

TRAFFIC IMPACT STUDY

For

Meadoworks Filings 1-4 Development Plan Colorado Springs, Colorado

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I. Introduction

Project Overview

This traffic impact study addresses the capacity, geometric, and control requirements associated with the development entitled Meadowworks Filings 1-4 Development Plan (DP).

This traffic impact study has been revised to address City Staff review comments made to the January 2022 version of the traffic impact study regarding discussion of required roadway improvements.

This proposed residential development consists of a single-family detached subdivision. The development is located near the southeast corner of S Marksheffel Boulevard and Drennan Road in Colorado Springs, Colorado.

Study Area Boundaries

The study area to be examined in this analysis encompasses the intersections of Drennan Road with S Marksheffel Boulevard and Horizonview Drive, as well as the intersections of Horizonview Drive with Bradley Road and proposed site accesses.

Figure 1 illustrates location of the site and study intersections.

Site Description

Land for the development is currently vacant and surrounded by a mix of residential and open space land uses.

The proposed development is understood to entail the new construction of approximately 358 single-family detached dwelling units.

Proposed access to the development is provided at the following locations: four full-movement access intersections along Horizonview Drive (referred to as Accesses A, B, C, and D).

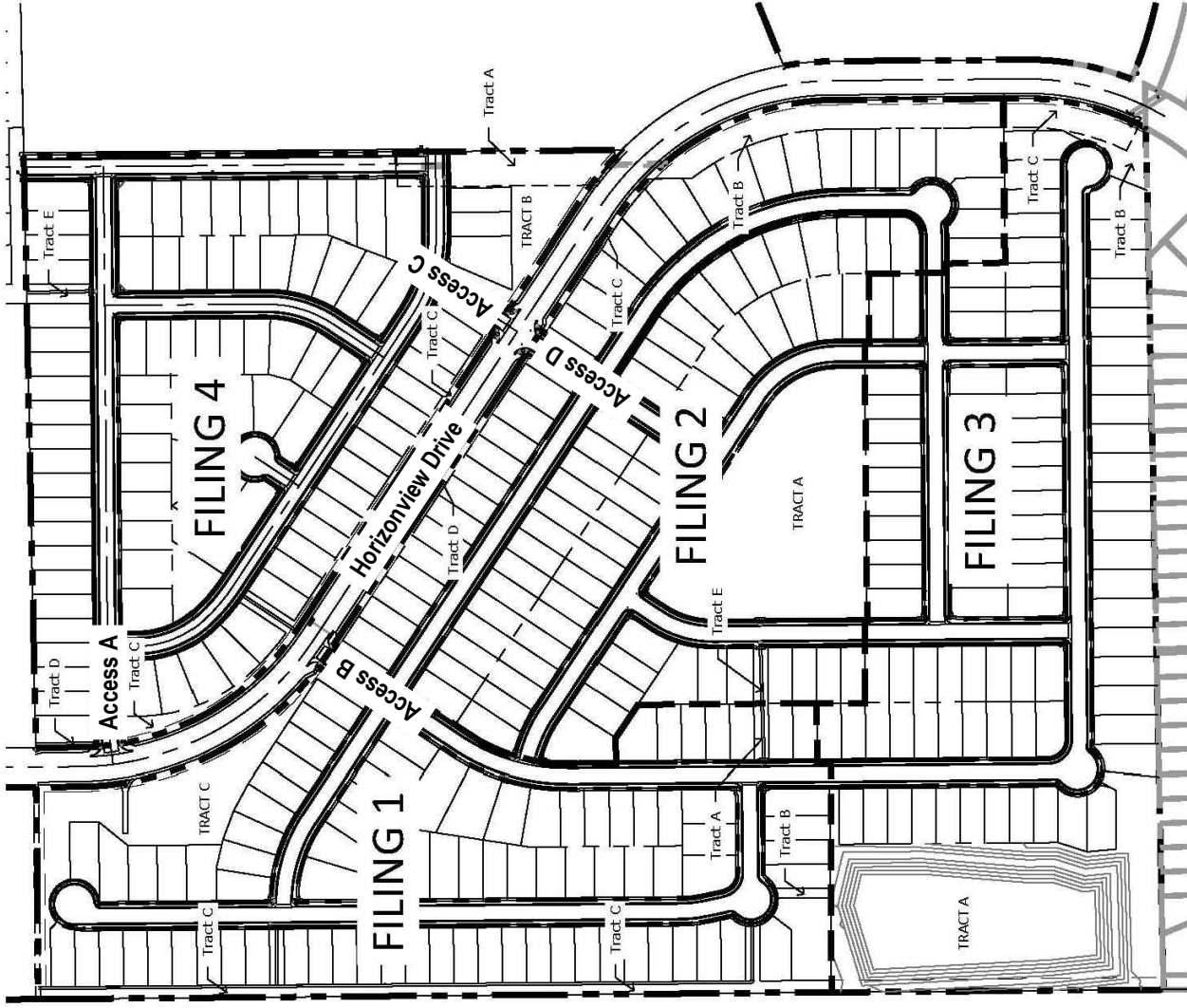
For purposes of this study, it is anticipated that development construction would be completed by end of Year 2024.

A conceptual site plan, as prepared by N.E.S. Inc., is shown on Figure 2. This plan is provided for illustrative purposes only.



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Existing and Committed Surface Transportation Network

Within the study area, Horizonview Drive is the primary roadway that will accommodate traffic to and from the proposed development. The secondary roadways include S Marksheffel Boulevard, Drennan Road, and Bradley Road. A brief description of each roadway is provided below:

Horizonview Drive is a north-south collector roadway having two through lanes (one lane in each direction) with a combination of shared and exclusive turn lanes at the intersections within the study area. Horizonview Drive provides a posted speed limit of 30 MPH.

S Marksheffel Boulevard is a north-south principal arterial roadway having four through lanes (two lanes in each direction) with exclusive turn lanes at the intersection within the study area. S Marksheffel Boulevard provides a posted speed limit of 55 MPH.

Drennan Road is an east-west arterial roadway having two through lanes (one lane in each direction) with a combination of shared and exclusive turn lanes at the intersections within the study area. Drennan Road provides a posted speed limit of 45 MPH.

Bradley Road is an east-west arterial roadway generally have two through lanes (one lane in each direction) with exclusive turn lanes at the intersection within the study area. Bradley Road provides a posted speed limit of 45 MPH.

All study intersections operate under a stop-controlled condition. A stop-controlled intersection is defined as a roadway intersection where vehicle rights-of-way are controlled by one or more “STOP” signs.

Pursuant to City’s Major Thoroughfare Plan¹, it is anticipated that S Marksheffel Boulevard will be reconstructed to the north of Drennan Road in order to better accommodate long-term regional development, including roadway widening and potential signalization at the intersection with Drennan Road. However, the City’s thoroughfare plan does not mention when these improvements may occur. Therefore, for analysis purposes, no specific improvements for the above-described roadways were considered beyond those warranted by projected future traffic volumes and site-generated trips, as applicable.

¹ Major Thoroughfare Plan, City of Colorado Springs, August 2011.

II. Existing Traffic Conditions

Morning (AM) and afternoon (PM) peak hour traffic counts were collected at the intersections of Drennan Road with Horizonview Drive and S Marksheffel Boulevard, as well as the intersection of Horizonview Drive with Bradley Road. Average daily (24-hour) traffic volumes were collected on Horizonview Drive. These counts are shown on Figure 3.

Traffic count data is included for reference in Appendix A.



