

REDICO - MIXED USE DEVELOPMENT

“HOOVER & GREENE”

TRAFFIC IMPACT ANALYSIS



Prepared by:

C&A Engineers

10722 Corkery Ln.

Grand Ledge, Michigan 48837

Phone: 517-898-8152

Email: CAEngineersllc@CAEngineersllc.com

January 2018

Table of Contents

	Page
I. Introduction	1
Project Description	1
Study Area	1
Roadway System & Intersections	1
II. Existing Conditions	4
Existing Traffic Volumes	4
Safety Analysis	4
Traffic Analysis Methodology	4
Existing Level of Service Analysis	5
III. Background Conditions	5
Background Traffic Volumes	5
IV. Future Site Conditions	6
Trip Generation	6
Trip Assignment & Trip Distribution	6
Future Traffic Level of Service Analysis	7
Proposed Site Access	7
V. Conclusions & Recommendation	7
Recommendations	7
Appendix – Supplemental Information	
Vehicle Turning Movement Surveys	
LOS Computations (Synchro Printouts)	
SEMOG Historical Crash Data	

List of Tables

Table	Title	Page
1	Level of Service Criteria (Signalized Intersection)	4
2	Level of Service Criteria (Un-Signalized Intersection)	5
3	Level of Service (LOS) Summary – Existing Conditions	5
4	ITE Trip Generation Characteristics	6
5	Level of Service (LOS) Summary – Future Conditions	7

List of Figures

Figure	Title	Page
1	Project Location Map	2
2	Site Plan	3

Executive Summary

Carter & Associates Engineers, LLC (C&A Engineers) conducted a traffic impact study for the proposed REDICO Mixed Use Development located on E. Hoover Avenue in Ann Arbor, Michigan. The proposed development is approximately 142,040 SF (231.310 GSF), 1.800 S.F. of retail and 112,765 SF of residential. The purpose of this study was to evaluate the impact on the existing road system from the additional vehicular traffic generated by the proposed development.

Access to the site will be via three (3) new driveways, two on Greene Street and one on E. Davis Avenue.

Based on the trip generation rates provided in the ITE Trip Generation Manual, the proposed development is expected to add 1,124 daily additional trips, 86 trips in the AM Peak and 105 trips in the PM peak.

C&A Engineers conducted peak-hour vehicular turning movement surveys at the intersections of E. Hoover Avenue at S. Main Street, and E. Hoover Avenue at Greene Street on December 27, 2017, during the AM and PM peak periods of 7:00 AM – 9:00 AM and 4:00 PM – 6:00 PM, respectively.

Currently, all study intersections operate at acceptable levels of service during the peak hour periods.

The study intersections are expected to continue operating at an acceptable level of service after the development is constructed, during both peak periods analyzed. All proposed access drives will operate at a level of service of A, during both the AM and PM peak periods.

The proposed development, is not expected to have any minimum impact on the nearby roadway system and key intersections. There is sufficient roadway capacity to accommodate the proposed project trips.

The proposed access drives should have unobstructed views of the roadway in both directions, clear of any vegetation, roadside objects etc.

I. INTRODUCTION

Project Description - This study determines and evaluates the traffic and impacts associated with for the proposed REDICO Mixed Use Development located on E. Hoover Avenue in Ann Arbor, Michigan. (See Figure 1).

Study Area - The scope of work contained in this report is as follows:

- ✚ Analysis of traffic conditions on the adjoining street system which will include the following:
 - E. Hoover Avenue
 - Greene Street
 - S. Main Street
 - Brown Street
 - E. Davis Avenue
- ✚ Projection of future traffic volumes to be generated by the proposed development.
- ✚ Evaluation of the impact of future traffic volumes at the intersections
 - E. Hoover Avenue and Greene Street
 - E. Hoover Avenue and S. Main Street
- ✚ Evaluation of the impact of future traffic volumes on E. Hoover Avenue and Greene Street.
- ✚ Evaluation of the proposed driveway entrances on E. Davis Avenue and Greene Street.
- ✚ Determination of what roadway and traffic control improvements, if any, will be needed to accommodate future traffic volumes.

Roadway System - This section describes the existing roadway system near the project site. The transportation systems serving the site includes Hoover Avenue, Greene Street, Brown Street, E. Davis Avenue and S. Main Street.

- ✚ Greene Street is a two-lane bituminous roadway, with curb and gutter and designated bike lanes on both sides of the roadway. The speed limit was not posted, assumed to be 25 MPH, on street parking is prohibited.
- ✚ E. Hoover Avenue west of Greene Street is a two-lane bituminous roadway, with curb and gutter on both sides of the roadway, on street parking is prohibited. The speed limit was not posted, assumed to be 25 MPH.
East of Greene Street, Hoover Avenue is a two-lane bituminous roadway, with curb and gutter on both sides of the roadway, with a designated bike lane on the south side of the roadway. On street parking is only allowed on the northside of the roadway.
- ✚ S. Main Street at E. Hoover Avenue is a four-lane bituminous roadway, with curb and gutter and designated bike lanes on both sides of the roadway. The speed limit of 30 MPH, on street parking is prohibited.
- ✚ Brown Street and E. Davis Avenue are both residential bituminous roadways, with curb and gutter on both sides of the roadway. The speed limit was not posted, assumed to be 25 MPH, on street parking is allowed.

Intersections - This section describes the existing key intersections near the project site.

- ✚ S. Main Street at E. Hoover Avenue intersection is an un-signalized T-intersection, with stop control for the E. Hoover Ave approach. There are right and left turn lanes for the E. Hoover Avenue approach.
- ✚ E. Hoover Avenue and Greene Street Intersection – is an un-signalized intersection, with stop control for Greene Street approaches.

