Norwood Park Phase 4 Residential Development

Albine Street, Norwood

Township of Asphodel-Norwood, County of Peterborough

Traffic Impact Study

Prepared by:

Tranplan Associates Inc.
Toronto 416-670-2005
Sudbury 705-522-0272
Peterborough 705-874-3638
www.tranplan.com

Prepared for:

DPH Developments Inc.

December, 2021

tranplan associates
TRAFFIC, TRANSIT, PARKING & TRANSPORTATION PLANNING
19 BANQUO ROAD, THORNHILL, ON L3T 3G9 p:416.670.2005 e:swan@tranplan.com

December 5, 2021

DPH Developments Inc.
c/o Brian Fenton
2345 Yonge Street Suite 800
Toronto, Ontario
M4P 2E5

Dear Mr. Fenton:

Re: Traffic Impact Assessment for Proposed Norwood Park Residential Development Phase 4, Norwood, County of Peterborough

Enclosed, please find our traffic impact study report in support of the Proposed Phase 4 of the Norwood Park Residential Development to be west of Peterborough County Road (CR) 40, north of Albine Street, in the Village of Norwood, in the Township of Asphodel-Norwood, County of Peterborough. The study found the following:

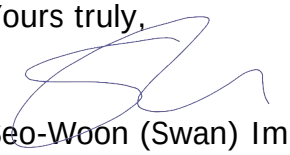
- All movements at all study intersections are projected to continue to operate at LOS "B" or better with minimum delay, no queue and sufficient residual capacity to accommodate future growth in background traffic. The site traffic will add minimal increase to the average intersection delay or the volume to capacity ratio or congestion for the CR 40 corridor during the AM and PM peak hour period.
- The site generated peak hour volumes will have an acceptable level of impact on the study intersection.
- The need for auxiliary turning lanes (left turn land and right turn lane) on County Road 40 were assessed at Albine Street and at Helen Street. It was found that the forecast 2028 future total traffic volumes do not meet the northbound left turn lane warrant at Albine Street and at Helen Street. It was also found that a southbound right turn taper volumes do not meet the warrant volumes at Albine Street and at Helen Street.
- After the review of the functional classification of Helen Street and Albine Street based on the Township of Asphodel-Norwood's 2008 Road Needs

Study Report (based on the MTO's Inventory Manual for Municipal Roads, 1991), as well as Transportation Association of Canada (TAC)'s Geometric Design Guide for Canadian Roads, 2017. The study recommended the following:

- Albine Street to maintain its semi-urban designation and be classified as Class 4 for road maintenance purposes.
- Internal Subdivision Roads to be built to urban local road standards.

Please do not hesitate to call if you have any questions. We would be pleased to meet with you to review the findings.

Yours truly,



Seo-Woon (Swan) Im, B.E.S.
Senior Project Manager

CONTENTS

APPENDICES

LIST OF EXHIBITS

LIST OF TABLES

1.0 INTRODUCTION AND BACKGROUND

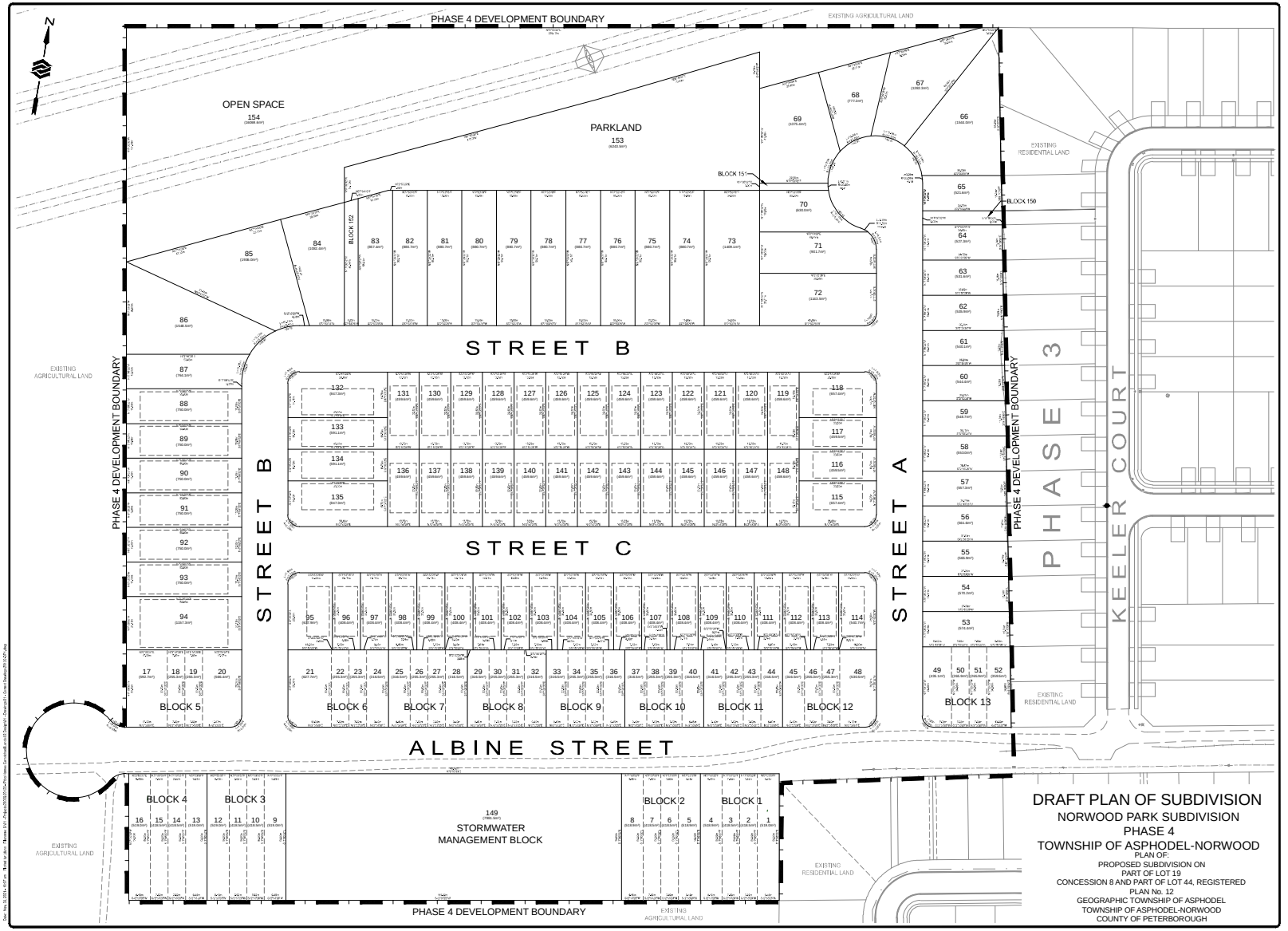
Tranplan Associates ("Tranplan") is pleased to present the findings and recommendations from our traffic impact study dealing with the proposed Norwood Park Phase 4 residential development to be located just west of Peterborough County Road 40, mainly on the north side of Albine Street (north of Phases 1 and 2, west of Phase 3 of the Norwood Park subdivision currently under construction) in the Village of Norwood, in the Township of Asphodel-Norwood, County of Peterborough (see Exhibit 1.1: Key map). The proposed Phase 4 of the development (see a site plan prepared by *Engage Engineering*, Exhibit 1.2: Proposed Site Plan) is a 148 single family residential development.

As part of the planning approvals process, the owners have been carrying out a number of technical studies in support of the proposed development, including a traffic impact study. Tranplan Associates was retained by the owners to carry out the traffic impact assessment study in support of the proposed Phase 4 development. The study has been prepared for use by the study team to assist in the planning and design of the proposed site plan.

It was agreed with the County of Peterborough that this study be an update to an earlier study (January 2019) carried out for Phase 3 of the Norwood Park Subdivision Development. The traffic levels along County Road (CR) 40 in the vicinity of the study site, along with CR 40/Wellington Street, CR 40/Helen Street and CR40/Albine Street intersections as well as the proposed extension of Albine Street were examined using the baseline traffic counts from 2021 and planned Phase 4 development with 2028 as the planning horizon.

EXHIBIT 1.1: KEY MAP

EXHIBIT 1.2: PROPOSED SITE PLAN



BENCHMARK

CUT CROSS IN CONCRETE GUTTER ON KEELER COURT AT THE INTERSECTION OF KEELER COURT AND MANY MAN LANE, CUT CROSS IS ON THE WEST SIDE OF THE ROAD APPROXIMATELY 10m NORTH OF THE INTERSECTION OF ALBINE STREET AND KEELER COURT.

ELEV: 213.160m

OWNER'S CERTIFICATE

I AUTHORIZE EGOWAY CONSULTING SERVICES INC. TO SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE COUNTY OF PETERBOROUGH.

DATE: 2021-12-10

SPH DEVELOPMENTS INC.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THE SURVEY AND PLAN ARE CORRECT AND ARE IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.

DATE: 2021-12-10

SHANNON O'CONNOR
Ontario Land Surveyor

KEY MAP

ADDITIONAL INFORMATION REQUIRED UNDER SECTION 51-17 (4-L) OF THE PLANNING ACT:

A. AS SHOWN ON THIS DRAFT PLAN
B. AS SHOWN ON THIS DRAFT PLAN
C. AS SHOWN ON THIS DRAFT PLAN
D. RESIDENTIAL DWELLINGS
E. AS SHOWN ON THIS DRAFT PLAN
F. AS SHOWN ON THIS DRAFT PLAN
G. AS SHOWN ON THIS DRAFT PLAN
H. REFER TO FUNCTIONAL SERVICING REPORT BY ENGAGE ENGINEERING
I. REFER TO STORMWATER MANAGEMENT REPORT BY ENGAGE ENGINEERING
J. AS SHOWN ON THIS DRAFT PLAN
K. HYDRO, TELEPHONE, MUNICIPAL SEWAGE SERVICING, MUNICIPAL WATER SERVICING AND STORMWATER MANAGEMENT PONDS
L. N/A

LAND USE SUMMARY

LAND USE	AREA (m²)	AREA (%)	UNITS
SEMI-DETACHED BLOCKS 1-3	19,076.76 m²	13.56%	52
SINGLE-FAMILY LOTS 53-148	61,568.36 m²	43.69%	96
SWM BLOCK 149	7961.59 m²	5.70%	-
SERVICING BLOCKS 150-152	671.20 m²	0.48%	-
PARKLAND BLOCK 153	6,243.50 m²	4.43%	-
OPEN SPACE BLOCK 154	16,099.66 m²	11.56%	-
20.0m MUNICIPAL ROAD ALLOWANCE	28,379.29 m²	20.19%	-
TOTAL AREA	140,678.60 m²	100.00%	148

No.	REVISION	BY	DATE
1.	ISSUED FOR DRAFT PLAN SUBMISSION	JD	2021-12-10

ENGAGE ENGINEERING

NORWOOD PARK SUBDIVISION PHASE 4

TOWNSHIP OF ASPHODEL-NORWOOD

DRAFT PLAN

NORWOOD, ONTARIO

DRAWN BY: J.DUNN
DESIGNED BY: J.DUNN
APPROVED BY: P.HURLEY
DATE: 2021-08-30
SCALE: 1:750
STAMP:

PROJECT NUMBER	SHEET NAME	SHEET
20120	DP1	1 of 1

DRAFT PLAN OF SUBDIVISION

NORWOOD PARK SUBDIVISION
PHASE 4
TOWNSHIP OF ASPHODEL-NORWOOD

PLAN OF:
PROPOSED SUBDIVISION ON
PART OF LOT 19
CONCESSION 8 AND PART OF LOT 44, REGISTERED
PLAN No. 12
GEOGRAPHIC TOWNSHIP OF ASPHODEL
TOWNSHIP OF ASPHODEL-NORWOOD
COUNTY OF PETERBOROUGH

2.0 EXISTING CONDITIONS

2.1 The Study Site

The study site, existing traffic controls and some of the land uses surrounding the study site are illustrated in Exhibit 2.1. The study area consists of the Phase 1 and 2 of Norwood Park subdivision that has been largely built-out (to the south of Albine Street) and Phase 3 that is currently building out, located adjacent to the study site.

2.2 Access to the Study Site

County Road 40 (CR 40) is under the jurisdiction of Peterborough County. It extends north from Highway 7 to Peterborough County Road 6. In the village of Norwood, it has an urban cross section with two travelled lanes and a sidewalk on the west side of the street. In the vicinity of the study area, the posted speed limit is 50 km/h. Based on Peterborough County traffic data collected at the station just south of Helen Street in the Spring of 2018, the daily traffic volume is approximately 3,300 vehicles (2021 Spring count ADT is stated as 2,707 vehicles).

Helen Street, is a local road, under the jurisdiction of Township of Asphodel-Norwood, that will provide direct access to the proposed development. It currently has a rural cross section with surface treated pavement with an unposted speed limit of 50 km/h. Based on observed peak hour volumes in the vicinity of the study site, the daily traffic volume would range approximately from 750 to 850 vehicles per day.

Albine Street, is a local road, under the jurisdiction of Township of Asphodel-Norwood, that will provide direct access to the proposed development. It currently has a rural cross section with surface treated pavement with an unposted speed limit of 50 km/h. Based on observed peak hour volumes in the vicinity of the study site, the daily traffic volume would range approximately

Exhibit 2.1: Existing Traffic Control and Lane Configurations

from 150 to 200 vehicles per day (mainly consisting of Phase 3 Norwood Park subdivision construction traffic).

2.3 Peak Hour Traffic Volumes

Exhibit 2.2(a) shows the 2021 peak hour traffic volumes used for study analysis. The study intersections' volumes were collected on Wednesday July 28, 2021, see Appendix "A". The Peterborough County provided the study with seasonal ATR traffic data collected in 2018 and 2021 (see Appendix "A"). The study determined that the most relevant data is the Spring and Fall 2018 pre-COVID 19 data. It indicated that the County Road 40 volumes were higher in 2018 than the 2021 observed volumes, even though the 2021 observed volumes now include the traffic from the fully built-out Phase 1 and 2 of the proposed Norwood Park development. To test the "worst case" scenario, the observed data (including the traffic from Phase 1 and 2) was adjusted to 2018 levels.

2.4 Level of Service

The existing peak hour traffic volumes were assessed against the capacity of the study area intersections in terms of Level of Service (LOS)[1] and volume/capacity ratios using the Highway Capacity Manual reports produced by *Trafficware Traffic Signal Timing Software - Synchro Version 9.0*. The results are summarized in Table 2.1 Summary of Intersection Analysis. Detailed reports from the analysis are contained in Appendix B *Intersection Capacity Analysis*.

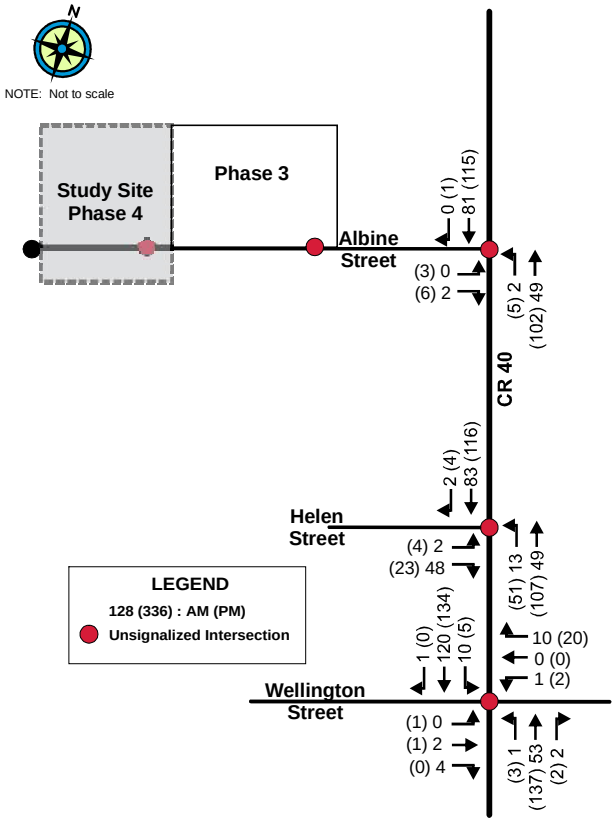
All study intersections and associated movements currently operate at LOS "B" or better with minimum delay during both AM and PM peak hours. The highest volume to capacity (v/c) ratio was at 0.08 for the southbound movement at the

[1] Level of Service (LOS) is commonly used in traffic engineering to describe the level of congestion along a roadway or at an intersection. Levels from "A" to "F" denote increasing amounts of congestion with "F" representing a complete breakdown in traffic flow. Level of Service "C" and "D" are commonly used as design standards. However, many individual turning movements at TWSC intersections and commercial entrances along urban arterial corridor operate at LOS "F" during peak periods. Synchro 9 software capable of producing Highway Capacity Manual 2010 results for unsignalized intersections was used to calculate the Levels of Service.

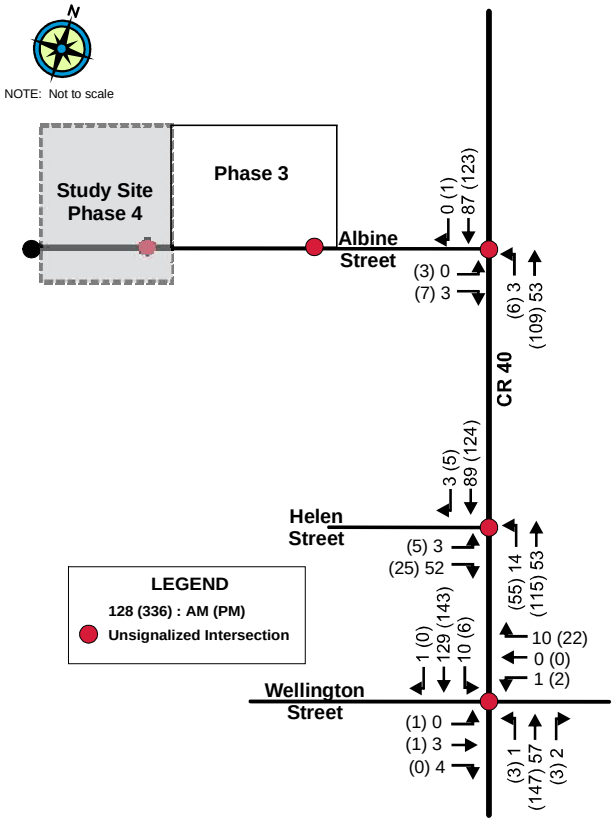
EXHIBIT 2.2: BACKGROUND TRAFFIC VOLUMES

A) 2021 Existing Traffic Volumes

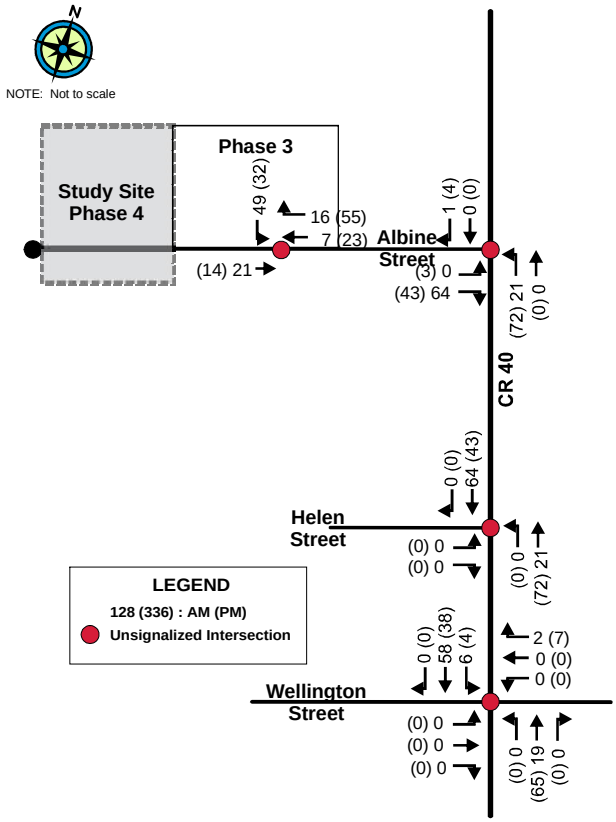
Observed volumes adjusted to reflect pre-Covid peak hour volumes



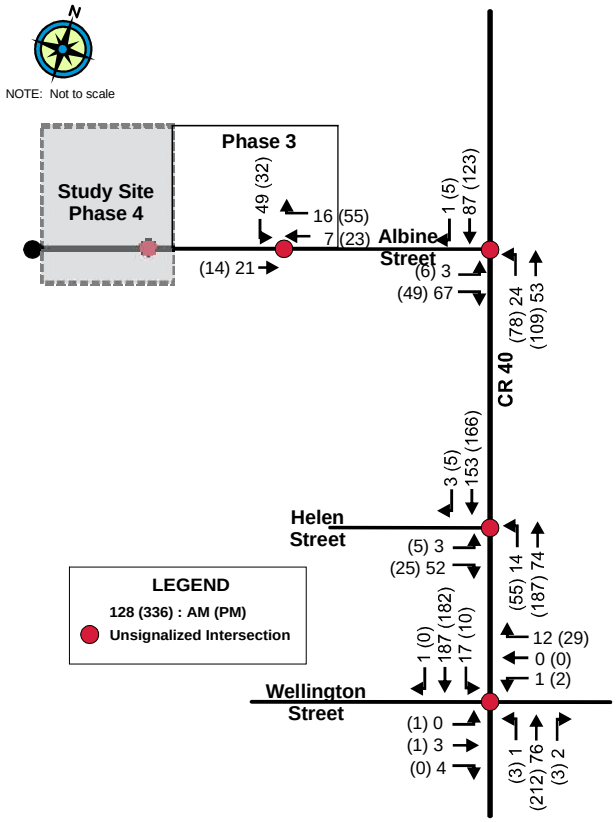
B) 2028 Background Traffic Volumes (1.0% growth rate per annum)



C) Phase 3 Traffic Volumes



D) 2028 Total Background Traffic Volumes



CR 40/Helen Street intersection during the PM peak hour. No intersection was found to have any meaningful 95th percentile queue length (queue length of one vehicle), indicating that there are no queuing issues at the study intersections. In assessing the three principal components of intersection measures of effectiveness (MOE's - delay, queue length and v/c ratio), it can be concluded that there will be sufficient capacity in the existing study road network to accommodate growth in the background traffic.

Table 2.1: Summary of Intersection Capacity Analysis: Existing Conditions

Intersection	2021 Existing Conditions							
	AM Peak Hour				PM Peak Hour			
CR 40 & Albine Street	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
EB - LR	A	8.8	0.1	0.00	A	9.2	0.3	0.01
NB - LT	A	0.3	0.0	0.00	A	0.3	0.1	0.00
SB - TR	-	0.0	0.0	0.04	-	0.0	0.0	0.07
CR 40 & Helen Street	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
EB - LR	A	8.9	1.2	0.05	A	9.3	0.8	0.03
NB - LT	A	1.6	0.2	0.01	A	2.6	0.9	0.04
SB - TR	-	0.0	0.0	0.05	-	0.0	0.0	0.08
CR 40 & Wellington Street	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
EB - LTR	A	9.4	0.2	0.01	B	11.0	0.1	0.00
WB - LTR	A	8.7	0.2	0.01	A	9.3	0.7	0.03
NB - LTR	A	0.2	0.0	0.00	A	0.2	0.1	0.00
SB - LTR	A	0.6	0.1	0.01	A	0.3	0.1	0.00

NOTE: Delay in seconds; 95th percentile queue in metres (unsignalized intersection) as provided in Synchro detail output, see Appendix B

3.0 TRAFFIC FORECASTS

3.1 Background Traffic

Background traffic is defined as all traffic within the study area that is not related to the proposed development. For the purposes of this study, 2028 planning horizon was assumed, to be consistent with the 2025 planning horizon used for Phase 3 analyses. The 2021 traffic volumes were projected ahead to 2028 based on an average growth rate of 1.0% per annum (the previous studies used 2% growth rate per annum) for the roads in the study area. Also included in the 2028 background traffic forecasts are the traffic from the Phase 3 Norwood Park Subdivision (Phase 1 and 2 are fully built-out and included in the 2021 existing traffic volumes), see Exhibit 2.2.

3.2 Traffic Generation by the Proposed Development

The proposed Phase 4 development is a 148 single family dwelling development (96 units of single detached and 52 units of townhouses). Forecasts of future site generated traffic volumes were developed using the trip generation relationships taken from the current Institute of Transportation Engineers (ITE) *Trip Generation Manual*[2]. The ITE land use *Single Family (LU 210)* and *Multi-family Housing (Low-Rise) LU 220*, using the number of units as an independent variable was used for the study analysis. The ITE peak hour trip generation of the single family dwelling units can be calculated using two methods, the average value and the fitted curve equation. The average value is a fixed rate which remains constant with the size of the development, that is, as the number of dwelling units increase, the number of forecast vehicle trips increase at the same rate. The fitted curve equation is a non-linear relationship where the number of dwelling units increase, the number of vehicle trips generated by the development will increase at a slightly reduced rate. The equilibrium between

2 The Institute of Transportation Engineers, based in the United States, is an international association for traffic engineers and transportation planners. The organization publishes a number of handbooks and manuals, including the Trip Generation Manual which is based on American and Canadian experience. The tenth edition of this publication was used.

the two rates occurs when there are 200 single family home development, that is, both the ITE average rate and the fitted curve rate would produce the same number of vehicle trips. As such, any development less than 200 units of single family homes, the fitted curve equation will forecast higher number of vehicle trips. To be consistent with the previous study, since the trip generation for each phase of the development was calculated separately, the Phase 4, 154 units was calculated using the fitted curve equation.

