-	-	-	645	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	935	-	-	-	223	502
Mov Cap-2 Maneuver	-	-	-	-	223	-
Stage 1	-	-	-	-	490	-
Stage 2	-	-	-	-	645	-
Approach	EB	WB		SB		
HCM Control Delay, s	2.2	0		14.4		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	935	-	-	-	411	
HCM Lane V/C Ratio	0.093	-	-	-	0.068	
HCM Control Delay (s)	9.2	0	-	-	14.4	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile O(veh)	0.3	-	-	-	0.2	

Intersection						
Int Delay, s/veh	2.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↗
Traffic Vol, veh/h	0	173	330	0	41	28
Future Vol, veh/h	0	173	330	0	41	28
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	56	56	56	56	56	56
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	0	309	589	0	73	50
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	898	589
Stage 1	-	-	-	-	589	-
Stage 2	-	-	-	-	309	-
Critical Hdwy	-	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	0	-	-	0	312	512
Stage 1	0	-	-	0	558	-
Stage 2	0	-	-	0	749	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	312	512
Mov Cap-2 Maneuver	-	-	-	-	312	-
Stage 1	-	-	-	-	558	-
Stage 2	-	-	-	-	749	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		17.1		
HCM LOS	C					
Minor Lane/Major Mvmt	EBT	WBT	SBLn1	SBLn2		
Capacity (veh/h)	-	-	312	512		
HCM Lane V/C Ratio	-	-	0.235	0.098		
HCM Control Delay (s)	-	-	20	12.8		
HCM Lane LOS	-	-	C	B		
HCM 95th %tile O(veh)	-	-	0.9	0.3		

Intersection												
Int Delay, s/veh	6.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	14	204	2	3	289	119	8	0	23	30	3	102
Future Vol, veh/h	14	204	2	3	289	119	8	0	23	30	3	102
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	57	57	57	57	57	57	57	57	57	57	57	57
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	25	358	4	5	507	209	14	0	40	53	5	179

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	716	0	0	362	0	0	1124	1136	360	1052	1034	612
Stage 1	-	-	-	-	-	-	410	410	-	622	622	-
Stage 2	-	-	-	-	-	-	714	726	-	430	412	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	894	-	-	1208	-	-	184	204	689	206	234	497
Stage 1	-	-	-	-	-	-	623	599	-	478	482	-
Stage 2	-	-	-	-	-	-	425	433	-	607	598	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	894	-	-	1208	-	-	112	195	689	188	224	497
Mov Cap-2 Maneuver	-	-	-	-	-	-	112	195	-	188	224	-
Stage 1	-	-	-	-	-	-	601	578	-	461	479	-
Stage 2	-	-	-	-	-	-	267	430	-	551	577	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.1			19.9			32.9		
HCM LOS							C			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	296	894	-	-	1208	-	-	357
HCM Lane V/C Ratio	0.184	0.027	-	-	0.004	-	-	0.663
HCM Control Delay (s)	19.9	9.1	0	-	8	0	-	32.9
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.7	0.1	-	-	0	-	-	4.5

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	253	411	26	6	5
Future Vol, veh/h	13	253	411	26	6	5
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	62	62	62	62	62	62
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	21	408	663	42	10	8

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	705	0	0 1134 684
Stage 1	-	-	- - 684 -
Stage 2	-	-	- - 450 -
Critical Hdwy	4.1	-	- - 6.4 6.2
Critical Hdwy Stg 1	-	-	- - 5.4 -
Critical Hdwy Stg 2	-	-	- - 5.4 -
Follow-up Hdwy	2.2	-	- - 3.5 3.3
Pot Cap-1 Maneuver	902	-	- - 226 452
Stage 1	-	-	- - 505 -
Stage 2	-	-	- - 647 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	902	-	- - 219 452
Mov Cap-2 Maneuver	-	-	- - 219 -
Stage 1	-	-	- - 490 -
Stage 2	-	-	- - 647 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	18.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	902	-	-	-	286
HCM Lane V/C Ratio	0.023	-	-	-	0.062
HCM Control Delay (s)	9.1	0	-	-	18.4
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	245	6	9	433	66	2	3	3	0	0	1
Future Vol, veh/h	0	245	6	9	433	66	2	3	3	0	0	1
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	60	60	60	60	60	60	60	60	60	60	60	60
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	0	408	10	15	722	110	3	5	5	0	0	2
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	832	0	0	418	0	0	1221	1275	413	1225	1225	777
Stage 1	-	-	-	-	-	-	413	413	-	807	807	-
Stage 2	-	-	-	-	-	-	808	862	-	418	418	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	809	-	-	1152	-	-	158	168	643	157	180	400
Stage 1	-	-	-	-	-	-	620	597	-	378	397	-
Stage 2	-	-	-	-	-	-	378	375	-	616	594	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	809	-	-	1152	-	-	154	164	643	149	176	400
Mov Cap-2 Maneuver	-	-	-	-	-	-	154	164	-	149	176	-
Stage 1	-	-	-	-	-	-	620	597	-	378	387	-
Stage 2	-	-	-	-	-	-	367	366	-	606	594	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.1			22.2			14		
HCM LOS							C			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	223	809	-	-	1152	-	-	400				
HCM Lane V/C Ratio	0.06	-	-	-	0.013	-	-	0.004				
HCM Control Delay (s)	22.2	0	-	-	8.2	0	-	14				
HCM Lane LOS	C	A	-	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0				

Intersection						
Int Delay, s/veh	3.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	145	112	21	52	40	45
Future Vol, veh/h	145	112	21	52	40	45
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	46	46	46	46	46	46
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	315	243	46	113	87	98
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	558	0	642	437
Stage 1	-	-	-	-	437	-
Stage 2	-	-	-	-	205	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1023	-	442	624
Stage 1	-	-	-	-	655	-
Stage 2	-	-	-	-	834	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1023	-	421	624
Mov Cap-2 Maneuver	-	-	-	-	421	-
Stage 1	-	-	-	-	624	-
Stage 2	-	-	-	-	834	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		2.5		16	
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	509	-	-	1023	-	
HCM Lane V/C Ratio	0.363	-	-	0.045	-	
HCM Control Delay (s)	16	-	-	8.7	0	
HCM Lane LOS	C	-	-	A	A	
HCM 95th %tile O(veh)	1.6	-	-	0.1	-	

Intersection						
Int Delay, s/veh	5.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	122	58	245	61	3	49
Future Vol, veh/h	122	58	245	61	3	49
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	51	51	51	51	51	51
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	239	114	480	120	6	96

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	353	0	1376
Stage 1	-	-	-	-	296
Stage 2	-	-	-	-	1080
Critical Hdwy	-	-	4.1	-	6.4
Critical Hdwy Stg 1	-	-	-	-	5.4
Critical Hdwy Stg 2	-	-	-	-	5.4
Follow-up Hdwy	-	-	2.2	-	3.5
Pot Cap-1 Maneuver	-	-	1217	-	162
Stage 1	-	-	-	-	759
Stage 2	-	-	-	-	329
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1217	-	94
Mov Cap-2 Maneuver	-	-	-	-	94
Stage 1	-	-	-	-	439
Stage 2	-	-	-	-	329

Approach	EB	WB	NB
HCM Control Delay, s	0	7.9	13.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	534	-	-	1217	-
HCM Lane V/C Ratio	0.191	-	-	0.395	-
HCM Control Delay (s)	13.3	-	-	9.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.7	-	-	1.9	-

Intersection

Int Delay, s/veh 1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	290	319	30	17	26
Future Vol, veh/h	13	290	319	30	17	26
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	84	84	84	84	84	84
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	15	345	380	36	20	31

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	416	0	0 773 398
Stage 1	-	-	- 398 -
Stage 2	-	-	- 375 -
Critical Hdwy	4.1	-	- 6.4 6.2
Critical Hdwy Stg 1	-	-	- 5.4 -
Critical Hdwy Stg 2	-	-	- 5.4 -
Follow-up Hdwy	2.2	-	- 3.5 3.3
Pot Cap-1 Maneuver	1154	-	- 370 656
Stage 1	-	-	- 683 -
Stage 2	-	-	- 699 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1154	-	- 364 656
Mov Cap-2 Maneuver	-	-	- 364 -
Stage 1	-	-	- 672 -
Stage 2	-	-	- 699 -

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	13.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1154	-	-	-	498
HCM Lane V/C Ratio	0.013	-	-	-	0.103
HCM Control Delay (s)	8.2	0	-	-	13.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

Intersection						
Int Delay, s/veh	1.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	↗
Traffic Vol, veh/h	0	295	358	0	55	28
Future Vol, veh/h	0	295	358	0	55	28
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	0	321	389	0	60	30
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	710	389
Stage 1	-	-	-	-	389	-
Stage 2	-	-	-	-	321	-
Critical Hdwy	-	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	0	-	-	0	403	664
Stage 1	0	-	-	0	689	-
Stage 2	0	-	-	0	740	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	403	664
Mov Cap-2 Maneuver	-	-	-	-	403	-
Stage 1	-	-	-	-	689	-
Stage 2	-	-	-	-	740	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		13.9		
HCM LOS	B					
Minor Lane/Major Mvmt	EBT	WBT	SBLn1	SBLn2		
Capacity (veh/h)	-	-	403	664		
HCM Lane V/C Ratio	-	-	0.148	0.046		
HCM Control Delay (s)	-	-	15.5	10.7		
HCM Lane LOS	-	-	C	B		
HCM 95th %tile Q(veh)	-	-	0.5	0.1		

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	21	279	23	11	272	36	5	1	6	29	4	42
Future Vol, veh/h	21	279	23	11	272	36	5	1	6	29	4	42
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	23	303	25	12	296	39	5	1	7	32	4	46
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	335	0	0	328	0	0	727	721	316	706	714	316
Stage 1	-	-	-	-	-	-	362	362	-	340	340	-
Stage 2	-	-	-	-	-	-	365	359	-	366	374	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1236	-	-	1243	-	-	342	356	729	353	359	729
Stage 1	-	-	-	-	-	-	661	629	-	679	643	-
Stage 2	-	-	-	-	-	-	658	631	-	657	621	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1236	-	-	1243	-	-	309	344	729	340	346	729
Mov Cap-2 Maneuver	-	-	-	-	-	-	309	344	-	340	346	-
Stage 1	-	-	-	-	-	-	646	615	-	663	635	-
Stage 2	-	-	-	-	-	-	605	623	-	635	607	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.3			13.5			13.9		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	439	1236	-	-	1243	-	-	486				
HCM Lane V/C Ratio	0.03	0.018	-	-	0.01	-	-	0.168				
HCM Control Delay (s)	13.5	8	0	-	7.9	0	-	13.9				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.6				

Intersection

Int Delay, s/veh 1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	333	321	4	54	20
Future Vol, veh/h	3	333	321	4	54	20
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	90	90	90	90	90	90
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	3	370	357	4	60	22

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	361	0	0 735 359
Stage 1	-	-	- - 359 -
Stage 2	-	-	- - 376 -
Critical Hdwy	4.1	-	- - 6.4 6.2
Critical Hdwy Stg 1	-	-	- - 5.4 -
Critical Hdwy Stg 2	-	-	- - 5.4 -
Follow-up Hdwy	2.2	-	- - 3.5 3.3
Pot Cap-1 Maneuver	1209	-	- - 390 690
Stage 1	-	-	- - 711 -
Stage 2	-	-	- - 699 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1209	-	- - 389 690
Mov Cap-2 Maneuver	-	-	- - 389 -
Stage 1	-	-	- - 709 -
Stage 2	-	-	- - 699 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	15
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1209	-	-	-	441
HCM Lane V/C Ratio	0.003	-	-	-	0.186
HCM Control Delay (s)	8	0	-	-	15
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.7