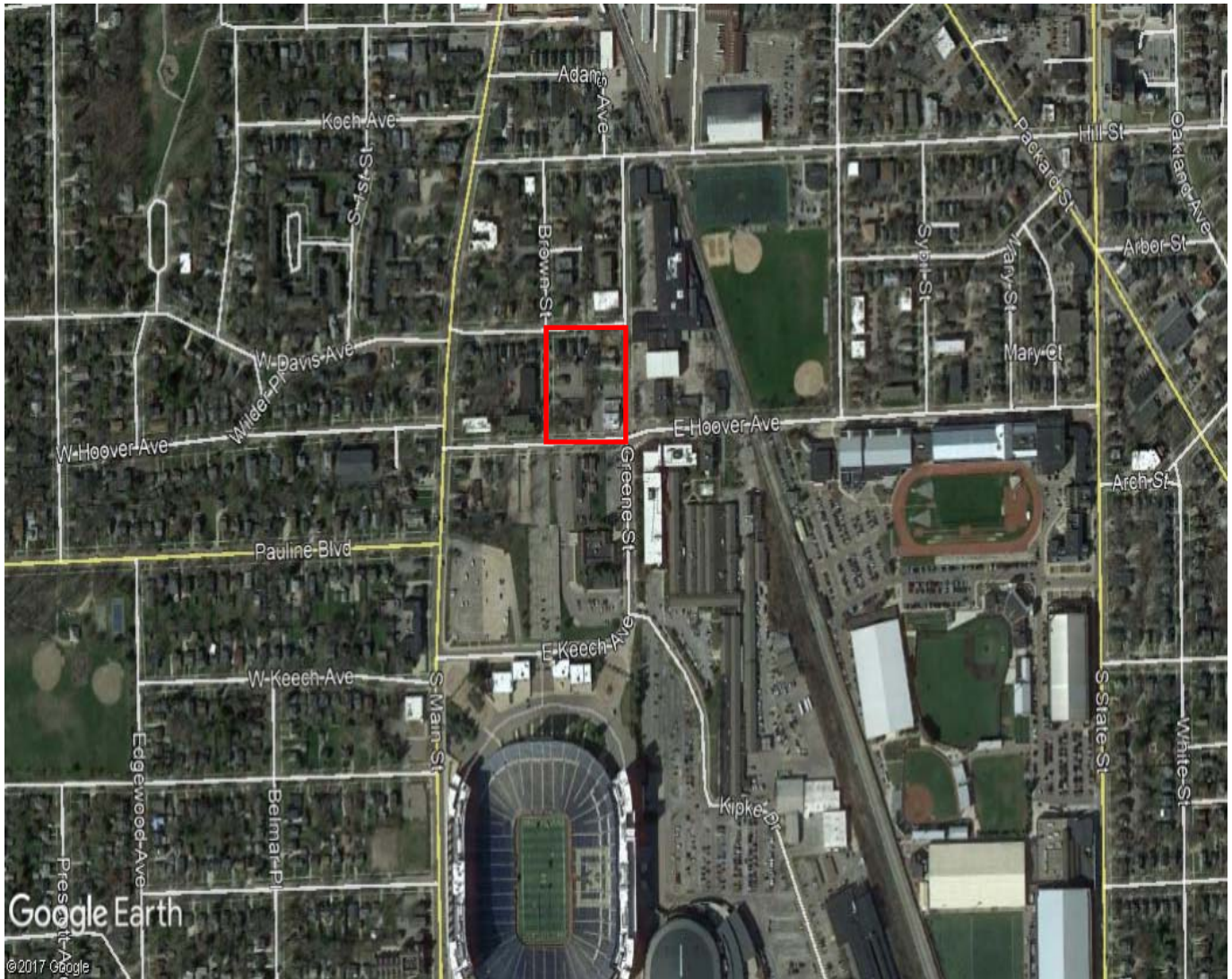


Figure 1: Project Location Map

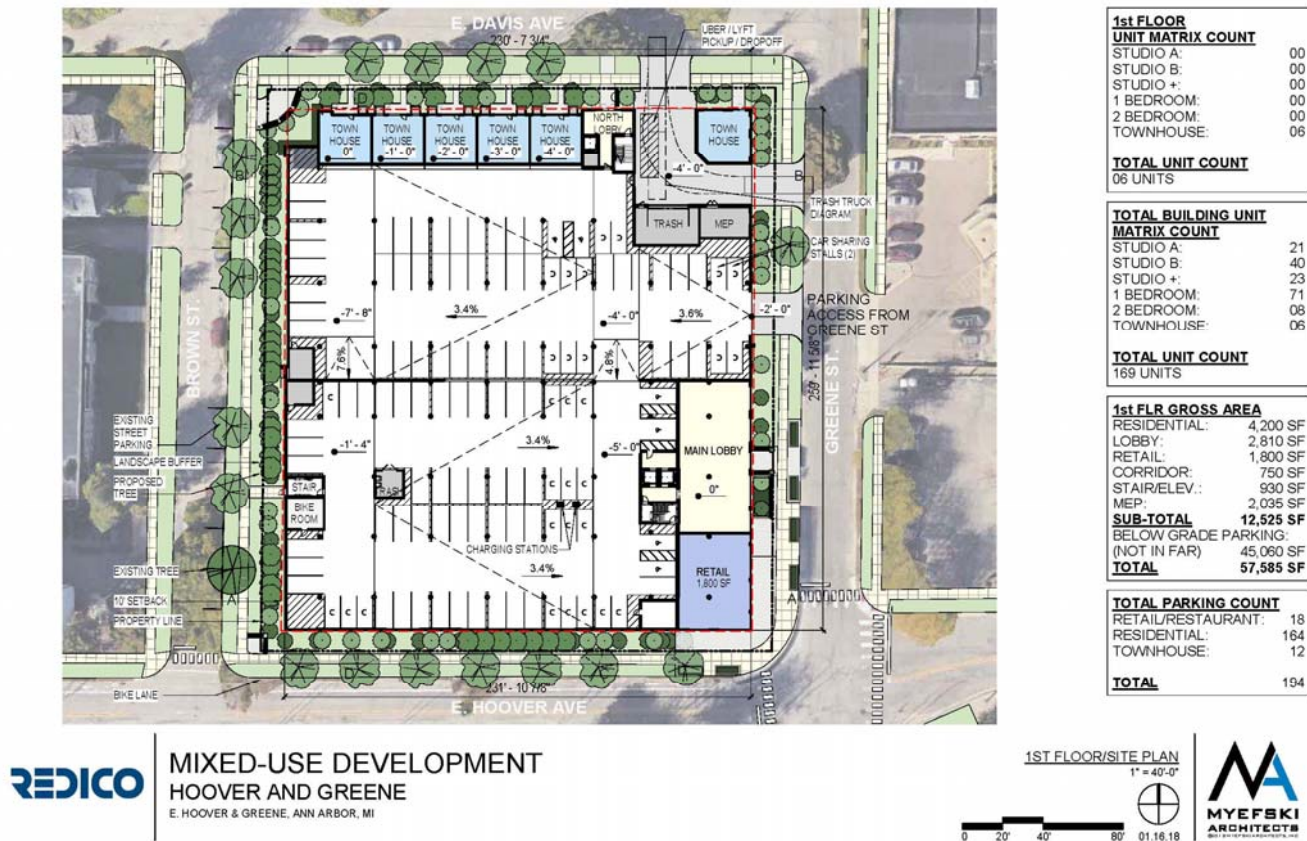


Figure 2: Site Plan

II. EXISTING CONDITIONS

Existing Traffic Volumes - C&A Engineers conducted peak-hour vehicular turning movement surveys at the intersections of E. Hoover Avenue at S. Main Street, and E. Hoover Avenue at Greene Street on December 27, 2017, during the AM and PM peak periods of 7:00 AM – 9:00 AM and 4:00 PM – 6:00 PM, respectively. A field review was conducted along the corridor to gather all pertinent information including the lane width and geometry, posted speed limits, intersection widths, travel distance between intersections, restrictions, and pedestrian facilities.

Safety Analysis - Crash data was collected for a five-year period from January 1, 2012 through December 31, 2016 at the following intersections below;

- E Hoover Avenue and Greene Street Intersection - there was a total of five (5) crashes reported, which equates to an average of one (1) per year.
- E. Hoover Avenue at S. Main Street - there was a total of thirty-seven (37) crashes reported, which equates to an average of 7.4 crashes per year.
- E Hoover Avenue and Brown Street Intersection - there was one (1) crash reported, which equates to an average of zero (0) per year.
- E Davis Avenue and Brown Street Intersection - there were no crash reported over the five-year period.
- E Davis Avenue and Greene Street Intersection - there were no crash reported over the five-year period.

The crash data was obtained from SEMCOG.

Traffic Analysis Methodology - To determine the operating conditions of an intersection or roadway, the concept of level of service (LOS) is commonly used. The LOS grading system is a rating scale ranging from LOS “A” to LOS “F”, where LOS “A” represents free-flow conditions and LOS “F” represents congested or jammed conditions. A unit of measure, such as vehicle delay, generally accompanies the LOS designation. For this study, the Transportation Research Board's Highway Capacity Manual (2010) signalized and un-signalized methodologies were utilized. For each, operations are defined by the average control delay per vehicle (measured in seconds). This incorporates delay associated with deceleration and acceleration, stopping, and moving up in the queue. Tables 1 and 2 relate the average control delay with each level of service category. For signalized intersections, the delay is typically represented as an average per vehicle for the total intersection. For un-signalized intersections, the delay is typically represented for each movement from the minor approaches only. Throughout this report, the average control delay per vehicle will be referred to as average delay. Operations during peak hours of LOS “D” or better are considered acceptable.

Table 1: Level of Service Criteria (Signalized Intersection)

LOS	Control Delay per Vehicle (second)
A	<10
B	10 TO 20
C	20 TO 35
D	35 TO 50
E	50 TO 80
F	>80

Source: TRB HCM 2010

Table 2: Level of Service Criteria (Un-Signalized Intersection)

LOS	Delay (Seconds/Vehicle)
A	<10
B	10 TO 15
C	15 TO 25
D	25 TO 35
E	35 TO 50
F	>50

Source: TRB HCM 2010

Existing Levels of Service Analysis - LOS are expressed in a range from “A” to “F,” with “A” being the highest LOS and “F” representing the lowest LOS. Level of service “D” is considered the minimum acceptable LOS in an urban area. Tables 1 & 2, shows the thresholds for levels of service “A” through “F” for signalized and un-signalized intersections, respectively. All level of service computations contained in this report were based upon the Synchro 9 software “*Synchro Studio, is a complete software package for modeling, optimizing, managing and simulating traffic systems*”. Delay per vehicle includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Table 3 summarizes the results of the weekday peak hour intersection analysis for the Existing Conditions. Detailed LOS calculations are provided in the Appendix.

Table 3: Existing Level of Service (LOS) Summary

ID	Intersection	Traffic Control Method	Movement	Existing Condition					
				AM Peak Hour			PM Peak Hour		
				Veh Delay	Approach LOS	Intersection LOS	Veh Delay	LOS	Intersection LOS
1	S. Main at E. Hoover	Un-signalized	WB	16.5	C	A (2.4)	15.0	B	A (2.0)
			NB	0.0	A		0.0	A	
			SB	1.3	A		0.8	A	
1	E. Hoover at Greene	Un-signalized	WB	1.7	A	A (6.1)	0.9	A	A (6.6)
			EB	1.5	A		1.1	A	
			NB	13.5	B		13.4	B	
			SB	12.2	B		13.1	B	

Notes: For unsignalized intersections, the delay values are for the critical minor approach. For signals, the delay values are the overall delay. Delay is expressed in seconds per vehicle. LOS = Level of the delay values are the overall delay.

The results of the existing conditions analysis for the study indicate that all approaches currently operate at acceptable LOS B or better, during both the AM and PM peaks.

III. Background Traffic Volumes

Background Traffic Volumes - In order to determine the applicable growth rate for the existing traffic volumes too projected build-out, historical traffic count data and population forecasts publish by SEMCOG were referenced. The data indicated that traffic volume in the study area will experience minor growth by 2020. However, the traffic data collected indicated that traffic volumes have remained relatively fixed, during the peak hours since 2010. Based on this data, and since the proposed development is scheduled to open in the 2020 the background without the proposed development is assumed to be equal to existing condition and it was added to the build condition.

IV. Future Site Conditions

This section evaluates the impacts of the proposed project on existing traffic operations in the vicinity of the project site.

Trip Generation - The trip generation rates and volumes used for this analysis were obtained from information published in the Institute of Trip Generation Manual, 10th Edition. This manual is a nationally recognized resource for determining trip generation characteristics for land uses.

For the future analysis, the both the Apartment (220) and Specialty Retail Center (826) were used represents the trip making characteristics of this development. Being conservative, the trips estimated, based on the DU was used for the Apartment (220), the development is estimated to generate 1,124 daily trips and 86 trips in the AM Peak and 105 trips in the PM peak, which is summarized in Table 4. According to the ITE Trip Generation Manual (10th Edition), ITE does not provide data on pass-by trips for this category.

The proposed development will be eliminating several homes/apartments, based on our observation it is assumed that 20% of the existing traffic volumes originates from those homes/apartments, thus a 20% reduction was applied to the future daily trips generated by the proposed development. Resulting in 899 daily trips and 69 trips in the AM Peak and 84 trips in the PM peak.