The forecast peak hour vehicular trip generation by the proposed development is summarized below and the resulting number of site generated vehicle trips is given in Table 3.1 and illustrated in Exhibit 3.1 and Exhibit 3.2.

Table 3.1: Projected Trip Generation by Proposed Development

LAND USE	WEEKDAY AM PEAK HOUR				WEEKDAY PM PEAK HOUR			
	Trip Generation Rate (ITE Trip Generation Manual - 10th Edition)	Vehicle Trips			Trip Generation Rate (ITE Trip Generation Manual - 10th Edition)	Vehicle Trips		
		Total	In	Out		Total	In	Out
			25%	75%			63%	37%
Single Family (Phase 4) Detached - 96 Units (ITE Land Use #210)	Trips Per Dwelling Units LU 210 Ln(T)=0.71Ln(X)+4.80	73	18	55	Trips Per Dwelling Units Ln(T)=0.96Ln(X)+0.20	98	62	36
			23%	77%			63%	37%
Attached - 52 Units (ITE Land Use #220)	LU 220 Ln(T)=0.95Ln(X)-0.51 where T = vehicle trips X = number of dwelling units	26	6	20	Ln(T)=0.89Ln(X)+0.02 where T = vehicle trips X = number of dwelling units	33	21	12
Total Phase 4 Trips		99	24	75		131	83	48

* Totals may not add up due to rounding

3.3 Directional Orientation of Site Traffic

The directional orientation of the site traffic is expected to be similar to the trip patterns observed at the proposed site entrances and consistent with population distribution within commuting distance. Exhibit 3.1 describes the directional

EXHIBIT 3.1: SITE TRAFFIC DISTRIBUTION

A) Distribution of Site Traffic

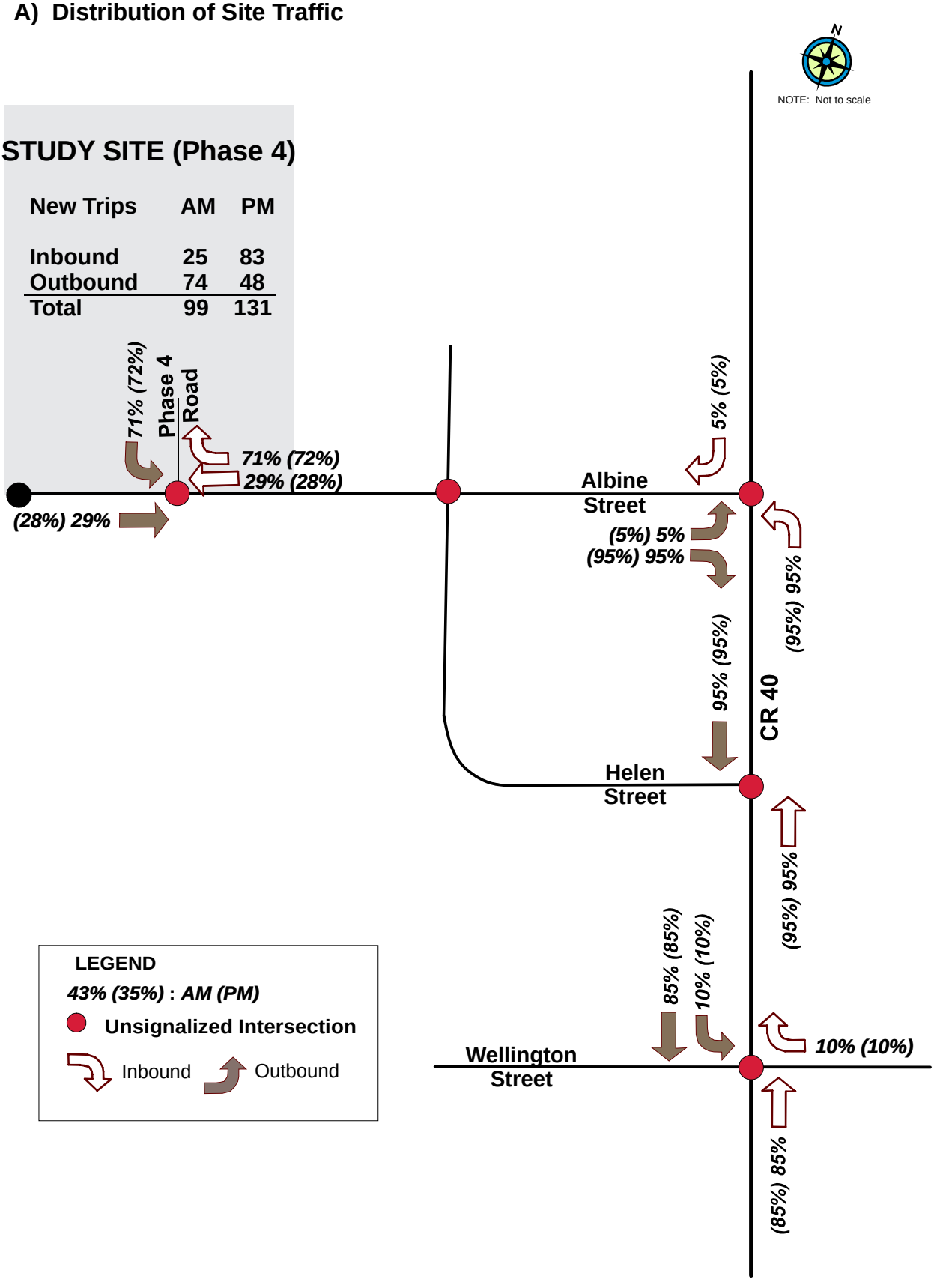
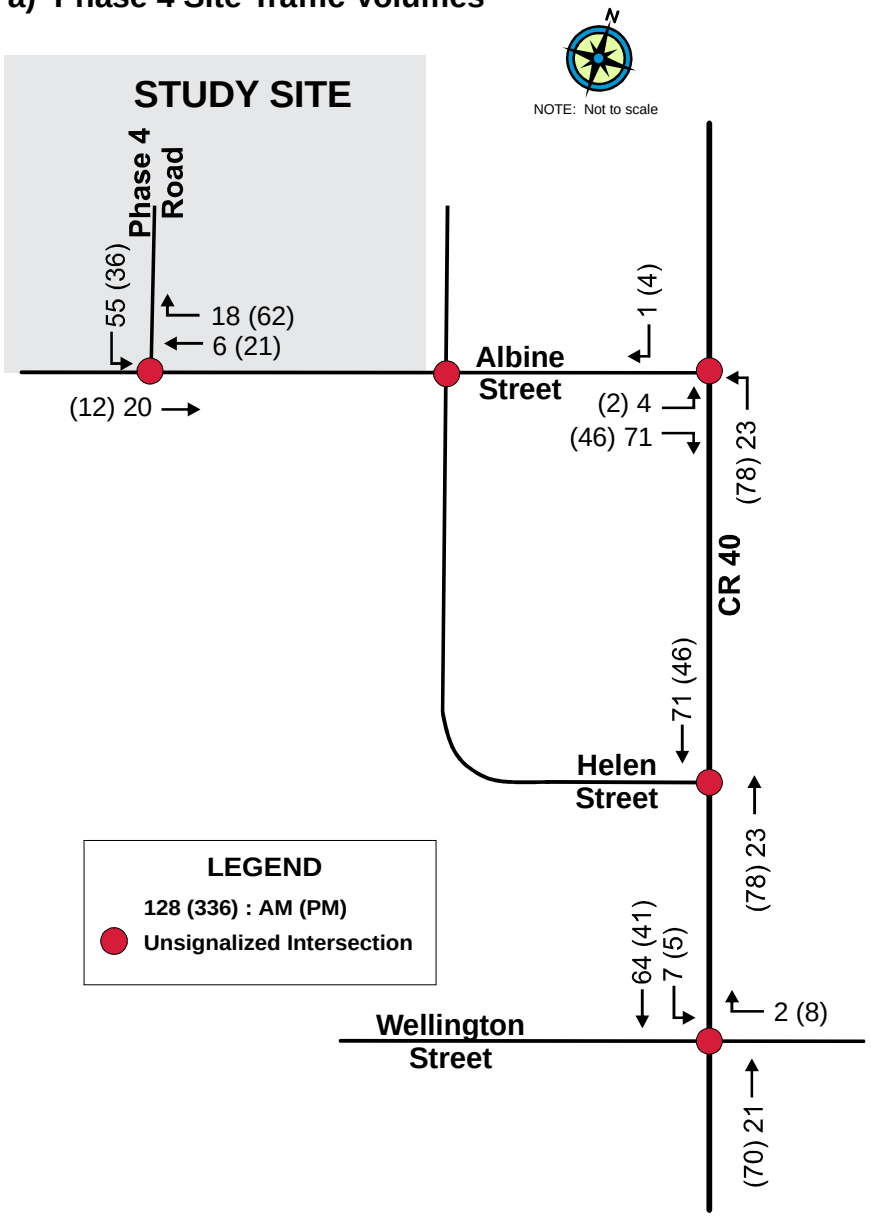
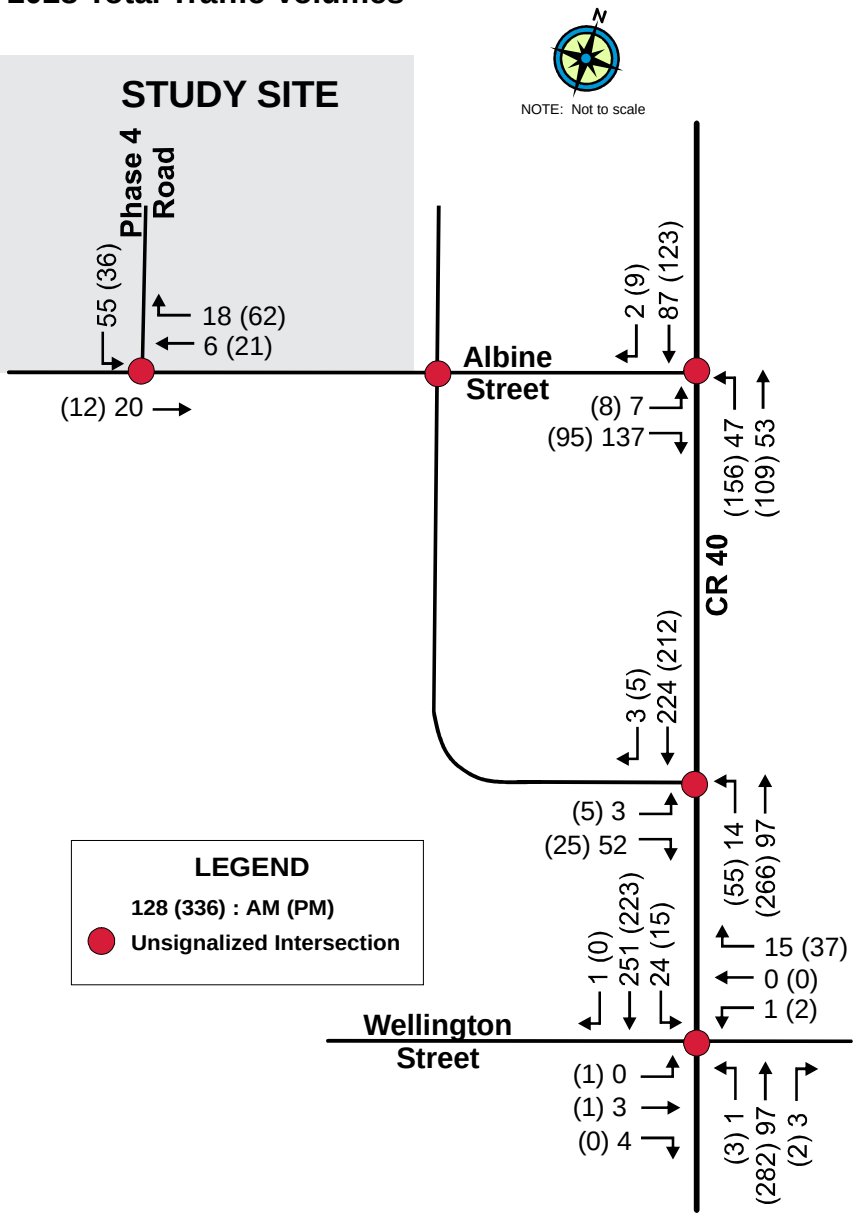


EXHIBIT 3.2: SITE TRAFFIC VOLUMES

a) Phase 4 Site Traffic Volumes



b) 2028 Total Traffic Volumes



distribution of the future residents to/from the study site. In general, 95% of the site traffic is assumed to travel to/from south on CR 40.

3.4 Projected Traffic Volumes

Exhibit 3.2 shows the projected site traffic vehicle volumes for the proposed development and the projected total traffic volumes in 2028 with the trips from the proposed development.

4.0 ANALYSIS OF PROJECTED TRAFFIC VOLUMES

Detailed intersection capacity analysis of conditions in 2028 with and without the proposed development was carried out using *Trafficware Traffic Signal Timing Software -Synchro Version 9.0*. The results are summarized in Table 4.1 and Table 4.2: Summary of Intersection Analysis, and detailed reports from the analysis are contained in Appendix B *Intersection Capacity Analysis*.

4.1 Study Intersections

2028 Background Conditions

Table 4.1: Summary of Intersection Capacity Analysis: Background Conditions

Intersection	2028 Background Conditions							
	AM Peak Hour				PM Peak Hour			
CR 40 & Albine Street	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
EB - LR	A	9.1	2.1	0.08	A	9.6	1.8	0.07
NB - LT	A	2.4	0.4	0.02	A	3.5	1.5	0.06
SB - TR	-	0.0	0.0	0.06	-	0.0	0.0	0.08
CR 40 & Helen Street	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
EB - LR	A	9.5	1.8	0.07	A	9.8	1.0	0.04
NB - LT	A	1.3	0.3	0.01	A	2.1	1.1	0.04
SB - TR	-	0.0	0.0	0.10	-	0.0	0.0	0.11
CR 40 & Wellington Street	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
EB - LTR	B	10.3	0.3	0.01	B	12.5	0.1	0.00
WB - LTR	A	8.9	0.4	0.01	A	9.8	1.1	0.04
NB - LTR	A	0.1	0.0	0.00	A	0.1	0.1	0.00
SB - LTR	A	0.7	0.3	0.01	A	0.5	0.2	0.01

NOTE: Delay in seconds; 95th percentile queue in metres (unsignalized intersection) as provided in Synchro detail output, see Appendix B

The impact of growth in the background traffic at the study intersections is minimal. All study intersections and associated movements are projected to continue to operate at LOS "B" or better with minimum delay during for both AM and PM peak hours. All movements at the study intersections are projected to operate at very low volume to capacity (v/c) ratio, all below 0.11. No intersection is expected to have any meaningful 95th percentile queue length,

indicating that there are no queuing issues at the study intersections. In assessing the three principal components of intersection measures of effectiveness (MOE's - delay, queue length and v/c ratio), it can be concluded that there will be sufficient capacity in the existing study road network to accommodate future growth in the background traffic.

2028 Total Traffic Conditions

Table 4.2: Summary of Intersection Capacity Analysis: Total Conditions

Intersection	2028 Total Conditions							
	AM Peak Hour				PM Peak Hour			
CR 40 & Albine Street	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
EB - LR	A	9.6	4.8	0.17	B	10.0	3.7	0.14
NB - LT	A	3.6	0.8	0.03	A	5.0	3.2	0.12
SB - TR	-	0.0	0.0	0.06	-	0.0	0.0	0.08
CR 40 & Helen Street	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
EB - LR	B	10.0	2.0	0.08	B	10.4	1.1	0.05
NB - LT	A	1.1	0.3	0.01	A	1.7	1.1	0.05
SB - TR	-	0.0	0.0	0.14	-	0.0	0.0	0.14
CR 40 & Wellington Street	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
EB - LTR	B	11.0	0.3	0.01	B	14.3	0.1	0.01
WB - LTR	A	9.1	0.5	0.02	B	10.4	1.5	0.06
NB - LTR	A	0.1	0.0	0.00	A	0.1	0.1	0.00
SB - LTR	A	0.8	0.4	0.02	A	0.6	0.3	0.01
Albine Street & Phase 4 N/S Road	LOS	Delay	95th Queue	v/c	LOS	Delay	95th Queue	v/c
EB - LR	-	0.0	0.0	0.00	-	0.0	0.0	0.00
WB - TR	-	0.0	0.0	0.02	-	0.0	0.0	0.05
SB - LR	A	8.9	1.6	0.06	A	9.0	1.0	0.04

NOTE: Delay in seconds; 95th percentile queue in metres (unsignalized intersection) as provided in Synchro detail output, see Appendix B

With the proposed Phase 4 traffic added to the 2028 background traffic, all study intersections and associated movements are projected to continue to operate at LOS "B" or better with minimum delay during for both AM and PM peak hours. The traffic from the Phase 4 development adds no significant increases in the three principal components of intersection measures of effectiveness (MOE's - delay, queue length and v/c ratio). The highest volume to capacity ratio will be at 0.17 for the eastbound movement at the CR 40/Albine

Street intersection during the AM peak hour. The longest projected 95th percentile queue length is 4.8 metres (less than one vehicle), occurring at the west approach at the CR 40/Albine Street intersection during the AM peak hour. It indicates that there are no queuing issues at the study intersections.

The site traffic will add no meaningful increase to the delay or to the volume to capacity ratio or congestion for the County Road 40 corridor during the AM and PM peak hour period. In general, the study intersections are projected to operate with acceptable delays and residual capacity to accommodate future growth in background traffic with the added site traffic.

4.2 Impact of Site Traffic on the Local Road Network

The impact of the proposed Phase 4 development on the existing road network was assessed. The basis for the assessment included the Township of Asphodel-Norwood's 2008 Road Needs Study Report (based on the MTO's Inventory Manual for Municipal Roads, 1991), as well as Transportation Association of Canada (TAC)'s Geometric Design Guide for Canadian Roads, 2017 were used as references for the current road classifications and standards.

The following roads were reviewed and analysis is provided in Table 4.2:

- Helen Street
- Albine Street
- New Internal Subdivision Local Roads

MTO Inventory Manual noted (see Appendix "C") that in cases where only a measure of "peak hour" traffic is available, an estimate of AADT may be obtained by multiplying the peak hour traffic by ten. According to TAC guidelines, a local residential road is expected to carry approximately 1,000 vehicles per day. The collector roads are expected to handle up to 8,000 vehicles per day. In the study area, Helen Street and Albine Street current

AADT is less than 1,000 vehicles (as per 2008 Road Needs Study). When the proposed Phase 4 development is fully built-out, it is expected that Albine Street will perform a minor collector road function as they provide direct land access to all four phases of the Norwood Park Subdivision and general traffic movements within the study area and carry traffic volumes around 2,700 vehicles per day in certain section of the road.

Furthermore, in assessing the Road Maintenance Classification (as per Ontario Regulation 239/02 under the Municipal Act), Albine Street is currently classified as Class 5. When the proposed Norwood Park Subdivision Residential Development is fully built-out, it is expected that the roads in the study area will be classified as Class 4 for road maintenance purposes.

Table 4.3 - Existing and Future Road Conditions

Road Section	Existing Conditions		Future Conditions	Level of Impact
	TAC	Road Needs Study (MTO Road Inventory Manual)		
Helen Street	Urban Local Residential <1000 veh/day	Semi-Urban Local Residential Road	AADT increase by approx. 1000 veh/day	Re-classify Local to Minor Collector when appropriate
Albine Street	Urban Local Residential <1000 veh/day	Semi-Urban Local Residential Road	AADT increase by approx. 2000 veh/day	Re-classify Local to Minor Collector when appropriate
New Internal Local Streets			AADT approx. 1000 veh/day	Urban Local Residential Road

4.3 Left Turn Lane Analysis

Left turn analysis is provided for the following intersections based on PM peak hour volumes (highest approach volumes occur during the PM peak hour) presented in Exhibit 3.2, in the report:

- County Road 40/Helen Street
- County Road 40/Albine Street

The posted speed on County Road 40 is 50 km/hr. As such design speed of 60 km/hr is used for analysis.

The need for a left-turn lane at a commercial site entrance or at an intersection can be determined through several established methods. The MTO method published in *Geometric Design Standards for Ontario Highways (2002),* which is based on the (for two lane undivided highway) highway design speed, the advancing volume, the opposing volume and the left-turn volume percentage of the total advancing volume. The Transportation Association Canada (TAC) Geometric Design Guide for Canadian Roads (2017), Section 9.17.2.1 provides volume warrants for left turn lane and states that "*When opposing traffic volumes are such that left turning vehicles must wait for a gap to make their turn, they interfere with the through traffic. The magnitude of this interference depends on the opposing volume, the advancing volume and the percentage of left turning vehicles."* The magnitude of the interference can be determined by the results from the intersection capacity analysis for the left turning vehicles. In the Section following 9.17.2.2, TAC guidelines also provide safety warrants and states that "*A left-turn storage may also be considered at locations where four or more collisions related to left turns occur per year or where six or more occur within a period of two years, provided the collisions are of a type which could reasonably be expected to be eliminated by provision of a left-turn lane.*"

Based on MTO criteria and examination of the projected advancing and the opposing traffic volumes, it was found that County Road 40 at Albine Street and at Helen Street do not meet the left turn lane warrant (see Appendix "D").

Based on TAC standards, as provided in Table 4.2, the summary of the intersection capacity analysis for the northbound left turning vehicles Helen

Street and at Albine Street, the magnitude of the interference can be measured by assessing the delay, queue length and v/c ratio of the left turning vehicles at the side street at County Road 40. For the northbound shared left turn and through lane, it indicates that all left turning vehicles will experience LOS "A" with minimum delay (delays of less than 10 seconds per vehicle), no meaningful queuing (queuing of less than one vehicle) is expected and very low volume to capacity ratio at both Helen Street and at Albine Street.

Based on these assessments, it appears that the projected magnitude of the interference caused by a left turning vehicles are very low and there doesn't appear to be any factors causing collisions (from previous Phase 3 assessment) by the left turning vehicles at Helen Street or at Albine Street. Thus, left turn lane is not warranted based on TAC guidelines.

Right Turn Lane Analysis

The right turn lane analysis is based on County of Peterborough right turn lane warrant guidelines for the following intersections based on AM peak hour volumes presented in Exhibit 3.2, in the report:

- County Road 40/Helen Street
- County Road 40/Albine Street

The right turn lane analysis indicate that the projected volumes do not meet the right turn taper or right turn lane warrant on County Road 40 at Helen Street and at Albine Street (see Appendix "E").

5.0 PRINCIPAL FINDINGS AND RECOMMENDATIONS

This traffic impact study was carried out in support of the proposed *Norwood Park Phase 4 Residential Development* located on the west side of CR 40 between Helen Street and Albine Street. The traffic operational analyses described in this report have provided a detailed examination of the anticipated impacts of future background and site-generated traffic for the proposed *Phase 4* development. The following are principal findings from the study and recommendations with respect to the proposed *Phase 4* development.

5.1 The study considered the weekday peak hour periods using AM and PM peak hour vehicular volumes generated by the proposed development.

5.2 Under the “worst case” pre-COVID existing conditions, the intersection capacity analysis indicates that all movements at all study intersections operate at LOS "B" or better with minimum delay, no queue and sufficient residual capacity to accommodate future growth in background traffic (see Table 2.1).

5.3 For planning purposes, the 2021 traffic volumes were projected ahead to 2028 planning horizon based on an average growth rate of 1.0% per annum for the roads in the study area. The background traffic also included the Phase 3 traffic from the Norwood Park Subdivision.

5.4 Under the 2028 background conditions, the intersection capacity analysis indicates that all movements at all study intersections are projected to continue to operate at LOS "B" or better with minimum delay, no queue and sufficient residual capacity to accommodate future growth in background traffic (see Table 4.1).

5.5 The forecasts of future site trip generation for the proposed development were developed using the ITE land use *Single Family (LU 210)* and *Multi-family Housing (Low-Rise) LU 220*, using the number of units as an independent

variable (using the “worst case” scenario analysis). The forecast peak hour vehicular trip generation by the proposed development is summarized below and the resulting number of site generated vehicle trips is given in Table 3.1 and illustrated in Exhibit 3.1 and Exhibit 3.2.

	AM Pk Hr	*PM Pk Hr*
Inbound	*24*	*83*
Outbound	*75*	*48*
Total	*99*	*131*

5.6 The projected distribution of site generated trips is illustrated on Exhibit 3.1. In general, the study assumed 95% of the site traffic travel to/from the south on CR 40.

5.7 Forecast future site generated trips are added to the 2028 background conditions to determine the 2028 total conditions. The intersection capacity analysis indicates that all movements at all study intersections are projected to continue to operate at LOS "B" or better with minimum delay, no queue and sufficient residual capacity to accommodate future growth in background traffic. The site traffic will add no significant increase to the average intersection delay or the volume to capacity ratio or congestion for the CR 40 corridor during the AM and PM peak hour period (see Table 4.2).

5.8 The left turn lane analyses indicate that the projected volumes do not meet the left turn lane warranted on County Road 40 at Albine Street or at Helen Street.