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	382	2	1	303	12	3	0	4	32	1	8
Future Vol, veh/h	1	382	2	1	303	12	3	0	4	32	1	8
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	1	415	2	1	329	13	3	0	4	35	1	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	342	0	0	417	0	0	761	762	416	758	757	336
Stage 1	-	-	-	-	-	-	418	418	-	338	338	-
Stage 2	-	-	-	-	-	-	343	344	-	420	419	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1228	-	-	1153	-	-	325	337	641	326	339	711
Stage 1	-	-	-	-	-	-	616	594	-	681	644	-
Stage 2	-	-	-	-	-	-	676	640	-	615	593	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1228	-	-	1153	-	-	320	336	641	323	338	711
Mov Cap-2 Maneuver	-	-	-	-	-	-	320	336	-	323	338	-
Stage 1	-	-	-	-	-	-	615	593	-	680	643	-
Stage 2	-	-	-	-	-	-	666	639	-	610	592	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	13.2	16.3
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	448	1228	-	-	1153	-	-	362
HCM Lane V/C Ratio	0.017	0.001	-	-	0.001	-	-	0.123
HCM Control Delay (s)	13.2	7.9	0	-	8.1	0	-	16.3
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.4

Intersection

Int Delay, s/veh 4.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	101	11	14	141	78	67
Future Vol, veh/h	101	11	14	141	78	67
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	77	77	77	77	77	77
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	131	14	18	183	101	87

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	145
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.1
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.2
Pot Cap-1 Maneuver	-	-	1450
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1450
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.7	11.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	741	-	-	1450	-
HCM Lane V/C Ratio	0.254	-	-	0.013	-
HCM Control Delay (s)	11.5	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	1	-	-	0	-

Intersection						
Int Delay, s/veh	5.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	155	9	45	112	40	138
Future Vol, veh/h	155	9	45	112	40	138
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	73	73	73	73	73	73
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	212	12	62	153	55	189
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	224	0	495	218
Stage 1	-	-	-	-	218	-
Stage 2	-	-	-	-	277	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1357	-	537	827
Stage 1	-	-	-	-	823	-
Stage 2	-	-	-	-	774	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1357	-	510	827
Mov Cap-2 Maneuver	-	-	-	-	510	-
Stage 1	-	-	-	-	782	-
Stage 2	-	-	-	-	774	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		2.2		12.4	
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	726	-	-	1357	-	
HCM Lane V/C Ratio	0.336	-	-	0.045	-	
HCM Control Delay (s)	12.4	-	-	7.8	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile O(veh)	1.5	-	-	0.1	-	

Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	57	175	336	81	3	14
Future Vol, veh/h	57	175	336	81	3	14
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	61	61	61	61	61	61
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	93	287	551	133	5	23

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	684	0	0 1091 618
Stage 1	-	-	- 618 -
Stage 2	-	-	- 473 -
Critical Hdwy	4.1	-	- 6.4 6.2
Critical Hdwy Stg 1	-	-	- 5.4 -
Critical Hdwy Stg 2	-	-	- 5.4 -
Follow-up Hdwy	2.2	-	- 3.5 3.3
Pot Cap-1 Maneuver	919	-	- 240 493
Stage 1	-	-	- 542 -
Stage 2	-	-	- 631 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	919	-	- 211 493
Mov Cap-2 Maneuver	-	-	- 211 -
Stage 1	-	-	- 477 -
Stage 2	-	-	- 631 -

Approach	EB	WB	SB
HCM Control Delay, s	2.3	0	14.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	919	-	-	-	399
HCM Lane V/C Ratio	0.102	-	-	-	0.07
HCM Control Delay (s)	9.4	0	-	-	14.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.2

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	↗
Traffic Vol, veh/h	0	178	341	0	48	29
Future Vol, veh/h	0	178	341	0	48	29
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	56	56	56	56	56	56
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	0	318	609	0	86	52
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	927	609
Stage 1	-	-	-	-	609	-
Stage 2	-	-	-	-	318	-
Critical Hdwy	-	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	0	-	-	0	300	499
Stage 1	0	-	-	0	547	-
Stage 2	0	-	-	0	742	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	300	499
Mov Cap-2 Maneuver	-	-	-	-	300	-
Stage 1	-	-	-	-	547	-
Stage 2	-	-	-	-	742	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		18.4		
HCM LOS	C					
Minor Lane/Major Mvmt	EBT	WBT	SBLn1	SBLn2		
Capacity (veh/h)	-	-	300	499		
HCM Lane V/C Ratio	-	-	0.286	0.104		
HCM Control Delay (s)	-	-	21.7	13		
HCM Lane LOS	-	-	C	B		
HCM 95th %tile Q(veh)	-	-	1.2	0.3		

Intersection												
Int Delay, s/veh	8.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	18	218	2	3	297	132	8	1	23	37	4	105
Future Vol, veh/h	18	218	2	3	297	132	8	1	23	37	4	105
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	58	58	58	58	58	58	58	58	58	58	58	58
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	31	376	3	5	512	228	14	2	40	64	7	181
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	740	0	0	379	0	0	1170	1190	378	1097	1077	626
Stage 1	-	-	-	-	-	-	440	440	-	636	636	-
Stage 2	-	-	-	-	-	-	730	750	-	461	441	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	876	-	-	1191	-	-	171	189	673	192	221	488
Stage 1	-	-	-	-	-	-	600	581	-	469	475	-
Stage 2	-	-	-	-	-	-	417	422	-	584	580	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	876	-	-	1191	-	-	101	179	673	172	210	488
Mov Cap-2 Maneuver	-	-	-	-	-	-	101	179	-	172	210	-
Stage 1	-	-	-	-	-	-	573	555	-	448	472	-
Stage 2	-	-	-	-	-	-	257	419	-	523	554	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.7			0.1			21.8			45.6		
HCM LOS							C			E		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	269	876	-	-	1191	-	-	325				
HCM Lane V/C Ratio	0.205	0.035	-	-	0.004	-	-	0.775				
HCM Control Delay (s)	21.8	9.3	0	-	8	0	-	45.6				
HCM Lane LOS	C	A	A	-	A	A	-	E				
HCM 95th %tile Q(veh)	0.8	0.1	-	-	0	-	-	6.2				

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	267	432	29	7	5
Future Vol, veh/h	14	267	432	29	7	5
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	62	62	62	62	62	62
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	23	431	697	47	11	8
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	744	0	-	0	1198	721
Stage 1	-	-	-	-	721	-
Stage 2	-	-	-	-	477	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	873	-	-	-	207	431
Stage 1	-	-	-	-	485	-
Stage 2	-	-	-	-	629	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	873	-	-	-	200	431
Mov Cap-2 Maneuver	-	-	-	-	200	-
Stage 1	-	-	-	-	468	-
Stage 2	-	-	-	-	629	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.5	0		20.1		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	873	-	-	-	258	
HCM Lane V/C Ratio	0.026	-	-	-	0.075	
HCM Control Delay (s)	9.2	0	-	-	20.1	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	

Intersection												
Int Delay, s/veh	0.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	260	6	9	457	73	2	3	3	0	0	1
Future Vol, veh/h	1	260	6	9	457	73	2	3	3	0	0	1
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	60	60	60	60	60	60	60	60	60	60	60	60
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	2	433	10	15	762	122	3	5	5	0	0	2
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	884	0	0	443	0	0	1296	1356	438	1300	1300	823
Stage 1	-	-	-	-	-	-	442	442	-	853	853	-
Stage 2	-	-	-	-	-	-	854	914	-	447	447	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	774	-	-	1128	-	-	140	151	623	140	163	377
Stage 1	-	-	-	-	-	-	598	580	-	357	378	-
Stage 2	-	-	-	-	-	-	356	355	-	595	577	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	774	-	-	1128	-	-	136	146	623	132	158	377
Mov Cap-2 Maneuver	-	-	-	-	-	-	136	146	-	132	158	-
Stage 1	-	-	-	-	-	-	596	578	-	356	368	-
Stage 2	-	-	-	-	-	-	345	345	-	583	575	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.1			24.3			14.6		
HCM LOS							C			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	200	774	-	-	1128	-	-	377				
HCM Lane V/C Ratio	0.067	0.002	-	-	0.013	-	-	0.004				
HCM Control Delay (s)	24.3	9.7	0	-	8.2	0	-	14.6				
HCM Lane LOS	C	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0				

Intersection

Int Delay, s/veh 4.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	148	118	23	53	43	50
Future Vol, veh/h	148	118	23	53	43	50
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	46	46	46	46	46	46
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	322	257	50	115	93	109

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	579
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.1
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.2
Pot Cap-1 Maneuver	-	-	1005
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	1005
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.7	17.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	495	-	-	1005	-
HCM Lane V/C Ratio	0.408	-	-	0.05	-
HCM Control Delay (s)	17.2	-	-	8.8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2	-	-	0.2	-

Intersection						
Int Delay, s/veh	6.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	127	61	268	63	4	55
Future Vol, veh/h	127	61	268	63	4	55
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	51	51	51	51	51	51
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	249	120	525	124	8	108
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	369	0	1483	309
Stage 1	-	-	-	-	309	-
Stage 2	-	-	-	-	1174	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1201	-	139	736
Stage 1	-	-	-	-	749	-
Stage 2	-	-	-	-	296	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1201	-	74	736
Mov Cap-2 Maneuver	-	-	-	-	74	-
Stage 1	-	-	-	-	398	-
Stage 2	-	-	-	-	296	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		8.3		15.5	
HCM LOS					C	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	458	-	-	1201	-	
HCM Lane V/C Ratio	0.253	-	-	0.438	-	
HCM Control Delay (s)	15.5	-	-	10.3	0	
HCM Lane LOS	C	-	-	B	A	
HCM 95th %tile Q(veh)	1	-	-	2.3	-	

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	14	292	324	33	18	27
Future Vol, veh/h	14	292	324	33	18	27
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	84	84	84	84	84	84
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	17	348	386	39	21	32
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	425	0	-	0	788	406
Stage 1	-	-	-	-	406	-
Stage 2	-	-	-	-	382	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1145	-	-	-	363	649
Stage 1	-	-	-	-	677	-
Stage 2	-	-	-	-	694	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1145	-	-	-	356	649
Mov Cap-2 Maneuver	-	-	-	-	356	-
Stage 1	-	-	-	-	665	-
Stage 2	-	-	-	-	694	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.4	0		13.3		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1145	-	-	-	488	
HCM Lane V/C Ratio	0.015	-	-	-	0.11	
HCM Control Delay (s)	8.2	0	-	-	13.3	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.4	

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	↓
Traffic Vol, veh/h	0	298	365	0	61	29
Future Vol, veh/h	0	298	365	0	61	29
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	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	0	324	397	0	66	32

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	0 721 397
Stage 1	-	-	- 397 -
Stage 2	-	-	- 324 -
Critical Hdwy	-	-	- 6.4 6.2
Critical Hdwy Stg 1	-	-	- 5.4 -
Critical Hdwy Stg 2	-	-	- 5.4 -
Follow-up Hdwy	-	-	- 3.5 3.3
Pot Cap-1 Maneuver	0	-	0 397 657
Stage 1	0	-	0 683 -
Stage 2	0	-	0 738 -
Platoon blocked, %	-	-	
Mov Cap-1 Maneuver	-	-	- 397 657
Mov Cap-2 Maneuver	-	-	- 397 -
Stage 1	-	-	- 683 -
Stage 2	-	-	- 738 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	14.3
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	397	657
HCM Lane V/C Ratio	-	-	0.167	0.048
HCM Control Delay (s)	-	-	15.9	10.8
HCM Lane LOS	-	-	C	B
HCM 95th %tile Q(veh)	-	-	0.6	0.2

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	23	286	23	11	276	41	5	2	6	32	5	45
Future Vol, veh/h	23	286	23	11	276	41	5	2	6	32	5	45
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	25	311	25	12	300	45	5	2	7	35	5	49
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	345	0	0	336	0	0	748	743	324	725	733	323
Stage 1	-	-	-	-	-	-	374	374	-	347	347	-
Stage 2	-	-	-	-	-	-	374	369	-	378	386	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1225	-	-	1235	-	-	331	346	722	343	350	723
Stage 1	-	-	-	-	-	-	651	621	-	673	638	-
Stage 2	-	-	-	-	-	-	651	624	-	648	614	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1225	-	-	1235	-	-	296	333	722	329	337	723
Mov Cap-2 Maneuver	-	-	-	-	-	-	296	333	-	329	337	-
Stage 1	-	-	-	-	-	-	635	605	-	656	630	-
Stage 2	-	-	-	-	-	-	595	617	-	624	599	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.3			13.9			14.4		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	417	1225	-	-	1235	-	-	470				
HCM Lane V/C Ratio	0.034	0.02	-	-	0.01	-	-	0.19				
HCM Control Delay (s)	13.9	8	0	-	7.9	0	-	14.4				
HCM Lane LOS	B	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.7				