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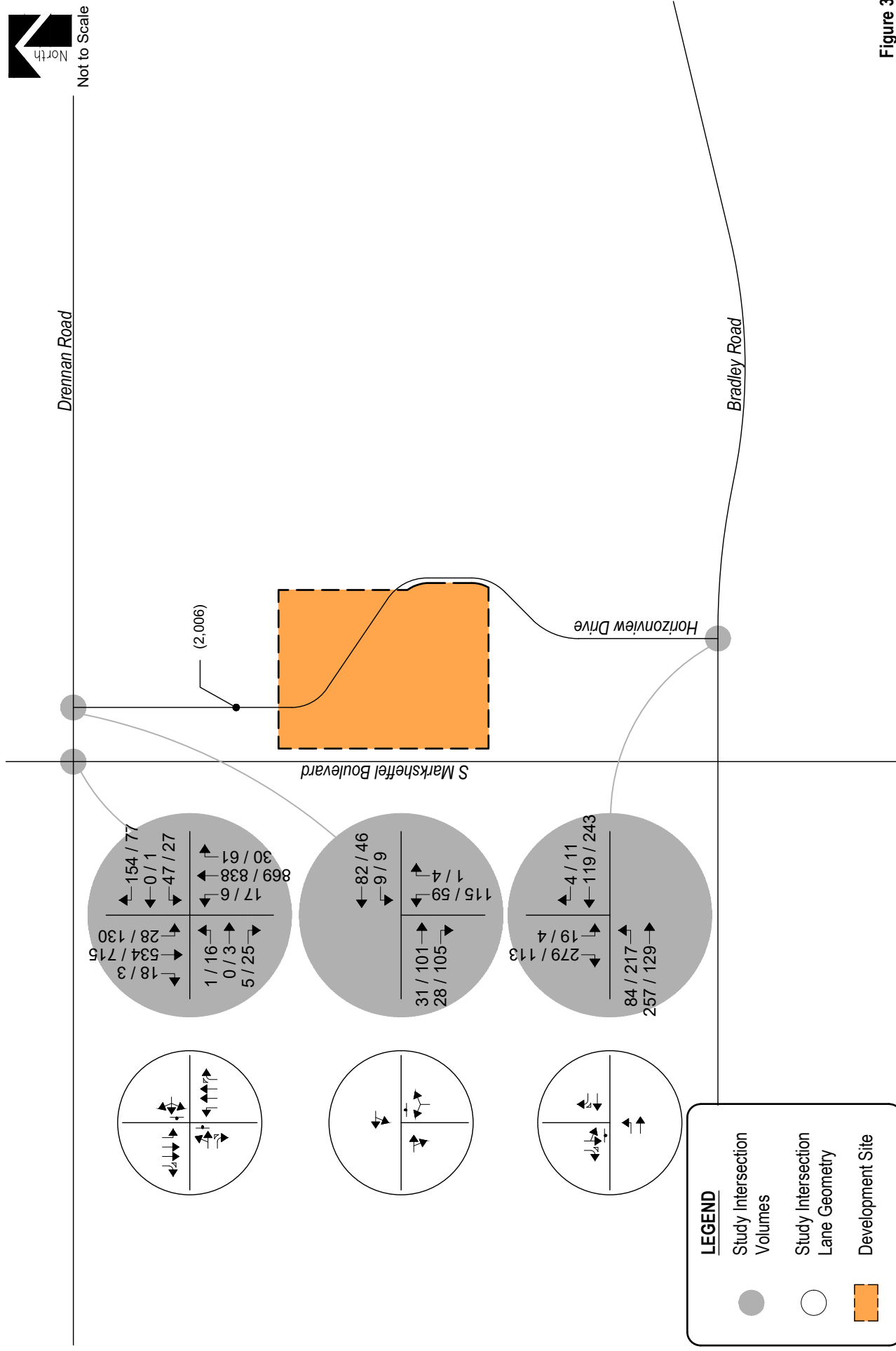


Figure 3
EXISTING TRAFFIC
Volumes & Intersection Geometry
AM / PM Peak Hour
(ADT) : Average Daily Traffic



The Signalized and Unsignalized Intersection Analysis techniques, as published in the Highway Capacity Manual (HCM) by the Transportation Research Board and as incorporated into the SYNCHRO computer program, were used to analyze the study intersections for existing traffic conditions. These nationally accepted techniques allow for the determination of intersection level of service (LOS) based on the congestion and delay of each traffic movement.

Level of service is a method of measurement used by transportation professionals to quantify a driver's perception of travel conditions that include travel time, number of stops, and total amount of stopped delay experienced on a roadway network. The HCM categorizes level of service into a range from "A" which indicates little, if any, vehicle delay, to "F" which indicates a level of operation considered unacceptable to most drivers. These levels of service grades with brief descriptions of the operating condition, for unsignalized and signalized intersections, are included for reference in Appendix B and have been used throughout this study.

The level of service analyses results for existing conditions are summarized in Table 1.

Intersection capacity worksheets developed for this study are provided in Appendix C.

Table 1 – Intersection Capacity Analysis Summary – Existing Traffic

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
S Marksheffel Boulevard / Drennan Road (Stop-Controlled)		
Eastbound Left and Through	F	F
Westbound Left, Through and Right	F	F
Northbound Left	A	A
Southbound Left	B	B
Drennan Road / Horizonview Drive (Stop-Controlled)		
Westbound Left and Through	A	A
Northbound Left and Right	B	B
Bradley Road / Horizonview Drive (Stop-Controlled)		
Eastbound Left	A	A
Southbound Left and Through	B	C

Key: Stop-Controlled Intersection: Level of Service

Existing Traffic Analysis Results

Under existing conditions, operational analysis shows that the stop-controlled intersection of S Marksheffel Boulevard with Drennan Road has turning movement operations at or better than LOS B during both the morning and afternoon peak traffic hours. Exceptions would include the eastbound and westbound turning movements which operate at LOS F during both peak traffic hours. The LOS F operations are attributed to the through traffic volume along S Marksheffel Boulevard and the stop-controlled nature of the intersection.

The stop-controlled intersection of Drennan Road with Horizonview Drive has turning movement operations at or better than LOS B during both the morning and afternoon peak traffic hours.

The stop-controlled intersection of Bradley Road with Horizonview Drive has turning movement operations at or better than LOS B during the morning peak traffic hour and LOS C or better during the afternoon peak traffic hour.

It is to be noted that it is not uncommon for unsignalized movements to or from an arterial roadway, in urban areas, to operate with noticeable delays during peak traffic hours. It is, however, likely that turn movements will operate better than the results obtained with this HCM Two Way Stop Control (TWSC) level of service analysis would indicate, as the HCM analysis may not accurately account for the effect of vehicle platooning and gaps caused by upstream signals. Upstream signal controls along S Marksheffel Boulevard may create additional gaps in the traffic stream for turning movements at Drennan Road and may provide mitigation to the LOS F operation projected during both peak traffic hours.

III. Future Traffic Conditions Without Proposed Development

Background traffic is the traffic projected to be on area roadways without consideration of the proposed development. Background traffic includes traffic generated by development of vacant parcels in the area.

To account for projected increases in background traffic for Years 2024 and 2042, a compounded annual growth rate was determined using population growth estimates provided by the Pikes Peak Area Council of Governments' (PPACG) 2045 Long Range Transportation Plan², as well as historical traffic data provided by the Colorado Department of Transportation's (CDOT) Traffic Count Database System (TCDS)³ along the adjacent segment of S Marksheffel Boulevard. PPACG's 2045 Long Range Transportation Plan anticipate a 20-year growth rate between one and two percent, while CDOT's TCDS anticipates average annual growth rates between two and three percent in recent years. Therefore, in order to provide for a conservative analysis, a growth rate of three percent was applied to existing traffic volumes. This annual growth rate is also considered consistent with regional growth projections and the level of in-fill development expected within the area.

A signal warrant analysis, using Year 2024 and 2042 background traffic volumes, was conducted for the S Marksheffel Boulevard intersection with Drennan Road in order to review potential for traffic signal control. Analysis results conclude that, with consideration of a 50 percent right turn volume reduction, the study intersection was found to be above the minimum vehicle volumes required to meet Warrant 3 – Peak Hour, from the Manual on Uniform Traffic Control Devices (MUTCD), for the installation of a traffic signal. As such, said intersection was analyzed under traffic signal control. Warrant study worksheets are provided for reference in Appendix D.

Warrant 3 is intended for use at locations where traffic conditions are such that for a minimum of one hour on an average day, the minor-street (Drennan Road) traffic suffer undue delay when entering or crossing the major street (S Marksheffel Boulevard). This assumption provides for a conservative analysis. Said study intersection should be monitored further by City Staff as area development occurs to determine when signalization installation is appropriate.

Pursuant to the non-committed area roadway improvements discussed in Section I, Year 2024 and Year 2042 background traffic conditions assume no roadway improvements to accommodate regional transportation demands. This assumption provides for a conservative analysis.

Projected background traffic volumes and intersection geometry for Years 2024 and 2042 are shown on Figure 4 and Figure 5, respectively.

² Moving Forward 2045: Pikes Peak Area Regional Transportation Plan, Pikes Peak Area Council of Governments, January 2020.

³ Transportation Data Management System, MS2, 2021.