5.9 The right turn lane analyses indicate that the projected volumes do not meet the right turn taper or right turn lane warrant on County Road 40 at Helen Street and at Albine Street.

5.10 The study reviewed the functional classification of Helen Street and Albine Street based on the Township of Asphodel-Norwood's 2008 Road Needs Study Report (based on the MTO's Inventory Manual for Municipal Roads, 1991), as

well as Transportation Association of Canada (TAC)'s Geometric Design Guide for Canadian Roads, 2017. The following are study recommendations:

- Albine Street to maintain its semi-urban designation and be classified as Class 4 for road maintenance purposes.
- Internal Subdivision Roads to be built to urban local road standards.

5.11 The site generated peak hour volumes will have an acceptable level of impact on the study intersections.

5.12 No other mitigation measures will be necessary for the study intersections to support the proposed *Phase 4* of Norwood Park Residential development.

TECHNICAL APPENDIX

APPENDIX A: Traffic Data

15 MINUTE REPORT

North-South Road: County Road 40
East-West Road: Albine Street

Municipality: Norwood
Weather: Mainly Clear

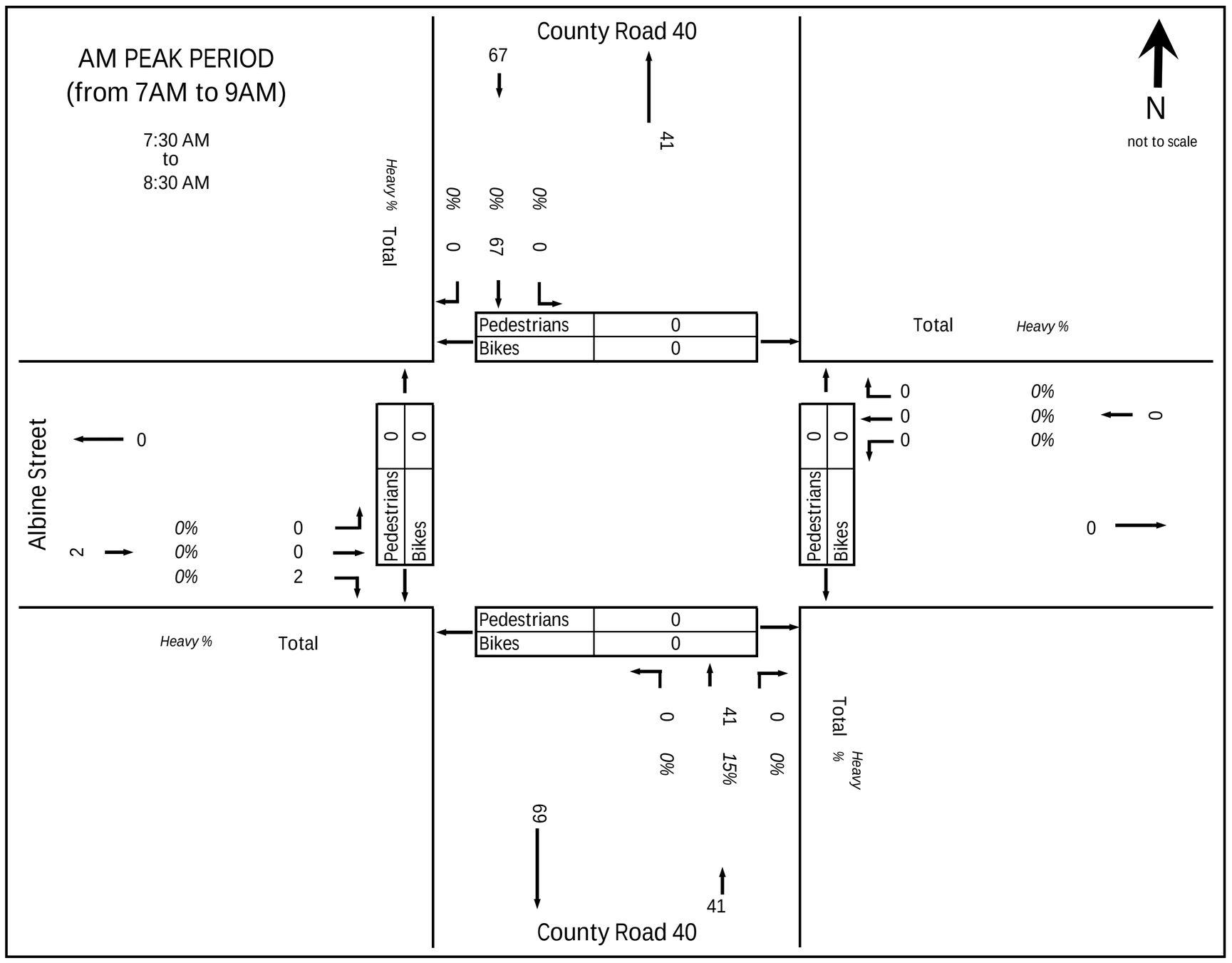
Day: Wednesday
Survey Date: July 28, 2021

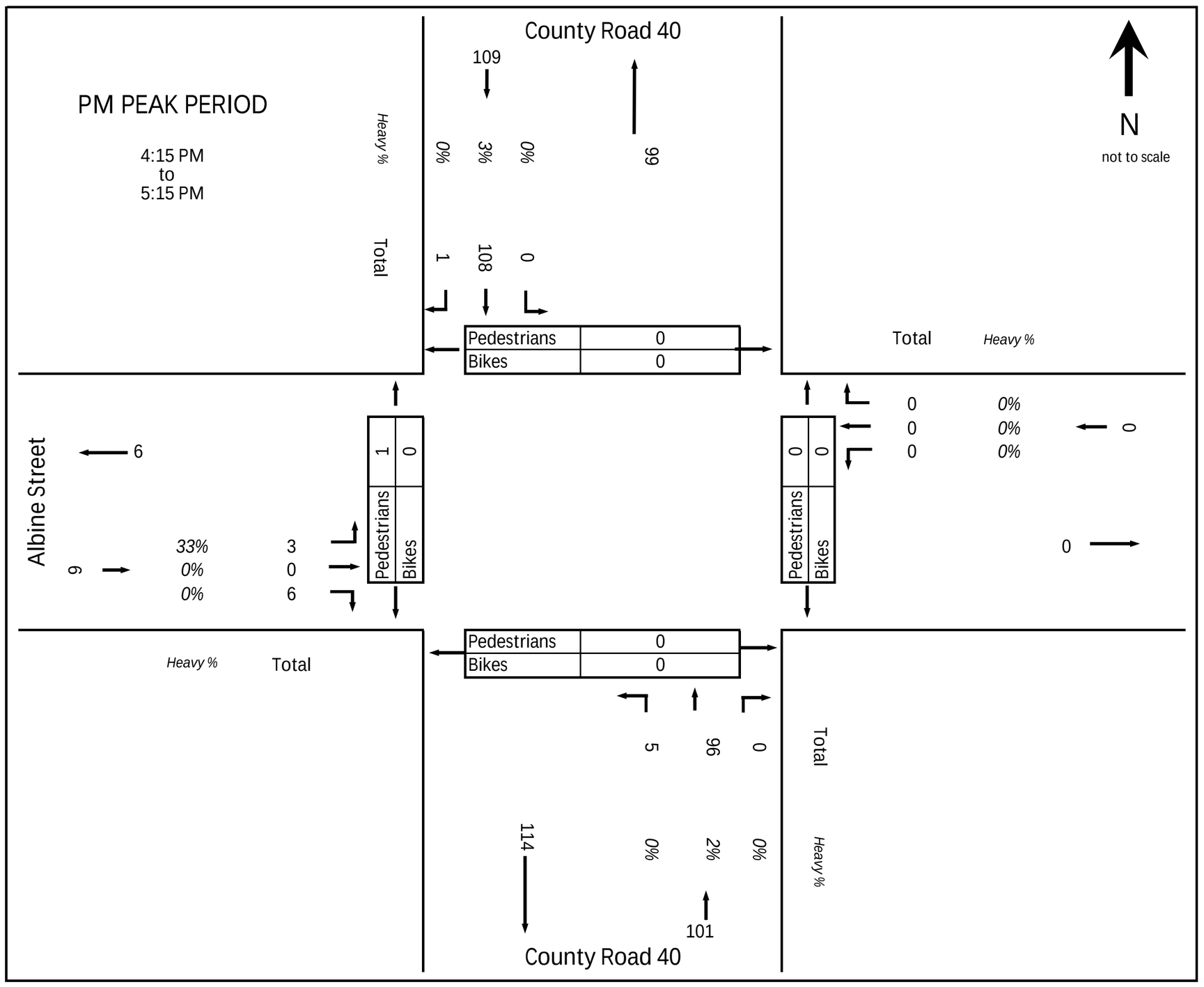
TIME BEGINNING	NORTH APPROACH								EAST APPROACH								SOUTH APPROACH								WEST APPROACH								Total Vehicular Traffic	Total PED/BIKE Traffic
	CAR & PICKUP			HEAVY			Ped	Bike	CAR & PICKUP			HEAVY			Ped	Bike	CAR & PICKUP			HEAVY			Ped	Bike	CAR & PICKUP			HEAVY			Ped	Bike		
	Left	Thru	Right	Left	Thru	Right			Left	Thru	Right	Left	Thru	Right			Left	Thru	Right	Left	Thru	Right			Left	Thru	Right	Left	Thru	Right				
7:00	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26	0
7:15	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0
7:30	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	1	0	0	0	0	0	0	0	0	0	0	0	30	0
7:45	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	1	0	0	0	0	0	1	0	0	0	0	0	26	0
8:00	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	1	0	0	0	0	0	1	0	0	0	0	0	28	0
8:15	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	3	0	0	0	0	0	0	0	0	0	0	0	26	0
8:30	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	1	0	20	1
8:45	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0	2	0	29	2
14:00	0	6	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	1	0	0	0	1	0	0	0	0	0	0	0	25	0
14:15	0	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	14	0	0	0	0	0	0	0	0	1	1	0	0	0	0	28	0
14:30	0	8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	11	0	0	1	0	0	0	0	0	1	0	0	0	1	0	23	1
14:45	0	15	1	0	3	0	0	0	0	0	0	0	0	0	0	0	1	14	0	0	0	0	0	0	0	0	1	0	0	0	0	0	35	0
15:00	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	14	0	0	1	0	0	0	0	0	1	0	0	0	0	0	32	0
15:15	0	20	1	0	2	0	0	0	0	0	0	0	0	0	0	0	1	18	0	0	1	0	0	0	0	0	0	0	0	0	2	0	43	2
15:30	0	10	0	0	2	0	4	0	0	0	0	0	0	0	0	0	1	18	0	0	1	0	0	0	0	0	1	0	0	0	0	0	33	4
15:45	0	17	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	21	0	0	1	0	0	0	1	0	1	0	0	0	1	0	42	1
16:00	0	23	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	18	0	0	0	0	0	0	0	0	0	1	0	0	0	0	45	0
16:15	0	29	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	19	0	0	1	0	0	0	0	0	2	0	0	0	0	0	53	0
16:30	0	30	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	1	0	0	0	1	0	1	0	0	0	0	0	61	0
16:45	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	26	0	0	0	0	0	0	1	0	2	1	0	0	0	0	50	0
17:00	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	24	0	0	0	0	0	0	0	0	1	0	0	0	1	0	55	1
17:15	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	20	0	0	0	0	0	0	0	0	2	0	0	0	0	0	45	0
17:30	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0	0	0	0	0	0	0	0	1	0	0	0	0	1	56	1
17:45	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	21	0	0	0	0	0	0	1	0	0	0	0	0	0	0	49	0

TURNING MOVEMENT DIAGRAMS

North-South Road: County Road 40 | Municipality: Norwood | Day: Wednesday
East-West Road: Albine Street | Weather: Mainly Clear | Survey Date: July 28, 2021

tranplan associates





15 MINUTE REPORT

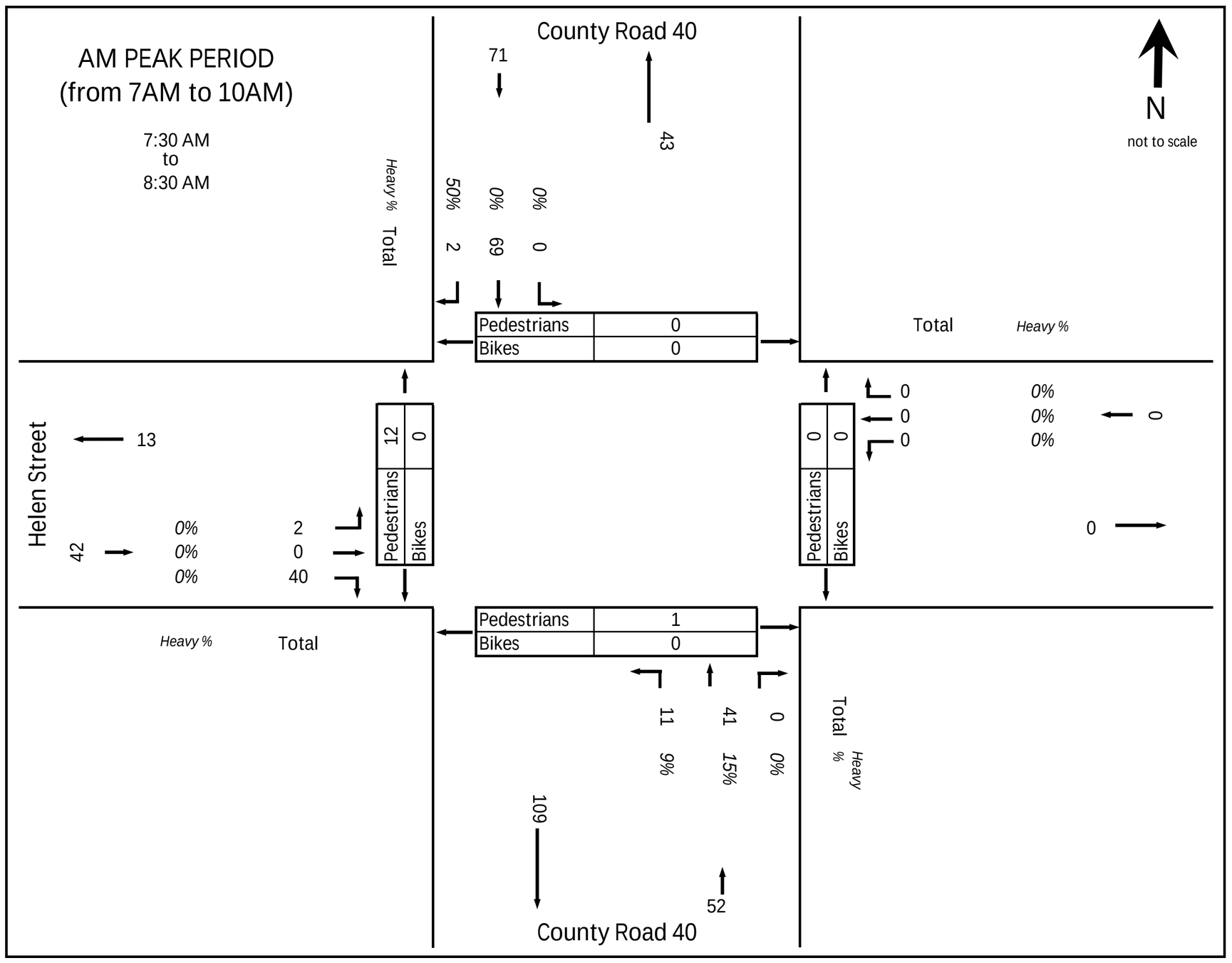
North-South Road: County Road 40
East-West Road: Helen Street
Municipality: Norwood
Weather: Mainly Clear
Day: Wednesday
Survey Date: July 28, 2021

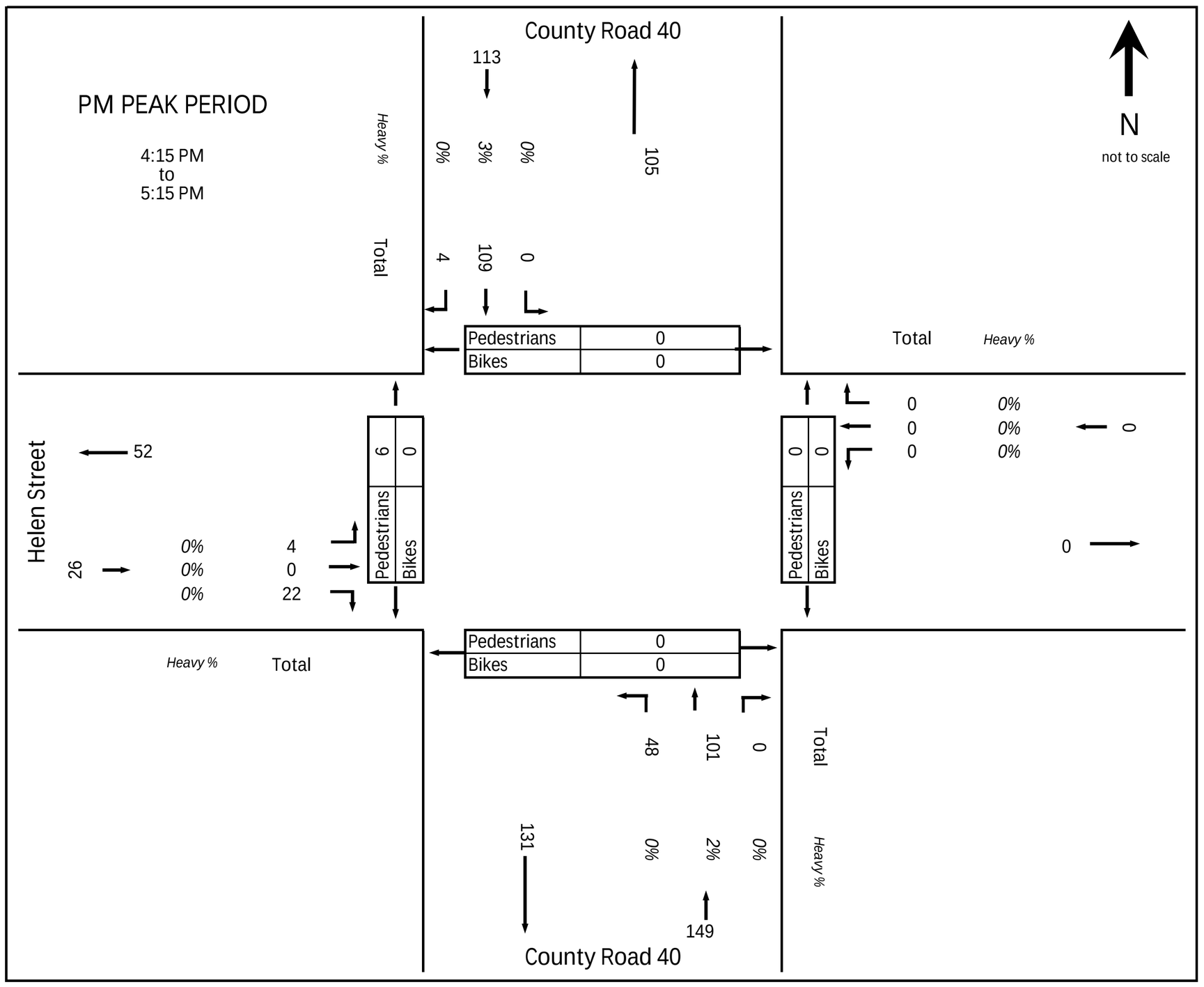
TIME BEGINNING	NORTH APPROACH								EAST APPROACH								SOUTH APPROACH								WEST APPROACH								Total Vehicular Traffic	Total PED/BIKE Traffic
	CAR & PICKUP			HEAVY			Ped	Bike	CAR & PICKUP			HEAVY			Ped	Bike	CAR & PICKUP			HEAVY			Ped	Bike	CAR & PICKUP			HEAVY			Ped	Bike		
	Left	Thru	Right	Left	Thru	Right			Left	Thru	Right	Left	Thru	Right			Left	Thru	Right	Left	Thru	Right			Left	Thru	Right	Left	Thru	Right				
7:00	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	6	0	0	0	1	0	32	1
7:15	0	6	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	7	0	0	0	0	0	0	0	0	11	0	0	0	4	0	26	4
7:30	0	18	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	11	0	1	1	0	0	0	1	0	15	0	0	0	1	0	51	1
7:45	0	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	7	0	0	1	0	0	0	1	0	3	0	0	0	1	0	32	1
8:00	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	10	0	0	1	0	0	0	0	0	10	0	0	0	5	0	42	5
8:15	0	16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7	0	0	3	0	1	0	0	0	12	0	0	0	5	0	39	6
8:30	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	6	0	0	0	0	1	0	1	0	8	0	0	0	2	0	32	3
8:45	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	15	0	0	0	0	0	0	0	0	6	0	0	0	1	0	36	1
9:00	0	14	0	0	0	2	0	0	0	0	0	0	0	0	0	0	5	8	0	0	0	0	0	0	1	0	7	0	0	0	0	0	37	0
9:15	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	8	0	0	0	0	0	0	0	0	4	1	0	0	0	0	30	0
9:30	0	17	0	0	2	0	0	0	0	0	0	0	0	0	0	0	3	8	0	0	1	0	0	0	0	0	1	0	0	0	0	0	32	0
9:45	0	14	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	0
14:00	0	6	0	0	3	0	0	0	0	0	0	0	0	0	0	0	1	14	0	0	1	0	0	0	0	0	3	0	0	0	1	0	28	1
14:15	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	14	0	0	0	0	0	0	0	0	1	0	0	1	1	0	28	1
14:30	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	11	0	0	1	0	0	0	0	0	2	0	0	0	2	0	26	2
14:45	0	16	0	0	3	1	1	0	0	0	0	0	0	0	0	0	1	14	0	0	0	0	0	0	0	0	2	0	0	0	0	0	37	1
15:00	0	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	14	0	0	1	0	0	0	0	0	4	0	0	0	1	0	35	1
15:15	0	21	0	0	2	0	0	0	0	0	0	0	0	0	0	0	3	18	0	0	1	0	0	0	0	0	2	0	0	0	3	0	47	3
15:30	0	10	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	18	0	0	1	0	1	0	0	0	5	0	0	2	3	0	39	4
15:45	0	17	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	21	0	0	1	0	0	0	0	0	3	1	0	0	5	0	46	5
16:00	0	24	3	0	1	0	0	0	0	0	0	0	0	0	0	0	12	19	0	0	0	0	1	0	2	0	7	0	0	0	1	0	65	2
16:15	0	29	1	0	1	0	0	0	0	0	0	0	0	0	0	0	7	20	0	0	1	0	0	0	1	0	6	0	0	0	0	0	65	0
16:30	0	31	2	0	2	0	0	0	0	0	0	0	0	0	0	0	10	25	0	0	1	0	0	0	0	0	7	0	0	0	2	0	76	2
16:45	0	18	1	0	0	0	0	0	0	0	0	0	0	0	0	0	18	28	0	0	0	0	0	0	1	0	5	0	0	0	2	0	70	2
17:00	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	26	0	0	0	0	0	0	2	0	4	0	0	0	2	0	73	2
17:15	0	20	3	0	0	0	0	0	0	0	0	0	0	0	0	0	13	23	0	0	0	0	0	0	2	0	5	0	0	0	0	0	63	0
17:30	0	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	27	0	0	0	0	0	0	2	0	3	0	0	0	0	1	75	1
17:45	0	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	23	0	0	0	0	0	0	1	0	5	0	0	0	1	0	63	1

TURNING MOVEMENT DIAGRAMS

North-South Road: County Road 40 | Municipality: Norwood | Day: Wednesday
East-West Road: Helen Street | Weather: Mainly Clear | Survey Date: July 28, 2021

tranplan associates





Basic Volume Report: 040000

Station ID : 040000

Info Line 1 : CR 40, on nb max 50 kph sign
Info Line 2 : just south of Helen Street
GPS Lat/Lon :
DB File : DBFILE 100518 - 94.DB

Last Connected Device Type : TT-8-BT
Version Number : 1.09
Serial Number : 22405

Number of Lanes : 1
Posted Speed Limit : 0.0 kph

Lane #1 Configuration

#	Dir.	Information	Volume Mode	Volume Sensors	Divide By 2	Comment
1.			Directional^	Axle	Yes	

Lane #1 Basic Volume Data From: 00:00 - 10/03/2018 To: 23:59 - 10/03/2018

Date	DW	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
100318	W	12	0	8	11	17	43	103	203	243	185	174	201	219	179	188	234	301	279	234	193	116	51	48	26	3268
Month Total :		12	0	8	11	17	43	103	203	243	185	174	201	219	179	188	234	301	279	234	193	116	51	48	26	3268
Percent :		0%	0%	0%	0%	1%	1%	3%	6%	7%	6%	5%	6%	7%	5%	6%	7%	9%	9%	7%	6%	4%	2%	1%	1%	
ADT :		12	0	8	11	17	43	103	203	243	185	174	201	219	179	188	234	301	279	234	193	116	51	48	26	3268

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
DW Totals :	0	0	0	3268	0	0	0
# Days :	0.0	0.0	0.0	1.0	0.0	0.0	0.0
ADT :	0	0	0	3268	0	0	0
Percent :	0%	0%	0%	100%	0%	0%	0%

	Total	Percent
Weekday (Mon-Fri) :	3268	100%
ADT :	3268	
Weekend (Sat-Sun) :	0	0%
ADT :	0	