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	343	329	4	60	21
Future Vol, veh/h	3	343	329	4	60	21
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	90	90	90	90	90	90
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	3	381	366	4	67	23

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	370	0	0 755 368
Stage 1	-	-	- - 368 -
Stage 2	-	-	- - 387 -
Critical Hdwy	4.1	-	- - 6.4 6.2
Critical Hdwy Stg 1	-	-	- - 5.4 -
Critical Hdwy Stg 2	-	-	- - 5.4 -
Follow-up Hdwy	2.2	-	- - 3.5 3.3
Pot Cap-1 Maneuver	1200	-	- - 379 682
Stage 1	-	-	- - 704 -
Stage 2	-	-	- - 691 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1200	-	- - 378 682
Mov Cap-2 Maneuver	-	-	- - 378 -
Stage 1	-	-	- - 702 -
Stage 2	-	-	- - 691 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1200	-	-	-	427
HCM Lane V/C Ratio	0.003	-	-	-	0.211
HCM Control Delay (s)	8	0	-	-	15.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.8

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	398	2	1	311	13	3	0	4	36	1	8
Future Vol, veh/h	1	398	2	1	311	13	3	0	4	36	1	8
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	1	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	1	433	2	1	338	14	3	0	4	39	1	9
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	352	0	0	435	0	0	788	790	434	785	784	345
Stage 1	-	-	-	-	-	-	436	436	-	347	347	-
Stage 2	-	-	-	-	-	-	352	354	-	438	437	-
Critical Hdwy	4.1	-	-	4.1	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1218	-	-	1135	-	-	311	325	626	313	327	702
Stage 1	-	-	-	-	-	-	603	583	-	673	638	-
Stage 2	-	-	-	-	-	-	669	634	-	601	583	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1218	-	-	1135	-	-	306	324	626	310	326	702
Mov Cap-2 Maneuver	-	-	-	-	-	-	306	324	-	310	326	-
Stage 1	-	-	-	-	-	-	602	582	-	672	637	-
Stage 2	-	-	-	-	-	-	659	633	-	596	582	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			13.5			17.2		
HCM LOS							B			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	432	1218	-	-	1135	-	-	345				
HCM Lane V/C Ratio	0.018	0.001	-	-	0.001	-	-	0.142				
HCM Control Delay (s)	13.5	8	0	-	8.2	0	-	17.2				
HCM Lane LOS	B	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.5				

Intersection						
Int Delay, s/veh	4.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	102	13	16	143	82	73
Future Vol, veh/h	102	13	16	143	82	73
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	77	77	77	77	77	77
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	132	17	21	186	106	95
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	149	0	369	141
Stage 1	-	-	-	-	141	-
Stage 2	-	-	-	-	228	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1445	-	635	912
Stage 1	-	-	-	-	891	-
Stage 2	-	-	-	-	815	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1445	-	625	912
Mov Cap-2 Maneuver	-	-	-	-	625	-
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	815	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.8		11.7	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	734	-	-	1445	-	
HCM Lane V/C Ratio	0.274	-	-	0.014	-	
HCM Control Delay (s)	11.7	-	-	7.5	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	1.1	-	-	0	-	

Intersection						
Int Delay, s/veh	5.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	161	10	52	114	42	149
Future Vol, veh/h	161	10	52	114	42	149
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	73	73	73	73	73	73
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	221	14	71	156	58	204
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	235	0	526	228
Stage 1	-	-	-	-	228	-
Stage 2	-	-	-	-	298	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1344	-	516	816
Stage 1	-	-	-	-	815	-
Stage 2	-	-	-	-	758	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1344	-	486	816
Mov Cap-2 Maneuver	-	-	-	-	486	-
Stage 1	-	-	-	-	768	-
Stage 2	-	-	-	-	758	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		2.5		13	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	710	-	-	1344	-	
HCM Lane V/C Ratio	0.369	-	-	0.053	-	
HCM Control Delay (s)	13	-	-	7.8	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	1.7	-	-	0.2	-	

OLYMPIA HIGH SCHOOL
TRAFFIC IMPACT ANALYSIS

APPENDIX

INTERSECTION LEVEL OF SERVICE

Intersection						
Int Delay, s/veh	9.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	122	50	105	468	171	165
Future Vol, veh/h	122	50	105	468	171	165
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	115	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	11	9	7	2	4	8
Mvmt Flow	151	62	130	578	211	204
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1151	313	415	0	-	0
Stage 1	313	-	-	-	-	-
Stage 2	838	-	-	-	-	-
Critical Hdwy	6.51	6.29	4.17	-	-	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.381	2.263	-	-	-
Pot Cap-1 Maneuver	210	711	1118	-	-	-
Stage 1	722	-	-	-	-	-
Stage 2	410	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	186	711	1118	-	-	-
Mov Cap-2 Maneuver	186	-	-	-	-	-
Stage 1	638	-	-	-	-	-
Stage 2	410	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	56.8	1.6		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1118	-	186	711	-	-
HCM Lane V/C Ratio	0.116	-	0.81	0.087	-	-
HCM Control Delay (s)	8.6	-	75.8	10.5	-	-
HCM Lane LOS	A	-	F	B	-	-
HCM 95th %tile Q(veh)	0.4	-	5.6	0.3	-	-

Intersection							
Int Delay, s/veh	4.1						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Vol, veh/h	80	68	84	354	108	63	
Future Vol, veh/h	80	68	84	354	108	63	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	150	0	115	-	-	-	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	81	81	81	81	81	81	
Heavy Vehicles, %	11	9	7	2	4	8	
Mvmt Flow	99	84	104	437	133	78	
Major/Minor	Minor2		Major1		Major2		
Conflicting Flow All	817	172	211	0	-	0	
Stage 1	172	-	-	-	-	-	
Stage 2	645	-	-	-	-	-	
Critical Hdwy	6.51	6.29	4.17	-	-	-	
Critical Hdwy Stg 1	5.51	-	-	-	-	-	
Critical Hdwy Stg 2	5.51	-	-	-	-	-	
Follow-up Hdwy	3.599	3.381	2.263	-	-	-	
Pot Cap-1 Maneuver	334	854	1330	-	-	-	
Stage 1	837	-	-	-	-	-	
Stage 2	506	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	308	854	1330	-	-	-	
Mov Cap-2 Maneuver	308	-	-	-	-	-	
Stage 1	772	-	-	-	-	-	
Stage 2	506	-	-	-	-	-	
Approach	EB		NB		SB		
HCM Control Delay, s	16.4		1.5		0		
HCM LOS	C						
Minor Lane/Major Mvmt	NBL		NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1330		-	308	854	-	-
HCM Lane V/C Ratio	0.078		-	0.321	0.098	-	-
HCM Control Delay (s)	7.9		-	22.1	9.7	-	-
HCM Lane LOS	A		-	C	A	-	-
HCM 95th %tile Q(veh)	0.3		-	1.3	0.3	-	-

Lanes, Volumes, Timings
2: Henderson Blvd SE & North Street SE

Existing School AM Peak Hour 1

01/08/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	186	35	53	360	187	81	351	65	35	98	83
Future Volume (vph)	42	186	35	53	360	187	81	351	65	35	98	83
Satd. Flow (prot)	1770	1825	0	0	1775	0	1752	1797	0	1656	1682	0
Flt Permitted	0.300				0.947		0.522			0.179		
Satd. Flow (perm)	559	1825	0	0	1688	0	963	1797	0	312	1682	0
Satd. Flow (RTOR)		12			43			10			45	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	2%	1%	5%	3%	1%	4%	3%	3%	5%	9%	7%	3%
Adj. Flow (vph)	55	242	45	69	468	243	105	456	84	45	127	108
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	287	0	0	780	0	105	540	0	45	235	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Total Split (s)	45.0	45.0		20.0	65.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Act Effect Green (s)	43.1	43.1			43.1		29.5	29.5		29.5	29.5	
Actuated g/C Ratio	0.55	0.55			0.55		0.37	0.37		0.37	0.37	
v/c Ratio	0.18	0.29			0.83		0.29	0.80		0.39	0.36	
Control Delay	10.6	9.9			22.6		24.2	34.9		35.3	18.7	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	10.6	9.9			22.6		24.2	34.9		35.3	18.7	
LOS	B	A			C		C	C		D	B	
Approach Delay		10.0			22.6			33.2			21.4	
Approach LOS		A			C			C			C	
Queue Length 50th (ft)	14	72			302		35	227		16	64	
Queue Length 95th (ft)	27	92			327		82	#384		50	129	
Internal Link Dist (ft)		321			634			812			983	
Turn Bay Length (ft)	150						100			100		
Base Capacity (vph)	348	1144			1344		409	770		132	741	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.16	0.25			0.58		0.26	0.70		0.34	0.32	

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 78.9

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 23.7

Intersection LOS: C

Intersection Capacity Utilization 84.3%

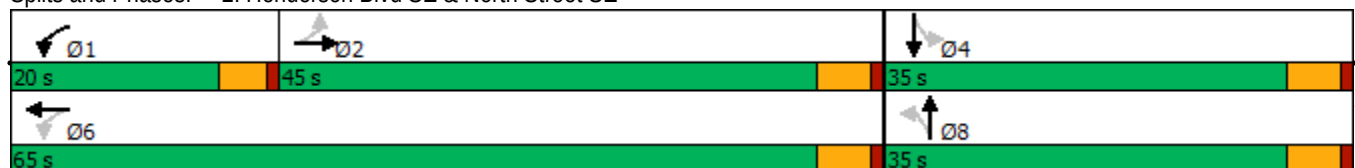
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: Henderson Blvd SE & North Street SE



Lanes, Volumes, Timings
2: Henderson Blvd SE & North Street SE

Existing School AM Peak Hour 2

01/08/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	111	17	61	170	149	52	266	23	42	100	46
Future Volume (vph)	45	111	17	61	170	149	52	266	23	42	100	46
Satd. Flow (prot)	1787	1834	0	0	1741	0	1752	1820	0	1656	1712	0
Flt Permitted	0.447				0.931		0.628			0.400		
Satd. Flow (perm)	841	1834	0	0	1634	0	1158	1820	0	697	1712	0
Satd. Flow (RTOR)		9			61			5			24	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	1%	1%	5%	3%	1%	4%	3%	3%	5%	9%	7%	3%
Adj. Flow (vph)	58	144	22	79	221	194	68	345	30	55	130	60
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	166	0	0	494	0	68	375	0	55	190	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Total Split (s)	45.0	45.0		20.0	65.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Act Effect Green (s)	21.8	21.8			21.8		16.9	16.9		16.9	16.9	
Actuated g/C Ratio	0.48	0.48			0.48		0.37	0.37		0.37	0.37	
v/c Ratio	0.14	0.19			0.60		0.16	0.55		0.21	0.29	
Control Delay	8.3	7.4			11.5		12.5	15.9		14.3	11.5	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	8.3	7.4			11.5		12.5	15.9		14.3	11.5	
LOS	A	A			B		B	B		B	B	
Approach Delay		7.7			11.5			15.4			12.1	
Approach LOS		A			B			B			B	
Queue Length 50th (ft)	7	19			64		10	67		9	26	
Queue Length 95th (ft)	24	50			144		35	150		32	70	
Internal Link Dist (ft)		321			634			812			983	
Turn Bay Length (ft)	150						100			100		
Base Capacity (vph)	743	1622			1613		866	1362		521	1286	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.08	0.10			0.31		0.08	0.28		0.11	0.15	

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 45.2

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 12.2

Intersection LOS: B

Intersection Capacity Utilization 60.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 2: Henderson Blvd SE & North Street SE