Table 4: Trip Generation Characteristics

Description/ITE Code	Units	ITE Vehicle Trip Generation Rates								Expected Units	Total Generated Trips			Total Distribution of Generated Trips					
		(peak hours are for peak hour of adjacent street traffic unless highlighted)																	
		Weekday	AM	PM	Pass-By	AM In	AM Out	PM In	PM Out		Daily	AM Hour	PM Hour	AM In	AM Out	Pass-By	PM In	PM Out	Pass-By
Apartment 220																			
Apartment 220	DU	6.65	0.51	0.62		20%	80%	65%	35%	169.0	1,124	86	105	17	69	0	68	37	0
Apartment 220	Persons	3.31	0.28	0.40		NA	NA	NA	NA	183.0	606	51	73	NA	NA	0	NA	NA	0
Apartment 220	Vehicles	5.10	0.46	0.60		NA	NA	NA	NA	175.0	893	81	105	NA	NA	0	NA	NA	0
Specialty Retail Center 826																			
Specialty Retail Center 826 (formerly 814)	KSF ²	44.32	6.84	2.71		48%	52%	44%	56%	1.8	80	12	5	6	6	0	2	3	0

Trip Assignment and Trip Distribution - Traffic expected to be generated by a project must be distributed and assigned to the roadway system so that the impacts of the proposed project on roadway links and intersections within the study area can be analyzed. After an estimate of the total traffic into and out of the site has been made, that traffic must be distributed and assigned to the roadway system. The trip distribution step produces estimates of trip origins and destinations. The assignment step produces estimates of the amount of site traffic that will use certain access routes between their origin and destination.

The vehicle trips that would be generated by the development were assigned to the study road network based on existing peak hour traffic patterns and the methodologies published by ITE. The traffic volumes from the development using these assignment and distribution parameters. The site-generated vehicle trips were assigned to the study road network based on this trip distribution model.

Future Traffic Level of Service Analysis - The results of the Future conditions analysis for the study indicates that all the approaches currently operate at acceptable LOS B or better, during both the AM and PM peak periods. The level of service analysis for the future condition is summarized in Table 5.

Table 5: Future Level of Service (LOS) Summary

ID	Intersection	Traffic Control Method	Movement	Existing Condition					
				AM Peak Hour			PM Peak Hour		
				Veh Delay	Approach LOS	Intersection LOS	Veh Delay	LOS	Intersection LOS
1	S. Main at E. Hoover	Un-signalized	WB	16.9	C	A (2.7)	16.6	B	A (2.6)
			NB	0.0	A		0.0	A	
			SB	2.4	A		0.9	A	
2	E. Hoover at Greene	Un-signalized	WB	1.8	A	A (6.8)	0.7	A	A (7.1)
			EB	1.6	A		1.0	A	
			NB	14.4	B		14.7	B	
			SB	12.5	B		14.0	B	
3	Greene at S. Drive	Un-signalized	EB	9.7	A	A (1.1)	19.4	A	B (12.9)
			NB	7.6	A		12.2	A	
			SB	0.0	A		0.0	A	

Notes: For unsignalized intersections, the delay values are for the critical minor approach. For signals, the delay values are the overall delay. Delay is expressed in seconds per vehicle. LOS = Level of the delay values are the overall delay.

Proposed Site Access - The proposed site layout includes four (3) access drive to the site, two on Greene Street, and one on E. Davis Avenue. The proposed drive on E. Davis Ave. is located approximately 50 feet west of the E. Davis Ave and Greene St. intersection, will serve solely as the exit for Uber/taxi pickups and drop-off. The northly drive on Greene St. is located approximately 50 feet south of the E. Davis Ave and Greene St. intersection, and will serve solely as trash truck pickup and Uber/taxi entrance drive. The south drive on Greene St. is located approximately 25 feet is located mid-block and will be the main entrance for residents and retail customers. The proposed geometry of the drive meets the standards set forth by the City.

All proposed access drives will operate at a level of service of B, during both the AM and PM peak periods.

V. Conclusions & Recommendations

The proposed development will have minimal if any impact on the traffic operations of the key intersection and proposed development driveways. A review of operations for all approaches, using existing and future conditions indicates that all approaches at the intersection and the proposed new access driveway will operate at an acceptable level of service B or better, during both the AM and PM peak periods.

Appendix – Supplemental Information

Vehicle Turning Movement Surveys
LOS Computations (Synchro Printouts)
Crash Data

Your Company Name Here

10722 Corkery Ln
Grand Ledge, MI, 48837
We Are Not Just Engineers

Hoover Ave at Greene Street
Weather: Snow/Cloudy

File Name :

Site Code : 00000000
Start Date : 12/27/2017
Page No : 1

Groups Printed- Class 1

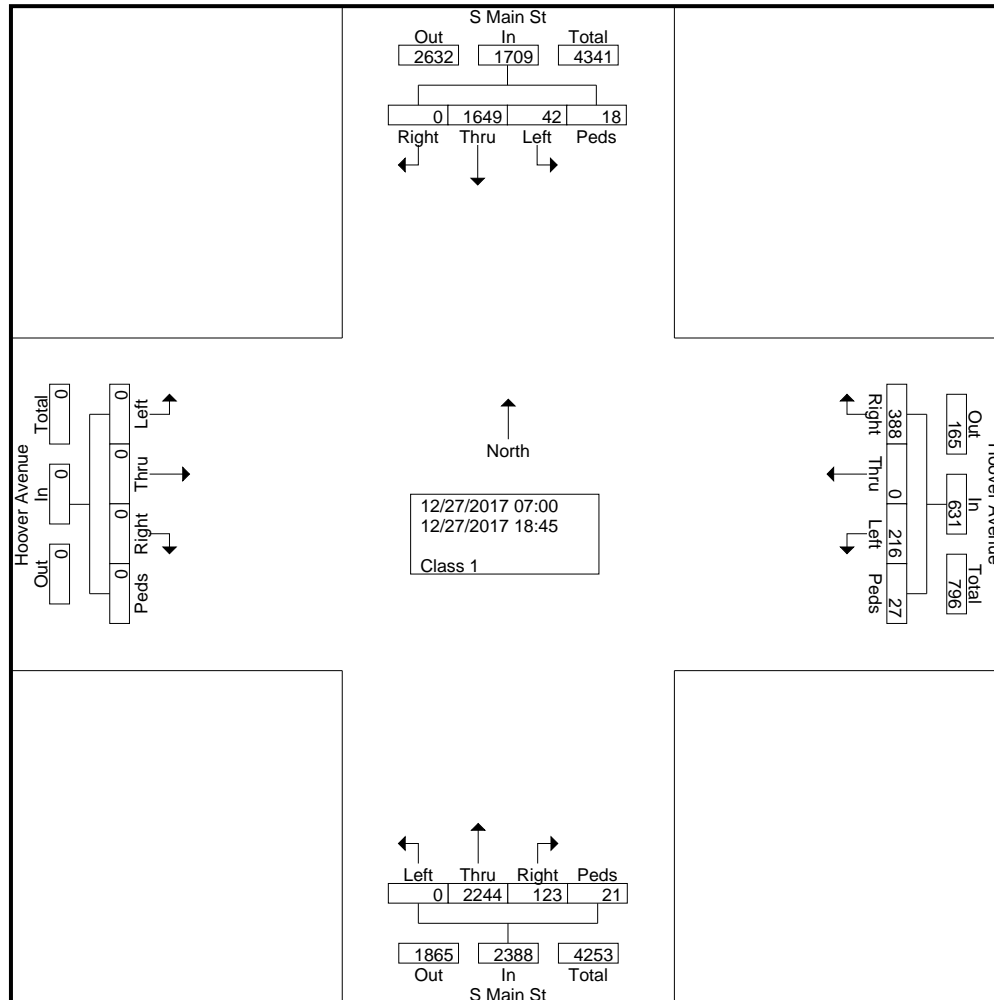
Start Time	S Main St From North					Hoover Avenue From East					S Main St From South					Hoover Avenue From West					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00	3	36	0	1	40	13	0	14	0	27	0	80	9	2	91	0	0	0	0	0	158
07:15	1	63	0	1	65	15	0	17	0	32	0	124	12	2	138	0	0	0	0	0	235
07:30	4	72	0	0	76	15	0	23	1	39	0	167	6	1	174	0	0	0	0	0	289
07:45	6	81	0	3	90	12	0	25	1	38	0	192	6	0	198	0	0	0	0	0	326
Total	14	252	0	5	271	55	0	79	2	136	0	563	33	5	601	0	0	0	0	0	1008
08:00	5	47	0	1	53	12	0	21	2	35	0	169	8	1	178	0	0	0	0	0	266
08:15	1	62	0	1	64	10	0	28	1	39	0	126	11	0	137	0	0	0	0	0	240
08:30	2	68	0	0	70	9	0	31	3	43	0	127	7	1	135	0	0	0	0	0	248
08:45	3	83	0	1	87	11	0	24	3	38	0	91	10	1	102	0	0	0	0	0	227
Total	11	260	0	3	274	42	0	104	9	155	0	513	36	3	552	0	0	0	0	0	981
09:00	1	74	0	1	76	8	0	13	1	22	0	67	8	3	78	0	0	0	0	0	176
*** BREAK ***																					
Total	1	74	0	1	76	8	0	13	1	22	0	67	8	3	78	0	0	0	0	0	176
*** BREAK ***																					
16:00	1	73	0	1	75	14	0	21	1	36	0	93	5	2	100	0	0	0	0	0	211
16:15	2	79	0	2	83	12	0	14	2	28	0	109	7	1	117	0	0	0	0	0	228
16:30	3	100	0	1	104	12	0	30	3	45	0	143	6	0	149	0	0	0	0	0	298
16:45	2	104	0	2	108	14	0	20	2	36	0	123	6	1	130	0	0	0	0	0	274
Total	8	356	0	6	370	52	0	85	8	145	0	468	24	4	496	0	0	0	0	0	1011
17:00	1	76	0	1	78	13	0	21	1	35	0	141	4	1	146	0	0	0	0	0	259
17:15	2	145	0	0	147	10	0	25	2	37	0	120	2	1	123	0	0	0	0	0	307
17:30	1	129	0	0	130	15	0	24	1	40	0	135	7	2	144	0	0	0	0	0	314
17:45	3	171	0	1	175	13	0	22	3	38	0	128	7	1	136	0	0	0	0	0	349
Total	7	521	0	2	530	51	0	92	7	150	0	524	20	5	549	0	0	0	0	0	1229
18:00	1	186	0	1	188	8	0	15	0	23	0	109	2	1	112	0	0	0	0	0	323
*** BREAK ***																					
Total	1	186	0	1	188	8	0	15	0	23	0	109	2	1	112	0	0	0	0	0	323
Grand Total	42	1649	0	18	1709	216	0	388	27	631	0	2244	123	21	2388	0	0	0	0	0	4728
Apprch %	2.5	96.5	0	1.1		34.2	0	61.5	4.3		0	94	5.2	0.9		0	0	0	0		
Total %	0.9	34.9	0	0.4	36.1	4.6	0	8.2	0.6	13.3	0	47.5	2.6	0.4	50.5	0	0	0	0	0	