Basic Volume Summary: 040000

Grand Total For Data From: 00:00 - 10/03/2018 To: 23:59 - 10/03/2018

Total Count	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
Lane #1	12	0	8	11	17	43	103	203	243	185	174	201	219	179	188	234	301	279	234	193	116	51	48	26	3268
TOTAL	12	0	8	11	17	43	103	203	243	185	174	201	219	179	188	234	301	279	234	193	116	51	48	26	3268

Percents:	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
Lane #1	0%	0%	0%	0%	1%	1%	3%	6%	7%	6%	5%	6%	7%	5%	6%	7%	9%	9%	7%	6%	4%	2%	1%	1%
TOTAL	0%	0%	0%	0%	1%	1%	3%	6%	7%	6%	5%	6%	7%	5%	6%	7%	9%	9%	7%	6%	4%	2%	1%	1%

ADT:	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
Lane #1	12	0	8	11	17	43	103	203	243	185	174	201	219	179	188	234	301	279	234	193	116	51	48	26	3268
TOTAL	12	0	8	11	17	43	103	203	243	185	174	201	219	179	188	234	301	279	234	193	116	51	48	26	3268

LANE #1

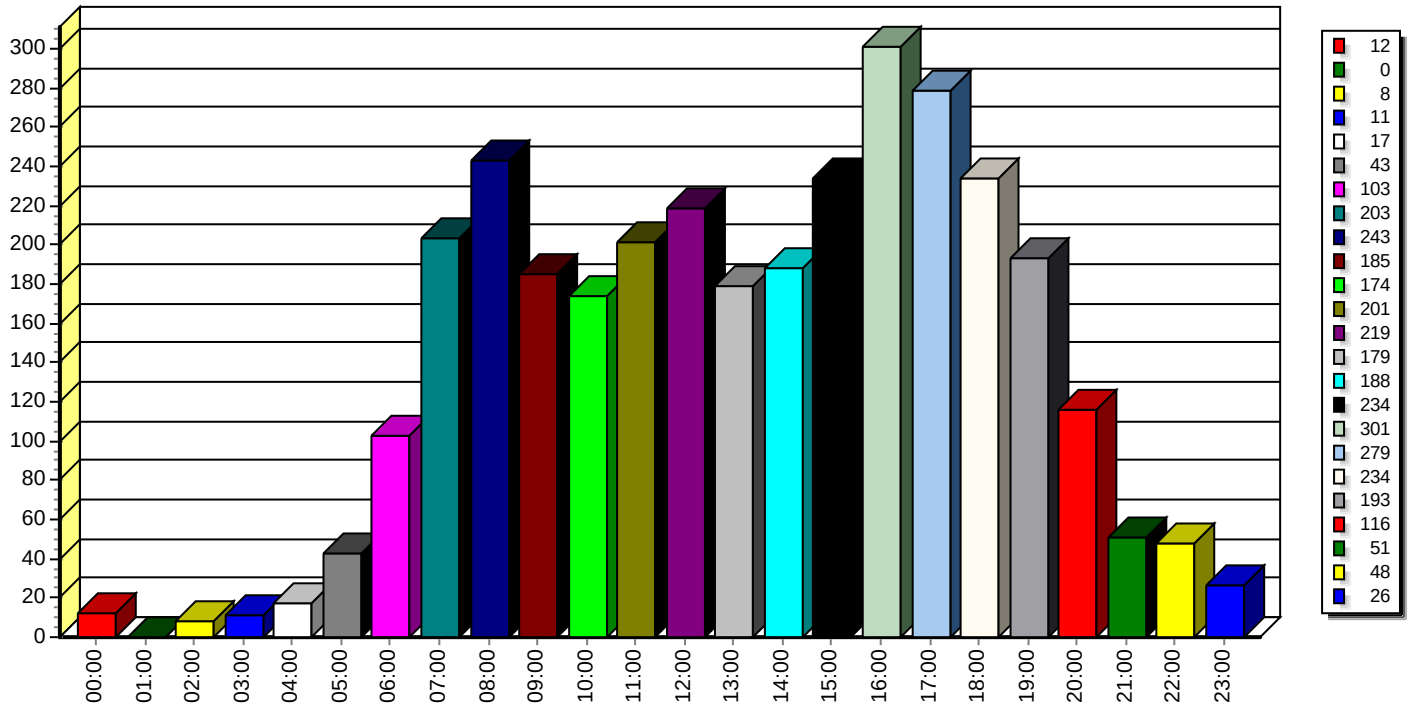
	Sun	Mon	Tue	Wed	Thu	Fri	Sat		Total	Percent
DW Totals :	0	0	0	3268	0	0	0	Weekday (Mon-Fri) :	3268	100%
# Days :	0.0	0.0	0.0	1.0	0.0	0.0	0.0	ADT :	3268	
ADT :	0	0	0	3268	0	0	0	Weekend (Sat-Sun) :	0	0%
Percent :	0%	0%	0%	100%	0%	0%	0%	ADT :	0	

ALL LANES

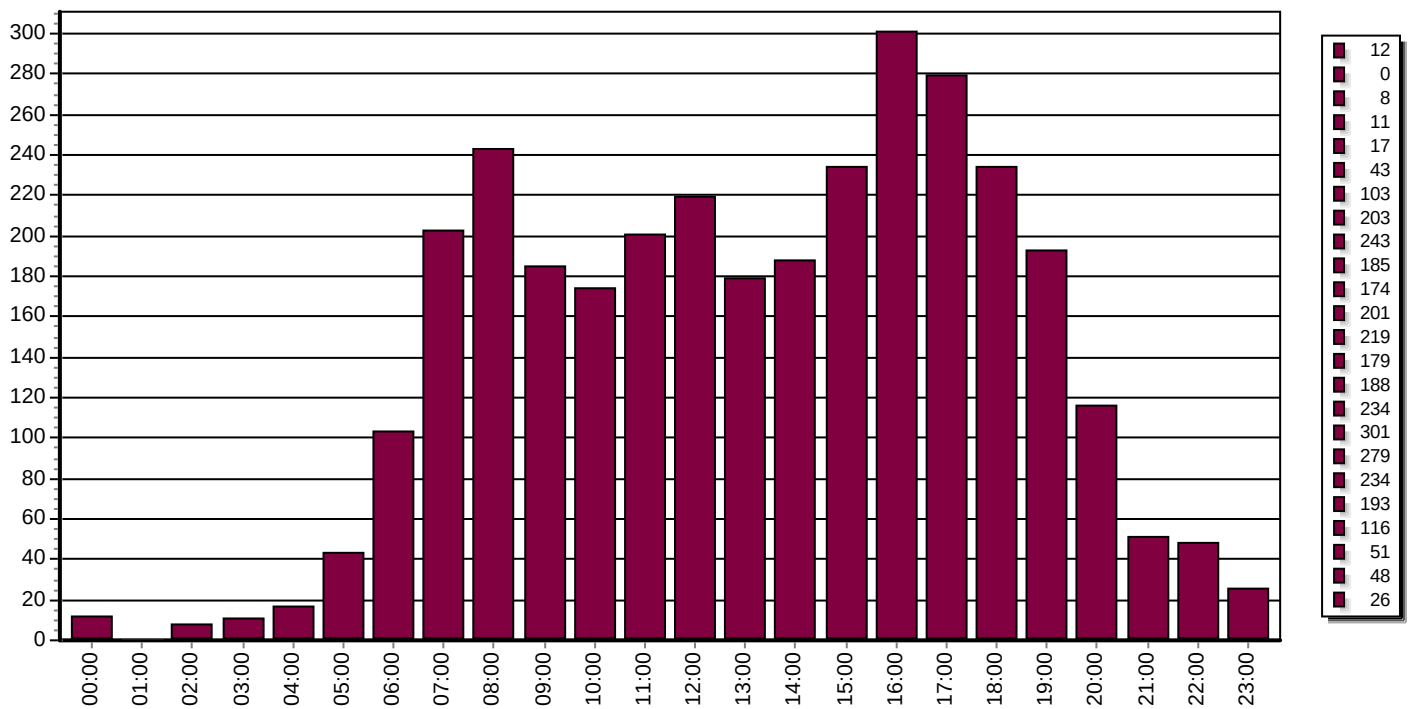
	Sun	Mon	Tue	Wed	Thu	Fri	Sat		Total	Percent
DW Totals :	0	0	0	3268	0	0	0	Weekday (Mon-Fri) :	3268	100%
# Days :	0.0	0.0	0.0	1.0	0.0	0.0	0.0	ADT :	3268	
ADT :	0	0	0	3268	0	0	0	Weekend (Sat-Sun) :	0	0%
Percent :	0%	0%	0%	100%	0%	0%	0%	ADT :	0	

040000 Charts For Data From: 00:00 - 10/03/2018 To: 23:59 - 10/03/2018

ADT Volume vs. Time (all lanes combined)

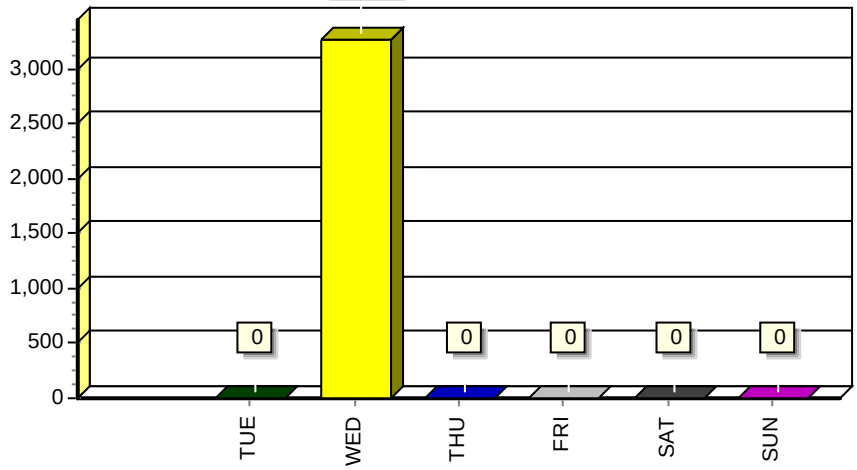


ADT Volume vs. Time (lane comparison)



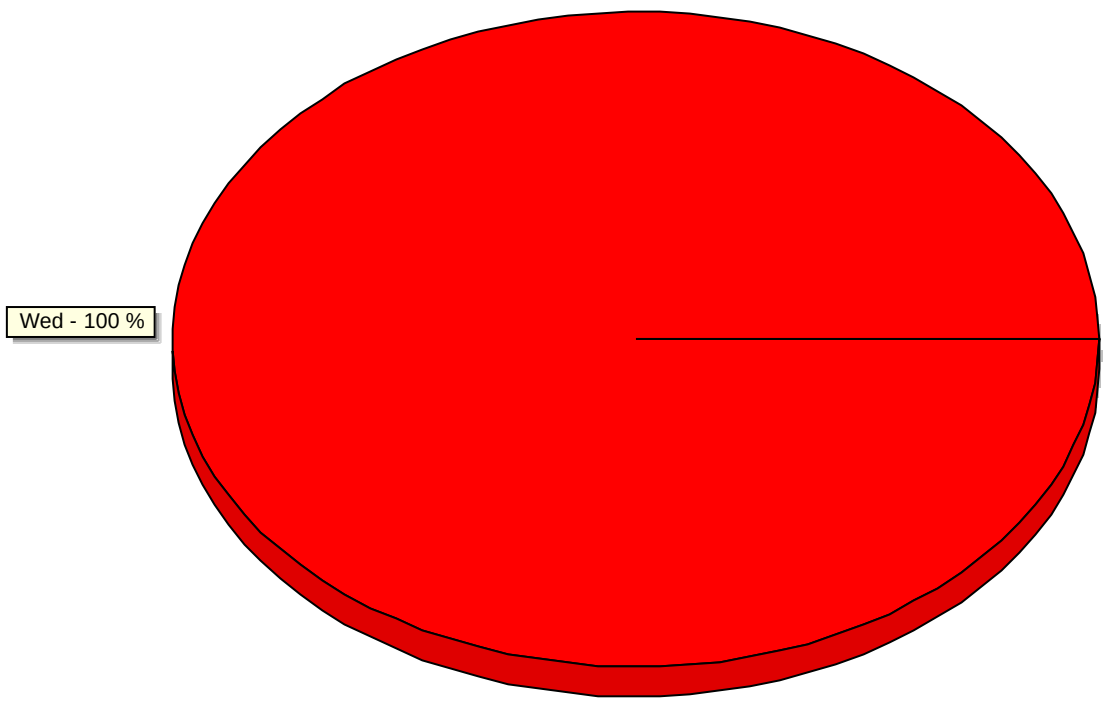
040000 Charts For Data From: 00:00 - 10/03/2018 To: 23:59 - 10/03/2018

ADT By 3,268 f Week (all lanes)



DAY	ADT	TOTAL	# DAYS
Mon	-	-	-
Tue	-	-	-
Wed	3268	3268	1.0
Thu	-	-	-
Fri	-	-	-
Sat	-	-	-
Sun	-	-	-

Percent of Totals by Day of Week



Basic Volume Report: 040000

Station ID : 040000

Info Line 1 : CR 40, on nb max 50 kph sign
Info Line 2 : just south of Helen Street
GPS Lat/Lon :
DB File : DBFILE 071218 - 13.DB

Last Connected Device Type : Unicorn
Version Number : 2.94
Serial Number : 45372

Number of Lanes : 2
Posted Speed Limit : 50.0 kph

Lane #1 Configuration

#	Dir.	Information	Volume Mode	Volume Sensors	Divide By 2	Comment
1.	N	NB	Normal	Veh.	No	

Lane #1 Basic Volume Data From: 00:00 - 07/10/2018 To: 23:59 - 07/10/2018

Date	DW	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
071018	T	4	1	1	1	5	12	24	32	80	44	47	57	81	70	52	84	76	75	68	41	32	27	8	5	927
Month Total :		4	1	1	1	5	12	24	32	80	44	47	57	81	70	52	84	76	75	68	41	32	27	8	5	927
Percent :		0%	0%	0%	0%	1%	1%	3%	3%	9%	5%	5%	6%	9%	8%	6%	9%	8%	8%	7%	4%	3%	3%	1%	1%	
ADT :		4	1	1	1	5	12	24	32	80	44	47	57	81	70	52	84	76	75	68	41	32	27	8	5	927

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
DW Totals :	0	0	927	0	0	0	0
# Days :	0.0	0.0	1.0	0.0	0.0	0.0	0.0
ADT :	0	0	927	0	0	0	0
Percent :	0%	0%	100%	0%	0%	0%	0%

	Total	Percent
Weekday (Mon-Fri) :	927	100%
ADT :	927	
Weekend (Sat-Sun) :	0	0%
ADT :	0	

Lane #2 Configuration

#	Dir.	Information	Volume Mode	Volume Sensors	Divide By 2	Comment
2.	S	SB	Normal	Veh.	No	

Lane #2 Basic Volume Data From: 00:00 - 07/10/2018 To: 23:59 - 07/10/2018

Date	DW	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
071018	T	5	3	2	2	4	19	39	60	84	57	68	48	96	58	58	66	79	67	51	33	25	16	9	2	951
Month Total :		5	3	2	2	4	19	39	60	84	57	68	48	96	58	58	66	79	67	51	33	25	16	9	2	951
Percent :		1%	0%	0%	0%	0%	2%	4%	6%	9%	6%	7%	5%	10%	6%	6%	7%	8%	7%	5%	3%	3%	2%	1%	0%	
ADT :		5	3	2	2	4	19	39	60	84	57	68	48	96	58	58	66	79	67	51	33	25	16	9	2	951

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
DW Totals :	0	0	951	0	0	0	0
# Days :	0.0	0.0	1.0	0.0	0.0	0.0	0.0
ADT :	0	0	951	0	0	0	0
Percent :	0%	0%	100%	0%	0%	0%	0%

	Total	Percent
Weekday (Mon-Fri) :	951	100%
ADT :	951	
Weekend (Sat-Sun) :	0	0%
ADT :	0	

Basic Volume Summary: 040000

Grand Total For Data From: 00:00 - 07/10/2018 To: 23:59 - 07/10/2018

Total Count	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
Lane #1	4	1	1	1	5	12	24	32	80	44	47	57	81	70	52	84	76	75	68	41	32	27	8	5	927
Lane #2	5	3	2	2	4	19	39	60	84	57	68	48	96	58	58	66	79	67	51	33	25	16	9	2	951
TOTAL	9	4	3	3	9	31	63	92	164	101	115	105	177	128	110	150	155	142	119	74	57	43	17	7	1878

Percents:	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
Lane #1	0%	0%	0%	0%	1%	1%	3%	3%	9%	5%	5%	6%	9%	8%	6%	9%	8%	8%	7%	4%	3%	3%	1%	1%
Lane #2	1%	0%	0%	0%	0%	2%	4%	6%	9%	6%	7%	5%	10%	6%	6%	7%	8%	7%	5%	3%	3%	2%	1%	0%
TOTAL	0%	0%	0%	0%	0%	2%	3%	5%	9%	5%	6%	6%	9%	7%	6%	8%	8%	8%	6%	4%	3%	2%	1%	0%

ADT:	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
Lane #1	4	1	1	1	5	12	24	32	80	44	47	57	81	70	52	84	76	75	68	41	32	27	8	5	927
Lane #2	5	3	2	2	4	19	39	60	84	57	68	48	96	58	58	66	79	67	51	33	25	16	9	2	951
TOTAL	9	4	3	3	9	31	63	92	164	101	115	105	177	128	110	150	155	142	119	74	57	43	17	7	1878

LANE #1

	Sun	Mon	Tue	Wed	Thu	Fri	Sat		Total	Percent
DW Totals :	0	0	927	0	0	0	0	Weekday (Mon-Fri) :	927	100%
# Days :	0.0	0.0	1.0	0.0	0.0	0.0	0.0	ADT :	927	
ADT :	0	0	927	0	0	0	0	Weekend (Sat-Sun) :	0	0%
Percent :	0%	0%	100%	0%	0%	0%	0%	ADT :	0	

LANE #2

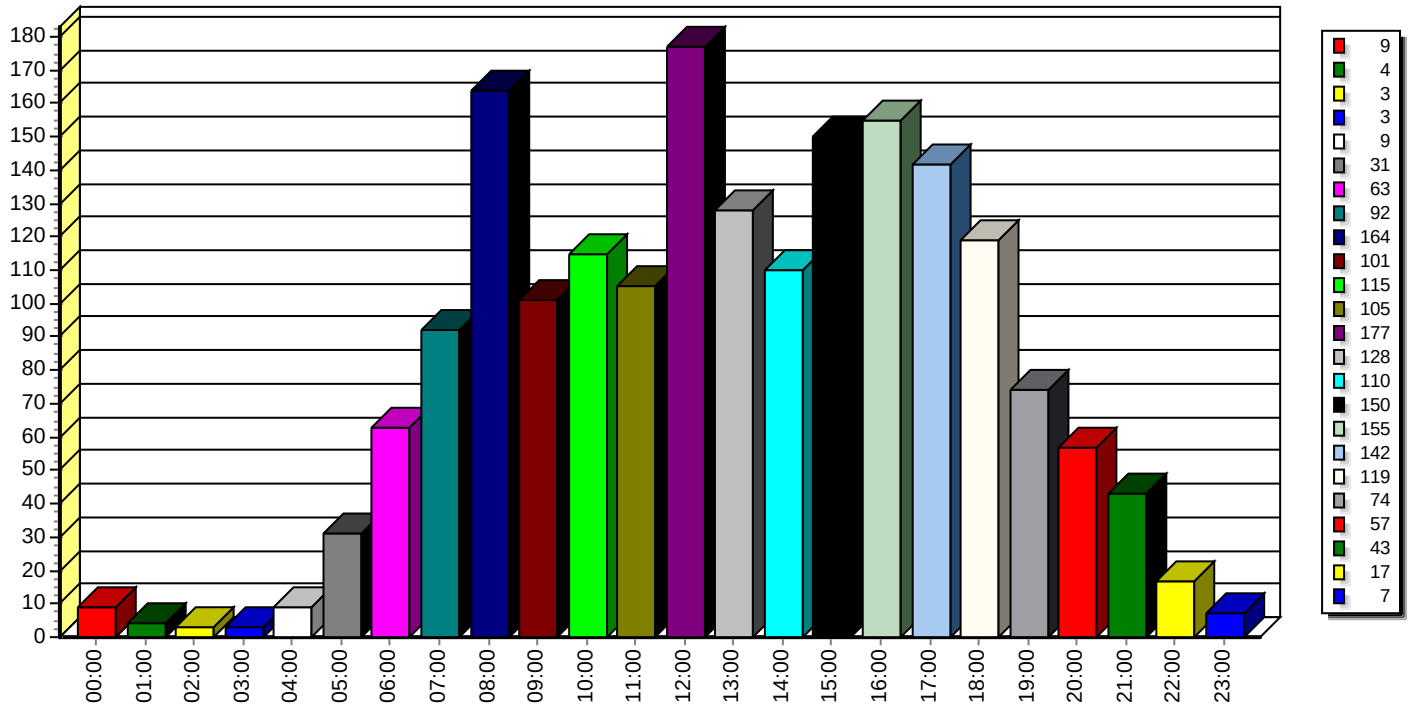
	Sun	Mon	Tue	Wed	Thu	Fri	Sat		Total	Percent
DW Totals :	0	0	951	0	0	0	0	Weekday (Mon-Fri) :	951	100%
# Days :	0.0	0.0	1.0	0.0	0.0	0.0	0.0	ADT :	951	
ADT :	0	0	951	0	0	0	0	Weekend (Sat-Sun) :	0	0%
Percent :	0%	0%	100%	0%	0%	0%	0%	ADT :	0	

ALL LANES

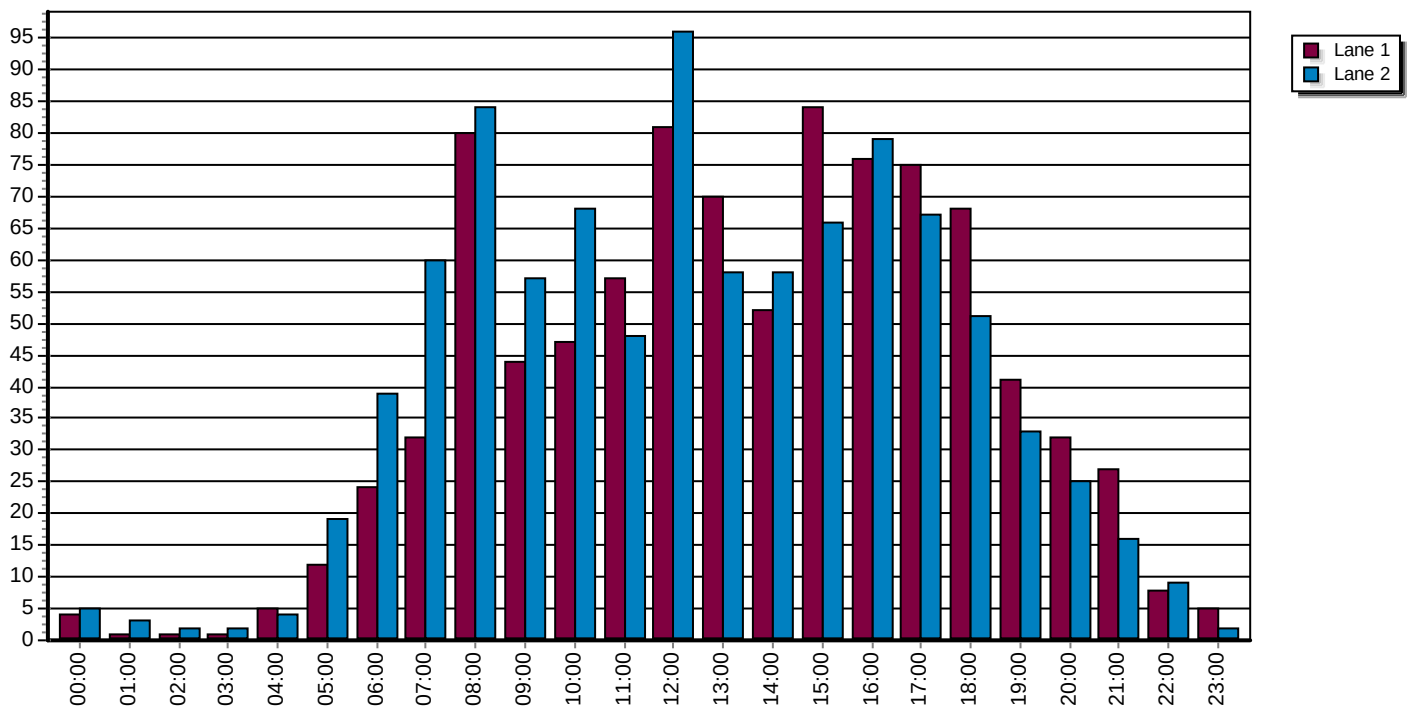
	Sun	Mon	Tue	Wed	Thu	Fri	Sat		Total	Percent
DW Totals :	0	0	1878	0	0	0	0	Weekday (Mon-Fri) :	1878	100%
# Days :	0.0	0.0	1.0	0.0	0.0	0.0	0.0	ADT :	1878	
ADT :	0	0	1878	0	0	0	0	Weekend (Sat-Sun) :	0	0%
Percent :	0%	0%	100%	0%	0%	0%	0%	ADT :	0	