Intersection						
Int Delay, s/veh	6.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	151	124	67	197	174	68
Future Vol, veh/h	151	124	67	197	174	68
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	115	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	8	8	0	2	3	17
Mvmt Flow	184	151	82	240	212	83

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	658	254	295	0	-	0
Stage 1	254	-	-	-	-	-
Stage 2	404	-	-	-	-	-
Critical Hdwy	6.48	6.28	4.1	-	-	-
Critical Hdwy Stg 1	5.48	-	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-	-
Follow-up Hdwy	3.572	3.372	2.2	-	-	-
Pot Cap-1 Maneuver	420	770	1278	-	-	-
Stage 1	775	-	-	-	-	-
Stage 2	661	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	393	770	1278	-	-	-
Mov Cap-2 Maneuver	393	-	-	-	-	-
Stage 1	725	-	-	-	-	-
Stage 2	661	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.9	2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1278	-	393	770	-	-
HCM Lane V/C Ratio	0.064	-	0.469	0.196	-	-
HCM Control Delay (s)	8	-	22	10.8	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	2.4	0.7	-	-

Intersection							
Int Delay, s/veh	4.4						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Vol, veh/h	109	74	40	216	252	60	
Future Vol, veh/h	109	74	40	216	252	60	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	150	0	115	-	-	-	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	82	82	82	82	82	82	
Heavy Vehicles, %	8	8	0	2	3	17	
Mvmt Flow	133	90	49	263	307	73	
Major/Minor	Minor2		Major1		Major2		
Conflicting Flow All	705	344	380	0	-	0	
Stage 1	344	-	-	-	-	-	
Stage 2	361	-	-	-	-	-	
Critical Hdwy	6.48	6.28	4.1	-	-	-	
Critical Hdwy Stg 1	5.48	-	-	-	-	-	
Critical Hdwy Stg 2	5.48	-	-	-	-	-	
Follow-up Hdwy	3.572	3.372	2.2	-	-	-	
Pot Cap-1 Maneuver	394	685	1190	-	-	-	
Stage 1	705	-	-	-	-	-	
Stage 2	692	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	378	685	1190	-	-	-	
Mov Cap-2 Maneuver	378	-	-	-	-	-	
Stage 1	676	-	-	-	-	-	
Stage 2	692	-	-	-	-	-	
Approach	EB		NB		SB		
HCM Control Delay, s	16.2		1.3		0		
HCM LOS	C						
Minor Lane/Major Mvmt	NBL		NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1190		-	378	685	-	-
HCM Lane V/C Ratio	0.041		-	0.352	0.132	-	-
HCM Control Delay (s)	8.2		-	19.6	11.1	-	-
HCM Lane LOS	A		-	C	B	-	-
HCM 95th %tile O(veh)	0.1		-	1.5	0.5	-	-

Lanes, Volumes, Timings
2: Henderson Blvd SE & North Street SE

Existing School PM Peak Hour

01/08/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	256	48	44	203	80	35	145	44	88	134	63
Future Volume (vph)	63	256	48	44	203	80	35	145	44	88	134	63
Satd. Flow (prot)	1805	1816	0	0	1775	0	1530	1732	0	1770	1727	0
Flt Permitted	0.564				0.921		0.621			0.626		
Satd. Flow (perm)	1072	1816	0	0	1647	0	1000	1732	0	1166	1727	0
Satd. Flow (RTOR)		12			31			16			25	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	1%	8%	5%	1%	6%	18%	4%	12%	2%	7%	0%
Adj. Flow (vph)	70	284	53	49	226	89	39	161	49	98	149	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	70	337	0	0	364	0	39	210	0	98	219	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Total Split (s)	45.0	45.0		20.0	65.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Act Effect Green (s)	14.3	14.3			14.3		11.4	11.4		11.4	11.4	
Actuated g/C Ratio	0.45	0.45			0.45		0.36	0.36		0.36	0.36	
v/c Ratio	0.15	0.41			0.48		0.11	0.33		0.24	0.35	
Control Delay	6.5	7.8			8.5		8.9	9.4		9.9	9.2	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	6.5	7.8			8.5		8.9	9.4		9.9	9.2	
LOS	A	A			A		A	A		A	A	
Approach Delay		7.6			8.5			9.3			9.4	
Approach LOS		A			A			A			A	
Queue Length 50th (ft)	6	30			32		4	21		10	21	
Queue Length 95th (ft)	23	86			94		20	68		40	69	
Internal Link Dist (ft)		321			634			812			983	
Turn Bay Length (ft)	150						100			100		
Base Capacity (vph)	1067	1808			1647		933	1617		1088	1613	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.07	0.19			0.22		0.04	0.13		0.09	0.14	

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 32

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.48

Intersection Signal Delay: 8.6

Intersection LOS: A

Intersection Capacity Utilization 62.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 2: Henderson Blvd SE & North Street SE



Lanes, Volumes, Timings
2: Henderson Blvd SE & North Street SE

Existing School PM Peak Hour 2

01/08/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	255	31	70	223	66	25	160	48	64	182	72
Future Volume (vph)	50	255	31	70	223	66	25	160	48	64	182	72
Satd. Flow (prot)	1805	1837	0	0	1786	0	1530	1734	0	1770	1731	0
Flt Permitted	0.527				0.886		0.527			0.594		
Satd. Flow (perm)	1001	1837	0	0	1598	0	849	1734	0	1106	1731	0
Satd. Flow (RTOR)		7			21			16			21	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	1%	8%	5%	1%	6%	18%	4%	12%	2%	7%	0%
Adj. Flow (vph)	56	283	34	78	248	73	28	178	53	71	202	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	56	317	0	0	399	0	28	231	0	71	282	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Total Split (s)	45.0	45.0		20.0	65.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Act Effect Green (s)	17.5	17.5			17.5		13.3	13.3		13.3	13.3	
Actuated g/C Ratio	0.47	0.47			0.47		0.36	0.36		0.36	0.36	
v/c Ratio	0.12	0.36			0.52		0.09	0.37		0.18	0.45	
Control Delay	6.7	7.8			9.7		10.8	11.4		11.2	12.2	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	6.7	7.8			9.7		10.8	11.4		11.2	12.2	
LOS	A	A			A		B	B		B	B	
Approach Delay		7.6			9.7			11.3			12.0	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)	5	32			43		3	28		9	35	
Queue Length 95th (ft)	23	93			126		20	94		38	115	
Internal Link Dist (ft)		321			634			812			983	
Turn Bay Length (ft)	150						100			100		
Base Capacity (vph)	956	1756			1598		744	1521		969	1519	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.06	0.18			0.25		0.04	0.15		0.07	0.19	

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 37.2

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 10.0

Intersection LOS: B

Intersection Capacity Utilization 65.6%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: Henderson Blvd SE & North Street SE



Intersection							
Int Delay, s/veh	2.6						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations							
Traffic Vol, veh/h	69	43	55	275	410	70	
Future Vol, veh/h	69	43	55	275	410	70	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	150	0	115	-	-	-	
Veh in Median Storage, #	0	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	93	93	93	93	93	93	
Heavy Vehicles, %	1	2	5	2	1	2	
Mvmt Flow	74	46	59	296	441	75	
Major/Minor	Minor2		Major1		Major2		
Conflicting Flow All	893	479	516	0	-	0	
Stage 1	479	-	-	-	-	-	
Stage 2	414	-	-	-	-	-	
Critical Hdwy	6.41	6.22	4.15	-	-	-	
Critical Hdwy Stg 1	5.41	-	-	-	-	-	
Critical Hdwy Stg 2	5.41	-	-	-	-	-	
Follow-up Hdwy	3.509	3.318	2.245	-	-	-	
Pot Cap-1 Maneuver	313	587	1035	-	-	-	
Stage 1	625	-	-	-	-	-	
Stage 2	669	-	-	-	-	-	
Platoon blocked, %				-	-	-	
Mov Cap-1 Maneuver	295	587	1035	-	-	-	
Mov Cap-2 Maneuver	295	-	-	-	-	-	
Stage 1	589	-	-	-	-	-	
Stage 2	669	-	-	-	-	-	
Approach	EB		NB		SB		
HCM Control Delay, s	17.6		1.4		0		
HCM LOS	C						
Minor Lane/Major Mvmt	NBL		NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1035		-	295	587	-	-
HCM Lane V/C Ratio	0.057		-	0.252	0.079	-	-
HCM Control Delay (s)	8.7		-	21.3	11.7	-	-
HCM Lane LOS	A		-	C	B	-	-
HCM 95th %tile Q(veh)	0.2		-	1	0.3	-	-

Intersection						
Int Delay, s/veh	2.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	68	51	62	275	428	62
Future Vol, veh/h	68	51	62	275	428	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	115	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	2	5	2	1	2
Mvmt Flow	73	55	67	296	460	67
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	924	494	527	0	-	0
Stage 1	494	-	-	-	-	-
Stage 2	430	-	-	-	-	-
Critical Hdwy	6.41	6.22	4.15	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.318	2.245	-	-	-
Pot Cap-1 Maneuver	300	575	1025	-	-	-
Stage 1	615	-	-	-	-	-
Stage 2	658	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	281	575	1025	-	-	-
Mov Cap-2 Maneuver	281	-	-	-	-	-
Stage 1	575	-	-	-	-	-
Stage 2	658	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	17.8	1.6		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1025	-	281	575	-	-
HCM Lane V/C Ratio	0.065	-	0.26	0.095	-	-
HCM Control Delay (s)	8.8	-	22.3	11.9	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1	0.3	-	-

Lanes, Volumes, Timings
2: Henderson Blvd SE & North Street SE

Adjacent Roadway 4-6 PM Peak Hour 1

01/08/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	277	37	65	270	97	43	137	51	112	277	51
Future Volume (vph)	53	277	37	65	270	97	43	137	51	112	277	51
Satd. Flow (prot)	1805	1866	0	0	1815	0	1719	1809	0	1805	1838	0
Flt Permitted	0.460				0.908		0.417			0.607		
Satd. Flow (perm)	874	1866	0	0	1659	0	755	1809	0	1153	1838	0
Satd. Flow (RTOR)		8			28			20			10	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	0%	0%	1%	1%	5%	1%	0%	0%	1%	1%
Adj. Flow (vph)	58	304	41	71	297	107	47	151	56	123	304	56
Shared Lane Traffic (%)												
Lane Group Flow (vph)	58	345	0	0	475	0	47	207	0	123	360	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Total Split (s)	45.0	45.0		20.0	65.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Act Effect Green (s)	21.4	21.4			21.4		16.3	16.3		16.3	16.3	
Actuated g/C Ratio	0.48	0.48			0.48		0.37	0.37		0.37	0.37	
v/c Ratio	0.14	0.38			0.58		0.17	0.30		0.29	0.53	
Control Delay	8.1	8.9			11.5		13.2	11.7		13.8	15.1	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	8.1	8.9			11.5		13.2	11.7		13.8	15.1	
LOS	A	A			B		B	B		B	B	
Approach Delay		8.8			11.5			12.0			14.8	
Approach LOS		A			B			B			B	
Queue Length 50th (ft)	6	43			63		7	29		19	60	
Queue Length 95th (ft)	28	123			187		33	93		68	172	
Internal Link Dist (ft)		321			634			812			983	
Turn Bay Length (ft)	150						100			100		
Base Capacity (vph)	780	1667			1643		588	1415		899	1435	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.07	0.21			0.29		0.08	0.15		0.14	0.25	

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 44.2

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.58

Intersection Signal Delay: 11.9

Intersection LOS: B

Intersection Capacity Utilization 74.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 2: Henderson Blvd SE & North Street SE