10722 Corkery Ln
Grand Ledge, MI, 48837
We Are Not Just Engineers

Main@Hoover

File Name :

Site Code : 00000000
Start Date : 12/27/2017
Page No : 2



	S Main St From North					Hoover Avenue From East					S Main St From South					Hoover Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 09:00 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30																					
07:30	4	72	0	0	76	15	0	23	1	39	0	167	6	1	174	0	0	0	0	0	289
07:45	6	81	0	3	90	12	0	25	1	38	0	192	6	0	198	0	0	0	0	0	326
08:00	5	47	0	1	53	12	0	21	2	35	0	169	8	1	178	0	0	0	0	0	266
08:15	1	62	0	1	64	10	0	28	1	39	0	126	11	0	137	0	0	0	0	0	240
Total Volume	16	262	0	5	283	49	0	97	5	151	0	654	31	2	687	0	0	0	0	0	1121
% App. Total	5.7	92.6	0	1.8		32.5	0	64.2	3.3		0	95.2	4.5	0.3		0	0	0	0	0	
PHF	.667	.809	.000	.417	.786	.817	.000	.866	.625	.968	.000	.852	.705	.500	.867	.000	.000	.000	.000	.000	.860

Your Company Name Here

10722 Corkery Ln
Grand Ledge, MI, 48837
We Are Not Just Engineers

File Name :

Main@Hoover

Site Code : 00000000
Start Date : 12/27/2017
Page No : 3

	S Main St From North					Hoover Avenue From East					S Main St From South					Hoover Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total

Peak Hour Analysis From 07:00 to 09:00 - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	08:15					07:45					07:15					07:00					
+0 mins.	1	62	0	1	64	12	0	25	1	38	0	124	12	2	138	0	0	0	0	0	
+15 mins.	2	68	0	0	70	12	0	21	2	35	0	167	6	1	174	0	0	0	0	0	
+30 mins.	3	83	0	1	87	10	0	28	1	39	0	192	6	0	198	0	0	0	0	0	
+45 mins.	1	74	0	1	76	9	0	31	3	43	0	169	8	1	178	0	0	0	0	0	
Total Volume	7	287	0	3	297	43	0	105	7	155	0	652	32	4	688	0	0	0	0	0	
% App. Total	2.4	96.6	0	1		27.7	0	67.7	4.5		0	94.8	4.7	0.6		0	0	0	0		
PHF	.583	.864	.000	.750	.853	.896	.000	.847	.583	.901	.000	.849	.667	.500	.869	.000	.000	.000	.000	.000	

Peak Hour Analysis From 16:00 to 18:00 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 17:15

	17:15					17:30					17:45					18:00					
17:15	2	145	0	0	147	10	0	25	2	37	0	120	2	1	123	0	0	0	0	0	307
17:30	1	129	0	0	130	15	0	24	1	40	0	135	7	2	144	0	0	0	0	0	314
17:45	3	171	0	1	175	13	0	22	3	38	0	128	7	1	136	0	0	0	0	0	349
18:00	1	186	0	1	188	8	0	15	0	23	0	109	2	1	112	0	0	0	0	0	323
Total Volume	7	631	0	2	640	46	0	86	6	138	0	492	18	5	515	0	0	0	0	0	1293
% App. Total	1.1	98.6	0	0.3		33.3	0	62.3	4.3		0	95.5	3.5	1		0	0	0	0		
PHF	.583	.848	.000	.500	.851	.767	.000	.860	.500	.863	.000	.911	.643	.625	.894	.000	.000	.000	.000	.000	.926

Peak Hour Analysis From 16:00 to 18:00 - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	17:15					16:30					17:00					16:00					
+0 mins.	2	145	0	0	147	12	0	30	3	45	0	141	4	1	146	0	0	0	0	0	
+15 mins.	1	129	0	0	130	14	0	20	2	36	0	120	2	1	123	0	0	0	0	0	
+30 mins.	3	171	0	1	175	13	0	21	1	35	0	135	7	2	144	0	0	0	0	0	
+45 mins.	1	186	0	1	188	10	0	25	2	37	0	128	7	1	136	0	0	0	0	0	
Total Volume	7	631	0	2	640	49	0	96	8	153	0	524	20	5	549	0	0	0	0	0	
% App. Total	1.1	98.6	0	0.3		32	0	62.7	5.2		0	95.4	3.6	0.9		0	0	0	0		
PHF	.583	.848	.000	.500	.851	.875	.000	.800	.667	.850	.000	.929	.714	.625	.940	.000	.000	.000	.000	.000	

Your Company Name Here

10722 Corkery Ln
Grand Ledge, MI, 48837
We Are Not Just Engineers

Hoover Ave at Greene Street
Weather - Snow/Cloudy

File Name : greene@hoover
Site Code : 00000000
Start Date : 12/27/2017
Page No : 1