040000 Charts For Data From: 00:00 - 07/10/2018 To: 23:59 - 07/10/2018

ADT Volume vs. Time (all lanes combined)

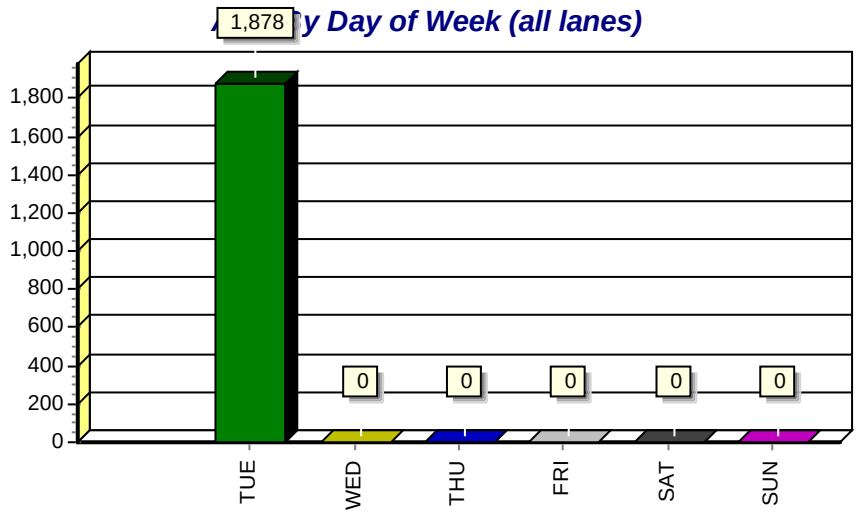


ADT Volume vs. Time (lane comparison)



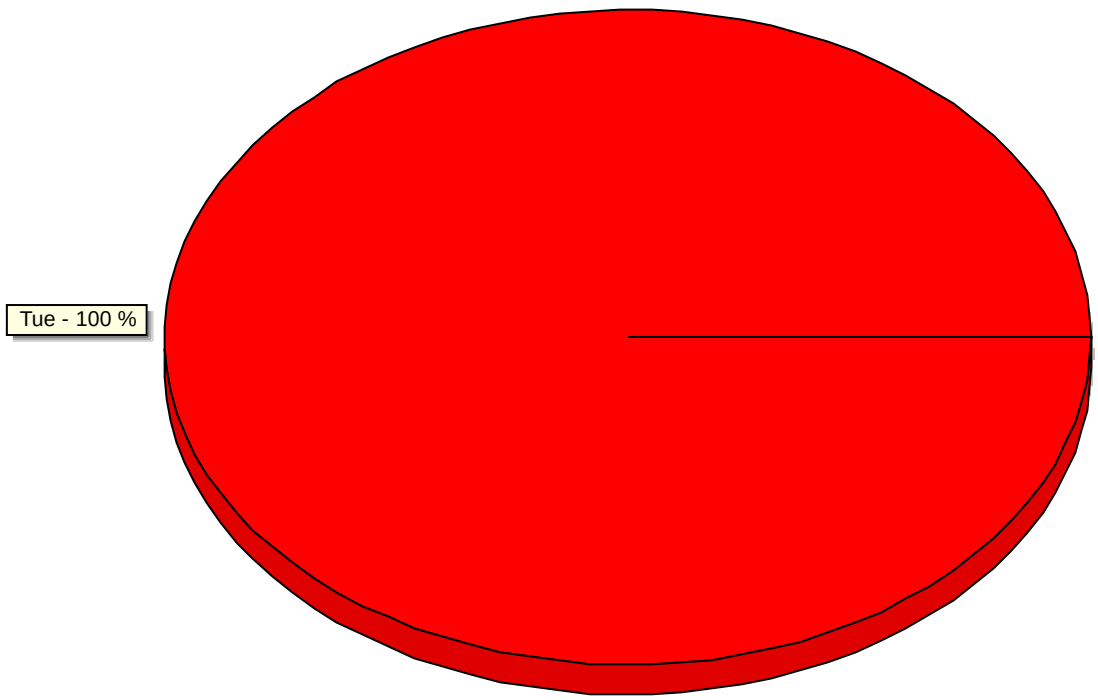
040000 Charts For Data From: 00:00 - 07/10/2018 To: 23:59 - 07/10/2018

Average by Day of Week (all lanes)



DAY	ADT	TOTAL	# DAYS
Mon	-	-	-
Tue	1878	1878	1.0
Wed	-	-	-
Thu	-	-	-
Fri	-	-	-
Sat	-	-	-
Sun	-	-	-

Percent of Totals by Day of Week



Basic Volume Report: 040000

Station ID : 040000

Info Line 1 : CR 40, on nb max 50 kph sign
Info Line 2 : just south of Helen Street
GPS Lat/Lon :
DB File : 040000.DB

Last Connected Device Type : TT-8-BT
Version Number : 1.07
Serial Number : 98677

Number of Lanes : 1
Posted Speed Limit : 0.0 kph

Lane #1 Configuration

#	Dir.	Information	Volume Mode	Volume Sensors	Divide By 2	Comment
1.			Normal	Axle	Yes	

Lane #1 Basic Volume Data From: 00:00 - 06/12/2018 To: 23:59 - 06/12/2018

Date	DW	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
061218	T	7	12	1	1	23	50	101	187	246	194	191	219	191	205	213	220	279	297	195	148	156	94	31	18	3279
Month Total :		7	12	1	1	23	50	101	187	246	194	191	219	191	205	213	220	279	297	195	148	156	94	31	18	3279
Percent :		0%	0%	0%	0%	1%	2%	3%	6%	8%	6%	6%	7%	6%	6%	6%	7%	9%	9%	6%	5%	5%	3%	1%	1%	
ADT :		7	12	1	1	23	50	101	187	246	194	191	219	191	205	213	220	279	297	195	148	156	94	31	18	3279

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
DW Totals :	0	0	3279	0	0	0	0
# Days :	0.0	0.0	1.0	0.0	0.0	0.0	0.0
ADT :	0	0	3279	0	0	0	0
Percent :	0%	0%	100%	0%	0%	0%	0%

	Total	Percent
Weekday (Mon-Fri) :	3279	100%
ADT :	3279	
Weekend (Sat-Sun) :	0	0%
ADT :	0	

Basic Volume Summary: 040000

Grand Total For Data From: 00:00 - 06/12/2018 To: 23:59 - 06/12/2018

Total Count	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
Lane #1	7	12	1	1	23	50	101	187	246	194	191	219	191	205	213	220	279	297	195	148	156	94	31	18	3279
TOTAL	7	12	1	1	23	50	101	187	246	194	191	219	191	205	213	220	279	297	195	148	156	94	31	18	3279

Percents:	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
Lane #1	0%	0%	0%	0%	1%	2%	3%	6%	8%	6%	6%	7%	6%	6%	6%	7%	9%	9%	6%	5%	5%	3%	1%	1%
TOTAL	0%	0%	0%	0%	1%	2%	3%	6%	8%	6%	6%	7%	6%	6%	6%	7%	9%	9%	6%	5%	5%	3%	1%	1%

ADT:	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
Lane #1	7	12	1	1	23	50	101	187	246	194	191	219	191	205	213	220	279	297	195	148	156	94	31	18	3279
TOTAL	7	12	1	1	23	50	101	187	246	194	191	219	191	205	213	220	279	297	195	148	156	94	31	18	3279

LANE #1

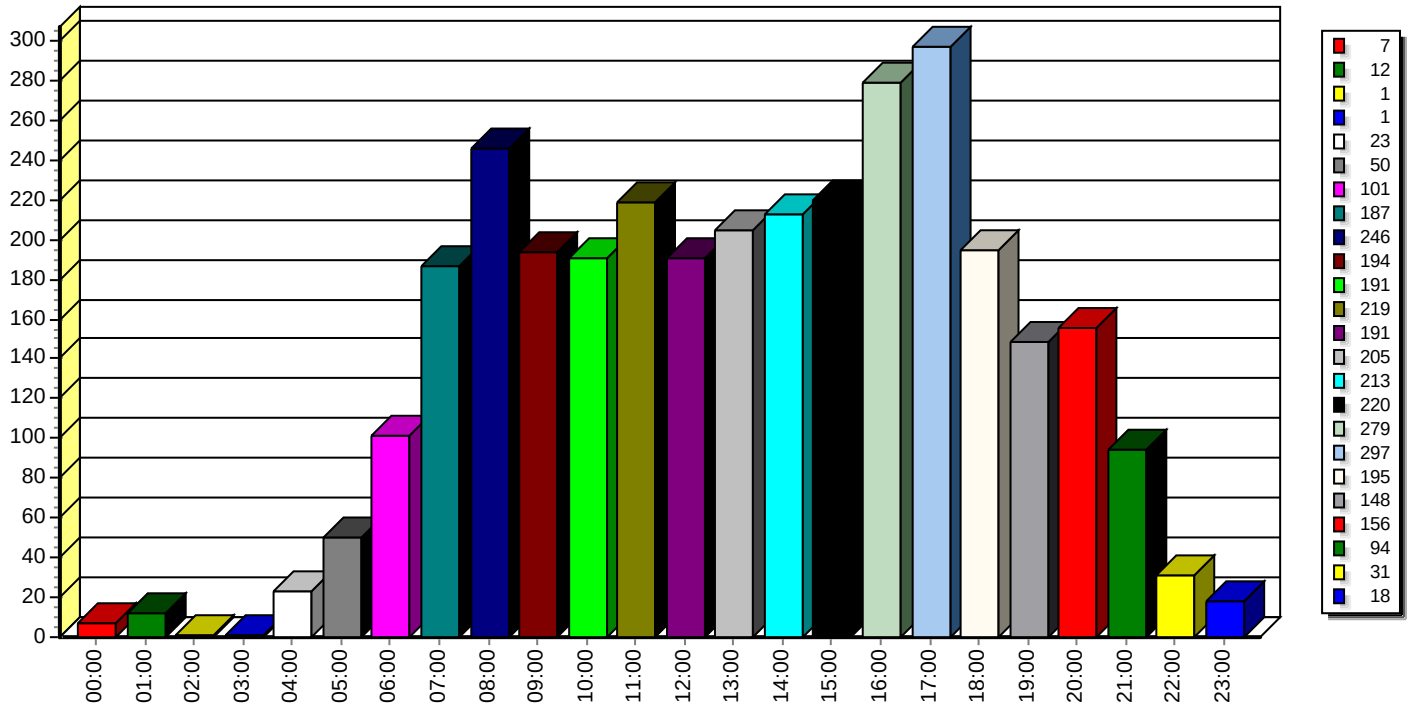
	Sun	Mon	Tue	Wed	Thu	Fri	Sat		Total	Percent
DW Totals :	0	0	3279	0	0	0	0	Weekday (Mon-Fri) :	3279	100%
# Days :	0.0	0.0	1.0	0.0	0.0	0.0	0.0	ADT :	3279	
ADT :	0	0	3279	0	0	0	0	Weekend (Sat-Sun) :	0	0%
Percent :	0%	0%	100%	0%	0%	0%	0%	ADT :	0	

ALL LANES

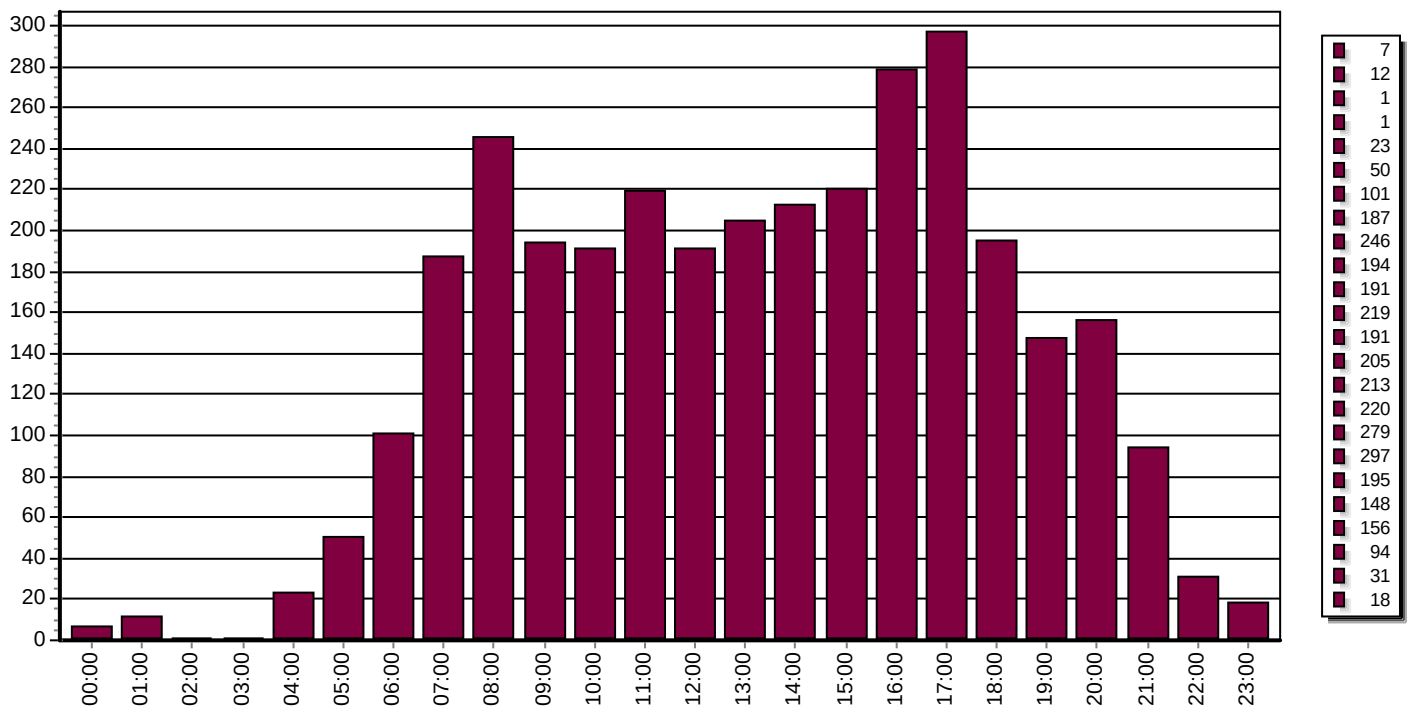
	Sun	Mon	Tue	Wed	Thu	Fri	Sat		Total	Percent
DW Totals :	0	0	3279	0	0	0	0	Weekday (Mon-Fri) :	3279	100%
# Days :	0.0	0.0	1.0	0.0	0.0	0.0	0.0	ADT :	3279	
ADT :	0	0	3279	0	0	0	0	Weekend (Sat-Sun) :	0	0%
Percent :	0%	0%	100%	0%	0%	0%	0%	ADT :	0	

040000 Charts For Data From: 00:00 - 06/12/2018 To: 23:59 - 06/12/2018

ADT Volume vs. Time (all lanes combined)

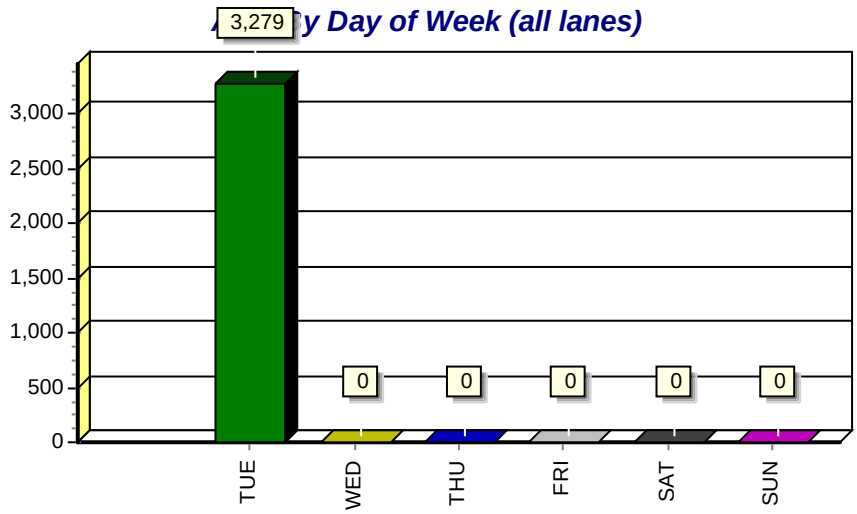


ADT Volume vs. Time (lane comparison)



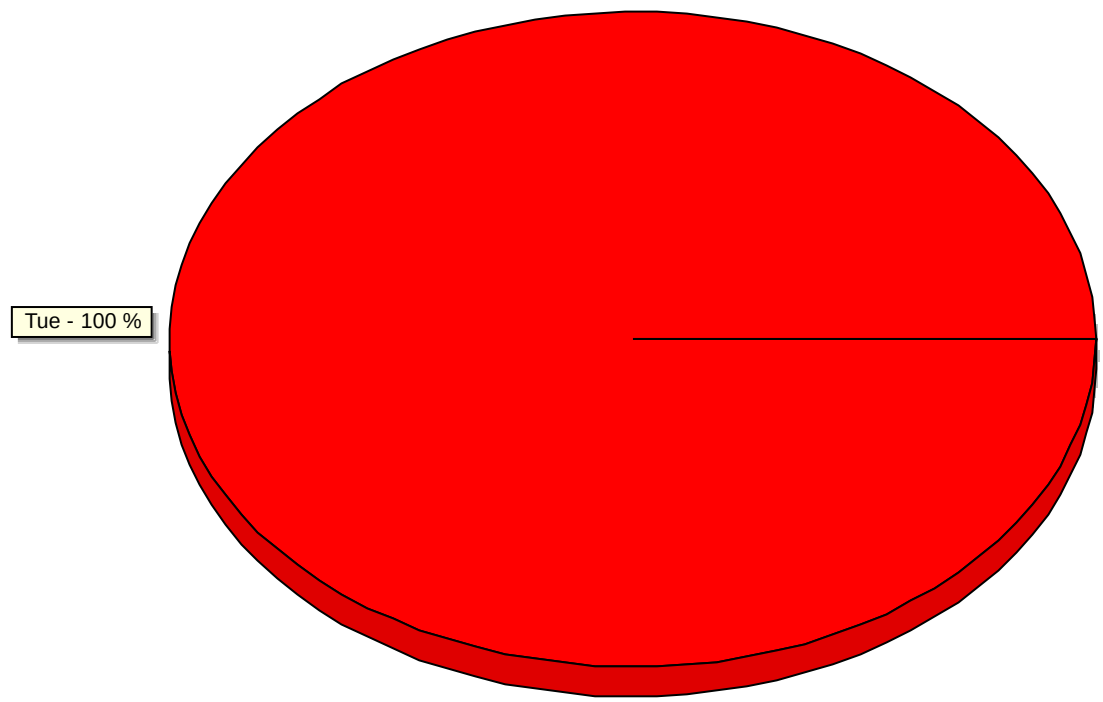
040000 Charts For Data From: 00:00 - 06/12/2018 To: 23:59 - 06/12/2018

Average by Day of Week (all lanes)



DAY	ADT	TOTAL	# DAYS
Mon	-	-	-
Tue	3279	3279	1.0
Wed	-	-	-
Thu	-	-	-
Fri	-	-	-
Sat	-	-	-
Sun	-	-	-

Percent of Totals by Day of Week



Basic Volume Report: 040-00000

Station ID : 040-00000
Info Line 1 : CR-40, on nb max 50 kph sign
Info Line 2 : just south of Helen Street
GPS Lat/Lon :
DB File : DBFILE 060921 - 4.DB

Last Connected Device Type : Phoenix
Version Number : 3.00
Serial Number : 43088
Number of Lanes : 2
Posted Speed Limit : 0.0 kph

Lane #1 Configuration

#	Dir.	Information	Volume Mode	Volume Sensors	Divide By 2	Comment
1.	N	NB	Normal	Veh.	No	

Lane #1 Basic Volume Data From: 00:00 - 06/07/2021 To: 23:59 - 06/07/2021

Date	DW	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
060721	M	1	3	0	1	7	23	22	51	65	79	86	98	99	72	89	102	140	149	89	57	39	24	16	4	1316
Month Total :		1	3	0	1	7	23	22	51	65	79	86	98	99	72	89	102	140	149	89	57	39	24	16	4	1316
Percent :		0%	0%	0%	0%	1%	2%	2%	4%	5%	6%	7%	7%	8%	5%	7%	8%	11%	11%	7%	4%	3%	2%	1%	0%	
ADT :		1	3	0	1	7	23	22	51	65	79	86	98	99	72	89	102	140	149	89	57	39	24	16	4	1316

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
DW Totals :	0	1316	0	0	0	0	0
# Days :	0.0	1.0	0.0	0.0	0.0	0.0	0.0
ADT :	0	1316	0	0	0	0	0
Percent :	0%	100%	0%	0%	0%	0%	0%

	Total	Percent
Weekday (Mon-Fri) :	1316	100%
ADT :	1316	
Weekend (Sat-Sun) :	0	0%
ADT :	0	

Lane #2 Configuration

#	Dir.	Information	Volume Mode	Volume Sensors	Divide By 2	Comment
2.	S	SB	Normal	Veh.	No	

Lane #2 Basic Volume Data From: 00:00 - 06/07/2021 To: 23:59 - 06/07/2021

Date	DW	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
060721	M	0	2	5	1	13	35	70	112	110	104	90	81	100	76	113	99	110	91	57	58	27	14	16	7	1391
Month Total :		0	2	5	1	13	35	70	112	110	104	90	81	100	76	113	99	110	91	57	58	27	14	16	7	1391
Percent :		0%	0%	0%	0%	1%	3%	5%	8%	8%	7%	6%	6%	7%	5%	8%	7%	8%	7%	4%	4%	2%	1%	1%	1%	
ADT :		0	2	5	1	13	35	70	112	110	104	90	81	100	76	113	99	110	91	57	58	27	14	16	7	1391

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
DW Totals :	0	1391	0	0	0	0	0
# Days :	0.0	1.0	0.0	0.0	0.0	0.0	0.0
ADT :	0	1391	0	0	0	0	0
Percent :	0%	100%	0%	0%	0%	0%	0%

	Total	Percent
Weekday (Mon-Fri) :	1391	100%
ADT :	1391	
Weekend (Sat-Sun) :	0	0%
ADT :	0	

Basic Volume Summary: 040-00000

Grand Total For Data From: 00:00 - 06/07/2021 To: 23:59 - 06/07/2021

Total Count	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
Lane #1	1	3	0	1	7	23	22	51	65	79	86	98	99	72	89	102	140	149	89	57	39	24	16	4	1316
Lane #2	0	2	5	1	13	35	70	112	110	104	90	81	100	76	113	99	110	91	57	58	27	14	16	7	1391
TOTAL	1	5	5	2	20	58	92	163	175	183	176	179	199	148	202	201	250	240	146	115	66	38	32	11	2707

Percents:	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
Lane #1	0%	0%	0%	0%	1%	2%	2%	4%	5%	6%	7%	7%	8%	5%	7%	8%	11%	11%	7%	4%	3%	2%	1%	0%
Lane #2	0%	0%	0%	0%	1%	3%	5%	8%	8%	7%	6%	6%	7%	5%	8%	7%	8%	7%	4%	4%	2%	1%	1%	1%
TOTAL	0%	0%	0%	0%	1%	2%	3%	6%	6%	7%	7%	7%	7%	5%	7%	7%	9%	9%	5%	4%	2%	1%	1%	0%

ADT:	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
Lane #1	1	3	0	1	7	23	22	51	65	79	86	98	99	72	89	102	140	149	89	57	39	24	16	4	1316
Lane #2	0	2	5	1	13	35	70	112	110	104	90	81	100	76	113	99	110	91	57	58	27	14	16	7	1391
TOTAL	1	5	5	2	20	58	92	163	175	183	176	179	199	148	202	201	250	240	146	115	66	38	32	11	2707

LANE #1

	Sun	Mon	Tue	Wed	Thu	Fri	Sat		Total	Percent
DW Totals :	0	1316	0	0	0	0	0	Weekday (Mon-Fri) :	1316	100%
# Days :	0.0	1.0	0.0	0.0	0.0	0.0	0.0	ADT :	1316	
ADT :	0	1316	0	0	0	0	0	Weekend (Sat-Sun) :	0	0%
Percent :	0%	100%	0%	0%	0%	0%	0%	ADT :	0	