Lanes, Volumes, Timings
2: Henderson Blvd SE & North Street SE

Adjacent Roadway 4-6 PM Peak Hour 2

01/08/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	327	60	73	273	213	40	220	56	152	326	82
Future Volume (vph)	67	327	60	73	273	213	40	220	56	152	326	82
Satd. Flow (prot)	1805	1856	0	0	1777	0	1719	1827	0	1805	1825	0
Flt Permitted	0.382				0.901		0.264			0.435		
Satd. Flow (perm)	726	1856	0	0	1611	0	478	1827	0	826	1825	0
Satd. Flow (RTOR)		11			58			14			13	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	0%	0%	1%	1%	5%	1%	0%	0%	1%	1%
Adj. Flow (vph)	74	359	66	80	300	234	44	242	62	167	358	90
Shared Lane Traffic (%)												
Lane Group Flow (vph)	74	425	0	0	614	0	44	304	0	167	448	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Total Split (s)	45.0	45.0		20.0	65.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Act Effct Green (s)	37.3	37.3			37.3		23.9	23.9		23.9	23.9	
Actuated g/C Ratio	0.55	0.55			0.55		0.35	0.35		0.35	0.35	
v/c Ratio	0.19	0.42			0.67		0.26	0.47		0.58	0.69	
Control Delay	9.7	10.3			14.4		25.5	21.8		31.5	27.5	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	9.7	10.3			14.4		25.5	21.8		31.5	27.5	
LOS	A	B			B		C	C		C	C	
Approach Delay		10.2			14.4			22.3			28.6	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)	14	89			146		13	89		54	148	
Queue Length 95th (ft)	40	177			301		53	231		#168	365	
Internal Link Dist (ft)		321			634			812			983	
Turn Bay Length (ft)	150						100			100		
Base Capacity (vph)	522	1339			1390		253	977		438	975	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.14	0.32			0.44		0.17	0.31		0.38	0.46	

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 67.9

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 18.9

Intersection LOS: B

Intersection Capacity Utilization 91.1%

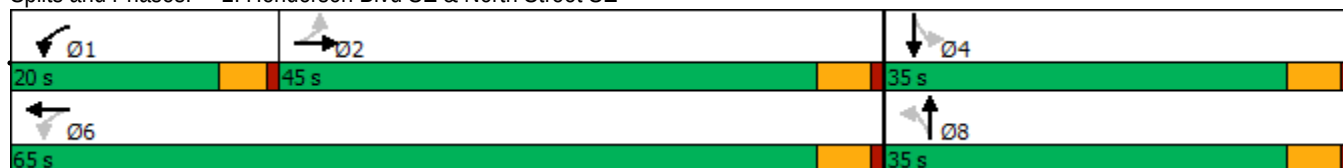
ICU Level of Service F

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: Henderson Blvd SE & North Street SE



Intersection						
Int Delay, s/veh	14.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	133	50	105	497	181	189
Future Vol, veh/h	133	50	105	497	181	189
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	115	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	11	9	7	2	4	8
Mvmt Flow	164	62	130	614	223	233
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1214	340	456	0	-	0
Stage 1	340	-	-	-	-	-
Stage 2	874	-	-	-	-	-
Critical Hdwy	6.51	6.29	4.17	-	-	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.381	2.263	-	-	-
Pot Cap-1 Maneuver	192	687	1079	-	-	-
Stage 1	701	-	-	-	-	-
Stage 2	394	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	169	687	1079	-	-	-
Mov Cap-2 Maneuver	169	-	-	-	-	-
Stage 1	617	-	-	-	-	-
Stage 2	394	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	87.7	1.5		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1079	-	169	687	-	-
HCM Lane V/C Ratio	0.12	-	0.972	0.09	-	-
HCM Control Delay (s)	8.8	-	116.6	10.8	-	-
HCM Lane LOS	A	-	F	B	-	-
HCM 95th %tile Q(veh)	0.4	-	7.6	0.3	-	-

Intersection						
Int Delay, s/veh	4.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	85	72	89	376	115	67
Future Vol, veh/h	85	72	89	376	115	67
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	115	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	11	9	7	2	4	8
Mvmt Flow	105	89	110	464	142	83
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	868	184	225	0	-	0
Stage 1	184	-	-	-	-	-
Stage 2	684	-	-	-	-	-
Critical Hdwy	6.51	6.29	4.17	-	-	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.381	2.263	-	-	-
Pot Cap-1 Maneuver	311	841	1315	-	-	-
Stage 1	826	-	-	-	-	-
Stage 2	485	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	285	841	1315	-	-	-
Mov Cap-2 Maneuver	285	-	-	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	485	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	17.9	1.5		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1315	-	285	841	-	-
HCM Lane V/C Ratio	0.084	-	0.368	0.106	-	-
HCM Control Delay (s)	8	-	24.8	9.8	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	1.6	0.4	-	-

Lanes, Volumes, Timings
2: Henderson Blvd SE & North Street SE

2021 School AM Peak Hour with Project 1

01/08/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	197	39	56	383	198	89	372	69	37	104	83
Future Volume (vph)	42	197	39	56	383	198	89	372	69	37	104	83
Satd. Flow (prot)	1770	1822	0	0	1775	0	1752	1795	0	1656	1685	0
Flt Permitted	0.283				0.943		0.508			0.145		
Satd. Flow (perm)	527	1822	0	0	1681	0	937	1795	0	253	1685	0
Satd. Flow (RTOR)		12			43			10			42	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	2%	1%	5%	3%	1%	4%	3%	3%	5%	9%	7%	3%
Adj. Flow (vph)	55	256	51	73	497	257	116	483	90	48	135	108
Shared Lane Traffic (%)												
Lane Group Flow (vph)	55	307	0	0	827	0	116	573	0	48	243	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Total Split (s)	45.0	45.0		20.0	65.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Act Effect Green (s)	46.7	46.7			46.7		31.9	31.9		31.9	31.9	
Actuated g/C Ratio	0.55	0.55			0.55		0.38	0.38		0.38	0.38	
v/c Ratio	0.19	0.30			0.88		0.33	0.84		0.51	0.37	
Control Delay	10.6	10.2			26.7		26.2	39.9		48.5	20.3	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	10.6	10.2			26.7		26.2	39.9		48.5	20.3	
LOS	B	B			C		C	D		D	C	
Approach Delay		10.2			26.7			37.5			24.9	
Approach LOS		B			C			D			C	
Queue Length 50th (ft)	14	78			340		44	273		20	76	
Queue Length 95th (ft)	27	99			364		90	#440		#65	137	
Internal Link Dist (ft)		321			634			812			983	
Turn Bay Length (ft)	150						100			100		
Base Capacity (vph)	313	1087			1269		362	700		97	677	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.18	0.28			0.65		0.32	0.82		0.49	0.36	

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 84.8

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 27.1

Intersection LOS: C

Intersection Capacity Utilization 88.5%

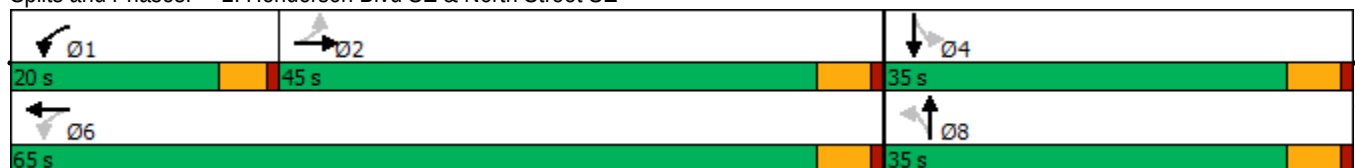
ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: Henderson Blvd SE & North Street SE



Lanes, Volumes, Timings
2: Henderson Blvd SE & North Street SE

2021 School AM Peak Hour with Project 2

01/08/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	118	18	65	180	158	24	282	55	45	105	49
Future Volume (vph)	48	118	18	65	180	158	24	282	55	45	105	49
Satd. Flow (prot)	1770	1834	0	0	1741	0	1752	1795	0	1656	1711	0
Flt Permitted	0.420				0.927		0.607			0.335		
Satd. Flow (perm)	782	1834	0	0	1627	0	1120	1795	0	584	1711	0
Satd. Flow (RTOR)		9			61			10			25	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Heavy Vehicles (%)	2%	1%	5%	3%	1%	4%	3%	3%	5%	9%	7%	3%
Adj. Flow (vph)	62	153	23	84	234	205	31	366	71	58	136	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	176	0	0	523	0	31	437	0	58	200	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Total Split (s)	45.0	45.0		20.0	65.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Act Effect Green (s)	24.6	24.6			24.6		19.9	19.9		19.9	19.9	
Actuated g/C Ratio	0.48	0.48			0.48		0.39	0.39		0.39	0.39	
v/c Ratio	0.16	0.20			0.64		0.07	0.62		0.26	0.29	
Control Delay	10.0	8.7			13.7		12.3	17.9		16.1	12.0	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	10.0	8.7			13.7		12.3	17.9		16.1	12.0	
LOS	A	A			B		B	B		B	B	
Approach Delay		9.0			13.7			17.5			12.9	
Approach LOS		A			B			B			B	
Queue Length 50th (ft)	9	24			84		5	97		11	34	
Queue Length 95th (ft)	30	61			184		20	185		36	77	
Internal Link Dist (ft)		321			634			812			983	
Turn Bay Length (ft)	150						100			100		
Base Capacity (vph)	644	1512			1575		764	1227		398	1175	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.10	0.12			0.33		0.04	0.36		0.15	0.17	

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 51

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 14.0

Intersection LOS: B

Intersection Capacity Utilization 64.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: Henderson Blvd SE & North Street SE



Intersection						
Int Delay, s/veh	7.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	167	124	67	209	185	76
Future Vol, veh/h	167	124	67	209	185	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	115	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	8	8	0	2	3	17
Mvmt Flow	204	151	82	255	226	93
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	692	273	319	0	-	0
Stage 1	273	-	-	-	-	-
Stage 2	419	-	-	-	-	-
Critical Hdwy	6.48	6.28	4.1	-	-	-
Critical Hdwy Stg 1	5.48	-	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-	-
Follow-up Hdwy	3.572	3.372	2.2	-	-	-
Pot Cap-1 Maneuver	401	752	1252	-	-	-
Stage 1	759	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	375	752	1252	-	-	-
Mov Cap-2 Maneuver	375	-	-	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	19.3	2		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1252	-	375	752	-	-
HCM Lane V/C Ratio	0.065	-	0.543	0.201	-	-
HCM Control Delay (s)	8.1	-	25.4	11	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.2	-	3.1	0.7	-	-

Intersection						
Int Delay, s/veh	4.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	116	79	42	229	267	64
Future Vol, veh/h	116	79	42	229	267	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	115	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	8	8	0	2	3	17
Mvmt Flow	141	96	51	279	326	78
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	746	365	404	0	-	0
Stage 1	365	-	-	-	-	-
Stage 2	381	-	-	-	-	-
Critical Hdwy	6.48	6.28	4.1	-	-	-
Critical Hdwy Stg 1	5.48	-	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-	-
Follow-up Hdwy	3.572	3.372	2.2	-	-	-
Pot Cap-1 Maneuver	372	667	1166	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	678	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	356	667	1166	-	-	-
Mov Cap-2 Maneuver	356	-	-	-	-	-
Stage 1	659	-	-	-	-	-
Stage 2	678	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	17.4	1.3		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1166	-	356	667	-	-
HCM Lane V/C Ratio	0.044	-	0.397	0.144	-	-
HCM Control Delay (s)	8.2	-	21.6	11.3	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.9	0.5	-	-

Lanes, Volumes, Timings
2: Henderson Blvd SE & North Street SE

2021 School PM Peak Hour with Project 1

01/08/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	63	271	53	47	210	85	37	154	47	93	142	63
Future Volume (vph)	63	271	53	47	210	85	37	154	47	93	142	63
Satd. Flow (prot)	1805	1814	0	0	1775	0	1530	1732	0	1770	1729	0
Flt Permitted	0.545				0.916		0.612			0.619		
Satd. Flow (perm)	1036	1814	0	0	1637	0	985	1732	0	1153	1729	0
Satd. Flow (RTOR)		12			31			16			23	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	1%	8%	5%	1%	6%	18%	4%	12%	2%	7%	0%
Adj. Flow (vph)	70	301	59	52	233	94	41	171	52	103	158	70
Shared Lane Traffic (%)												
Lane Group Flow (vph)	70	360	0	0	379	0	41	223	0	103	228	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Total Split (s)	45.0	45.0		20.0	65.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Act Effect Green (s)	15.3	15.3			15.3		12.2	12.2		12.2	12.2	
Actuated g/C Ratio	0.45	0.45			0.45		0.36	0.36		0.36	0.36	
v/c Ratio	0.15	0.44			0.50		0.12	0.35		0.25	0.36	
Control Delay	6.9	8.3			9.0		9.5	10.1		10.6	9.9	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	6.9	8.3			9.0		9.5	10.1		10.6	9.9	
LOS	A	A			A		A	B		B	A	
Approach Delay		8.1			9.0			10.0			10.1	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)	6	34			35		4	24		11	23	
Queue Length 95th (ft)	26	102			109		23	80		46	80	
Internal Link Dist (ft)		321			634			812			983	
Turn Bay Length (ft)	150						100			100		
Base Capacity (vph)	1009	1767			1637		895	1575		1048	1573	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.07	0.20			0.23		0.05	0.14		0.10	0.14	