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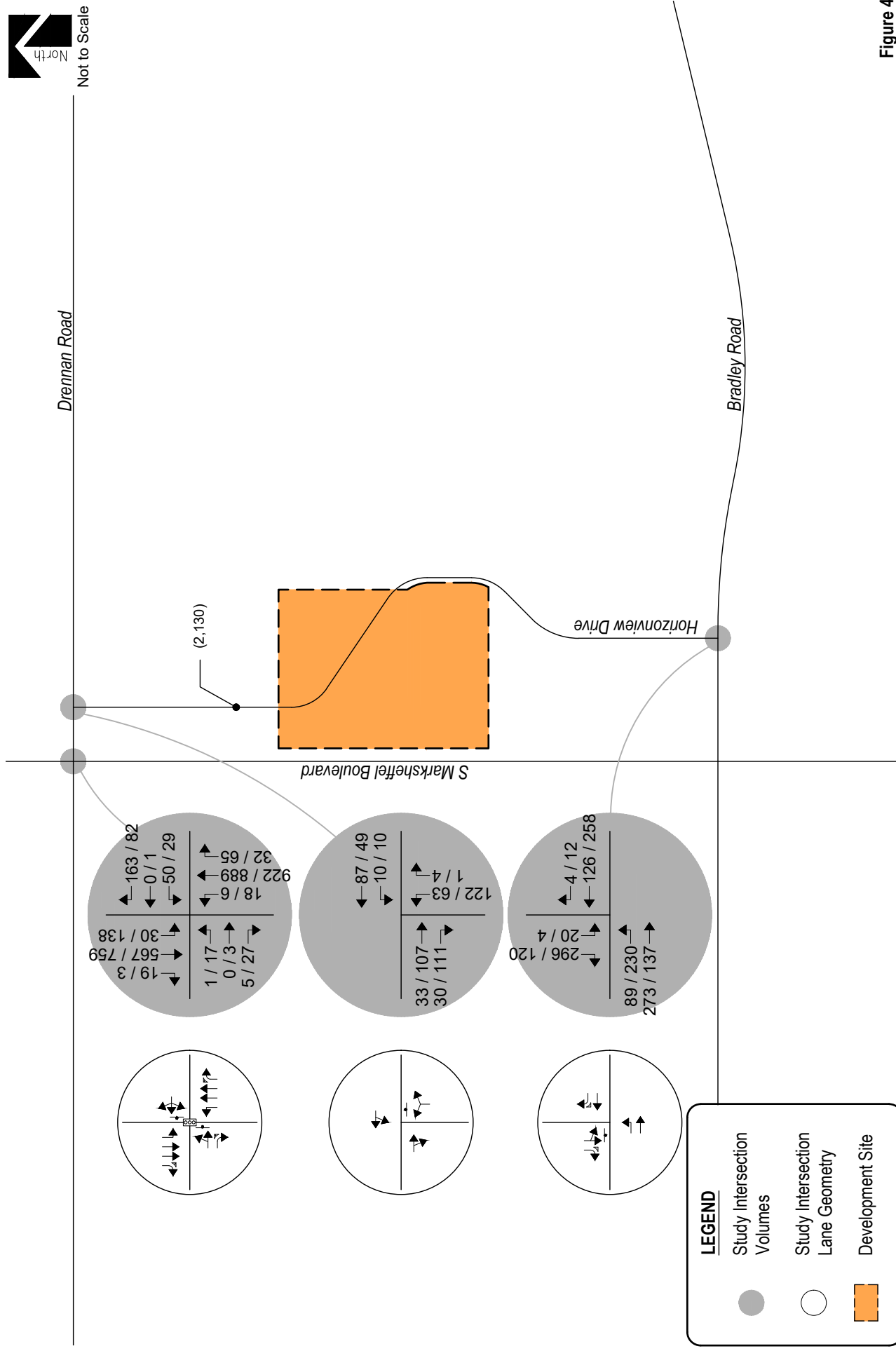


Figure 4
BACKGROUND TRAFFIC - YEAR 2024
Volumes & Intersection Geometry
AM / PM Peak Hour
(ADT) : Average Daily Traffic

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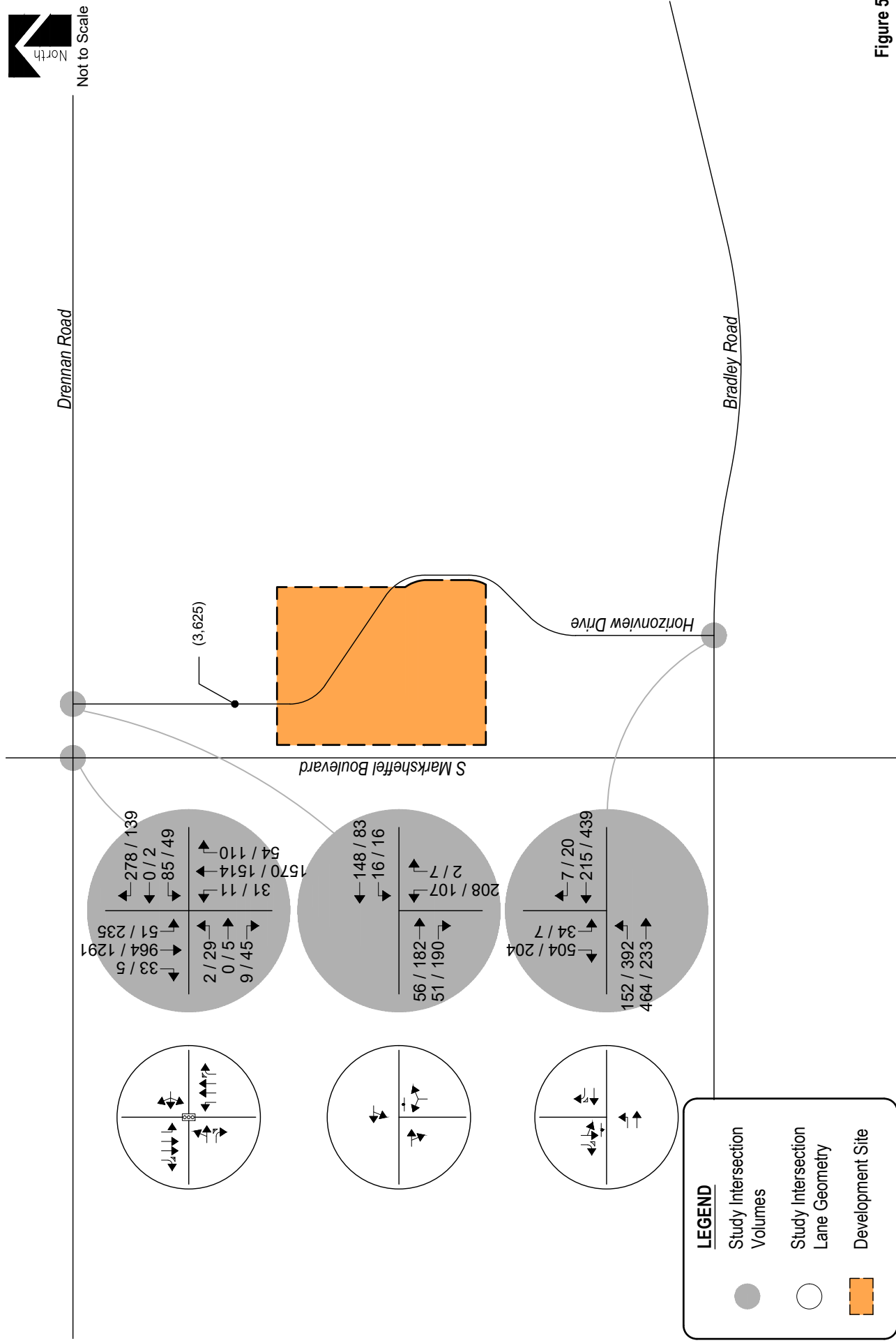


Figure 5
BACKGROUND TRAFFIC - YEAR 2042
Volumes & Intersection Geometry
AM / PM Peak Hour
(ADT) : Average Daily Traffic

As with existing traffic conditions, the operations of study intersections were analyzed under background conditions, without the proposed development, using the SYNCHRO computer program.

Background traffic level of service analysis results for Year 2024 are listed in Table 2. Year 2042 operational results are summarized in Table 3.

Definitions of levels of service are given in Appendix B. Intersection capacity worksheets are provided in Appendix C.

Table 2 – Intersection Capacity Analysis Summary – Background Traffic – Year 2024

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
S Marksheffel Boulevard / Drennan Road (Signalized)	A (10.0)	A (6.5)
Drennan Road / Horizonview Drive (Stop-Controlled)		
Westbound Left and Through	A	A
Northbound Left and Right	B	B
Bradley Road / Horizonview Drive (Stop-Controlled)		
Eastbound Left	A	A
Southbound Left and Through	B	C

Key: Signalized Intersection: Level of Service (Control Delay in sec/veh)
Stop-Controlled Intersection: Level of Service

Background Traffic Analysis Results – Year 2024

Year 2024 background traffic analysis indicates that the signalized intersection of S Marksheffel Boulevard with Drennan Road has overall operations at LOS A during both the morning and afternoon peak traffic hours.

The stop-controlled intersection of Drennan Road with Horizonview Drive shows turning movement operations at or better than LOS B during both the morning and afternoon peak traffic hours.

The stop-controlled intersection of Bradley Road with Horizonview Drive has turning movement operations at or better than LOS B during the morning peak traffic hour and LOS C or better during the afternoon peak traffic hour.