LANE #2

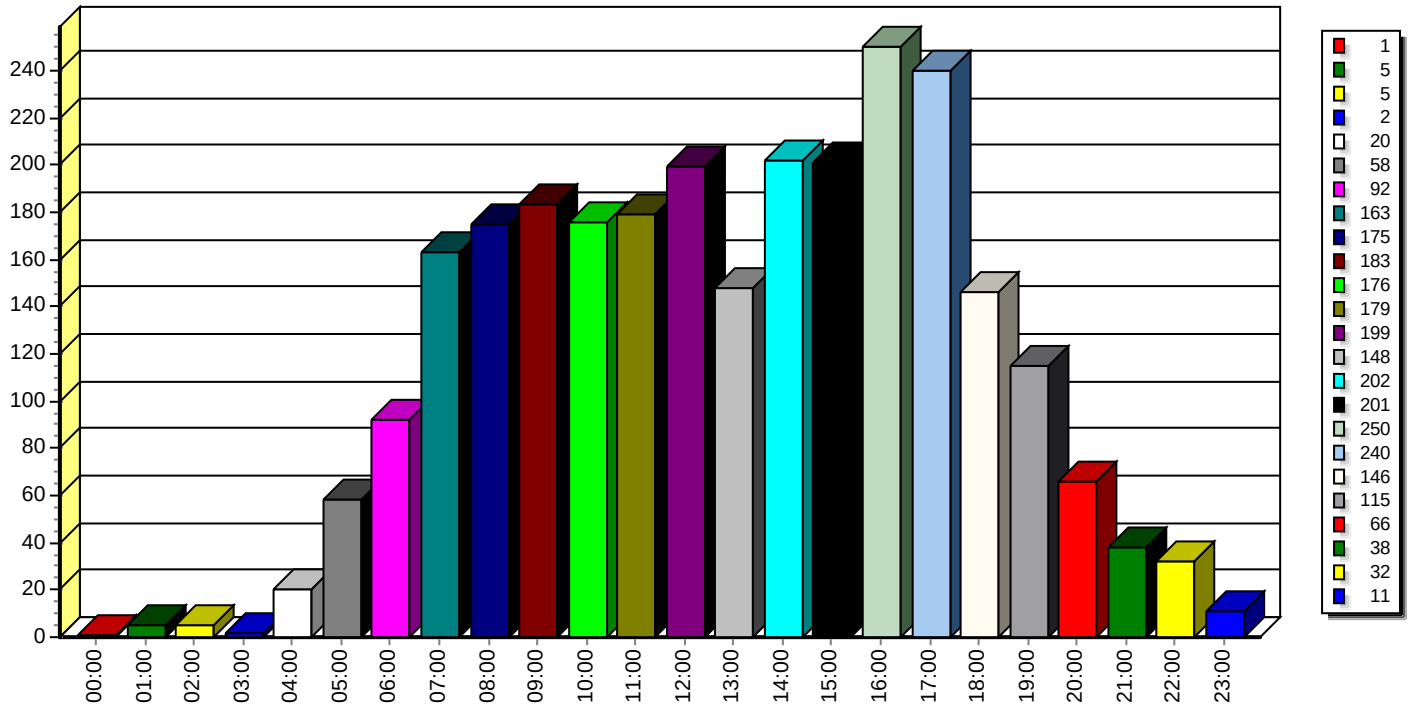
	Sun	Mon	Tue	Wed	Thu	Fri	Sat		Total	Percent
DW Totals :	0	1391	0	0	0	0	0	Weekday (Mon-Fri) :	1391	100%
# Days :	0.0	1.0	0.0	0.0	0.0	0.0	0.0	ADT :	1391	
ADT :	0	1391	0	0	0	0	0	Weekend (Sat-Sun) :	0	0%
Percent :	0%	100%	0%	0%	0%	0%	0%	ADT :	0	

ALL LANES

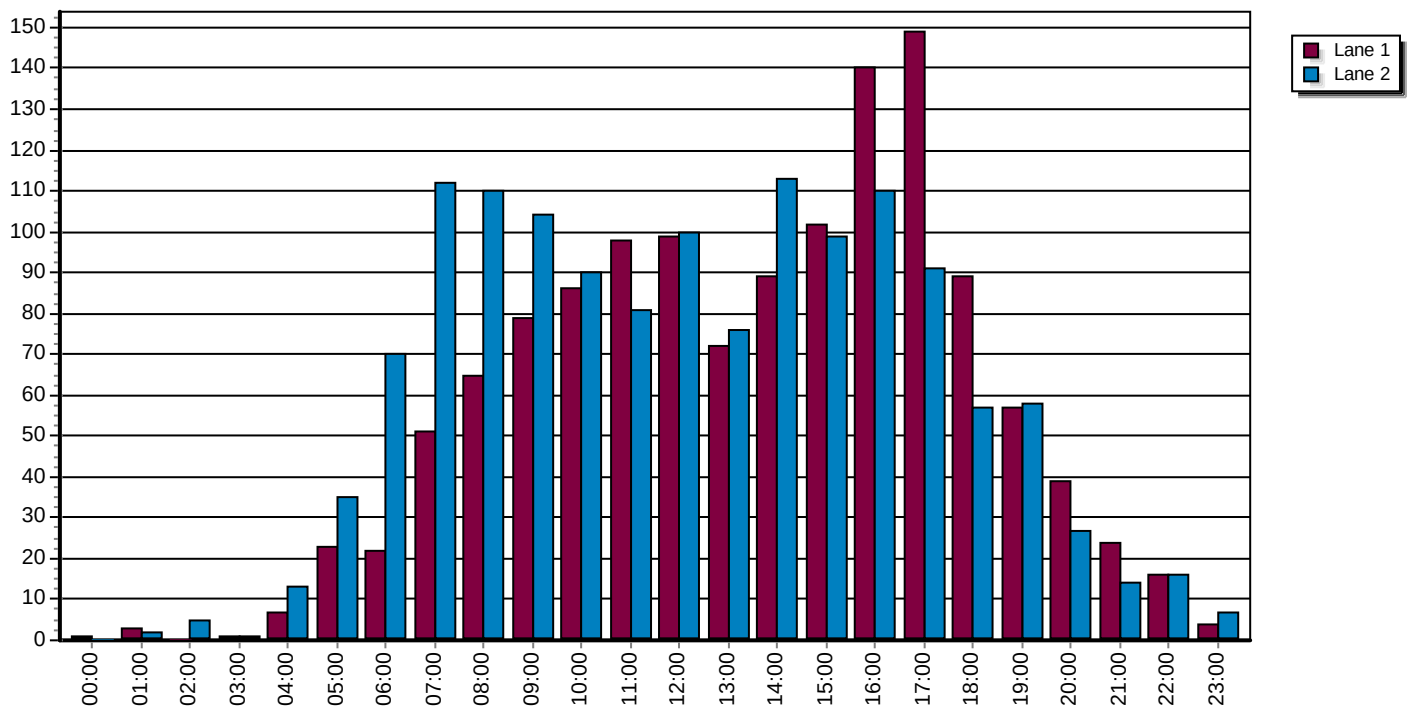
	Sun	Mon	Tue	Wed	Thu	Fri	Sat		Total	Percent
DW Totals :	0	2707	0	0	0	0	0	Weekday (Mon-Fri) :	2707	100%
# Days :	0.0	1.0	0.0	0.0	0.0	0.0	0.0	ADT :	2707	
ADT :	0	2707	0	0	0	0	0	Weekend (Sat-Sun) :	0	0%
Percent :	0%	100%	0%	0%	0%	0%	0%	ADT :	0	

040-00000 Charts For Data From: 00:00 - 06/07/2021 To: 23:59 - 06/07/2021

ADT Volume vs. Time (all lanes combined)

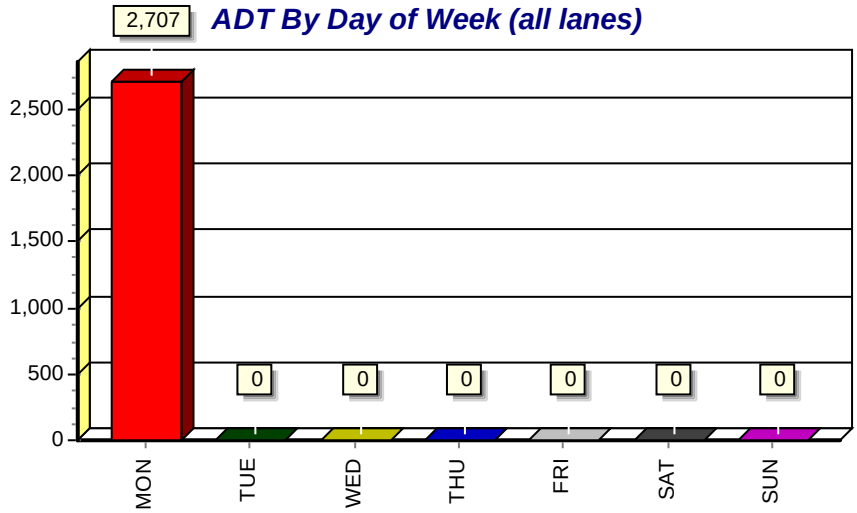


ADT Volume vs. Time (lane comparison)



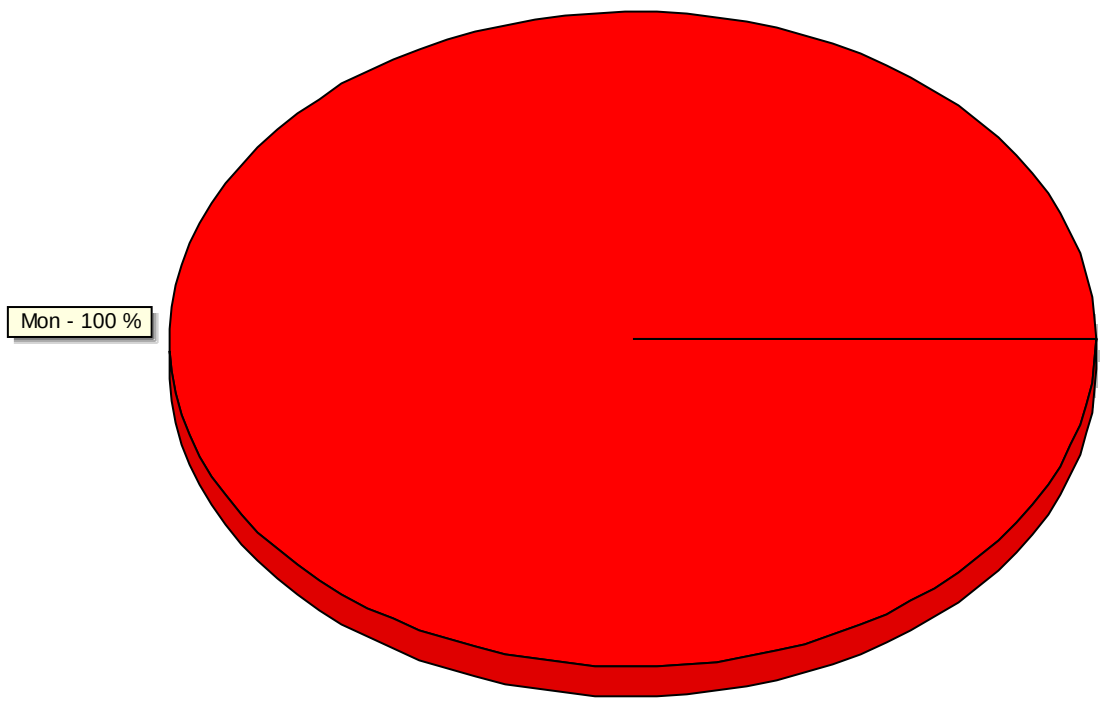
040-00000 Charts For Data From: 00:00 - 06/07/2021 To: 23:59 - 06/07/2021

ADT By Day of Week (all lanes)



DAY	ADT	TOTAL	# DAYS
Mon	2707	2707	1.0
Tue	-	-	-
Wed	-	-	-
Thu	-	-	-
Fri	-	-	-
Sat	-	-	-
Sun	-	-	-

Percent of Totals by Day of Week



APPENDIX B: Intersection Analysis Summaries

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	1	2	2	41	67	1
Future Volume (Veh/h)	1	2	2	41	67	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	2	2	45	73	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	122	74	74			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	122	74	74			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	100	100			
cM capacity (veh/h)	872	988	1526			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	3	47	74
Volume Left	1	2	0
Volume Right	2	0	1
cSH	946	1526	1700
Volume to Capacity	0.00	0.00	0.04
Queue Length 95th (m)	0.1	0.0	0.0
Control Delay (s)	8.8	0.3	0.0
Lane LOS	A	A	
Approach Delay (s)	8.8	0.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	13.8%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	2	2	41	67	1
Future Vol, veh/h	1	2	2	41	67	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	2	2	45	73	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	123	74	74	0	-	0
Stage 1	74	-	-	-	-	-
Stage 2	49	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	872	988	1526	-	-	-
Stage 1	949	-	-	-	-	-
Stage 2	973	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	871	988	1526	-	-	-
Mov Cap-2 Maneuver	871	-	-	-	-	-
Stage 1	948	-	-	-	-	-
Stage 2	973	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1526	-	946	-	-
HCM Lane V/C Ratio	0.001	-	0.003	-	-
HCM Control Delay (s)	7.4	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	2	40	11	41	69	2
Future Volume (Veh/h)	2	40	11	41	69	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	43	12	45	75	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	145	76	77			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	145	76	77			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	96	99			
cM capacity (veh/h)	841	985	1522			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	45	57	77
Volume Left	2	12	0
Volume Right	43	0	2
cSH	978	1522	1700
Volume to Capacity	0.05	0.01	0.05
Queue Length 95th (m)	1.2	0.2	0.0
Control Delay (s)	8.9	1.6	0.0
Lane LOS	A	A	
Approach Delay (s)	8.9	1.6	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	19.4%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	40	11	41	69	2
Future Vol, veh/h	2	40	11	41	69	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	43	12	45	75	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	145	76	77	0	-	0
Stage 1	76	-	-	-	-	-
Stage 2	69	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	847	985	1522	-	-	-
Stage 1	947	-	-	-	-	-
Stage 2	954	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	840	985	1522	-	-	-
Mov Cap-2 Maneuver	840	-	-	-	-	-
Stage 1	939	-	-	-	-	-
Stage 2	954	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.9	1.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1522	-	977	-	-
HCM Lane V/C Ratio	0.008	-	0.047	-	-
HCM Control Delay (s)	7.4	0	8.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	2	3	1	0	8	1	44	2	8	100	1
Future Volume (Veh/h)	1	2	3	1	0	8	1	44	2	8	100	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	2	3	1	0	9	1	48	2	9	109	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	188	180	110	182	179	49	110			50		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	188	180	110	182	179	49	110			50		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	99	100			99		
cM capacity (veh/h)	762	710	944	771	710	1020	1480			1557		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	6	10	51	119
Volume Left	1	1	1	9
Volume Right	3	9	2	1
cSH	821	988	1480	1557
Volume to Capacity	0.01	0.01	0.00	0.01
Queue Length 95th (m)	0.2	0.2	0.0	0.1
Control Delay (s)	9.4	8.7	0.2	0.6
Lane LOS	A	A	A	A
Approach Delay (s)	9.4	8.7	0.2	0.6
Approach LOS	A	A		

Intersection Summary				
Average Delay	1.2			
Intersection Capacity Utilization	19.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	2	3	1	0	8	1	44	2	8	100	1
Future Vol, veh/h	1	2	3	1	0	8	1	44	2	8	100	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	2	3	1	0	9	1	48	2	9	109	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	184	180	110	181	179	49	110	0	0	50	0	0
Stage 1	128	128	-	51	51	-	-	-	-	-	-	-
Stage 2	56	52	-	130	128	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	777	714	943	781	715	1020	1480	-	-	1557	-	-
Stage 1	876	790	-	962	852	-	-	-	-	-	-	-
Stage 2	956	852	-	874	790	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	766	709	943	772	710	1020	1480	-	-	1557	-	-
Mov Cap-2 Maneuver	766	709	-	772	710	-	-	-	-	-	-	-
Stage 1	875	785	-	961	851	-	-	-	-	-	-	-
Stage 2	947	851	-	863	785	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.4	8.7	0.2	0.5
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1480	-	-	821	985	1557	-	-
HCM Lane V/C Ratio	0.001	-	-	0.008	0.01	0.006	-	-
HCM Control Delay (s)	7.4	0	-	9.4	8.7	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	6	5	102	115	1
Future Volume (Veh/h)	3	6	5	102	115	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	7	5	111	125	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	246	126	126			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	246	126	126			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	99	100			
cM capacity (veh/h)	739	925	1460			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	10	116	126
Volume Left	3	5	0
Volume Right	7	0	1
cSH	860	1460	1700
Volume to Capacity	0.01	0.00	0.07
Queue Length 95th (m)	0.3	0.1	0.0
Control Delay (s)	9.2	0.3	0.0
Lane LOS	A	A	
Approach Delay (s)	9.2	0.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	19.4%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	6	5	102	115	1
Future Vol, veh/h	3	6	5	102	115	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	7	5	111	125	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	247	126	126	0	-	0
Stage 1	126	-	-	-	-	-
Stage 2	121	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	741	924	1460	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	904	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	738	924	1460	-	-	-
Mov Cap-2 Maneuver	738	-	-	-	-	-
Stage 1	896	-	-	-	-	-
Stage 2	904	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1460	-	852	-	-
HCM Lane V/C Ratio	0.004	-	0.011	-	-
HCM Control Delay (s)	7.5	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	4	23	51	107	116	4
Future Volume (Veh/h)	4	23	51	107	116	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	25	55	116	126	4
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	354	128	130			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	354	128	130			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	97	96			
cM capacity (veh/h)	620	922	1455			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	29	171	130
Volume Left	4	55	0
Volume Right	25	0	4
cSH	864	1455	1700
Volume to Capacity	0.03	0.04	0.08
Queue Length 95th (m)	0.8	0.9	0.0
Control Delay (s)	9.3	2.6	0.0
Lane LOS	A	A	
Approach Delay (s)	9.3	2.6	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	25.1%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	23	51	107	116	4
Future Vol, veh/h	4	23	51	107	116	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	25	55	116	126	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	354	128	130	0	-	0
Stage 1	128	-	-	-	-	-
Stage 2	226	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	644	922	1455	-	-	-
Stage 1	898	-	-	-	-	-
Stage 2	812	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	618	922	1455	-	-	-
Mov Cap-2 Maneuver	618	-	-	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	812	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.3	2.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1455	-	859	-	-
HCM Lane V/C Ratio	0.038	-	0.034	-	-
HCM Control Delay (s)	7.6	0	9.3	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	0	2	0	20	3	137	2	5	134	0
Future Volume (Veh/h)	1	1	0	2	0	20	3	137	2	5	134	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	0	2	0	22	3	149	2	5	146	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	334	313	146	312	312	150	146			151		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	334	313	146	312	312	150	146			151		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	98	100			100		
cM capacity (veh/h)	602	599	901	637	600	896	1436			1430		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	2	24	154	151
Volume Left	1	2	3	5
Volume Right	0	22	2	0
cSH	600	867	1436	1430
Volume to Capacity	0.00	0.03	0.00	0.00
Queue Length 95th (m)	0.1	0.7	0.1	0.1
Control Delay (s)	11.0	9.3	0.2	0.3
Lane LOS	B	A	A	A
Approach Delay (s)	11.0	9.3	0.2	0.3
Approach LOS	B	A		

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	19.6%	ICU Level of Service	A	
Analysis Period (min)	15			

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	1	0	2	0	20	3	137	2	5	134	0
Future Vol, veh/h	1	1	0	2	0	20	3	137	2	5	134	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	0	2	0	22	3	149	2	5	146	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	323	313	146	313	312	150	146	0	0	151	0	0
Stage 1	156	156	-	156	156	-	-	-	-	-	-	-
Stage 2	167	157	-	157	156	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	630	602	901	640	603	896	1436	-	-	1430	-	-
Stage 1	846	769	-	846	769	-	-	-	-	-	-	-
Stage 2	835	768	-	845	769	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	612	598	901	636	599	896	1436	-	-	1430	-	-
Mov Cap-2 Maneuver	612	598	-	636	599	-	-	-	-	-	-	-
Stage 1	844	766	-	844	767	-	-	-	-	-	-	-
Stage 2	813	766	-	840	766	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11	9.3	0.2	0.3
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1436	-	-	605	864	1430	-	-
HCM Lane V/C Ratio	0.002	-	-	0.004	0.028	0.004	-	-
HCM Control Delay (s)	7.5	0	-	11	9.3	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	67	24	53	87	1
Future Volume (Veh/h)	3	67	24	53	87	1
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	73	26	58	95	1
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	206	96	96			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	206	96	96			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	92	98			
cM capacity (veh/h)	769	961	1498			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	76	84	96
Volume Left	3	26	0
Volume Right	73	0	1
cSH	952	1498	1700
Volume to Capacity	0.08	0.02	0.06
Queue Length 95th (m)	2.1	0.4	0.0
Control Delay (s)	9.1	2.4	0.0
Lane LOS	A	A	
Approach Delay (s)	9.1	2.4	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	21.8%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	67	24	53	87	1
Future Vol, veh/h	3	67	24	53	87	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	73	26	58	95	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	206	96	96	0	-	0
Stage 1	96	-	-	-	-	-
Stage 2	110	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	782	960	1498	-	-	-
Stage 1	928	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	768	960	1498	-	-	-
Mov Cap-2 Maneuver	768	-	-	-	-	-
Stage 1	911	-	-	-	-	-
Stage 2	915	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	2.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1498	-	950	-	-
HCM Lane V/C Ratio	0.017	-	0.08	-	-
HCM Control Delay (s)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	52	14	74	153	3
Future Volume (Veh/h)	3	52	14	74	153	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	57	15	80	166	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	278	168	169			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	278	168	169			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	93	99			
cM capacity (veh/h)	705	877	1409			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	60	95	169
Volume Left	3	15	0
Volume Right	57	0	3
cSH	866	1409	1700
Volume to Capacity	0.07	0.01	0.10
Queue Length 95th (m)	1.8	0.3	0.0
Control Delay (s)	9.5	1.3	0.0
Lane LOS	A	A	
Approach Delay (s)	9.5	1.3	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	25.9%	ICU Level of Service	A
Analysis Period (min)	15		

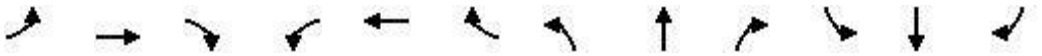
Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	52	14	74	153	3
Future Vol, veh/h	3	52	14	74	153	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	57	15	80	166	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	278	168	169	0	-	0
Stage 1	168	-	-	-	-	-
Stage 2	110	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	712	876	1409	-	-	-
Stage 1	862	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	704	876	1409	-	-	-
Mov Cap-2 Maneuver	704	-	-	-	-	-
Stage 1	853	-	-	-	-	-
Stage 2	915	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	1.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1409	-	864	-	-
HCM Lane V/C Ratio	0.011	-	0.069	-	-
HCM Control Delay (s)	7.6	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	3	4	1	0	12	1	76	3	17	187	1
Future Volume (Veh/h)	1	3	4	1	0	12	1	76	3	17	187	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	3	4	1	0	13	1	83	3	18	203	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	339	328	204	332	326	84	204			86		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	339	328	204	332	326	84	204			86		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	100	100	100	99	100			99		
cM capacity (veh/h)	601	584	837	611	584	975	1368			1510		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	8	14	87	222
Volume Left	1	1	1	18
Volume Right	4	13	3	1
cSH	691	935	1368	1510
Volume to Capacity	0.01	0.01	0.00	0.01
Queue Length 95th (m)	0.3	0.4	0.0	0.3
Control Delay (s)	10.3	8.9	0.1	0.7
Lane LOS	B	A	A	A
Approach Delay (s)	10.3	8.9	0.1	0.7
Approach LOS	B	A		

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	27.5%	ICU Level of Service	A	
Analysis Period (min)	15			

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	3	4	1	0	12	1	76	3	17	187	1
Future Vol, veh/h	1	3	4	1	0	12	1	76	3	17	187	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	3	4	1	0	13	1	83	3	18	203	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	333	328	204	330	327	85	204	0	0	86	0	0
Stage 1	240	240	-	87	87	-	-	-	-	-	-	-
Stage 2	93	88	-	243	240	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	620	591	837	623	591	974	1368	-	-	1510	-	-
Stage 1	763	707	-	921	823	-	-	-	-	-	-	-
Stage 2	914	822	-	761	707	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	605	583	837	611	583	974	1368	-	-	1510	-	-
Mov Cap-2 Maneuver	605	583	-	611	583	-	-	-	-	-	-	-
Stage 1	762	698	-	920	822	-	-	-	-	-	-	-
Stage 2	901	821	-	744	698	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.3	8.9	0.1	0.6
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1368	-	-	691	931	1510	-	-
HCM Lane V/C Ratio	0.001	-	-	0.013	0.015	0.012	-	-
HCM Control Delay (s)	7.6	0	-	10.3	8.9	7.4	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	0	0	0	0	0
Future Volume (Veh/h)	0	0	0	0	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	0	0	0	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	0				0	0
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	0				0	0
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1623				1023	1085

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	0	0	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	1700	1700
Volume to Capacity	0.00	0.00	0.02
Queue Length 95th (m)	0.0	0.0	0.0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	0.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1	0	-	0	1	1
Stage 1	-	-	-	-	1	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1622	-	-	-	1022	1084
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1622	-	-	-	1022	1084
Mov Cap-2 Maneuver	-	-	-	-	1022	-
Stage 1	-	-	-	-	1022	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1622	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	6	49	78	109	123	5
Future Volume (Veh/h)	6	49	78	109	123	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	53	85	118	134	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	424	136	139			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	424	136	139			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	94	94			
cM capacity (veh/h)	552	912	1445			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	60	203	139
Volume Left	7	85	0
Volume Right	53	0	5
cSH	848	1445	1700
Volume to Capacity	0.07	0.06	0.08
Queue Length 95th (m)	1.8	1.5	0.0
Control Delay (s)	9.6	3.5	0.0
Lane LOS	A	A	
Approach Delay (s)	9.6	3.5	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	30.2%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	49	78	109	123	5
Future Vol, veh/h	6	49	78	109	123	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	53	85	118	134	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	425	137	139	0	-	0
Stage 1	137	-	-	-	-	-
Stage 2	288	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	586	911	1445	-	-	-
Stage 1	890	-	-	-	-	-
Stage 2	761	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	549	911	1445	-	-	-
Mov Cap-2 Maneuver	549	-	-	-	-	-
Stage 1	834	-	-	-	-	-
Stage 2	761	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	3.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1445	-	850	-	-
HCM Lane V/C Ratio	0.059	-	0.07	-	-
HCM Control Delay (s)	7.6	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.2	-	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	25	55	187	166	5
Future Volume (Veh/h)	5	25	55	187	166	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	27	60	203	180	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	506	182	185			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	506	182	185			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	97	96			
cM capacity (veh/h)	504	860	1390			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	32	263	185
Volume Left	5	60	0
Volume Right	27	0	5
cSH	774	1390	1700
Volume to Capacity	0.04	0.04	0.11
Queue Length 95th (m)	1.0	1.1	0.0
Control Delay (s)	9.8	2.1	0.0
Lane LOS	A	A	
Approach Delay (s)	9.8	2.1	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