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 33.8

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 9.2

Intersection LOS: A

Intersection Capacity Utilization 65.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: Henderson Blvd SE & North Street SE



Lanes, Volumes, Timings
2: Henderson Blvd SE & North Street SE

2021 School PM Peak Hour with Project 2

01/08/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	271	33	74	237	70	27	170	51	68	193	76
Future Volume (vph)	53	271	33	74	237	70	27	170	51	68	193	76
Satd. Flow (prot)	1805	1837	0	0	1786	0	1530	1732	0	1770	1733	0
Flt Permitted	0.507				0.882		0.494			0.562		
Satd. Flow (perm)	963	1837	0	0	1591	0	795	1732	0	1047	1733	0
Satd. Flow (RTOR)		8			21			16			21	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	0%	1%	8%	5%	1%	6%	18%	4%	12%	2%	7%	0%
Adj. Flow (vph)	59	301	37	82	263	78	30	189	57	76	214	84
Shared Lane Traffic (%)												
Lane Group Flow (vph)	59	338	0	0	423	0	30	246	0	76	298	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Total Split (s)	45.0	45.0		20.0	65.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Act Effect Green (s)	19.5	19.5			19.5		14.2	14.2		14.2	14.2	
Actuated g/C Ratio	0.49	0.49			0.49		0.35	0.35		0.35	0.35	
v/c Ratio	0.13	0.38			0.54		0.11	0.40		0.21	0.48	
Control Delay	6.9	8.0			10.1		12.1	12.7		12.7	13.7	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	6.9	8.0			10.1		12.1	12.7		12.7	13.7	
LOS	A	A			B		B	B		B	B	
Approach Delay		7.8			10.1			12.7			13.5	
Approach LOS		A			B			B			B	
Queue Length 50th (ft)	6	37			50		4	34		10	42	
Queue Length 95th (ft)	25	106			144		23	111		45	135	
Internal Link Dist (ft)		321			634			812			983	
Turn Bay Length (ft)	150						100			100		
Base Capacity (vph)	896	1710			1591		651	1421		857	1423	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.07	0.20			0.27		0.05	0.17		0.09	0.21	

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 40.2

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 10.8

Intersection LOS: B

Intersection Capacity Utilization 68.5%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 2: Henderson Blvd SE & North Street SE



Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	79	46	58	292	435	79
Future Vol, veh/h	79	46	58	292	435	79
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	115	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	2	5	2	1	2
Mvmt Flow	85	49	62	314	468	85
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	949	511	553	0	-	0
Stage 1	511	-	-	-	-	-
Stage 2	438	-	-	-	-	-
Critical Hdwy	6.41	6.22	4.15	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.318	2.245	-	-	-
Pot Cap-1 Maneuver	290	563	1002	-	-	-
Stage 1	604	-	-	-	-	-
Stage 2	653	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	272	563	1002	-	-	-
Mov Cap-2 Maneuver	272	-	-	-	-	-
Stage 1	567	-	-	-	-	-
Stage 2	653	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	19.6	1.5		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1002	-	272	563	-	-
HCM Lane V/C Ratio	0.062	-	0.312	0.088	-	-
HCM Control Delay (s)	8.8	-	24.1	12	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.3	0.3	-	-

Intersection

Int Delay, s/veh 3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	72	54	66	292	454	66
Future Vol, veh/h	72	54	66	292	454	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	115	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	2	5	2	1	2
Mvmt Flow	77	58	71	314	488	71

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	980	524	559
Stage 1	524	-	-
Stage 2	456	-	-
Critical Hdwy	6.41	6.22	4.15
Critical Hdwy Stg 1	5.41	-	-
Critical Hdwy Stg 2	5.41	-	-
Follow-up Hdwy	3.509	3.318	2.245
Pot Cap-1 Maneuver	278	553	997
Stage 1	596	-	-
Stage 2	640	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	258	553	997
Mov Cap-2 Maneuver	258	-	-
Stage 1	554	-	-
Stage 2	640	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19.4	1.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	997	-	258	553	-	-
HCM Lane V/C Ratio	0.071	-	0.3	0.105	-	-
HCM Control Delay (s)	8.9	-	24.8	12.3	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.2	0.3	-	-

Lanes, Volumes, Timings
2: Henderson Blvd SE & North Street SE

2021 Adjacent Roadway 4-6 PM Peak Hour 1

01/08/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	299	41	69	292	103	46	145	54	119	294	54
Future Volume (vph)	56	299	41	69	292	103	46	145	54	119	294	54
Satd. Flow (prot)	1805	1866	0	0	1815	0	1719	1809	0	1805	1838	0
Flt Permitted	0.438				0.902		0.376			0.578		
Satd. Flow (perm)	832	1866	0	0	1648	0	680	1809	0	1098	1838	0
Satd. Flow (RTOR)		8			27			20			10	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	0%	0%	1%	1%	5%	1%	0%	0%	1%	1%
Adj. Flow (vph)	62	329	45	76	321	113	51	159	59	131	323	59
Shared Lane Traffic (%)												
Lane Group Flow (vph)	62	374	0	0	510	0	51	218	0	131	382	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Total Split (s)	45.0	45.0		20.0	65.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Act Effect Green (s)	25.0	25.0			25.0		18.1	18.1		18.1	18.1	
Actuated g/C Ratio	0.50	0.50			0.50		0.36	0.36		0.36	0.36	
v/c Ratio	0.15	0.40			0.60		0.21	0.33		0.33	0.57	
Control Delay	8.6	9.4			12.4		15.8	13.4		16.3	17.6	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	8.6	9.4			12.4		15.8	13.4		16.3	17.6	
LOS	A	A			B		B	B		B	B	
Approach Delay		9.3			12.4			13.9			17.3	
Approach LOS		A			B			B			B	
Queue Length 50th (ft)	8	52			78		9	36		24	76	
Queue Length 95th (ft)	33	149			229		40	111		83	210	
Internal Link Dist (ft)		321			634			812			983	
Turn Bay Length (ft)	150						100			100		
Base Capacity (vph)	698	1567			1592		476	1273		769	1291	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.09	0.24			0.32		0.11	0.17		0.17	0.30	

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 49.7

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 13.3

Intersection LOS: B

Intersection Capacity Utilization 79.1%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 2: Henderson Blvd SE & North Street SE



Lanes, Volumes, Timings
2: Henderson Blvd SE & North Street SE

2021 Adjacent Roadway 4-6 PM Peak Hour 2

01/08/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	347	64	77	290	226	42	233	59	161	346	87
Future Volume (vph)	71	347	64	77	290	226	42	233	59	161	346	87
Satd. Flow (prot)	1805	1856	0	0	1777	0	1719	1828	0	1805	1825	0
Flt Permitted	0.366				0.893		0.220			0.403		
Satd. Flow (perm)	695	1856	0	0	1596	0	398	1828	0	766	1825	0
Satd. Flow (RTOR)		11			58			13			13	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Heavy Vehicles (%)	0%	0%	0%	0%	1%	1%	5%	1%	0%	0%	1%	1%
Adj. Flow (vph)	78	381	70	85	319	248	46	256	65	177	380	96
Shared Lane Traffic (%)												
Lane Group Flow (vph)	78	451	0	0	652	0	46	321	0	177	476	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		2		1	6			8			4	
Permitted Phases	2			6			8			4		
Total Split (s)	45.0	45.0		20.0	65.0		35.0	35.0		35.0	35.0	
Total Lost Time (s)	3.0	3.0			3.0		3.0	3.0		3.0	3.0	
Act Effect Green (s)	43.8	43.8			43.8		27.1	27.1		27.1	27.1	
Actuated g/C Ratio	0.57	0.57			0.57		0.35	0.35		0.35	0.35	
v/c Ratio	0.20	0.43			0.70		0.33	0.50		0.66	0.74	
Control Delay	10.1	10.9			15.9		31.5	24.9		39.8	32.4	
Queue Delay	0.0	0.0			0.0		0.0	0.0		0.0	0.0	
Total Delay	10.1	10.9			15.9		31.5	24.9		39.8	32.4	
LOS	B	B			B		C	C		D	C	
Approach Delay		10.8			15.9			25.8			34.4	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)	20	129			219		16	118		73	198	
Queue Length 95th (ft)	42	190			338		59	248		#206	#429	
Internal Link Dist (ft)		321			634			812			983	
Turn Bay Length (ft)	150						100			100		
Base Capacity (vph)	470	1261			1275		181	837		348	835	
Starvation Cap Reductn	0	0			0		0	0		0	0	
Spillback Cap Reductn	0	0			0		0	0		0	0	
Storage Cap Reductn	0	0			0		0	0		0	0	
Reduced v/c Ratio	0.17	0.36			0.51		0.25	0.38		0.51	0.57	

Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 77.5

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 21.8

Intersection LOS: C

Intersection Capacity Utilization 95.6%

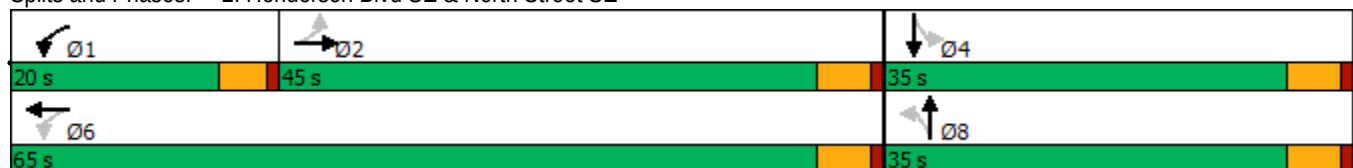
ICU Level of Service F

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 2: Henderson Blvd SE & North Street SE



Intersection						
Int Delay, s/veh	5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	133	50	105	497	181	189
Future Vol, veh/h	133	50	105	497	181	189
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	115	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	11	9	7	2	4	8
Mvmt Flow	164	62	130	614	223	233
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1214	340	456	0	-	0
Stage 1	340	-	-	-	-	-
Stage 2	874	-	-	-	-	-
Critical Hdwy	6.51	6.29	4.17	-	-	-
Critical Hdwy Stg 1	5.51	-	-	-	-	-
Critical Hdwy Stg 2	5.51	-	-	-	-	-
Follow-up Hdwy	3.599	3.381	2.263	-	-	-
Pot Cap-1 Maneuver	192	687	1079	-	-	-
Stage 1	701	-	-	-	-	-
Stage 2	394	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	169	687	1079	-	-	-
Mov Cap-2 Maneuver	291	-	-	-	-	-
Stage 1	617	-	-	-	-	-
Stage 2	394	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	26.4	1.5		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1079	-	291	687	-	-
HCM Lane V/C Ratio	0.12	-	0.564	0.09	-	-
HCM Control Delay (s)	8.8	-	32.3	10.8	-	-
HCM Lane LOS	A	-	D	B	-	-
HCM 95th %tile Q(veh)	0.4	-	3.2	0.3	-	-

Intersection

Int Delay, s/veh 3.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	85	72	89	376	115	67
Future Vol, veh/h	85	72	89	376	115	67
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	115	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	11	9	7	2	4	8
Mvmt Flow	105	89	110	464	142	83