Table 3 – Intersection Capacity Analysis Summary – Background Traffic – Year 2042

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
S Marksheffel Boulevard / Drennan Road (Signalized)	B (19.6)	D (36.3)
Drennan Road / Horizonview Drive (Stop-Controlled)		
Westbound Left and Through	A	A
Northbound Left and Right	B	B
Bradley Road / Horizonview Drive (Stop-Controlled)		
Eastbound Left	A	B
Southbound Left and Through	D	F

Key: Signalized Intersection: Level of Service (Control Delay in sec/veh)
 Stop-Controlled Intersection: Level of Service

Background Traffic Analysis Results – Year 2042

By Year 2042 and without the proposed development, the study intersection of S Marksheffel Boulevard with Drennan Road experiences LOS B operations during the morning peak traffic hour and LOS D operations during the PM peak traffic hour.

The stop-controlled intersection of Drennan Road with Horizonview Drive projects turning movement operations at or better than LOS B during both the morning and afternoon peak traffic hours.

The stop-controlled intersection of Bradley Road with Horizonview Drive anticipates turning movement operations at or better than LOS D during the morning peak traffic hour and LOS B during the afternoon peak traffic hour. Exceptions include the southbound left and through turning movement which operates at LOS F during the afternoon peak traffic hour. The LOS F operation is attributed to the through traffic volumes along Bradley Road and the stop-controlled nature of the intersection.

It is to be noted that it is not uncommon for unsignalized movements to or from an arterial roadway, in urban areas, to operate with noticeable delays during peak traffic hours. It is, however, likely that turn movements will operate better than the results obtained with this HCM Two Way Stop Control (TWSC) level of service analysis would indicate, as the HCM analysis may not accurately account for the effect of vehicle platooning and gaps caused by upstream signals. The upstream signal control at S Marksheffel Boulevard and Bradley Road will tend to create additional gaps in the traffic stream for turning movements at Horizonview Drive and will most likely provide mitigation to the LOS F operation projected during PM peak traffic hours.

IV. Proposed Project Traffic

Trip Generation

Standard traffic generation characteristics compiled by the Institute of Transportation Engineers (ITE) in their report entitled Trip Generation Manual, 10th Edition, were applied to the proposed land use in order to estimate average daily traffic (ADT), AM Peak Hour, and PM Peak Hour vehicle trips. A vehicle trip is defined as a one-way vehicle movement from a point of origin to a point of destination.

The ITE land use code 210 (Single-Family Detached Housing) was used for estimating trip generation because of its best fit to the proposed land use description.

Trip generation rates used in this study are presented in Table 4.

Table 4 – Trip Generation Rates

ITE CODE	LAND USE	UNIT	TRIP GENERATION RATES						
			24 HOUR	AM PEAK HOUR			PM PEAK HOUR		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
210	Single-Family Housing	DU	9.44	0.19	0.56	0.74	0.62	0.37	0.99

Key: DU = Dwelling Units.

Note: All data and calculations above are subject to being rounded to nearest value.

Table 5 illustrates projected ADT, AM Peak Hour, and PM Peak Hour traffic volumes likely generated by the proposed development upon build-out.

Table 5 – Trip Generation Summary

ITE CODELAND USESIZE				TOTAL TRIPS GENERATED						
				24 HOUR	AM PEAK HOUR			PM PEAK HOUR		
					ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
210	Single-Family Housing	358	DU	3,380	66	199	265	223	131	354
Total:				3,380	66	199	265	223	131	354

Note: All data and calculations above are subject to being rounded to nearest value.

Upon build-out, Table 5 illustrates that the proposed development has the potential to generate approximately 3,380 daily trips with 265 of those occurring during the morning peak hour and 354 during the afternoon peak hour.

Adjustments to Trip Generation Rates

A development of this type is not likely to attract trips from within area land uses nor pass-by or diverted link trips from the adjacent roadway system, therefore no trip reduction was taken in this analysis.

Trip Distribution

The overall directional distribution of site-generated traffic was determined based on the location of development site within the City, proposed and existing area land uses, allowed turning movements, and available roadway network.

Overall trip distribution patterns for the development are shown on Figure 6.

Trip Assignment

Trip assignment is how generated and distributed vehicle trips are expected to be loaded onto the available roadway network.

Applying trip distribution patterns to site-generated traffic provides the overall site-generated trip assignments shown on Figure 6.



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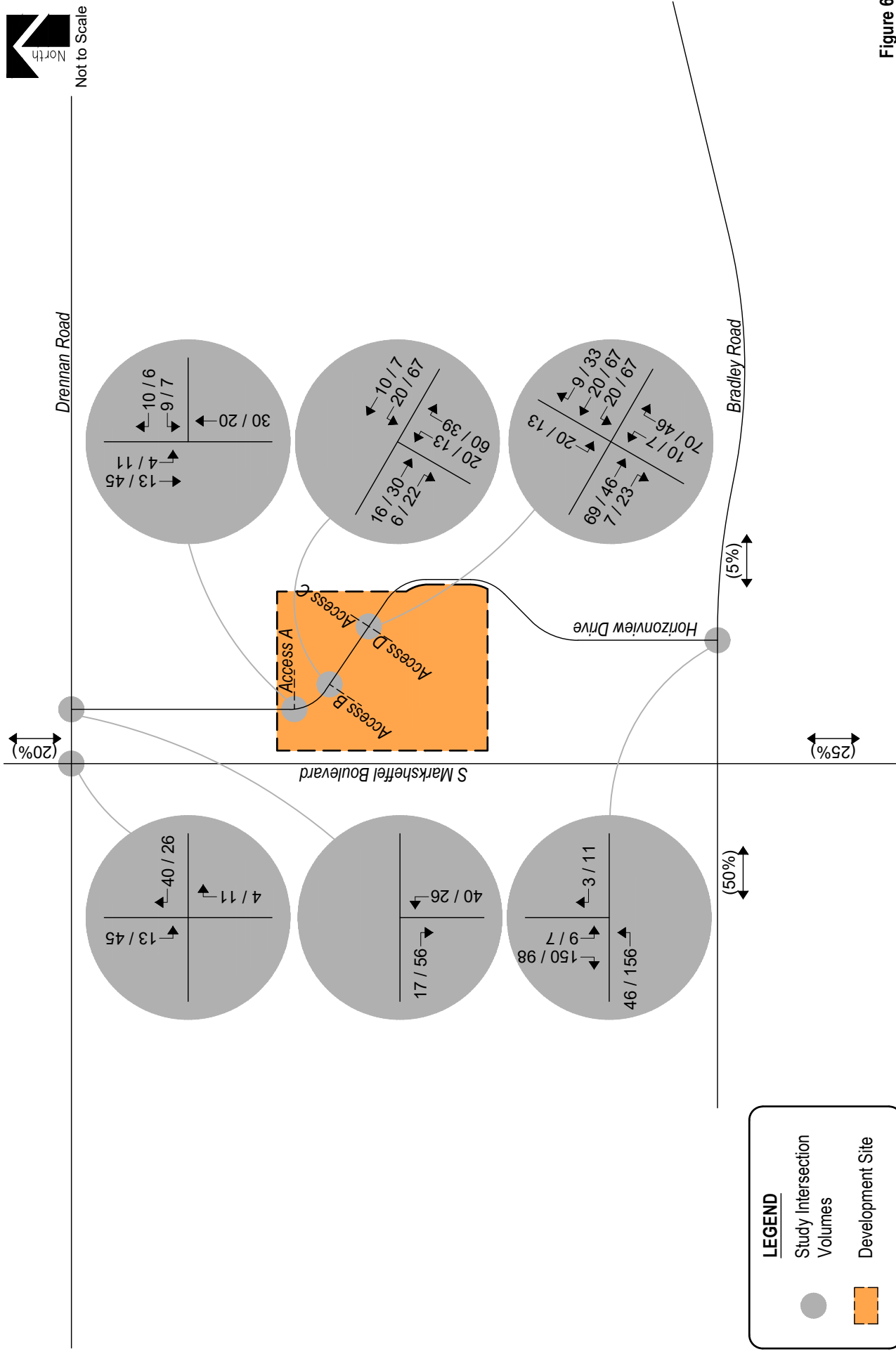


Figure 6

SITE DEVELOPMENT DISTRIBUTION
(%) : Overall

SITE-GENERATED
AM / PM Peak Hour

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V. Future Traffic Conditions With Proposed Developments

Site-generated traffic was added to background traffic projections for Years 2024 and 2042 to develop total traffic projections. For analysis purposes, it was assumed that development construction would be completed by end of Year 2024.