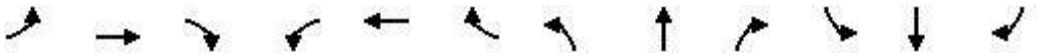
Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	25	55	187	166	5
Future Vol, veh/h	5	25	55	187	166	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	27	60	203	180	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	506	183	185	0	-	0
Stage 1	183	-	-	-	-	-
Stage 2	323	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	526	859	1390	-	-	-
Stage 1	848	-	-	-	-	-
Stage 2	734	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	500	859	1390	-	-	-
Mov Cap-2 Maneuver	500	-	-	-	-	-
Stage 1	806	-	-	-	-	-
Stage 2	734	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	1.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1390	-	767	-	-
HCM Lane V/C Ratio	0.043	-	0.043	-	-
HCM Control Delay (s)	7.7	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	0	2	0	29	3	212	2	10	182	0
Future Volume (Veh/h)	1	1	0	2	0	29	3	212	2	10	182	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	0	2	0	32	3	230	2	11	198	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	489	458	198	458	457	231	198			232		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	489	458	198	458	457	231	198			232		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	96	100			99		
cM capacity (veh/h)	466	494	843	509	495	808	1375			1336		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	2	34	235	209
Volume Left	1	2	3	11
Volume Right	0	32	2	0
cSH	480	781	1375	1336
Volume to Capacity	0.00	0.04	0.00	0.01
Queue Length 95th (m)	0.1	1.1	0.1	0.2
Control Delay (s)	12.5	9.8	0.1	0.5
Lane LOS	B	A	A	A
Approach Delay (s)	12.5	9.8	0.1	0.5
Approach LOS	B	A		

Intersection Summary				
Average Delay	1.0			
Intersection Capacity Utilization	25.4%	ICU Level of Service	A	
Analysis Period (min)	15			

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	1	0	2	0	29	3	212	2	10	182	0
Future Vol, veh/h	1	1	0	2	0	29	3	212	2	10	182	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	0	2	0	32	3	230	2	11	198	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	473	458	198	458	457	231	198	0	0	232	0	0
Stage 1	220	220	-	237	237	-	-	-	-	-	-	-
Stage 2	253	238	-	221	220	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	501	499	843	513	500	808	1375	-	-	1336	-	-
Stage 1	782	721	-	766	709	-	-	-	-	-	-	-
Stage 2	751	708	-	781	721	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	477	493	843	507	494	808	1375	-	-	1336	-	-
Mov Cap-2 Maneuver	477	493	-	507	494	-	-	-	-	-	-	-
Stage 1	780	715	-	764	707	-	-	-	-	-	-	-
Stage 2	720	706	-	773	715	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.5	9.8	0.1	0.4
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1375	-	-	485	778	1336	-	-
HCM Lane V/C Ratio	0.002	-	-	0.004	0.043	0.008	-	-
HCM Control Delay (s)	7.6	0	-	12.5	9.8	7.7	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	7	137	47	53	87	2
Future Volume (Veh/h)	7	137	47	53	87	2
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	149	51	58	95	2
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	256	96	97			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	256	96	97			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	84	97			
cM capacity (veh/h)	708	960	1496			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	157	109	97
Volume Left	8	51	0
Volume Right	149	0	2
cSH	943	1496	1700
Volume to Capacity	0.17	0.03	0.06
Queue Length 95th (m)	4.8	0.8	0.0
Control Delay (s)	9.6	3.6	0.0
Lane LOS	A	A	
Approach Delay (s)	9.6	3.6	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	27.6%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	137	47	53	87	2
Future Vol, veh/h	7	137	47	53	87	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	149	51	58	95	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	256	96	97	0	-	0
Stage 1	96	-	-	-	-	-
Stage 2	160	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	733	960	1496	-	-	-
Stage 1	928	-	-	-	-	-
Stage 2	869	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	707	960	1496	-	-	-
Mov Cap-2 Maneuver	707	-	-	-	-	-
Stage 1	896	-	-	-	-	-
Stage 2	869	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	3.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1496	-	944	-	-
HCM Lane V/C Ratio	0.034	-	0.166	-	-
HCM Control Delay (s)	7.5	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	3	52	14	97	224	3
Future Volume (Veh/h)	3	52	14	97	224	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	57	15	105	243	3
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	380	244	246			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	380	244	246			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	93	99			
cM capacity (veh/h)	615	794	1320			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	60	120	246
Volume Left	3	15	0
Volume Right	57	0	3
cSH	783	1320	1700
Volume to Capacity	0.08	0.01	0.14
Queue Length 95th (m)	2.0	0.3	0.0
Control Delay (s)	10.0	1.1	0.0
Lane LOS	A	A	
Approach Delay (s)	10.0	1.1	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	27.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	52	14	97	224	3
Future Vol, veh/h	3	52	14	97	224	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	57	15	105	243	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	380	245	246	0	-	0
Stage 1	245	-	-	-	-	-
Stage 2	135	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	622	794	1320	-	-	-
Stage 1	796	-	-	-	-	-
Stage 2	891	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	615	794	1320	-	-	-
Mov Cap-2 Maneuver	615	-	-	-	-	-
Stage 1	786	-	-	-	-	-
Stage 2	891	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1320	-	782	-	-
HCM Lane V/C Ratio	0.012	-	0.076	-	-
HCM Control Delay (s)	7.8	0	10	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	3	4	1	0	15	1	97	3	24	251	1
Future Volume (Veh/h)	1	3	4	1	0	15	1	97	3	24	251	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	3	4	1	0	16	1	105	3	26	273	1
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	450	436	274	440	434	106	274			108		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	450	436	274	440	434	106	274			108		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	99	100	100	98	100			98		
cM capacity (veh/h)	503	505	765	515	505	948	1289			1483		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	8	17	109	300
Volume Left	1	1	1	26
Volume Right	4	16	3	1
cSH	608	903	1289	1483
Volume to Capacity	0.01	0.02	0.00	0.02
Queue Length 95th (m)	0.3	0.5	0.0	0.4
Control Delay (s)	11.0	9.1	0.1	0.8
Lane LOS	B	A	A	A
Approach Delay (s)	11.0	9.1	0.1	0.8
Approach LOS	B	A		

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	31.3%	ICU Level of Service	A	
Analysis Period (min)	15			

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	3	4	1	0	15	1	97	3	24	251	1
Future Vol, veh/h	1	3	4	1	0	15	1	97	3	24	251	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	3	4	1	0	16	1	105	3	26	273	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	443	436	274	438	435	107	274	0	0	108	0	0
Stage 1	326	326	-	109	109	-	-	-	-	-	-	-
Stage 2	117	110	-	329	326	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	525	514	765	529	514	947	1289	-	-	1483	-	-
Stage 1	687	648	-	896	805	-	-	-	-	-	-	-
Stage 2	888	804	-	684	648	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	507	503	765	515	503	947	1289	-	-	1483	-	-
Mov Cap-2 Maneuver	507	503	-	515	503	-	-	-	-	-	-	-
Stage 1	686	634	-	895	804	-	-	-	-	-	-	-
Stage 2	872	803	-	662	634	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11	9.1	0.1	0.6
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1289	-	-	608	900	1483	-	-
HCM Lane V/C Ratio	0.001	-	-	0.014	0.019	0.018	-	-
HCM Control Delay (s)	7.8	0	-	11	9.1	7.5	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0.1	-	-

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	20	6	18	55	0
Future Volume (Veh/h)	0	20	6	18	55	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	22	7	20	60	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	27				39	17
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	27				39	17
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				94	100
cM capacity (veh/h)	1587				973	1062

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	22	27	60
Volume Left	0	0	60
Volume Right	0	20	0
cSH	1587	1700	973
Volume to Capacity	0.00	0.02	0.06
Queue Length 95th (m)	0.0	0.0	1.6
Control Delay (s)	0.0	0.0	8.9
Lane LOS			A
Approach Delay (s)	0.0	0.0	8.9
Approach LOS			A

Intersection Summary			
Average Delay	4.9		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	6	18	55	0
Future Vol, veh/h	0	20	6	18	55	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	22	7	20	60	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	27	0	-	0	39	17
Stage 1	-	-	-	-	17	-
Stage 2	-	-	-	-	22	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1587	-	-	-	973	1062
Stage 1	-	-	-	-	1006	-
Stage 2	-	-	-	-	1001	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1587	-	-	-	973	1062
Mov Cap-2 Maneuver	-	-	-	-	973	-
Stage 1	-	-	-	-	1006	-
Stage 2	-	-	-	-	1001	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1587	-	-	-	973
HCM Lane V/C Ratio	-	-	-	-	0.061
HCM Control Delay (s)	0	-	-	-	8.9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	95	156	109	123	9
Future Volume (Veh/h)	8	95	156	109	123	9
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	103	170	118	134	10
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	597	139	144			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	597	139	144			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	89	88			
cM capacity (veh/h)	411	909	1438			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	112	288	144
Volume Left	9	170	0
Volume Right	103	0	10
cSH	828	1438	1700
Volume to Capacity	0.14	0.12	0.08
Queue Length 95th (m)	3.7	3.2	0.0
Control Delay (s)	10.0	5.0	0.0
Lane LOS	B	A	
Approach Delay (s)	10.0	5.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	4.7		
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	95	156	109	123	9
Future Vol, veh/h	8	95	156	109	123	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	103	170	118	134	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	597	139	144	0	-	0
Stage 1	139	-	-	-	-	-
Stage 2	458	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	466	909	1438	-	-	-
Stage 1	888	-	-	-	-	-
Stage 2	637	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	407	909	1438	-	-	-
Mov Cap-2 Maneuver	407	-	-	-	-	-
Stage 1	775	-	-	-	-	-
Stage 2	637	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10	4.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1438	-	830	-	-
HCM Lane V/C Ratio	0.118	-	0.135	-	-
HCM Control Delay (s)	7.8	0	10	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.5	-	-

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	25	55	266	212	5
Future Volume (Veh/h)	5	25	55	266	212	5
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	27	60	289	230	5
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	642	232	235			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	642	232	235			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	97	95			
cM capacity (veh/h)	419	807	1332			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	32	349	235
Volume Left	5	60	0
Volume Right	27	0	5
cSH	705	1332	1700
Volume to Capacity	0.05	0.05	0.14
Queue Length 95th (m)	1.1	1.1	0.0
Control Delay (s)	10.4	1.7	0.0
Lane LOS	B	A	
Approach Delay (s)	10.4	1.7	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	41.8%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	25	55	266	212	5
Future Vol, veh/h	5	25	55	266	212	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	27	60	289	230	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	642	233	235	0	-	0
Stage 1	233	-	-	-	-	-
Stage 2	409	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	438	806	1332	-	-	-
Stage 1	806	-	-	-	-	-
Stage 2	671	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	414	806	1332	-	-	-
Mov Cap-2 Maneuver	414	-	-	-	-	-
Stage 1	762	-	-	-	-	-
Stage 2	671	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.4	1.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1332	-	696	-	-
HCM Lane V/C Ratio	0.045	-	0.047	-	-
HCM Control Delay (s)	7.8	0	10.4	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	1	0	2	0	37	3	282	2	15	223	0
Future Volume (Veh/h)	1	1	0	2	0	37	3	282	2	15	223	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	1	0	2	0	40	3	307	2	16	242	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	628	589	242	588	588	308	242			309		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	628	589	242	588	588	308	242			309		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	95	100			99		
cM capacity (veh/h)	370	414	797	415	415	732	1324			1252		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	2	42	312	258
Volume Left	1	2	3	16
Volume Right	0	40	2	0
cSH	391	706	1324	1252
Volume to Capacity	0.01	0.06	0.00	0.01
Queue Length 95th (m)	0.1	1.5	0.1	0.3
Control Delay (s)	14.3	10.4	0.1	0.6
Lane LOS	B	B	A	A
Approach Delay (s)	14.3	10.4	0.1	0.6
Approach LOS	B	B		

Intersection Summary				
Average Delay	1.1			
Intersection Capacity Utilization	31.3%	ICU Level of Service	A	
Analysis Period (min)	15			

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	1	0	2	0	37	3	282	2	15	223	0
Future Vol, veh/h	1	1	0	2	0	37	3	282	2	15	223	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1	0	2	0	40	3	307	2	16	242	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	608	589	242	589	588	308	242	0	0	309	0	0
Stage 1	274	274	-	314	314	-	-	-	-	-	-	-
Stage 2	334	315	-	275	274	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	408	421	797	420	421	732	1324	-	-	1252	-	-
Stage 1	732	683	-	697	656	-	-	-	-	-	-	-
Stage 2	680	656	-	731	683	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	380	413	797	413	413	732	1324	-	-	1252	-	-
Mov Cap-2 Maneuver	380	413	-	413	413	-	-	-	-	-	-	-
Stage 1	730	673	-	695	654	-	-	-	-	-	-	-
Stage 2	641	654	-	719	673	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.1	10.4	0.1	0.5
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1324	-	-	396	704	1252	-	-
HCM Lane V/C Ratio	0.002	-	-	0.005	0.06	0.013	-	-
HCM Control Delay (s)	7.7	0	-	14.1	10.4	7.9	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0.2	0	-	-

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	12	21	62	36	0
Future Volume (Veh/h)	0	12	21	62	36	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	13	23	67	39	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	90				70	56
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	90				70	56
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				96	100
cM capacity (veh/h)	1505				935	1010

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	13	90	39
Volume Left	0	0	39
Volume Right	0	67	0
cSH	1505	1700	935
Volume to Capacity	0.00	0.05	0.04
Queue Length 95th (m)	0.0	0.0	1.0
Control Delay (s)	0.0	0.0	9.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	9.0
Approach LOS			A

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	14.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	12	21	62	36	0
Future Vol, veh/h	0	12	21	62	36	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	13	23	67	39	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	90	0	-	0	70	57
Stage 1	-	-	-	-	57	-
Stage 2	-	-	-	-	13	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1505	-	-	-	934	1009
Stage 1	-	-	-	-	966	-
Stage 2	-	-	-	-	1010	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1505	-	-	-	934	1009
Mov Cap-2 Maneuver	-	-	-	-	934	-
Stage 1	-	-	-	-	966	-
Stage 2	-	-	-	-	1010	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1505	-	-	-	934
HCM Lane V/C Ratio	-	-	-	-	0.042
HCM Control Delay (s)	0	-	-	-	9
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

APPENDIX C: Excerpts from MTO Road Inventory Manual

TRAFFIC COUNT

For most municipalities, the traffic information required will be the Annual Average Daily Traffic (AADT). However, for municipalities located in Tourist and/or cottage areas, the traffic data may include a measure of the summer traffic. See the Methods Manual for details on the various methods of counting and estimating traffic volumes.

ITEM 56 YEAR

In the first box enter the type of traffic.

CODE (A) - Annual Average Daily Traffic
(S) - If Summer Traffic has been included.

Enter in the two boxes following 19, the last two digits of the Year the count was taken or the estimate of traffic was made.

Enter the code in the last box as follows:

CODE (C) - Counted Traffic
(E) - Estimated Traffic

ITEM 57 PRESENT TRAFFIC VOLUME (AADT)

Enter the Present Traffic Volume in AADT (Average Annual Daily Traffic).

Note, that in cases where only a measure of "peak hour" traffic is available, an estimate of the AADT may be obtained by multiplying the peak hour traffic by ten.

All roads, including subdivision roads, must have a traffic volume entered. An estimate of traffic for subdivision and other local roads can be obtained from the trip generation table shown in **Appendix - A**. In Urban areas where traffic volumes are in the range of 4,000 AADT an actual traffic count should be considered or scheduled in the future.

ITEM 58 DESIGN HOURLY VOLUME FACTOR (DHV %)

Depending on the characteristics of the traffic on the road section, select and enter an appropriate DHV factor as a percentage of the present AADT (Item 57). Enter the DHV factor to the nearest tenth of a percent.

For sections with an AADT (Item 57) of less than 10,000 vpd, the information with respect to DHV is insignificant and the DHV factor (%) need not be entered.

In some cases, when the DHV is known, it may be necessary to calculate the DHV Factor from the AADT and the known value of DHV.

Where no DHV is given, nor a percentage with which to calculate one, and one is required, estimate a percentage and apply it to the AADT.

estimate a percentage and apply it to the AADT.

Note, that DHV's vary:

- from about 8% to 12% of the AADT on low seasonal variation urban type routes;
- from about 13% to 17% on average seasonal variation rural routes;
- and from about 18% to 35% on high seasonal variation tourist traffic routes.

Where a measure of "peak hour" traffic is available (such as for some higher volume urban sections) it may be assumed that this is equal to the DHV.

*ITEM 59 DESIGN HOURLY VOLUME (DHV)

The computer will calculate this item using the AADT (item 57) and DHV factor (item 58). For sections with a DHV of less than 1200 vph, the information with respect to the DHV is insignificant and no DHV value will be derived.

For sections with a DHV of 1200 vph or greater, the DHV is determined in vehicles per hour.

If neither the DHV nor the DHV Factor is available, the "peak hour" traffic volume may be used as a measure of the DHV.

ITEM 60 TRUCKS (%)

For all Upper Tier roads and all arterial and collector roads in the urban centres and rural roads with 400 AADT or more, enter the percentage of truck traffic to the nearest whole number.

Where classification counts are not available, estimate a percent from a low of 3% on low volume residential streets to a high of 15% on arterials and industrial collector roads. Where it is known that there is a high percentage of truck traffic on a low volume rural, residential or other local street, enter a percentage of trucks accordingly.

For needs study purposes, **a truck includes any vehicle with dual rear wheels and all buses.**

ITEM 61 TRAFFIC COUNT LOCATION

Completion of this item is optional. Traffic Count Location code numbers may be used, however, when the municipality has in place or intends to carry out a planned traffic counting program.

If available, enter the Traffic Count Location code number in the boxes provided for the location for which the existing traffic data were obtained.

If the road section lies between two count locations, enter the location code number which more closely reflects the actual traffic pattern.

ITEM 62 PEAK DIRECTIONAL SPLIT (%)

In all cases where a DHV is required, enter the given or estimated percentage of DHV travelling in the direction of the major traffic flow, rounded to the nearest whole number.

For one way streets (Item 53 coded 1W or 1M) enter 99.

ITEM 63 10 YEAR GROWTH FACTOR

For each road section, determine and enter the most realistic 10 Year Traffic Growth Factor to be applied to the existing AADT (**Item 57**) to obtain an estimated AADT for the end of the study period.

Rural Municipalities

The 10 Year Traffic Growth Factor may be derived using one of the following methods:

(i) where at leat two traffic counts are available with a minimum of a five year interval between them, a straight line projection of the 5 year traffic increase will establish the 10 year AADT.

(ii) a review of the past growth in population projected for the future 10 year period will provide a reasonable 10 Year Growth Factor to be applied to the existing AADT (Refer to **Appendix B** for guidelines).

(iii) a combination of the above where part of the municipality is exhibiting some growth while the other areas are relatively stable.

Urban Municipalities

In urban municipalities, there may be several growth factors developed for the various areas of the municipality. For example, the older, more stable areas may have a low factor while areas scheduled for new development or older areas where redevelopment is occurring or planned will have a higher factor. In all cases local residential and local commercial/industrial road classifications (**Item 33**) shall be given a low growth factor.

Most larger municipalities will have long range land use and transportation plans that can be used in developing the 10 Year Growth Factors. The small and medium sized municipalities will have official land use plans that will give guidance to the future development patterns. In all cases, municipalities must take into consideration all previous traffic data, previous traffic operation and/or transportation studies and any other material that is relative to the future transportation needs.

10 YEAR TRAFFIC FORECAST

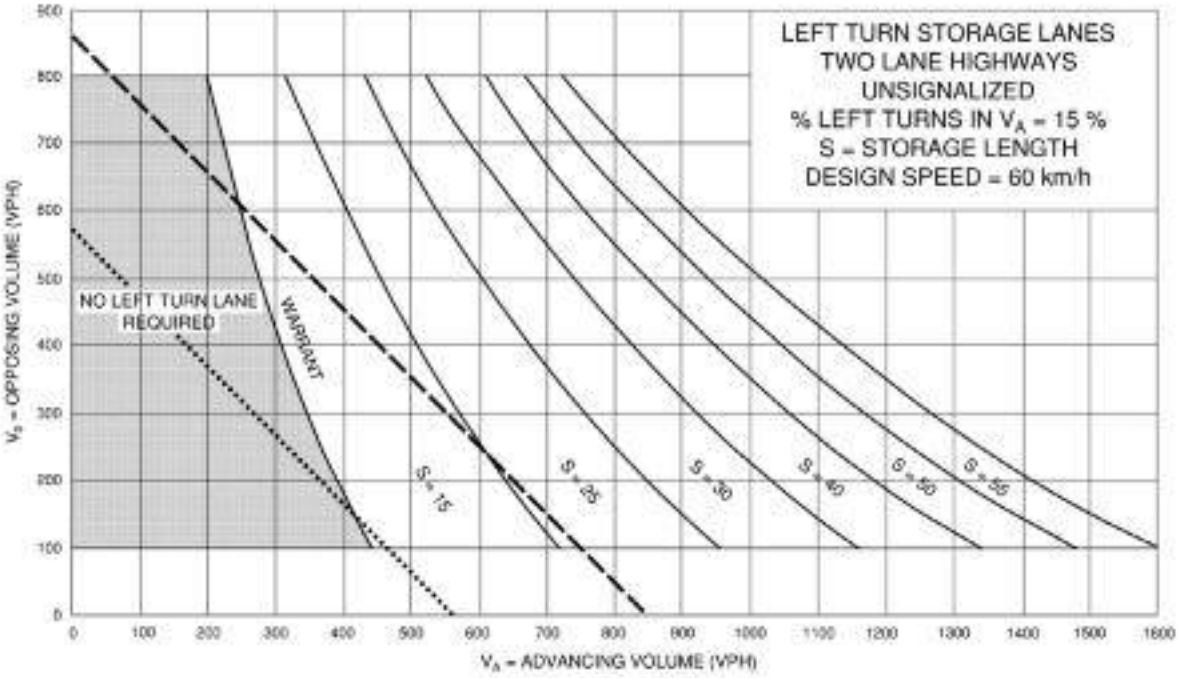
The future traffic will be based on the traffic considerations noted in **Items 56 to 63.**

APPENDIX D: Left Turn Lane Analysis

LEFT TURN LANE ANALYSIS

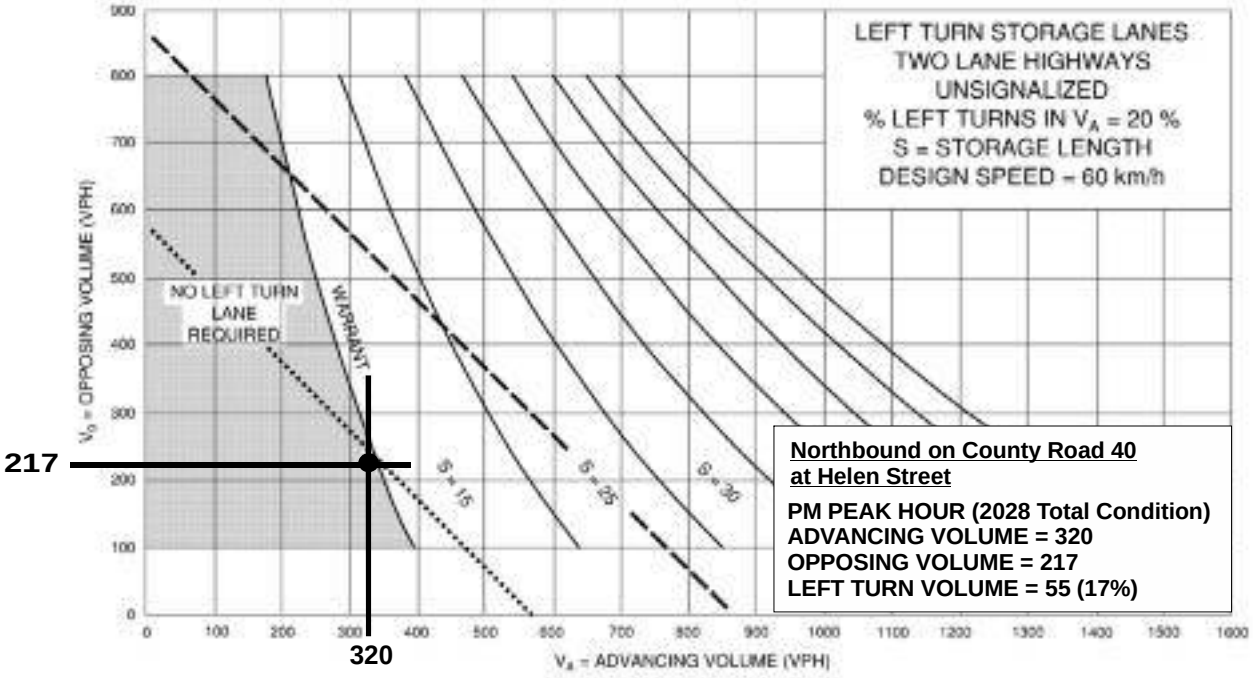
NORTHBOUND LEFT TURN LANE ON COUNTY ROAD 40 AT HELEN STREET