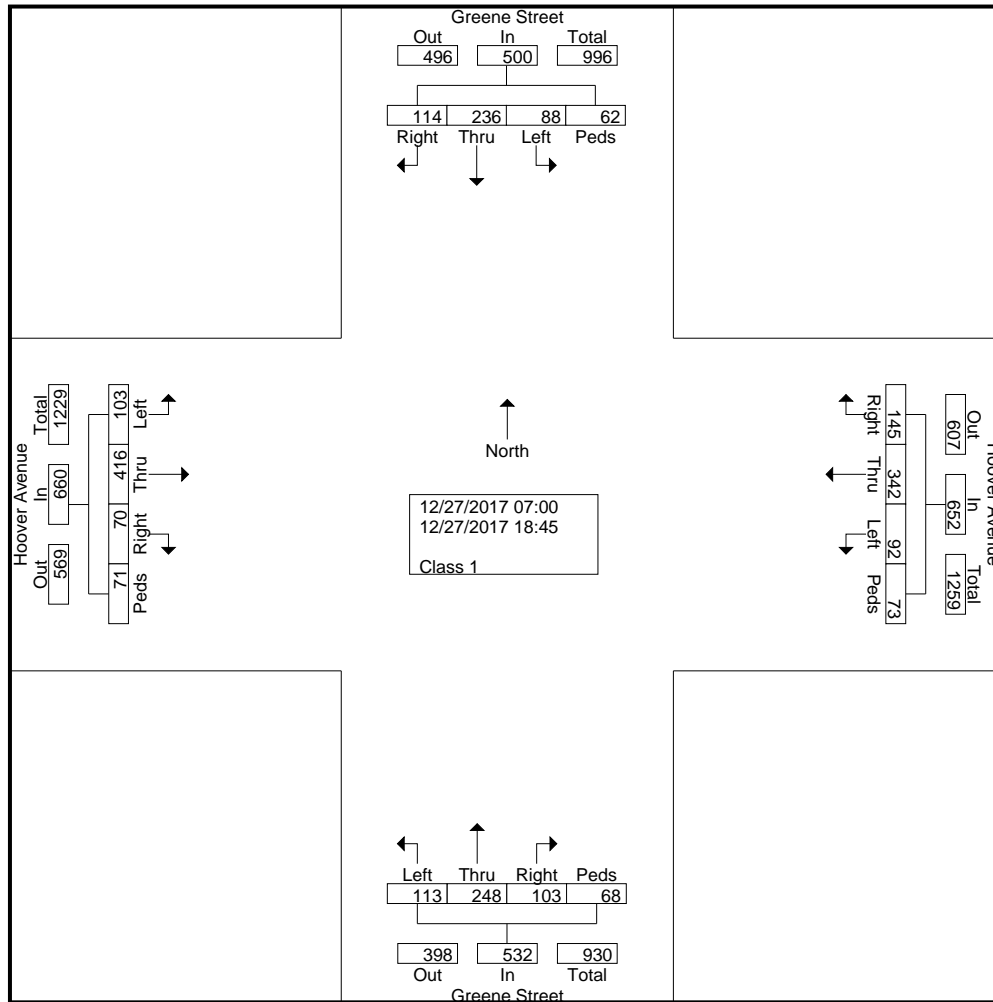
Groups Printed- Class 1

Start Time	Greene Street From North					Hoover Avenue From East					Greene Street From South					Hoover Avenue From West					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00	2	7	6	5	20	7	16	7	3	33	5	12	3	3	23	7	22	1	5	35	111
07:15	3	10	5	6	24	8	20	10	5	43	7	19	7	4	37	9	29	3	5	46	150
07:30	5	13	7	3	28	8	21	13	5	47	10	11	9	3	33	7	21	4	4	36	144
07:45	2	18	8	5	33	11	19	8	6	44	10	12	5	4	31	8	22	3	5	38	146
Total	12	48	26	19	105	34	76	38	19	167	32	54	24	14	124	31	94	11	19	155	551
*** BREAK ***																					
08:00	3	10	5	3	21	8	20	10	6	44	8	13	4	4	29	6	33	3	5	47	141
08:15	5	16	7	5	33	6	23	6	8	43	8	11	6	5	30	8	21	1	6	36	142
08:30	4	16	6	3	29	6	26	6	6	44	7	13	9	6	35	6	25	5	7	43	151
08:45	5	12	8	3	28	7	20	12	7	46	6	23	5	4	38	5	23	1	4	33	145
Total	17	54	26	14	111	27	89	34	27	177	29	60	24	19	132	25	102	10	22	159	579
*** BREAK ***																					
16:00	8	11	10	3	32	4	25	11	4	44	7	9	6	2	24	6	31	5	4	46	146
16:15	11	16	7	3	37	5	25	13	5	48	5	15	5	4	29	3	22	3	3	31	145
16:30	9	12	11	5	37	3	24	8	4	39	7	20	12	4	43	4	24	8	4	40	159
16:45	5	15	5	4	29	4	21	8	6	39	7	23	8	5	43	3	27	9	4	43	154
Total	33	54	33	15	135	16	95	40	19	170	26	67	31	15	139	16	104	25	15	160	604
*** BREAK ***																					
17:00	6	20	9	5	40	3	16	11	3	33	7	15	5	5	32	4	34	5	5	48	153
17:15	6	23	8	6	43	4	18	6	2	30	7	14	9	4	34	9	41	5	4	59	166
17:30	10	21	6	3	40	5	25	9	2	41	7	22	6	6	41	10	27	8	4	49	171
17:45	4	16	6	0	26	3	23	7	1	34	5	16	4	5	30	8	14	6	2	30	120
Total	26	80	29	14	149	15	82	33	8	138	26	67	24	20	137	31	116	24	15	186	610
*** BREAK ***																					
Grand Total	88	236	114	62	500	92	342	145	73	652	113	248	103	68	532	103	416	70	71	660	2344
Apprch %	17.6	47.2	22.8	12.4		14.1	52.5	22.2	11.2		21.2	46.6	19.4	12.8		15.6	63	10.6	10.8		
Total %	3.8	10.1	4.9	2.6	21.3	3.9	14.6	6.2	3.1	27.8	4.8	10.6	4.4	2.9	22.7	4.4	17.7	3	3	28.2	

Your Company Name Here

10722 Corkery Ln
Grand Ledge, MI, 48837
We Are Not Just Engineers

File Name : greene@hoover
Site Code : 00000000
Start Date : 12/27/2017
Page No : 2



	Greene Street From North					Hoover Avenue From East					Greene Street From South					Hoover Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 to 09:00 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15																					
07:15	3	10	5	6	24	8	20	10	5	43	7	19	7	4	37	9	29	3	5	46	150
07:30	5	13	7	3	28	8	21	13	5	47	10	11	9	3	33	7	21	4	4	36	144
07:45	2	18	8	5	33	11	19	8	6	44	10	12	5	4	31	8	22	3	5	38	146
08:00	3	10	5	3	21	8	20	10	6	44	8	13	4	4	29	6	33	3	5	47	141
Total Volume	13	51	25	17	106	35	80	41	22	178	35	55	25	15	130	30	105	13	19	167	581
% App. Total	12.3	48.1	23.6	16		19.7	44.9	23	12.4		26.9	42.3	19.2	11.5		18	62.9	7.8	11.4		
PHF	.650	.708	.781	.708	.803	.795	.952	.788	.917	.947	.875	.724	.694	.938	.878	.833	.795	.813	.950	.888	.968

Your Company Name Here

10722 Corkery Ln
Grand Ledge, MI, 48837

We Are Not Just Engineers

File Name : greene@hoover

Site Code : 00000000

Start Date : 12/27/2017

Page No : 3

	Greene Street From North					Hoover Avenue From East					Greene Street From South					Hoover Avenue From West					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total

Peak Hour Analysis From 07:00 to 09:00 - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:45					07:15					08:00					07:15				
+0 mins.	2	18	8	5	33	8	20	10	5	43	8	13	4	4	29	9	29	3	5	46
+15 mins.	3	10	5	3	21	8	21	13	5	47	8	11	6	5	30	7	21	4	4	36
+30 mins.	5	16	7	5	33	11	19	8	6	44	7	13	9	6	35	8	22	3	5	38
+45 mins.	4	16	6	3	29	8	20	10	6	44	6	23	5	4	38	6	33	3	5	47
Total Volume	14	60	26	16	116	35	80	41	22	178	29	60	24	19	132	30	105	13	19	167
% App. Total	12.1	51.7	22.4	13.8		19.7	44.9	23	12.4		22	45.5	18.2	14.4		18	62.9	7.8	11.4	
PHF	.700	.833	.813	.800	.879	.795	.952	.788	.917	.947	.906	.652	.667	.792	.868	.833	.795	.813	.950	.888

Peak Hour Analysis From 16:00 to 18:00 - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 16:45

	16:45					16:00					16:30					16:45					
16:45	5	15	5	4	29	4	21	8	6	39	7	23	8	5	43	3	27	9	4	43	154
17:00	6	20	9	5	40	3	16	11	3	33	7	15	5	5	32	4	34	5	5	48	153
17:15	6	23	8	6	43	4	18	6	2	30	7	14	9	4	34	9	41	5	4	59	166
17:30	10	21	6	3	40	5	25	9	2	41	7	22	6	6	41	10	27	8	4	49	171
Total Volume	27	79	28	18	152	16	80	34	13	143	28	74	28	20	150	26	129	27	17	199	644
% App. Total	17.8	52	18.4	11.8		11.2	55.9	23.8	9.1		18.7	49.3	18.7	13.3		13.1	64.8	13.6	8.5		
PHF	.675	.859	.778	.750	.884	.800	.800	.773	.542	.872	1.000	.804	.778	.833	.872	.650	.787	.750	.850	.843	.942

Peak Hour Analysis From 16:00 to 18:00 - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	16:45					16:00					16:30					16:45				
+0 mins.	5	15	5	4	29	4	25	11	4	44	7	20	12	4	43	3	27	9	4	43
+15 mins.	6	20	9	5	40	5	25	13	5	48	7	23	8	5	43	4	34	5	5	48
+30 mins.	6	23	8	6	43	3	24	8	4	39	7	15	5	5	32	9	41	5	4	59
+45 mins.	10	21	6	3	40	4	21	8	6	39	7	14	9	4	34	10	27	8	4	49
Total Volume	27	79	28	18	152	16	95	40	19	170	28	72	34	18	152	26	129	27	17	199
% App. Total	17.8	52	18.4	11.8		9.4	55.9	23.5	11.2		18.4	47.4	22.4	11.8		13.1	64.8	13.6	8.5	
PHF	.675	.859	.778	.750	.884	.800	.950	.769	.792	.885	1.000	.783	.708	.900	.884	.650	.787	.750	.850	.843

Crash and Road Data

Intersection

Main St S - Hoover Ave E

Main St S - 4603186 Mile 0.852

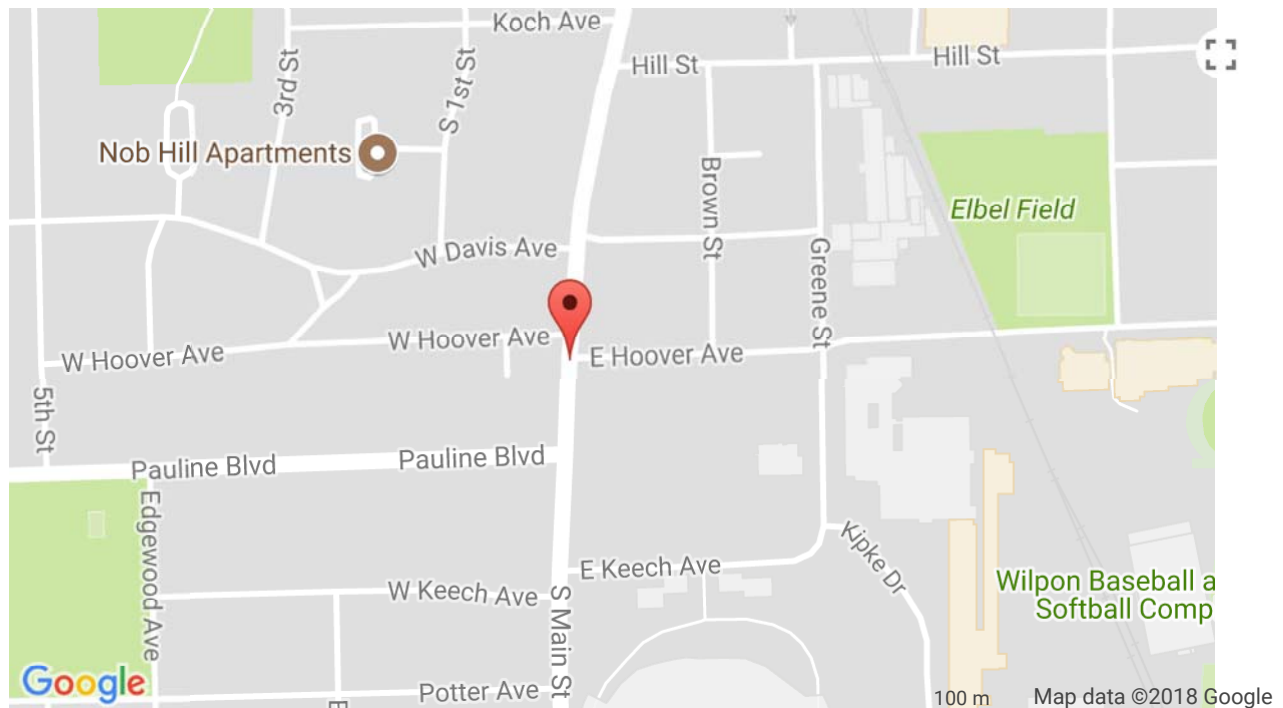
At: Hoover Ave E (1430605 Mile 0.000)