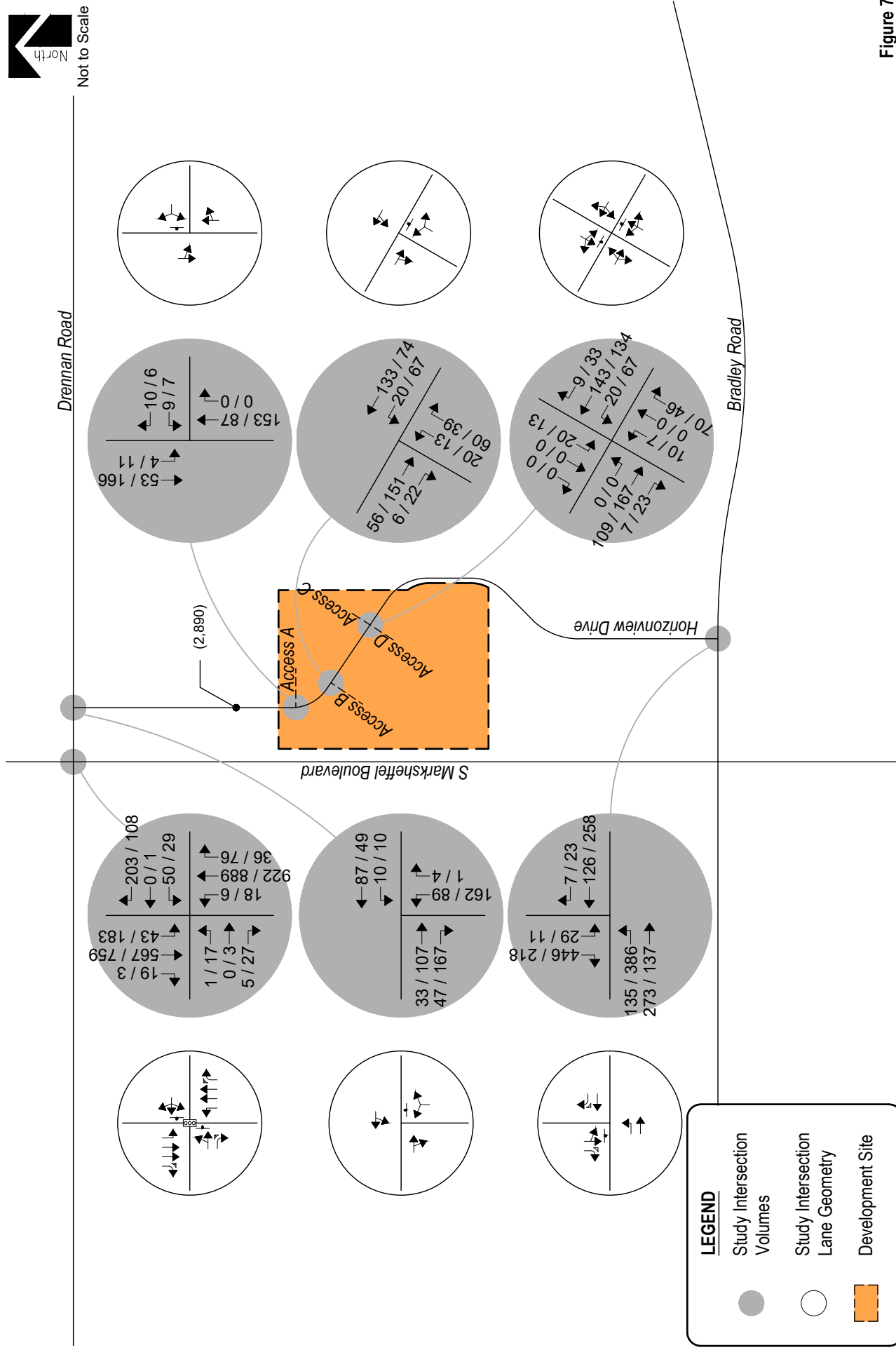
Pursuant to area roadway improvement discussions provided in Section III, Year 2024 and Year 2042 total traffic conditions assume no additional roadway improvements to accommodate regional transportation demands. Roadway improvements associated with site development are expected to be limited to site access and frontage as required by the governing agency.

Projected Year 2024 total traffic volumes and intersection geometry are shown in Figure 7.

Figure 8 shows projected total traffic volumes and intersection geometry for Year 2042.



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LEGEND

- Study Intersection Volumes
- Study Intersection Lane Geometry
- Development Site

Figure 7
TOTAL TRAFFIC - YEAR 2024
Volumes & Intersection Geometry
AM / PM Peak Hour
(ADT) : Average Daily Traffic



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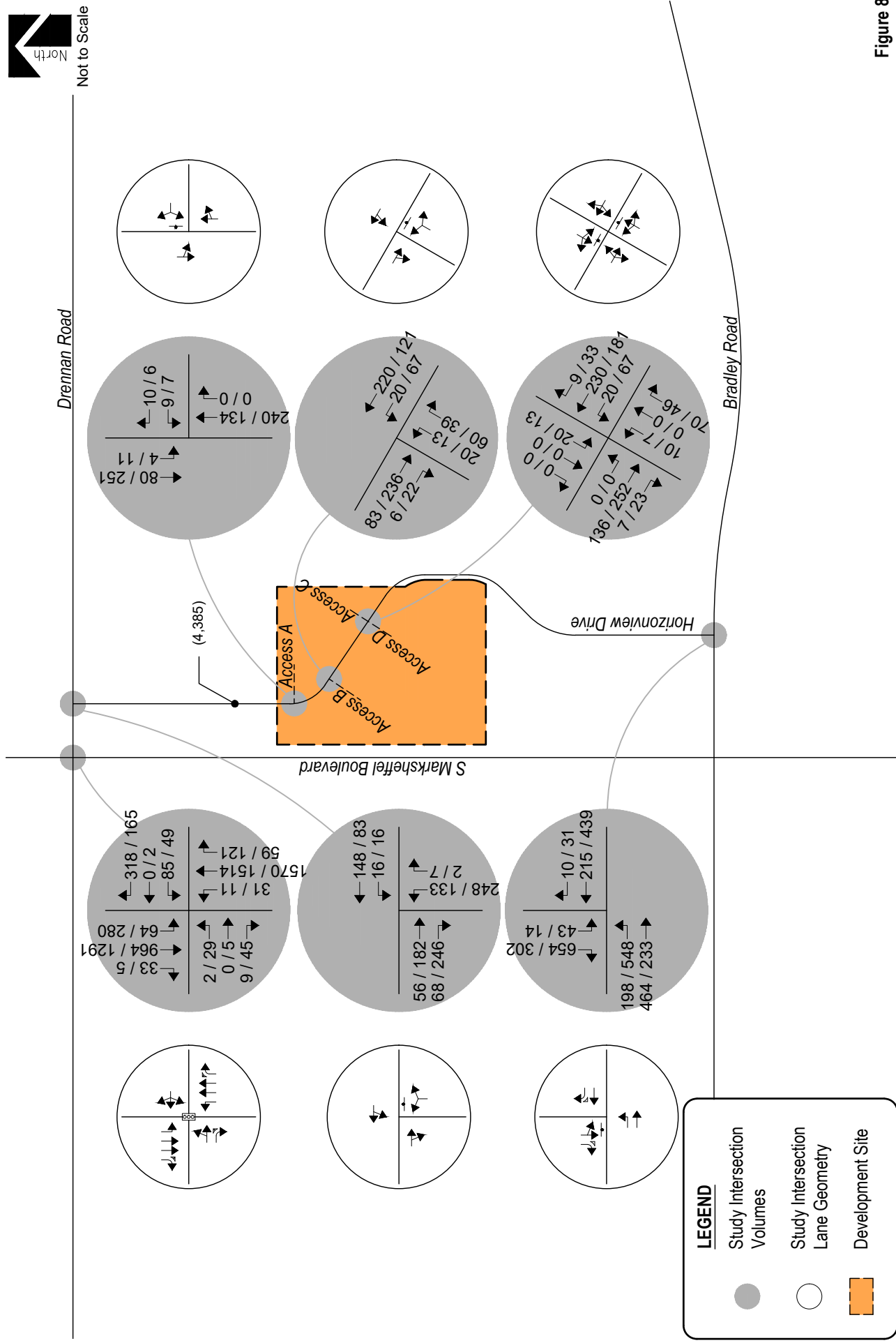


Figure 8
TOTAL TRAFFIC - YEAR 2042
Volumes & Intersection Geometry
AM / PM Peak Hour
(ADT) : Average Daily Traffic



VI. Project Impacts

The analyses and procedures described in this study were performed in accordance with the Highway Capacity Manual (HCM) and are based upon the worst-case conditions that occur during a typical weekday upon build-out of site development and analyzed land uses. Therefore, study intersections are likely to operate with traffic conditions better than those described within this study, which represent the peak hours of weekday operations only.

Peak Hour Intersection Levels of Service

As with background traffic, the operations of the study intersections were analyzed under projected total traffic conditions using the SYNCHRO computer program. Total traffic level of service analysis results for Years 2024 and 2042 are summarized in Table 6 and Table 7, respectively.

Definitions of levels of service are given in Appendix B. Intersection capacity worksheets are provided in Appendix C.