Exhibit 9A-7



TRAFFIC SIGNALS MAY BE WARRANTED IN RURAL AREAS OR URBAN AREAS WITH RESTRICTED FLOW

TRAFFIC SIGNALS MAY BE WARRANTED IN "FREE FLOW" URBAN AREAS



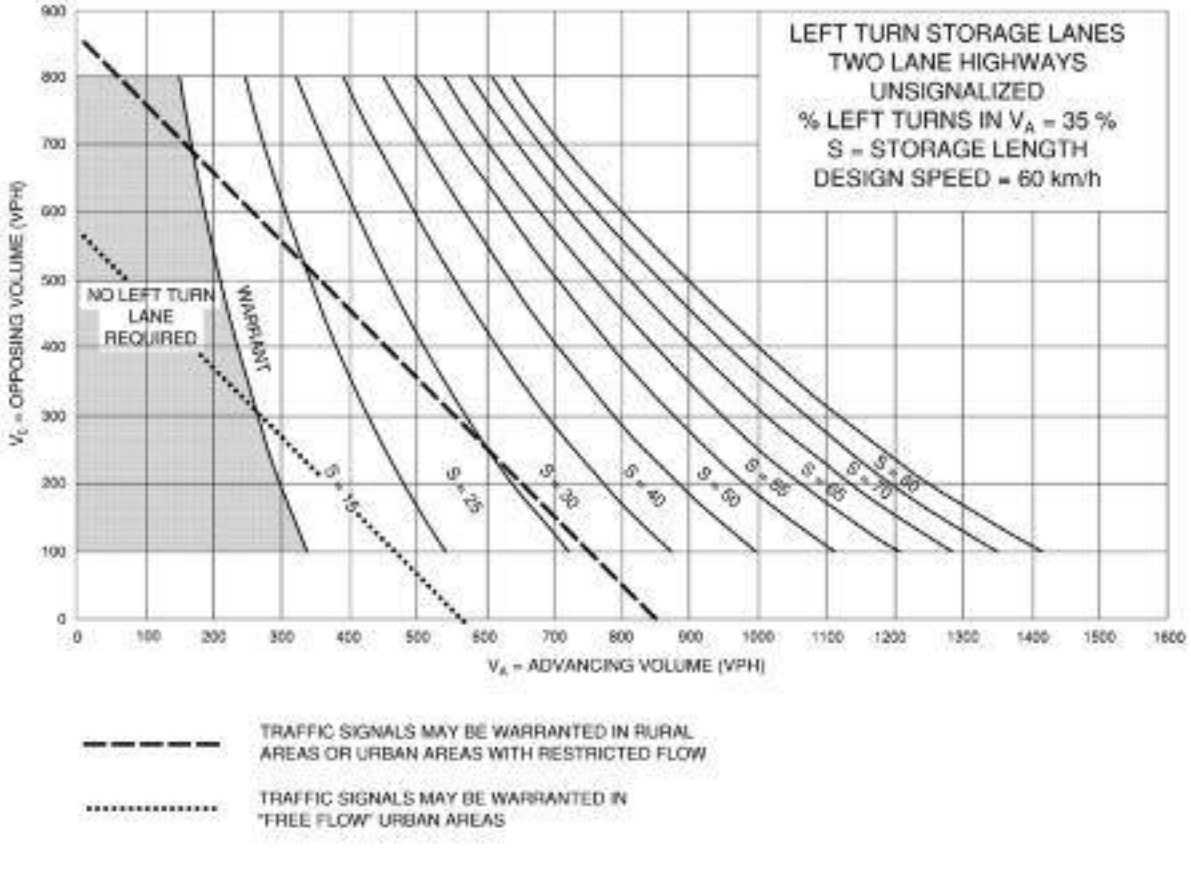
Northbound on County Road 40 at Helen Street

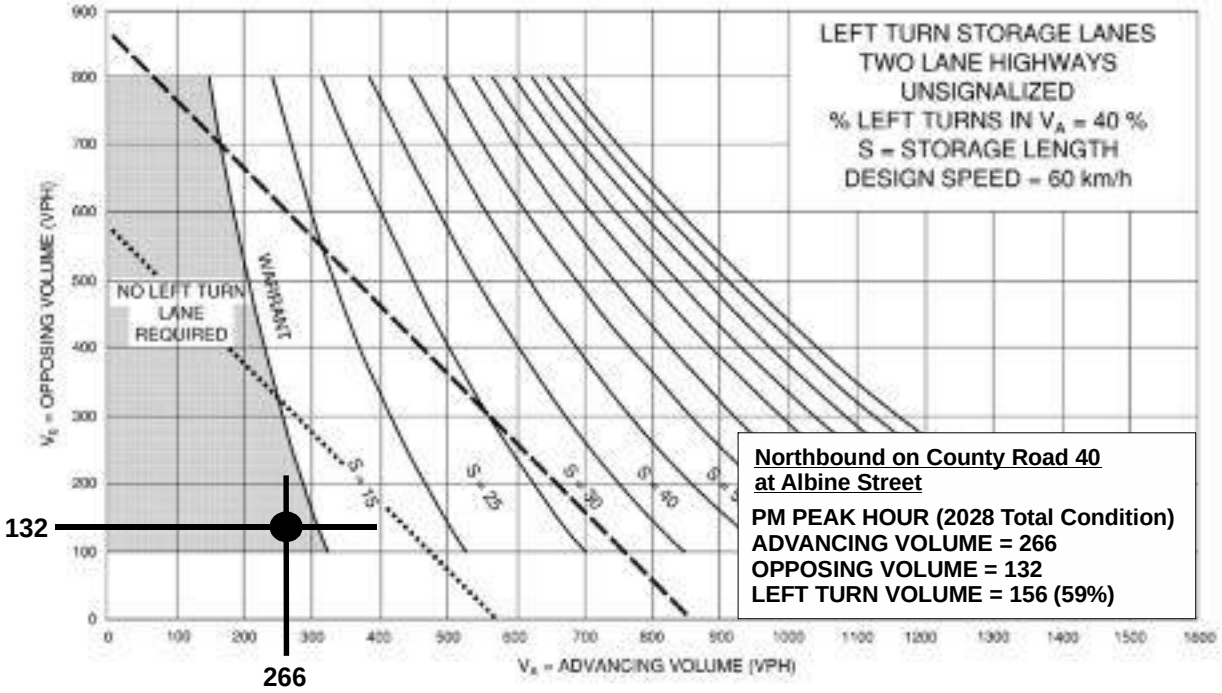
PM PEAK HOUR (2028 Total Condition)
ADVANCING VOLUME = 320
OPPOSING VOLUME = 217
LEFT TURN VOLUME = 55 (17%)

LEFT TURN LANE ANALYSIS

NORTHBOUND LEFT TURN LANE ON COUNTY ROAD 40 AT ALBINE STREET

Exhibit 9A-9

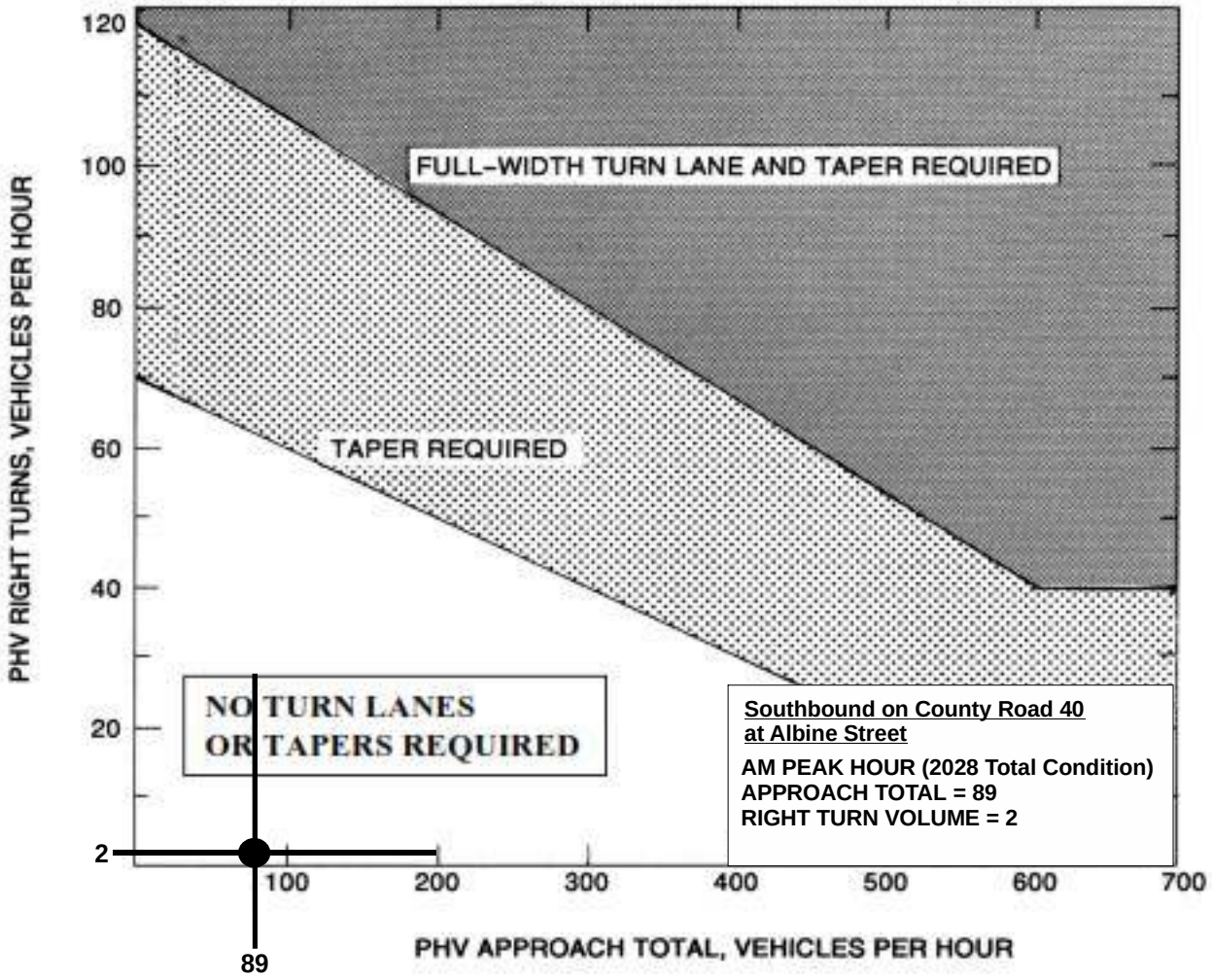




APPENDIX E: Right Turn Lane Analysis

RIGHT TURN LANE ANALYSIS

SOUTHBOUND RIGHT TURN LANE ON COUNTY ROAD 40 AT ALBINE STREET



Appropriate Radius required at all Intersections and Entrances (Commercial or Private).

LEGEND

PHV - Peak Hour Volume (also Design Hourly Volume equivalent)

Adjustment for Right Turns

For posted speeds at or under 45 mph, PHV right turns > 40, and PHV total < 300.
Adjusted right turns = PHV Right Turns - 20
If PHV is not known use formula: PHV = ADT x K x D

K = the percent of AADT occurring in the peak hour
D = the percent of traffic in the peak direction of flow

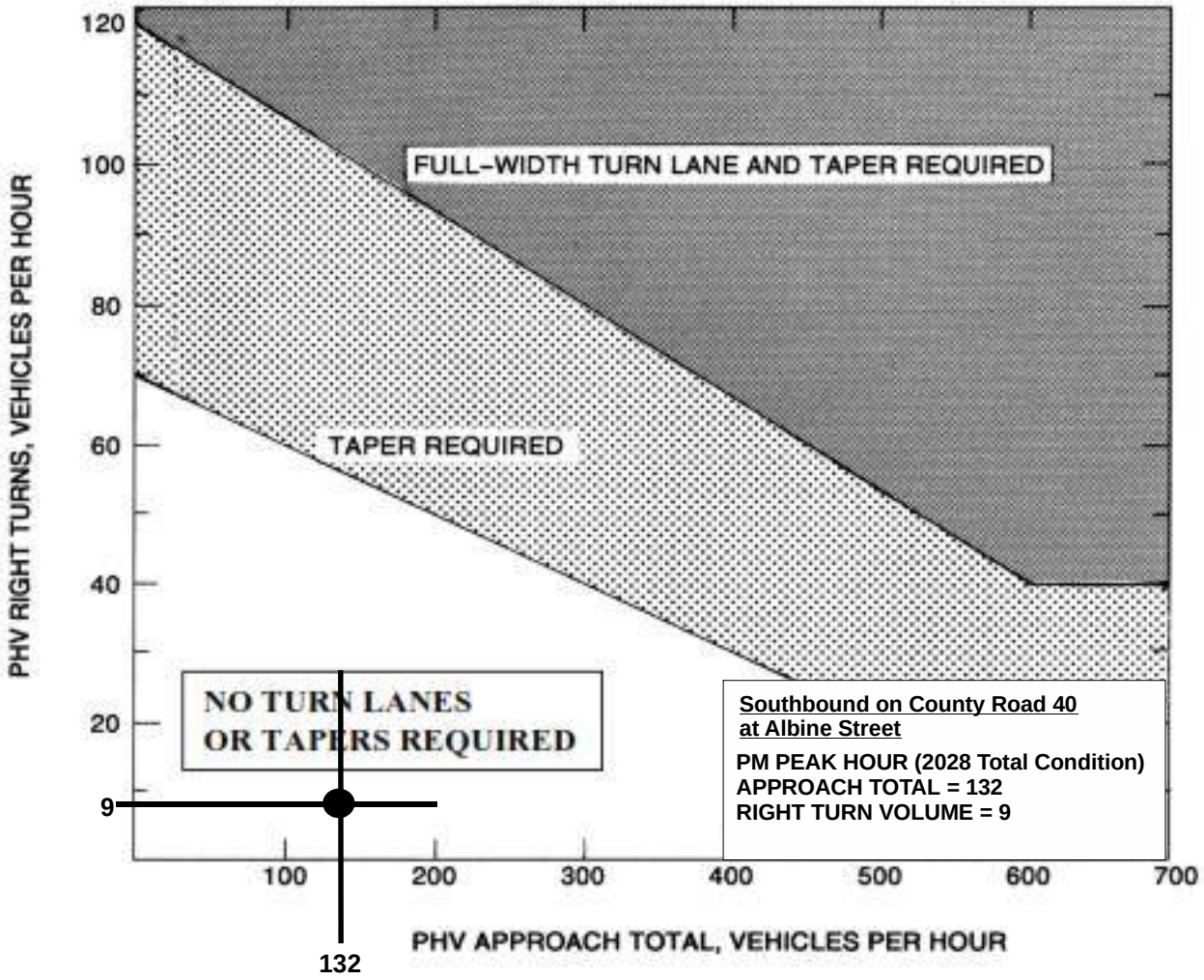
Note: An average of 11% for K x D will suffice.

When right turn facilities are warranted, see Figure 3-1 for design criteria.*

FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

RIGHT TURN LANE ANALYSIS

SOUTHBOUND RIGHT TURN LANE ON COUNTY ROAD 40 AT ALBINE STREET



Appropriate Radius required at all Intersections and Entrances (Commercial or Private).

LEGEND

PHV - Peak Hour Volume (also Design Hourly Volume equivalent)

Adjustment for Right Turns

For posted speeds at or under 45 mph, PHV right turns > 40, and PHV total < 300.
Adjusted right turns = PHV Right Turns - 20
If PHV is not known use formula: PHV = ADT x K x D

K = the percent of AADT occurring in the peak hour
D = the percent of traffic in the peak direction of flow

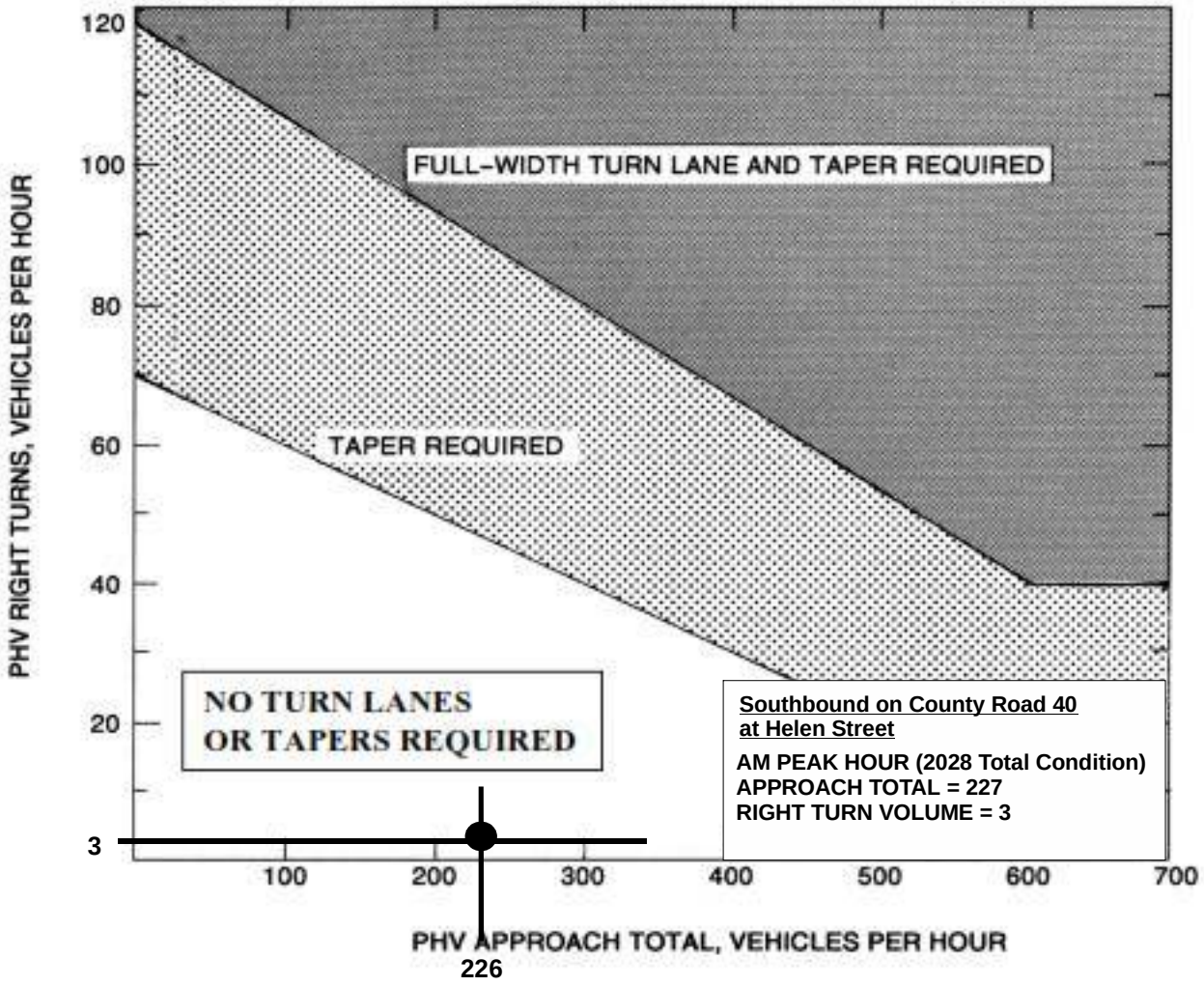
Note: An average of 11% for K x D will suffice.

When right turn facilities are warranted, see Figure 3-1 for design criteria.*

FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

RIGHT TURN LANE ANALYSIS

SOUTHBOUND RIGHT TURN LANE ON COUNTY ROAD 40 AT HELEN STREET



Appropriate Radius required at all Intersections and Entrances (Commercial or Private).

LEGEND

PHV - Peak Hour Volume (also Design Hourly Volume equivalent)

Adjustment for Right Turns

For posted speeds at or under 45 mph, PHV right turns > 40, and PHV total < 300.
Adjusted right turns = PHV Right Turns - 20
If PHV is not known use formula: PHV = ADT x K x D

K = the percent of AADT occurring in the peak hour
D = the percent of traffic in the peak direction of flow

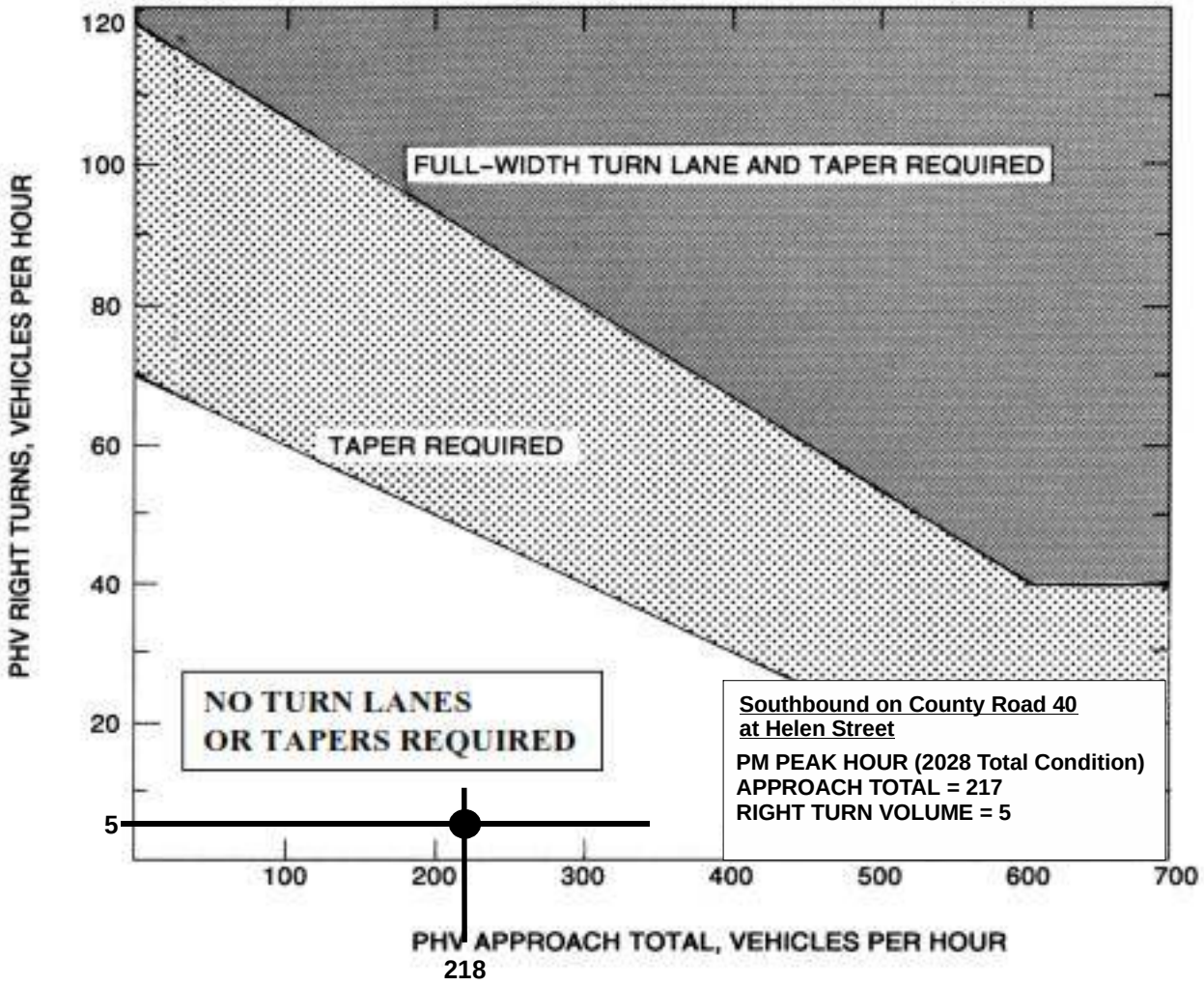
Note: An average of 11% for K x D will suffice.

When right turn facilities are warranted, see Figure 3-1 for design criteria.*

FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)

RIGHT TURN LANE ANALYSIS

SOUTHBOUND RIGHT TURN LANE ON COUNTY ROAD 40 AT HELEN STREET



Appropriate Radius required at all Intersections and Entrances (Commercial or Private).

LEGEND

PHV - Peak Hour Volume (also Design Hourly Volume equivalent)

Adjustment for Right Turns

For posted speeds at or under 45 mph, PHV right turns > 40, and PHV total < 300.
Adjusted right turns = PHV Right Turns - 20
If PHV is not known use formula: PHV = ADT x K x D

K = the percent of AADT occurring in the peak hour
D = the percent of traffic in the peak direction of flow

Note: An average of 11% for K x D will suffice.

When right turn facilities are warranted, see Figure 3-1 for design criteria.*

FIGURE 3-26 WARRANTS FOR RIGHT TURN TREATMENT (2-LANE HIGHWAY)