Point ID: 81023601

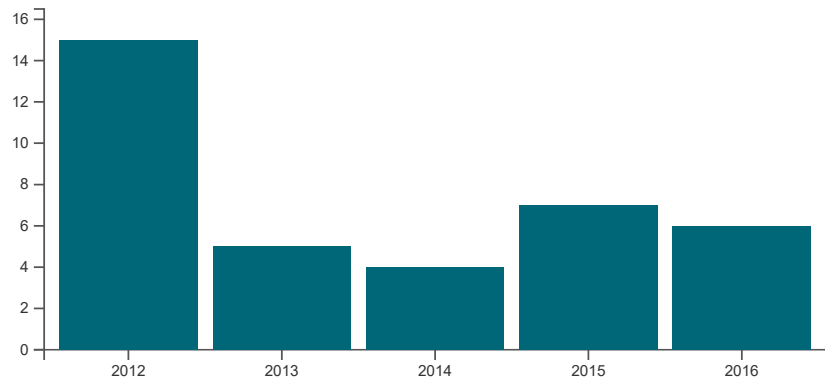
Includes crashes within 250 feet of intersection

VIEW DETAIL CRASH LIST

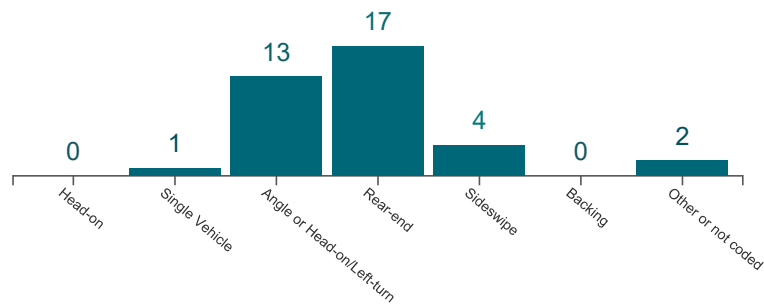
Street View



Crashes, 2012-2016



Crashes by Type, 2012-2016



Crash Type

Crash Type	2012	2013	2014	2015	2016	Percent of Crashes
Head On	0	0	0	0	0	0.0%
Single Vehicle	0	0	0	1	0	2.7%
Angle	5	2	1	3	2	35.1%
Total Crashes	15	5	4	7	6	100.0%

Crash Type	2012	2013	2014	2015	2016	Percent of Crashes
Head On/Left Turn	0	0	0	0	0	0.0%
Rear End	8	2	1	3	3	45.9%
Read End Left	0	0	0	0	0	0.0%
Rear End Right	0	0	0	0	0	0.0%
Sideswipe Opposite	0	0	0	0	0	0.0%
Sideswipe Same	1	1	1	0	1	10.8%
Backing	0	0	0	0	0	0.0%
Other/Unknown	1	0	1	0	0	5.4%
Total Crashes	15	5	4	7	6	100.0%

Crash Severity

Crash Severity	2012	2013	2014	2015	2016	Percent of Crashes
Fatal	0	0	0	0	0	0.0%
Serious Injury	0	0	0	0	0	0.0%
Other Injury	2	1	1	1	1	16.2%
Property Damage Only	13	4	3	6	5	83.8%
Total Crashes	15	5	4	7	6	100.0%

Crash by Involvement

Crash by Involvement	2012	2013	2014	2015	2016	Percent of Crashes
Red-light Running	0	0	0	0	0	0.0%
Lane Departure	0	0	0	0	0	0.0%
Alcohol	0	0	0	0	0	0.0%

Crash by Involvement	2012	2013	2014	2015	2016	Percent of Crashes
Drugs	0	0	0	0	0	0.0%
Deer	0	0	0	0	0	0.0%
Train	0	0	0	0	0	0.0%
Commercial Truck/Bus	1	0	0	0	0	2.7%
School Bus	0	0	0	0	0	0.0%
Emergency Vehicle	0	0	0	0	0	0.0%
Motorcycle	0	0	0	0	0	0.0%
Intersection	8	2	1	2	3	43.2%
Work Zone	0	0	0	0	0	0.0%
Pedestrian	0	0	1	1	0	5.4%
Bicyclist	1	0	0	0	0	2.7%
Distracted Driver	0	0	0	0	0	0.0%
Older Driver (65 and older)	2	1	1	0	0	10.8%
Young Driver (16 to 24)	10	4	1	4	5	64.9%

Crash and Road Data

Intersection

Hoover Ave E - Greene St

Hoover Ave E - 1430605 Mile 0.142

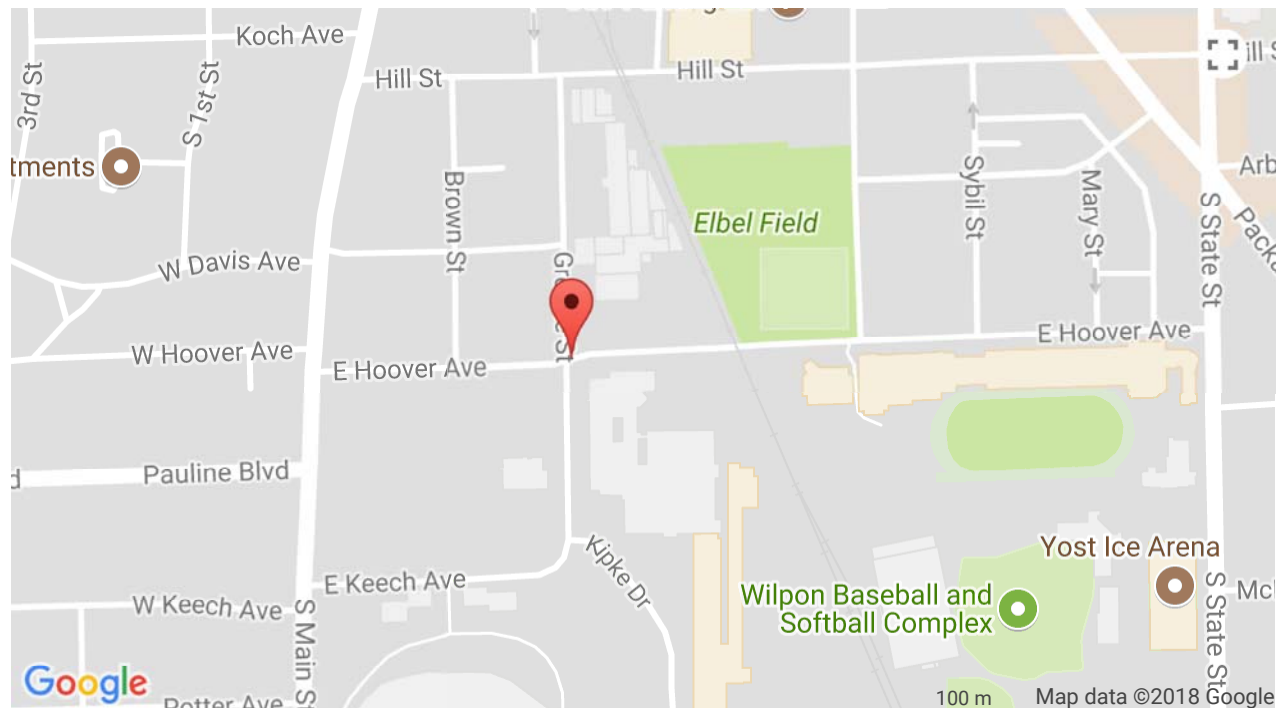
At: Greene St (1430603 Mile 0.256)

Point ID: 81011243

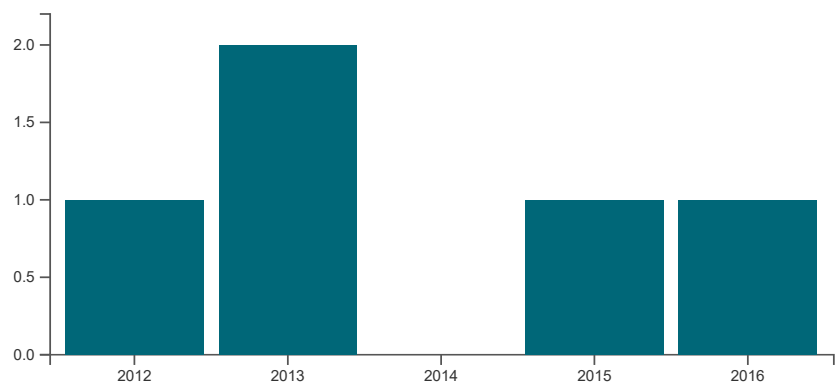
Includes crashes within 250 feet of intersection

VIEW DETAIL CRASH LIST

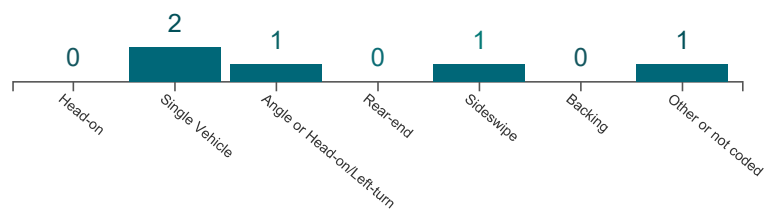
Street View



Crashes, 2012-2016



Crashes by Type, 2012-2016



Crash Type

Crash Type	2012	2013	2014	2015	2016	Percent of Crashes
Head On	0	0	0	0	0	0.0%
Single Vehicle	0	1	0	0	1	40.0%
Angle	0	1	0	0	0	20.0%
Total Crashes	1	2	0	1	1	100.0%