Table 6 – Intersection Capacity Analysis Summary – Total Traffic – Year 2024

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
S Marksheffel Boulevard / Drennan Road (Signalized)	B (11.1)	A (6.4)
Drennan Road / Horizonview Drive (Stop-Controlled)		
Westbound Left and Through	A	A
Northbound Left and Right	B	B
Bradley Road / Horizonview Drive (Stop-Controlled)		
Eastbound Left	A	A
Southbound Left and Through	C	E
Horizonview Drive / Access A (Stop-Controlled)		
Westbound Left and Right	A	A
Southbound Left and Through	A	A
Horizonview Drive / Access B (Stop-Controlled)		
Westbound Left and Through	A	A
Northbound Left and Right	A	B
Horizonview Drive / Access C / Access D (Stop-Controlled)		
Eastbound Left, Through and Right	A	A
Westbound Left, Through and Right	A	A
Northbound Left, Through and Right	A	B
Southbound Left, Through and Right	B	B

Key: Signalized Intersection: Level of Service (Control Delay in sec/veh)
Stop-Controlled Intersection: Level of Service

Table 7 – Intersection Capacity Analysis Summary – Total Traffic – Year 2042

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
S Marksheffel Boulevard / Drennan Road (Signalized)	C (22.9)	E (55.7)
Drennan Road / Horizonview Drive (Stop-Controlled) Westbound Left and Through Northbound Left and Right	A B	A B
Bradley Road / Horizonview Drive (Stop-Controlled) Eastbound Left Southbound Left and Through	A D	B F
Horizonview Drive / Access A (Stop-Controlled) Westbound Left and Right Southbound Left and Through	B A	B A
Horizonview Drive / Access B (Stop-Controlled) Westbound Left and Through Northbound Left and Right	A A	A B
Horizonview Drive / Access C / Access D (Stop-Controlled) Eastbound Left, Through and Right Westbound Left, Through and Right Northbound Left, Through and Right Southbound Left, Through and Right	A A A B	A A B C

Key: Signalized Intersection: Level of Service (Control Delay in sec/veh)
 Stop-Controlled Intersection: Level of Service

Total Traffic Analysis Results Upon Development Build-Out

Table 7 illustrates how, by Year 2042 and upon development build-out, the signalized intersection of S Marksheffel Boulevard with Drennan Road experiences LOS C operations during the morning peak traffic hour and LOS E operations during the PM peak traffic hour. The LOS E operation anticipated during the AM peak traffic period is attributed to the eastbound and southbound left turning movements. To mitigate the anticipated LOS E operation, it is recommended increasing the cycle length to 120 seconds. This is shown to allow for LOS D operations during the PM peak traffic period.

The stop-controlled intersection of Drennan Road with Horizonview Drive continues to project turning movement operations at or better than LOS B during both the morning and afternoon peak traffic hours.

The stop-controlled intersection of Bradley Road with Horizonview Drive anticipates turning movement operations at or better than LOS D during the morning peak traffic hour and LOS B during the afternoon peak traffic hour. Exceptions still include the southbound left and through turning movement which operates at LOS F during the afternoon peak traffic hour. The LOS F operation is attributed to the through traffic volumes along Bradley Road and the stop-controlled nature of the intersection.

The stop-controlled Horizonview Drive intersections with proposed access drives expected turning movement operations at or better than LOS B during the morning peak traffic hour and LOS C or better during the afternoon peak traffic hour.

It is to be noted that it is not uncommon for unsignalized movements to or from an arterial roadway, in urban areas, to operate with noticeable delays during peak traffic hours. It is, however, likely that turn movements will operate better than the results obtained with this HCM Two Way Stop Control (TWSC) level of service analysis would indicate, as the HCM analysis may not accurately account for the effect of vehicle platooning and gaps caused by upstream signals. The upstream signal control at S Marksheffel Boulevard and Bradley Road will tend to create additional gaps in the traffic stream for turning movements at Horizonview Drive and will most likely provide mitigation to the LOS F operation projected during PM peak traffic hours.

Queue Length Analysis

Queue lengths for the study intersections were analyzed using Year 2042 total traffic conditions. The analysis yields estimate of 95th percentile queue lengths, which have only a five percent probability of being exceeded during the analysis time period. Queue lengths were modeled and are included with the Synchro worksheets in Appendix C.

At the Bradley Road and Horizonview Drive intersection, the greatest 95th percentile queue length occurs during the afternoon peak traffic hour. The queue length is approximately four vehicles for the eastbound left turning movement. While Table 7 shows poor levels of service for the southbound turning movement, 95th percentile queuing only estimates a queue length of approximately two vehicles.

No significant queue at the proposed site accesses were indicated. The greatest on-site queue length anticipated at either site access drive occurs during either peak hour and is estimated to be approximately one to two vehicles in length for any turning movement.

Auxiliary Lane Analysis

Auxiliary lanes for site development accesses are to be based on the City's Traffic Criteria Manual⁴.

Considering the roadway classification along Horizonview Drive, as mentioned in Section I, an evaluation of auxiliary lane requirements, pursuant to Section 8.0, Table 2 of the City's Traffic Criteria Manual, reveals that exclusive turn lanes along Horizonview Drive at proposed site access drives are not required.

⁴ Engineering Criteria Manual, Section III: Traffic Criteria Manual, City of Colorado Springs City Engineering, July 2010.

VII. Conclusion

This traffic impact study addressed the capacity, geometric, and control requirements associated with the development entitled Meadowworks Filings 1-4 Development Plan (DP). This proposed residential development consists of a single-family detached subdivision. The development is located near the southeast corner of S Marksheffel Boulevard and Drennan Road in Colorado Springs, Colorado.

The study area examined in this analysis encompassed the intersections of Drennan Road with S Marksheffel Boulevard and Horizonview Drive, as well as the intersection of Horizonview Drive with Bradley Road and proposed site accesses.

Analysis was conducted for critical AM Peak Hour and PM Peak Hour traffic operations for existing traffic conditions, Year 2024 and Year 2042 background traffic conditions, and Year 2024 and Year 2042 total traffic conditions.

Analysis of existing traffic conditions indicates that the stop-controlled intersections within the study area have turning movement operations at or better than LOS B during the morning peak traffic hour and LOS C or better during the afternoon peak traffic hour. Exceptions include the eastbound and westbound turning movements at S Marksheffel Boulevard and Drennan Road, which operate at LOS F during both peak traffic hours. The LOS F operations are attributed to the through traffic volume along S Marksheffel Boulevard and the stop-controlled nature of the intersection.

Without the proposed development, Year 2024 background operational analysis shows that the signalized intersection of S Marksheffel Boulevard with Drennan Road has overall operations at LOS A during both the morning and afternoon peak traffic hours. The stop-controlled intersections of Horizonview Drive with Drennan Road and Bradley Road expect turning movement operations at or better than LOS B during the morning peak traffic hour and LOS C or better during the afternoon peak traffic hour.

By Year 2042 and without the proposed development, the study intersection of S Marksheffel Boulevard with Drennan Road experiences LOS B operations during the morning peak traffic hour and LOS D operations during the PM peak traffic hour. The stop-controlled intersection of Drennan Road with Horizonview Drive projects turning movement operations at or better than LOS B during both the morning and afternoon peak traffic hours. The stop-controlled intersection of Bradley Road with Horizonview Drive anticipates turning movement operations at or better than LOS D during the morning peak traffic hour and LOS B during the afternoon peak traffic hour. Exceptions include the southbound left and through turning movement which operates at LOS F during the afternoon peak traffic hour. The LOS F operation is attributed to the through traffic volumes along Bradley Road and the stop-controlled nature of the intersection.

It is to be noted that it is not uncommon for unsignalized movements to or from an arterial roadway, in urban areas, to operate with noticeable delays during peak traffic hours. It is, however, likely that turn movements will operate better than the results obtained with this HCM Two Way Stop Control (TWSC) level of service analysis would indicate, as the HCM analysis may not accurately account for the effect of vehicle platooning and gaps caused by upstream signals. The upstream signal control at S Marksheffel Boulevard and Bradley Road will tend to create additional gaps in the traffic stream for turning movements at Horizonview Drive and will most likely provide mitigation to the LOS F operation projected during PM peak traffic hours.

Analysis of future traffic conditions indicates that the addition of site-generated traffic is expected to create minimal negative impact to traffic operations for the existing and surrounding roadway system upon intersection control improvements assumed within this analysis. With all conservative assumptions defined in this analysis, the study intersections are projected to operate at future levels of service comparable to Year 2042 background traffic conditions. Proposed site accesses have long-term operations at LOS C or better during peak traffic periods and upon build-out.