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	868	184	225
Stage 1	184	-	-
Stage 2	684	-	-
Critical Hdwy	6.51	6.29	4.17
Critical Hdwy Stg 1	5.51	-	-
Critical Hdwy Stg 2	5.51	-	-
Follow-up Hdwy	3.599	3.381	2.263
Pot Cap-1 Maneuver	311	841	1315
Stage 1	826	-	-
Stage 2	485	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	285	841	1315
Mov Cap-2 Maneuver	388	-	-
Stage 1	757	-	-
Stage 2	485	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.1	1.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1315	-	388	841	-	-
HCM Lane V/C Ratio	0.084	-	0.27	0.106	-	-
HCM Control Delay (s)	8	-	17.7	9.8	-	-
HCM Lane LOS	A	-	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	1.1	0.4	-	-

Intersection						
Int Delay, s/veh	5.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	167	124	67	209	185	76
Future Vol, veh/h	167	124	67	209	185	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	115	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	8	8	0	2	3	17
Mvmt Flow	204	151	82	255	226	93
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	692	273	319	0	-	0
Stage 1	273	-	-	-	-	-
Stage 2	419	-	-	-	-	-
Critical Hdwy	6.48	6.28	4.1	-	-	-
Critical Hdwy Stg 1	5.48	-	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-	-
Follow-up Hdwy	3.572	3.372	2.2	-	-	-
Pot Cap-1 Maneuver	401	752	1252	-	-	-
Stage 1	759	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	375	752	1252	-	-	-
Mov Cap-2 Maneuver	480	-	-	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	651	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	15	2		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1252	-	480	752	-	-
HCM Lane V/C Ratio	0.065	-	0.424	0.201	-	-
HCM Control Delay (s)	8.1	-	17.9	11	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	2.1	0.7	-	-

Intersection						
Int Delay, s/veh	3.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	116	79	42	229	267	64
Future Vol, veh/h	116	79	42	229	267	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	115	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	82	82	82	82	82	82
Heavy Vehicles, %	8	8	0	2	3	17
Mvmt Flow	141	96	51	279	326	78
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	746	365	404	0	-	0
Stage 1	365	-	-	-	-	-
Stage 2	381	-	-	-	-	-
Critical Hdwy	6.48	6.28	4.1	-	-	-
Critical Hdwy Stg 1	5.48	-	-	-	-	-
Critical Hdwy Stg 2	5.48	-	-	-	-	-
Follow-up Hdwy	3.572	3.372	2.2	-	-	-
Pot Cap-1 Maneuver	372	667	1166	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	678	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	356	667	1166	-	-	-
Mov Cap-2 Maneuver	467	-	-	-	-	-
Stage 1	659	-	-	-	-	-
Stage 2	678	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.1	1.3		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1166	-	467	667	-	-
HCM Lane V/C Ratio	0.044	-	0.303	0.144	-	-
HCM Control Delay (s)	8.2	-	16	11.3	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.1	-	1.3	0.5	-	-

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	79	46	58	292	435	79
Future Vol, veh/h	79	46	58	292	435	79
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	115	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	2	5	2	1	2
Mvmt Flow	85	49	62	314	468	85
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	949	511	553	0	-	0
Stage 1	511	-	-	-	-	-
Stage 2	438	-	-	-	-	-
Critical Hdwy	6.41	6.22	4.15	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.318	2.245	-	-	-
Pot Cap-1 Maneuver	290	563	1002	-	-	-
Stage 1	604	-	-	-	-	-
Stage 2	653	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	272	563	1002	-	-	-
Mov Cap-2 Maneuver	400	-	-	-	-	-
Stage 1	567	-	-	-	-	-
Stage 2	653	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.8	1.5		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	1002	-	400	563	-	-
HCM Lane V/C Ratio	0.062	-	0.212	0.088	-	-
HCM Control Delay (s)	8.8	-	16.4	12	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.8	0.3	-	-

Intersection

Int Delay, s/veh 2.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	72	54	66	292	454	66
Future Vol, veh/h	72	54	66	292	454	66
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	150	0	115	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	2	5	2	1	2
Mvmt Flow	77	58	71	314	488	71

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	980	524	559
Stage 1	524	-	-
Stage 2	456	-	-
Critical Hdwy	6.41	6.22	4.15
Critical Hdwy Stg 1	5.41	-	-
Critical Hdwy Stg 2	5.41	-	-
Follow-up Hdwy	3.509	3.318	2.245
Pot Cap-1 Maneuver	278	553	997
Stage 1	596	-	-
Stage 2	640	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	258	553	997
Mov Cap-2 Maneuver	388	-	-
Stage 1	554	-	-
Stage 2	640	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.8	1.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	EBLn2	SBT	SBR
Capacity (veh/h)	997	-	388	553	-	-
HCM Lane V/C Ratio	0.071	-	0.2	0.105	-	-
HCM Control Delay (s)	8.9	-	16.6	12.3	-	-
HCM Lane LOS	A	-	C	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.7	0.3	-	-

Note:

FOR TOTAL INTERSECTION DELAY

Major Approach:

Left-Through-Right Shared is added together and entered as the left movement with the LT delay.

In Olympia drivers do not pass a queued left-turn and are assigned delay.

HCS assumes there is no delay for the TH movement. (See HCS2000 manual equation 17-40 and 17-41 text)

If there is an exclusive Left-turn lane enter the Through and the Right volume without delay

Delay max 1000 sec.

Henderson Blvd SE & Carlyon Ave SE

Unsignalized Intersection Calculation

Weighted Average

Existing AM Peak Hour 1

	NB			SB			WB			EB		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement	1	2	3	4	5	6	7	8	9	10	11	12
Volume (HFR)	105	468	0	0	171	165	0	0	0	122	0	50
Control Delay	8.6	0	0	0	0	0	0	0	0	75.8	0	10.5
Intersection Delay	9.9	A										

Existing AM Peak Hour 2

	NB			SB			WB			EB		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement	1	2	3	4	5	6	7	8	9	10	11	12
Volume	84	354	0	0	108	63	0	0	0	80	0	68
Control Delay	7.9	0	0	0	0	0	0	0	0	22.1	0	9.7
Intersection Delay	4.1	A										

2021 AM Peak Hour 1

	NB			SB			WB			EB		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement	1	2	3	4	5	6	7	8	9	10	11	12
Volume	105	497	0	0	181	189	0	0	0	133	0	50
Control Delay	8.8	0	0	0	0	0	0	0	0	116.6	0	10.8
Intersection Delay	14.7	B										

2021 AM Peak Hour 2

	NB			SB			WB			EB		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement	1	2	3	4	5	6	7	8	9	10	11	12
Volume	89	376	0	0	115	67	0	0	0	85	0	72
Control Delay	8	0	0	0	0	0	0	0	0	24.8	0	9.8
Intersection Delay	4.4	A										

Note:

FOR TOTAL INTERSECTION DELAY

Major Approach:

Left-Through-Right Shared is added together and entered as the left movement with the LT delay.

In Olympia drivers do not pass a queued left-turn and are assigned delay.

HCS assumes there is no delay for the TH movement. (See HCS2000 manual equation 17-40 and 17-41 text)

If there is an exclusive Left-turn lane enter the Through and the Right volume without delay

Delay max 1000 sec.

Henderson Blvd SE & Carlyon Ave SE

Unsignalized Intersection Calculation

Weighted Average

Existing School PM Peak Hour 1

	NB			SB			WB			EB		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement	1	2	3	4	5	6	7	8	9	10	11	12
Volume (HFR)	67	197	0	0	174	68	0	0	0	151	0	124
Control Delay	8	0	0	0	0	0	0	0	0	22	0	10.8
Intersection Delay	6.7	A										

Existing Shool PM Peak Hour 2

	NB			SB			WB			EB		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement	1	2	3	4	5	6	7	8	9	10	11	12
Volume	40	216	0	0	252	60	0	0	0	109	0	74
Control Delay	8.2	0	0	0	0	0	0	0	0	19.6	0	11.1
Intersection Delay	4.4	A										

2021 School PM Peak Hour 1

	NB			SB			WB			EB		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement	1	2	3	4	5	6	7	8	9	10	11	12
Volume	67	209	0	0	185	76	0	0	0	167	0	124
Control Delay	8.1	0	0	0	0	0	0	0	0	25.4	0	11
Intersection Delay	7.4	A										

2021 School PM Peak Hour 2

	NB			SB			WB			EB		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement	1	2	3	4	5	6	7	8	9	10	11	12
Volume	42	229	0	0	267	64	0	0	0	116	0	79
Control Delay	8.2	0	0	0	0	0	0	0	0	21.6	0	11.3
Intersection Delay	4.7	A										

Note:

FOR TOTAL INTERSECTION DELAY

Major Approach:

Left-Through-Right Shared is added together and entered as the left movement with the LT delay.

In Olympia drivers do not pass a queued left-turn and are assigned delay.

HCS assumes there is no delay for the TH movement. (See HCS2000 manual equation 17-40 and 17-41 text)

If there is an exclusive Left-turn lane enter the Through and the Right volume without delay

Delay max 1000 sec.

Henderson Blvd SE & Carlyon Ave SE

Unsignalized Intersection Calculation

Weighted Average

Existing 4-6 PM Peak Hour 1

	NB			SB			WB			EB		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement	1	2	3	4	5	6	7	8	9	10	11	12
Volume (HFR)	55	275	0	0	410	70	0	0	0	69	0	43
Control Delay	8.7	0	0	0	0	0	0	0	0	21.3	0	11.7
Intersection Delay	2.7	A										

Existing 4-6 PM Peak Hour 2

	NB			SB			WB			EB		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement	1	2	3	4	5	6	7	8	9	10	11	12
Volume	62	275	0	0	428	62	0	0	0	68	0	51
Control Delay	8.8	0	0	0	0	0	0	0	0	22.3	0	11.9
Intersection Delay	2.8	A										

2021 4-6 PM Peak Hour 1

	NB			SB			WB			EB		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement	1	2	3	4	5	6	7	8	9	10	11	12
Volume	58	292	0	0	435	79	0	0	0	79	0	46
Control Delay	8.8	0	0	0	0	0	0	0	0	24.1	0	12
Intersection Delay	3.0	A										