Crash Type	2012	2013	2014	2015	2016	Percent of Crashes
Head On/Left Turn	0	0	0	0	0	0.0%
Rear End	0	0	0	0	0	0.0%
Read End Left	0	0	0	0	0	0.0%
Rear End Right	0	0	0	0	0	0.0%
Sideswipe Opposite	0	0	0	0	0	0.0%
Sideswipe Same	0	0	0	1	0	20.0%
Backing	0	0	0	0	0	0.0%
Other/Unknown	1	0	0	0	0	20.0%
Total Crashes	1	2	0	1	1	100.0%

Crash Severity

Crash Severity	2012	2013	2014	2015	2016	Percent of Crashes
Fatal	0	0	0	0	0	0.0%
Serious Injury	0	0	0	0	0	0.0%
Other Injury	0	1	0	0	0	20.0%
Property Damage Only	1	1	0	1	1	80.0%
Total Crashes	1	2	0	1	1	100.0%

Crash by Involvement

Crash by Involvement	2012	2013	2014	2015	2016	Percent of Crashes
Red-light Running	0	0	0	0	0	0.0%
Lane Departure	0	0	0	0	0	0.0%
Alcohol	0	0	0	0	1	20.0%

Crash by Involvement	2012	2013	2014	2015	2016	Percent of Crashes
Drugs	0	0	0	0	0	0.0%
Deer	0	0	0	0	0	0.0%
Train	0	0	0	0	0	0.0%
Commercial Truck/Bus	0	0	0	0	0	0.0%
School Bus	0	0	0	0	0	0.0%
Emergency Vehicle	0	0	0	0	0	0.0%
Motorcycle	0	0	0	0	0	0.0%
Intersection	0	1	0	0	1	40.0%
Work Zone	0	0	0	0	0	0.0%
Pedestrian	0	1	0	0	0	20.0%
Bicyclist	0	0	0	0	0	0.0%
Distracted Driver	0	0	0	0	0	0.0%
Older Driver (65 and older)	0	0	0	1	0	20.0%
Young Driver (16 to 24)	0	0	0	0	0	0.0%

Crash and Road Data

Intersection

Hoover Ave E - Brown St

Hoover Ave E - 1430605 Mile 0.080

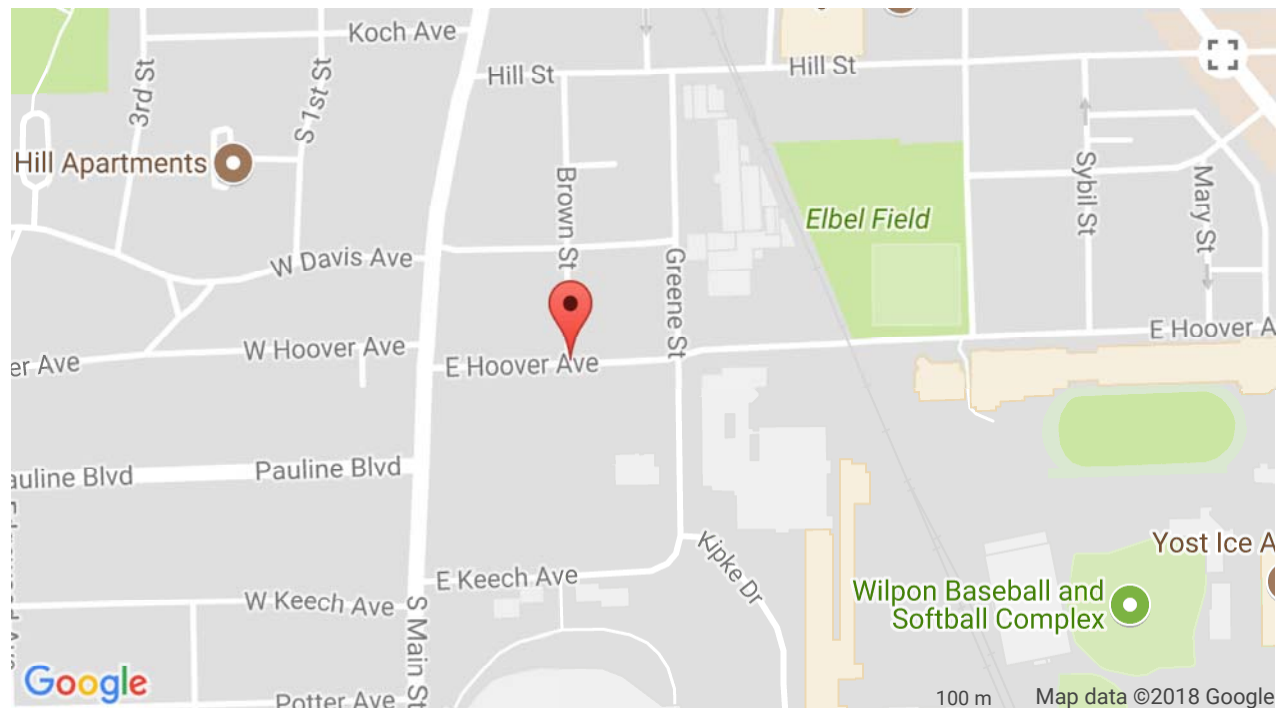
At: Brown St (1446406 Mile 0.000)

Point ID: 81011249

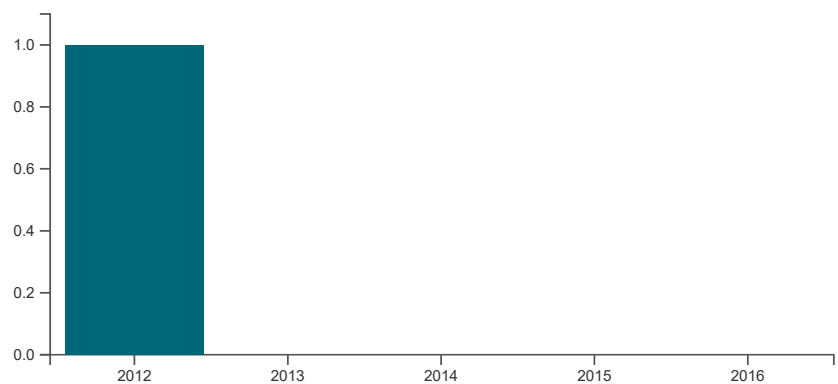
Includes crashes within 250 feet of intersection

VIEW DETAIL CRASH LIST

Street View



Crashes, 2012-2016



Crashes by Type, 2012-2016



Crash Type

Crash Type	2012	2013	2014	2015	2016	Percent of Crashes
Head On	0	0	0	0	0	0.0%
Single Vehicle	0	0	0	0	0	0.0%
Angle	1	0	0	0	0	100.0%
Total Crashes	1	0	0	0	0	100.0%

Crash Type	2012	2013	2014	2015	2016	Percent of Crashes
Head On/Left Turn	0	0	0	0	0	0.0%
Rear End	0	0	0	0	0	0.0%
Read End Left	0	0	0	0	0	0.0%
Rear End Right	0	0	0	0	0	0.0%
Sideswipe Opposite	0	0	0	0	0	0.0%
Sideswipe Same	0	0	0	0	0	0.0%
Backing	0	0	0	0	0	0.0%
Other/Unknown	0	0	0	0	0	0.0%
Total Crashes	1	0	0	0	0	100.0%





Crash Severity

Crash Severity	2012	2013	2014	2015	2016	Percent of Crashes
Fatal	0	0	0	0	0	0.0%
Serious Injury	0	0	0	0	0	0.0%
Other Injury	0	0	0	0	0	0.0%
Property Damage Only	1	0	0	0	0	100.0%
Total Crashes	1	0	0	0	0	100.0%

Crash by Involvement

Crash by Involvement	2012	2013	2014	2015	2016	Percent of Crashes
Red-light Running	0	0	0	0	0	0.0%
Lane Departure	0	0	0	0	0	0.0%
Alcohol	0	0	0	0	0	0.0%

Crash by Involvement	2012	2013	2014	2015	2016	Percent of Crashes
Drugs	0	0	0	0	0	0.0%
Deer	0	0	0	0	0	0.0%
Train	0	0	0	0	0	0.0%
Commercial Truck/Bus	0	0	0	0	0	0.0%
School Bus	0	0	0	0	0	0.0%
Emergency Vehicle	0	0	0	0	0	0.0%
Motorcycle	0	0	0	0	0	0.0%
Intersection	1	0	0	0	0	100.0%
Work Zone	0	0	0	0	0	0.0%
Pedestrian	0	0	0	0	0	0.0%
Bicyclist	0	0	0	0	0	0.0%
Distracted Driver	0	0	0	0	0	0.0%
Older Driver (65 and older)	0	0	0	0	0	0.0%
Young Driver (16 to 24)	0	0	0	0	0	0.0%

Intersection						
Int Delay, s/veh	2.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	49	97	654	81	36	262
Future Vol, veh/h	49	97	654	81	36	262
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	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	53	105	711	88	39	285




Approach	WB	NB	SB
HCM Control Delay, s	16.5	0	1.3
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	- 234 600	819	-
HCM Lane V/C Ratio	-	- 0.228 0.176	0.048	-
HCM Control Delay (s)	-	- 24.9 12.3	9.6	0.2
HCM Lane LOS	-	- C B	A	A
HCM 95th %tile Q(veh)	-	- 0.9 0.6	0.1	-