Recommendations

At the direction of City Staff, the Meadoworks Filings 1-4 DP development will be responsible for the following roadway improvements:

1. Striping of Horizonview Drive (adjacent to the development property line) to accommodate two 12-foot through lanes and one 8-foot shoulder.
2. Construction of an eastbound right turn deceleration lane at the Drennan Road and Horizonview Drive intersection, accommodating 200 feet of storage plus 180 feet of transition taper.
3. Construction of a westbound left turn deceleration lane at the Drennan Road and Horizonview Drive intersection, accommodating 200 feet of storage plus 180 feet of transition taper.

APPENDIX A

Traffic Count Data



ALL TRAFFIC DATA SERVICES

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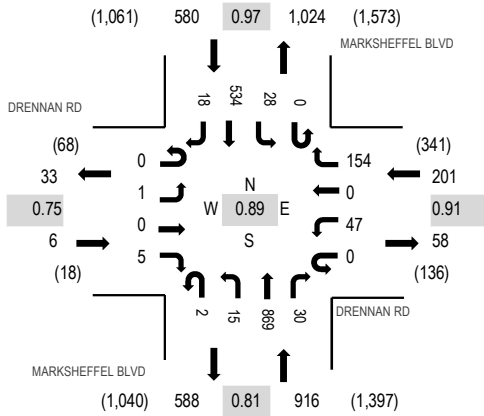
Location: 1 MARKSHEFFEL BLVD & DRENNAN RD AM

Date: Thursday, December 9, 2021

Peak Hour: 07:00 AM - 08:00 AM

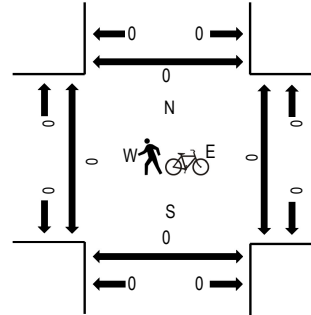
Peak 15-Minutes: 07:30 AM - 07:45 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	DRENNAN RD Eastbound				DRENNAN RD Westbound				MARKSHEFFEL BLVD Northbound				MARKSHEFFEL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	0	0	0	13	0	40	0	5	216	4	0	5	121	3	407	1,703	0	0	0	0
7:15 AM	0	1	0	0	0	15	0	40	1	1	226	7	0	5	137	7	440	1,633	0	0	0	0
7:30 AM	0	0	0	3	0	11	0	40	1	5	265	10	0	10	132	4	481	1,495	0	0	0	0
7:45 AM	0	0	0	2	0	8	0	34	0	4	162	9	0	8	144	4	375	1,282	0	0	0	0
8:00 AM	0	1	0	3	0	15	0	25	0	2	128	7	0	14	130	12	337	1,114	0	0	2	0
8:15 AM	0	1	0	0	0	14	0	22	1	6	112	4	1	18	119	4	302		0	0	0	0
8:30 AM	0	3	0	1	0	4	0	29	0	0	118	8	0	15	86	4	268		0	0	0	0
8:45 AM	0	3	0	0	0	11	1	19	0	3	87	5	0	7	68	3	207		0	0	2	0
Count Total	0	9	0	9	0	91	1	249	3	26	1,314	54	1	82	937	41	2,817		0	0	4	0
Peak Hour	0	1	0	5	0	47	0	154	2	15	869	30	0	28	534	18	1,703		0	0	0	0



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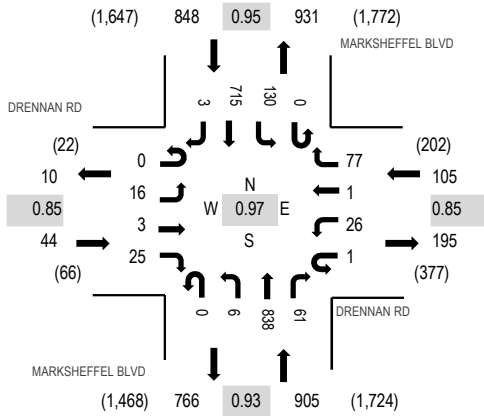
Location: 1 MARKSHEFFEL BLVD & DRENNAN RD PM

Date: Thursday, December 9, 2021

Peak Hour: 04:15 PM - 05:15 PM

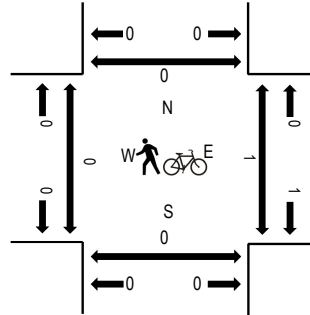
Peak 15-Minutes: 04:30 PM - 04:45 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	DRENNAN RD Eastbound				DRENNAN RD Westbound				MARKSHEFFEL BLVD Northbound				MARKSHEFFEL BLVD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	3	0	5	0	7	0	18	0	4	217	12	0	27	152	2	447	1,870	0	0	0	0
4:15 PM	0	3	0	8	0	6	1	10	0	1	186	14	0	35	188	0	452	1,902	0	0	0	0
4:30 PM	0	5	2	6	0	8	0	19	0	2	227	15	0	26	179	1	490	1,854	0	0	0	0
4:45 PM	0	4	1	6	1	6	0	25	0	1	213	12	0	33	178	1	481	1,836	0	1	0	0
5:00 PM	0	4	0	5	0	6	0	23	0	2	212	20	0	36	170	1	479	1,769	0	0	0	0
5:15 PM	0	2	0	2	0	2	0	18	0	1	169	13	0	28	169	0	404		0	0	0	0
5:30 PM	0	3	0	2	0	5	0	23	1	1	203	22	0	37	174	1	472		0	0	0	0
5:45 PM	0	2	0	3	0	1	0	23	0	2	160	14	0	29	179	1	414		0	0	0	0
Count Total	0	26	3	37	1	41	1	159	1	14	1,587	122	0	251	1,389	7	3,639		0	1	0	0
Peak Hour	0	16	3	25	1	26	1	77	0	6	838	61	0	130	715	3	1,902		0	1	0	0



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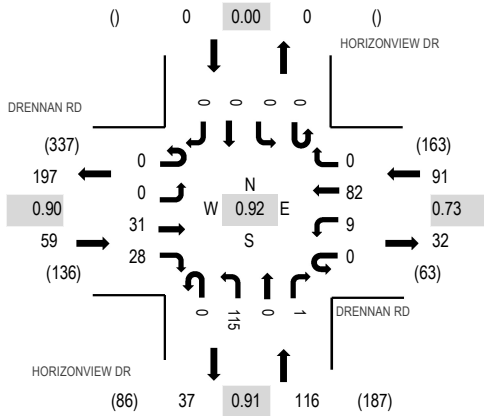
Location: 2 HORIZONVIEW DR & DRENNAN RD AM

Date: Thursday, December 9, 2021

Peak Hour: 07:00 AM - 08:00 AM

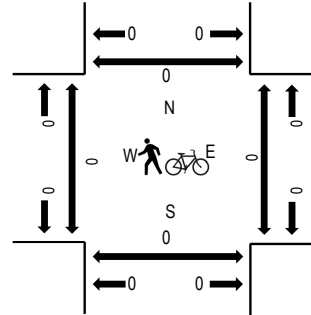
Peak 15-Minutes: 07:15 AM - 07:30 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	DRENNAN RD Eastbound				DRENNAN RD Westbound				HORIZONVIEW DR Northbound				HORIZONVIEW DR Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	4	6	0	2	20	0	0	32	0	0	0	0	0	0	64	266	0	0	0	0
7:15 AM	0	0	7	5	0	1	30	0	0	29	0	0	0	0	0	0	72	264	0	0	0	0
7:30 AM	0	0	11	8	0	4	17	0	0	32	0	0	0	0	0	0	72	249	0	0	0	0
7:45 AM	0	0	9	9	0	2	15	0	0	22	0	1	0	0	0	0	58	235	0	0	0	0
8:00 AM	0	0	10	11	0	1	19	0	0	21	0	0	0	0	0	0	62	220	0	0	0	0
8:15 AM	0	0	3	18	0	0	19	0	0	17	0	0	0	0	0	0	57		0	0	0	0
8:30 AM	0	0	12	11	0	1	16	0	0	18	0	0	0	0	0	0	58		0	0	0	0
8:45 AM	0	0	6	6	0	1	15	0	0	15	0	0	0	0	0	0	43		0	0	2	0
Count Total	0	0	62	74	0	12	151	0	0	186	0	1	0	0	0	0	486		0	0	2	0
Peak Hour	0	0	31	28	0	9	82	0	0	115	0	1	0	0	0	0	266		0	0	0	0