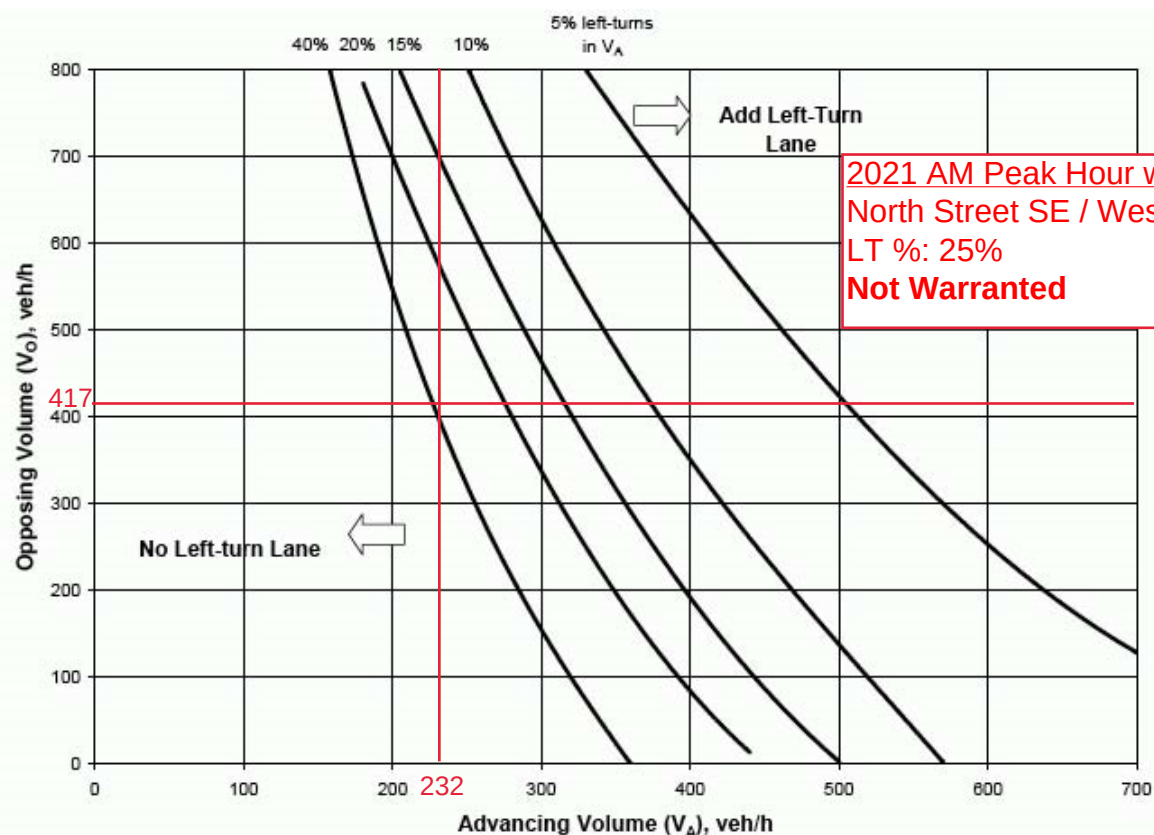
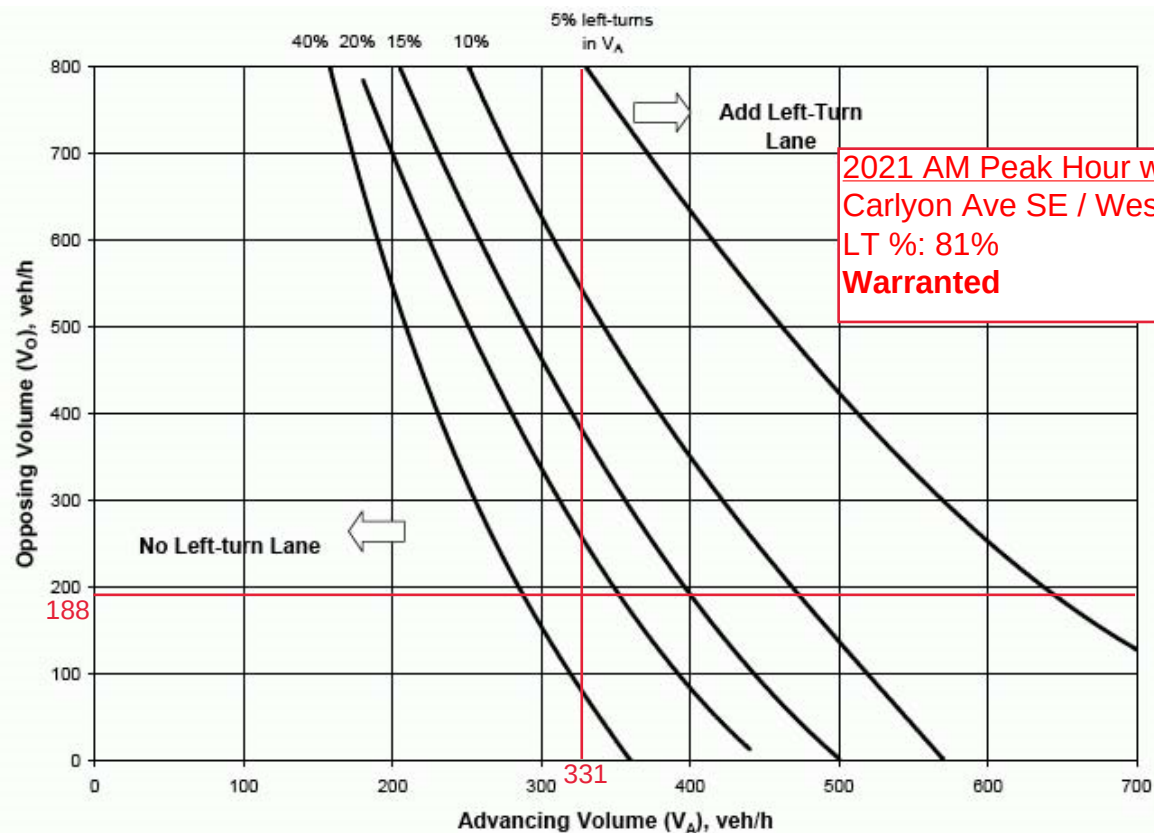
2021 4-6 PM Peak Hour 2

	NB			SB			WB			EB		
	L	T	R	L	T	R	L	T	R	L	T	R
Movement	1	2	3	4	5	6	7	8	9	10	11	12
Volume	66	292	0	0	454	66	0	0	0	72	0	66
Control Delay	8.9	0	0	0	0	0	0	0	0	24.8	0	12.3
Intersection Delay	3.1	A										

OLYMPIA HIGH SCHOOL
TRAFFIC IMPACT ANALYSIS

APPENDIX

WARRANTS



SIGNAL WARRANT ANALYSIS, WARRANT 3

North Street SE & Looped Entrance/Pifer Rd SE 2021 AM Peak Hour Volumes with Project

Warrant met if criteria in either of the following two categories A and B are met:

A. If ALL 3 of the following conditions exist for the same 1 hour of an average day: **NOT MET**

1. The total stopped time delay for the minor-street approach equals or exceeds 4 vehicle-hours for a one-lane approach (5 veh-hrs for a two-lane approach).

SB: $[(105 + 4 + 37) * 45.6] / 3600 = 1.86 < 4.0$ **NOT MET**

2. The volume on the same minor street approach equals or exceeds 100 vehicles per hour for one moving lane of traffic (150 veh/hr for two moving lanes).

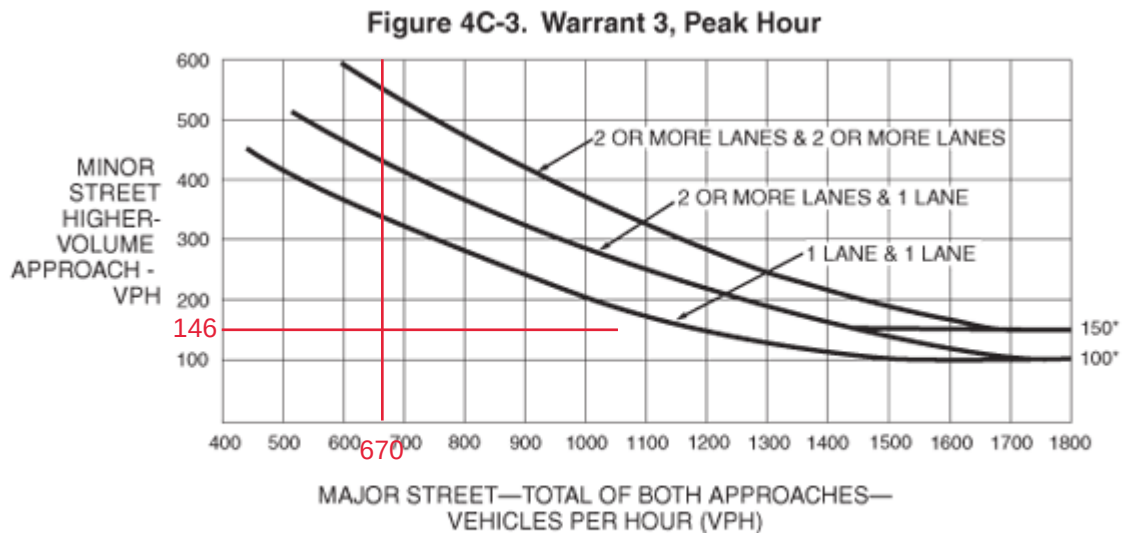
SB: $105 + 4 + 37 = 146 < 100$ **MET**

3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for intersections with 3 approaches (800 veh/hr for 4 approaches).

$848 < 800$ **MET**

B. The plotted point in Figure 4C-3 falls above the applicable curve for the existing combination of approach lanes. **NOT MET**

WARRANT 3 NOT MET
(Based on estimated future volumes)



TRAFFIC SIGNAL WARRANT WORKSHEET

REVISED 12/13/2018

LOCATION: Henderson Jct Carlyon Major Street: Henderson
 NUMBER OF LANES: Minor 2 Major 1
 SPEED: Major: Posted: 25 mph : < 40 mph
 SPEED: Minor: Posted: 25 mph
 DATE OF COUNT: March, 2018 (all legs)

Match

Match

Match

Match

TIME	MAJOR STREET NB DIRECTION	MAJOR STREET SB DIRECTION	TOTAL BOTH APPROACHES MAJOR	MINOR STREET DIRECTION	MINOR ST ONE APPROACH	WARRANT #1 a Major	WARRANT #1 a Minor	WARRANT #1 b Major	WARRANT #1 b Minor	WARRANT #8 80% of #1 a Major	WARRANT #8 80% of #1 a Minor	WARRANT #8 80% of #1 b Major	WARRANT #8 80% of #1 b Minor
AM 6:00	295	82	377	EB	43	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
7:00	604	275	879	EB	190	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
8:00	496	182	678	EB	196	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE
9:00	285	134	419	EB	52	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
10:00	233	138	371	EB	63	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
11:00	283	237	520	EB	140	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE
12:00	289	218	507	EB	95	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE
PM 1:00	271	212	483	EB	150	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
2:00	285	251	536	EB	243	TRUE	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE
3:00	284	289	573	EB	139	TRUE	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE
4:00	318	469	787	EB	143	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
5:00	352	504	856	EB	173	TRUE	FALSE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
6:00	236	260	496	EB	111	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
7:00	151	187	338	EB	145	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
8:00	100	128	228	EB	49	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE	FALSE
	4482	3566			1932								

Warrant #1 a Minimum Vehicular Volume

Warrant met: No

INPUT Major VPH: 500

INPUT Minor VPH: 200

12

Comments: 1 of 8 — NO

Warrant #1 b Interruption of Continuous Traffic

Warrant met: No

INPUT Major VPH: 750

INPUT Minor VPH: 100

Comments: 3 of 8 — NO

Warrant #1 Combination of Warrants

Warrant met: No

Warrant #1 a Std. Warrant #1 b Std.
 Major VPH: 400 Major VPH: 600
 Minor VPH: 160 Minor VPH: 80
 (80% of values for Warrant #1&2)

Comments: 3 of 8 — NO

Warrant #2 Four Hour Volume

Warrant met: No

Comments: 1 of 4 — NO

Warrant #3 a Peak Hour Delay

Warrant met: No

Comments: 1.68 veh-hours (AM 7:15) : 1.41 veh-hours (2:15) : 0.75 veh-hours (PM 4:30) : all less than 5 veh-hours — NO

	Major St. Vol.	Minor St. Vol.
1)	879	190
2)	536	243
3)	787	143
4)	856	173

x

Warrant #3 b Peak Hour Volume

Comments: NO

Major VPH: 879
Minor VPH: 190
Warrant met: No

Warrant #4 Minimum Pedestrian Volume

Warrant met: No

Comments: Maximum Hourly Pedestrian Volume occurred 2:15 - 3:15 with 232 peds and Major Street 571 vehicles. --- NO

Warrant #5 School Crossings

Warrant met: No

Comments: Gap Analysis 09:30-14:30-8:30 Gap based on 3.5 foot/sec crossing time to center island
Southbound 128 - 7 second gaps 60 minute crossing period - Warrant NO -
Northbound 105 - 10 second gaps > 60 minute crossing period - Warrant NO
Look for additional crossing enhancements above the current overhead signing, flashing beacons and advanced school zone flashing beacons, pedestrian crossing island and xing guards.

Warrant #6 Coordinated Signal System

Warrant met: N/A

Comments: NA - Not in a coordinated system corridor. - NO

Warrant #7 Crash Experience (Attach Accident Summary Sheet and Diagram)

Warrant #1a	Std.	Warrant #1 b	Std.	Warrant met:
Major VPH:	400	Major VPH:	600	No
Minor VPH:	160	Minor VPH:	80	
(80% of values for Warrant #1b2)				
Number of correctable accidents in one year - 5 minimum				
No more than 3 accidents in any one year.				

Comments: No minimum thresholds met. - NO
Combination warrant is 4 of 8

Warrant #8 Roadway Network

Warrant met: No

Comments: Intersection not part of two intersecting arterials or projected to meet one of warrants 1, 2 or 3 in the next 5-years. - NO