Intersection												
Int Delay, s/veh	6.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕		↕			↕	
Traffic Vol, veh/h	30	105	19	35	80	41	35	55	25	13	51	25
Future Vol, veh/h	30	105	19	35	80	41	35	55	25	13	51	25
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
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	33	114	21	38	87	45	38	60	27	14	55	27

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.5	1.7	13.5	12.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	550	1453	-	-	1449	-	-	600
HCM Lane V/C Ratio	0.227	0.022	-	-	0.026	-	-	0.161
HCM Control Delay (s)	13.5	7.5	0	-	7.6	0	-	12.2
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.9	0.1	-	-	0.1	-	-	0.6

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	18	6	120	71	5
Future Vol, veh/h	7	18	6	120	71	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	8	20	7	130	77	5

Approach	EB	NB	SB
HCM Control Delay, s	9.1	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1515	-	907	-	-
HCM Lane V/C Ratio	0.004	-	0.03	-	-
HCM Control Delay (s)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection												
Int Delay, s/veh	6.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	25	2	0	14	0	2	3	1	1	11	4
Future Vol, veh/h	0	25	2	0	14	0	2	3	1	1	11	4
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	0	27	2	0	15	0	2	3	1	1	12	4





Approach	EB	WB	NB	SB
HCM Control Delay, s	9.2	9.2	2.4	0.5
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1602	-	-	879 865	1618	-	-
HCM Lane V/C Ratio	0.001	-	-	0.033 0.018	0.001	-	-
HCM Control Delay (s)	7.2	0	-	9.2 9.2	7.2	0	-
HCM Lane LOS	A	A	-	A A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1 0.1	0	-	-

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	97	10	15	123	2	8	3	5	20	5	12
Future Vol, veh/h	5	97	10	15	123	2	8	3	5	20	5	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	105	11	16	134	2	9	3	5	22	5	13

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.3	0.8	10.3	10.4
HCM LOS			B	B




Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	700	1448	-	-	1473	-	-	707
HCM Lane V/C Ratio	0.025	0.004	-	-	0.011	-	-	0.057
HCM Control Delay (s)	10.3	7.5	0	-	7.5	0	-	10.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.2

Intersection						
Int Delay, s/veh	2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	43	105	492	48	37	631
Future Vol, veh/h	43	105	492	48	37	631
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	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	47	114	535	52	40	686
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	984	294	0	0	587	0
Stage 1	561	-	-	-	-	-
Stage 2	423	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	246	702	-	-	984	-
Stage 1	535	-	-	-	-	-
Stage 2	629	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	230	702	-	-	984	-
Mov Cap-2 Maneuver	230	-	-	-	-	-
Stage 1	500	-	-	-	-	-
Stage 2	629	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	15	0		0.8		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	230	702	984	-
HCM Lane V/C Ratio	-	-	0.203	0.163	0.041	-
HCM Control Delay (s)	-	-	24.6	11.1	8.8	0.3
HCM Lane LOS	-	-	C	B	A	A
HCM 95th %tile Q(veh)	-	-	0.7	0.6	0.1	-

Intersection												
Int Delay, s/veh	6.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕		↕			↕	
Traffic Vol, veh/h	26	129	27	16	80	34	28	74	28	27	79	28
Future Vol, veh/h	26	129	27	16	80	34	28	74	28	27	79	28
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
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	28	140	29	17	87	37	30	80	30	29	86	30

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0.9	13.4	13.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	568	1463	-	-	1409	-	-	590
HCM Lane V/C Ratio	0.249	0.019	-	-	0.012	-	-	0.247
HCM Control Delay (s)	13.4	7.5	0	-	7.6	0	-	13.1
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1	0.1	-	-	0	-	-	1

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	12	8	126	122	5
Future Vol, veh/h	7	12	8	126	122	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	8	13	9	137	133	5

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1446	-	818	-	-
HCM Lane V/C Ratio	0.006	-	0.025	-	-
HCM Control Delay (s)	7.5	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection												
Int Delay, s/veh	5.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	19	2	0	13	0	3	5	1	1	11	4
Future Vol, veh/h	0	19	2	0	13	0	3	5	1	1	11	4
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	0	21	2	0	14	0	3	5	1	1	12	4

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.2	9.3	2.4	0.5
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1602	-	-	878 860	1615	-	-
HCM Lane V/C Ratio	0.002	-	-	0.026 0.016	0.001	-	-
HCM Control Delay (s)	7.3	0	-	9.2 9.3	7.2	0	-
HCM Lane LOS	A	A	-	A A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1 0.1	0	-	-





Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	76	1	1	120	5	24	6	55	4	5	4
Future Vol, veh/h	8	76	1	1	120	5	24	6	55	4	5	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	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	9	83	1	1	130	5	26	7	60	4	5	4

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.1	9.7	10.2
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	852	1449	-	-	1513	-	-	711
HCM Lane V/C Ratio	0.108	0.006	-	-	0.001	-	-	0.02
HCM Control Delay (s)	9.7	7.5	0	-	7.4	0	-	10.2
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.1

Intersection

Int Delay, s/veh 2.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	49	97	654	81	36	262
Future Vol, veh/h	58	110	654	89	44	267
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	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	65	130	711	97	46	285




Approach	WB	NB	SB
HCM Control Delay, s	16.9	0	2.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	- 229 596	813	-
HCM Lane V/C Ratio	-	- 0.29 0.221	0.053	-
HCM Control Delay (s)	-	- 25.2 12.3	10.7	0.2
HCM Lane LOS	-	- D B	B	A
HCM 95th %tile Q(veh)	-	- 1.1 0.8	0.3	-

Intersection												
Int Delay, s/veh	6.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕		↕			↕	
Traffic Vol, veh/h	30	105	19	35	80	41	35	55	25	13	51	25
Future Vol, veh/h	42	112	20	35	82	44	36	58	25	14	58	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
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	39	122	22	38	89	48	39	63	27	17	65	47




Approach	EB	WB	NB	SB
HCM Control Delay, s	1.8	1.6	14.4	12.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	511	1447	-	-	1441	-	-	622
HCM Lane V/C Ratio	0.29	0.027	-	-	0.026	-	-	0.213
HCM Control Delay (s)	14.6	7.8	0	-	7.6	0	-	12.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1	0.1	-	-	0.1	-	-	0.8

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	18	6	120	71	5
Future Vol, veh/h	7	19	4	137	75	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	8	19	7	148	82	5

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1505	-	901	-	-
HCM Lane V/C Ratio	0.005	-	0.032	-	-
HCM Control Delay (s)	7.1	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-





Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	120	89	0
Future Vol, veh/h	17	52	12	124	85	6
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	19	59	5	135	89	3

Approach	EB	NB	SB
HCM Control Delay, s	24.4	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1474	-	837	-	-
HCM Lane V/C Ratio	0.023	-	0.083	-	-
HCM Control Delay (s)	8.2	0	24.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Intersection

Int Delay, s/veh 2.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	43	105	492	48	37	631
Future Vol, veh/h	48	105	492	62	45	631
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	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	52	114	535	66	49	686

Approach	WB	NB	SB
HCM Control Delay, s	16.3	0	0.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT
Capacity (veh/h)	-	- 218 696	973	-
HCM Lane V/C Ratio	-	- 0.234 0.183	0.05	-
HCM Control Delay (s)	-	- 26.6 12.5	8.9	0.3
HCM Lane LOS	-	- D B	A	A
HCM 95th %tile Q(veh)	-	- 0.9 0.7	0.2	-




Intersection												
Int Delay, s/veh	7.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕		↕			↕	
Traffic Vol, veh/h	26	129	27	16	80	34	28	74	28	27	79	28
Future Vol, veh/h	24	133	28	16	85	50	30	88	28	33	85	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	-	-	-	-	-	-
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	28	145	30	17	92	43	33	97	30	33	92	39

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.0	0.7	14.7	14
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	529	1449	-	-	1401	-	-	564
HCM Lane V/C Ratio	0.302	0.027	-	-	0.012	-	-	0.291
HCM Control Delay (s)	14.7	7.5	0	-	7.5	0	-	14
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	1.0	0.1	-	-	0	-	-	1.2

Intersection

Int Delay, s/veh 1.1




Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	12	8	126	122	5
Future Vol, veh/h	7	17	12	138	137	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	8	18	16	145	149	5

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1425	-	808	-	-
HCM Lane V/C Ratio	0.011	-	0.032	-	-
HCM Control Delay (s)	7.5	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-




Intersection

Int Delay, s/veh 12.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	134	134	0
Future Vol, veh/h	16	24	40	122	128	26
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	18	28	44	126	135	28

Approach	EB	NB	SB
HCM Control Delay, s	19.4	12..2	0
HCM LOS	B	B	

Minor Lane/Major Mvmt	NBL	NBT EBLn1	SBT	SBR
Capacity (veh/h)	1411	-	775	-
HCM Lane V/C Ratio	0.009	-	0.015	-
HCM Control Delay (s)	12.2	0	19.4	-
HCM Lane LOS	B	A	B	-
HCM 95th %tile Q(veh)	0	-	0	-

Intersection						
Int Delay, s/veh	4.0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	134	134	0
Future Vol, veh/h	2	4	0	138	137	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	2	5	13	138	139	10

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT EBLn1	SBT	SBR
Capacity (veh/h)	1409	- 776	-	-
HCM Lane V/C Ratio	0.009	- 0.015	-	-
HCM Control Delay (s)	7.6	0 9.7	-	-
HCM Lane LOS	A	A A	-	-
HCM 95th %tile Q(veh)	0	- 0	-	-