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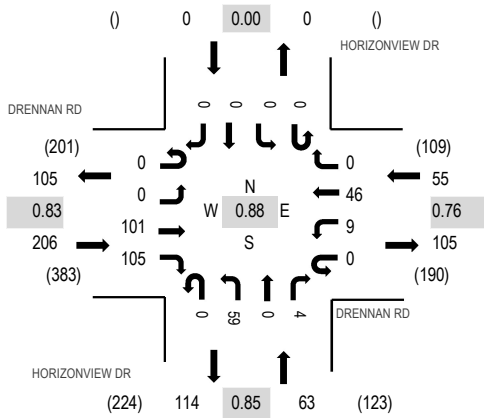
Location: 2 HORIZONVIEW DR & DRENNAN RD PM

Date: Thursday, December 9, 2021

Peak Hour: 04:45 PM - 05:45 PM

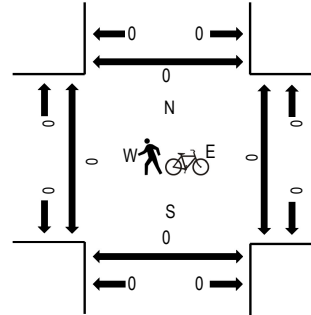
Peak 15-Minutes: 05:30 PM - 05:45 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	DRENNAN RD Eastbound				DRENNAN RD Westbound				HORIZONVIEW DR Northbound				HORIZONVIEW DR Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	0	18	24	0	5	15	0	0	11	0	1	0	0	0	0	74	301	0	0	0	0
4:15 PM	0	0	21	28	0	0	8	0	0	7	0	1	0	0	0	0	65	318	0	0	0	0
4:30 PM	0	0	22	19	0	4	17	0	0	13	0	6	0	0	0	0	81	313	0	0	0	0
4:45 PM	0	0	25	23	0	3	12	0	0	16	0	2	0	0	0	0	81	324	0	0	0	0
5:00 PM	0	0	27	29	0	2	12	0	0	19	0	2	0	0	0	0	91	314	0	0	0	0
5:15 PM	0	0	17	23	0	1	6	0	0	13	0	0	0	0	0	0	60		0	0	0	0
5:30 PM	0	0	32	30	0	3	16	0	0	11	0	0	0	0	0	0	92		0	0	0	0
5:45 PM	0	0	15	30	0	0	5	0	0	20	0	1	0	0	0	0	71		0	0	0	0
Count Total	0	0	177	206	0	18	91	0	0	110	0	13	0	0	0	0	615		0	0	0	0
Peak Hour	0	0	101	105	0	9	46	0	0	59	0	4	0	0	0	0	324		0	0	0	0



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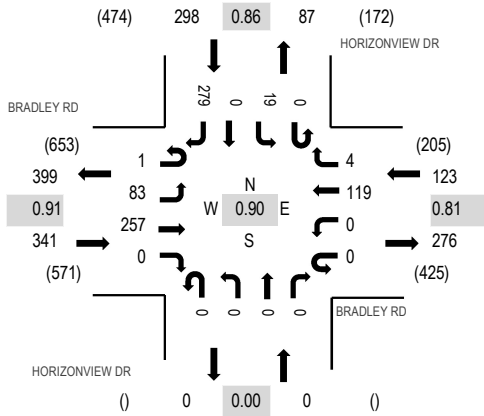
Location: 3 HORIZONVIEW DR & BRADLEY RD AM

Date: Thursday, December 9, 2021

Peak Hour: 07:00 AM - 08:00 AM

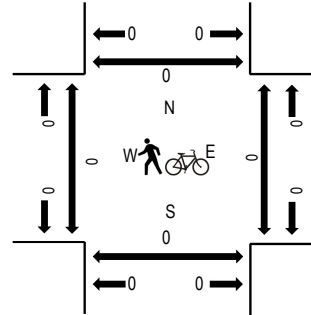
Peak 15-Minutes: 07:15 AM - 07:30 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	BRADLEY RD Eastbound				BRADLEY RD Westbound				HORIZONVIEW DR Northbound				HORIZONVIEW DR Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	17	64	0	0	0	36	1	0	0	0	0	0	6	0	81	205	762	0	0	0	0
7:15 AM	1	16	74	0	0	0	36	2	0	0	0	0	0	5	0	77	211	704	0	0	0	0
7:30 AM	0	28	66	0	0	0	23	0	0	0	0	0	0	4	0	60	181	628	0	0	0	0
7:45 AM	0	22	53	0	0	0	24	1	0	0	0	0	0	4	0	61	165	565	0	0	0	0
8:00 AM	3	23	42	0	0	0	22	0	0	0	0	0	0	1	0	56	147	488	0	0	0	0
8:15 AM	0	20	42	0	0	0	20	1	0	0	0	0	0	0	0	52	135		0	0	0	0
8:30 AM	1	25	37	0	0	0	22	1	0	0	0	0	0	2	0	30	118		0	0	0	0
8:45 AM	0	15	22	0	0	0	16	0	0	0	0	0	0	3	0	32	88		0	0	0	0
Count Total	5	166	400	0	0	0	199	6	0	0	0	0	0	25	0	449	1,250		0	0	0	0
Peak Hour	1	83	257	0	0	0	119	4	0	0	0	0	0	19	0	279	762		0	0	0	0



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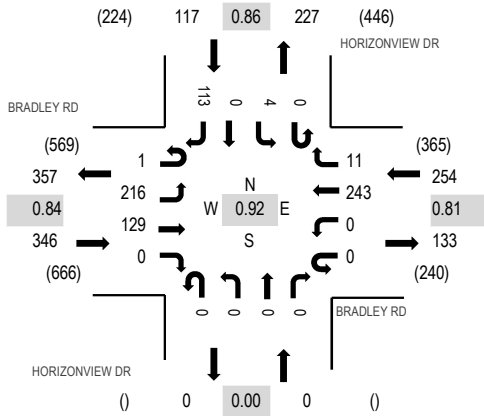
Location: 3 HORIZONVIEW DR & BRADLEY RD PM

Date: Thursday, December 9, 2021

Peak Hour: 04:00 PM - 05:00 PM

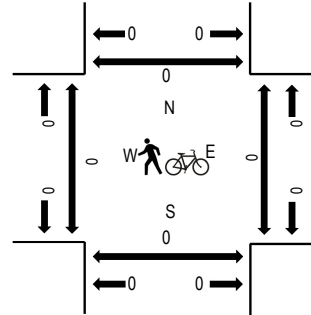
Peak 15-Minutes: 04:15 PM - 04:30 PM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles on Crosswalk



Traffic Counts

Interval Start Time	BRADLEY RD Eastbound				BRADLEY RD Westbound				HORIZONVIEW DR Northbound				HORIZONVIEW DR Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	45	29	0	0	0	59	2	0	0	0	0	0	2	0	31	168	717	0	0	0	0
4:15 PM	1	59	29	0	0	0	73	5	0	0	0	0	0	1	0	26	194	692	0	0	0	0
4:30 PM	0	61	43	0	0	0	55	1	0	0	0	0	0	1	0	33	194	640	0	0	0	0
4:45 PM	0	51	28	0	0	0	56	3	0	0	0	0	0	0	0	23	161	577	0	0	0	0
5:00 PM	1	48	27	0	0	0	35	5	0	0	0	0	0	1	0	26	143	538	0	0	0	0
5:15 PM	0	61	30	0	0	0	23	0	0	0	0	0	0	1	0	27	142		0	0	0	0
5:30 PM	0	53	29	0	0	0	27	0	0	0	0	0	0	0	0	22	131		0	0	0	0
5:45 PM	0	52	19	0	0	0	21	0	0	0	0	0	0	0	0	30	122		0	0	0	0
Count Total	2	430	234	0	0	0	349	16	0	0	0	0	0	6	0	218	1,255		0	0	0	0
Peak Hour	1	216	129	0	0	0	243	11	0	0	0	0	0	4	0	113	717		0	0	0	0

Date Start: 09-Dec-21
Site Code: 4
Station ID: 4
HORIZONVIEW DR S.O. HAZY MORNING DR

Start Time	09-Dec-21 Thu	NB	SB	Total
12:00 AM		5	1	6
01:00		1	0	1
02:00		0	3	3
03:00		2	5	7
04:00		5	5	10
05:00		10	32	42
06:00		29	75	104
07:00		80	136	216
08:00		60	86	146
09:00		29	48	77
10:00		34	50	84
11:00		37	54	91
12:00 PM		38	42	80
01:00		53	55	108
02:00		52	60	112
03:00		85	78	163
04:00		117	93	210
05:00		97	94	191
06:00		54	60	114
07:00		46	56	102
08:00		35	36	71
09:00		21	19	40
10:00		10	8	18
11:00		5	5	10
Total		905	1101	2006
Percent		45.1%	54.9%	
AM Peak	-	07:00	07:00	-
Vol.	-	80	136	-
PM Peak	-	16:00	17:00	-
Vol.	-	117	94	-
Grand Total		905	1101	2006
Percent		45.1%	54.9%	
ADT		ADT 2,006	AADT 2,006	

APPENDIX B

Level of Service Definitions

The following information can be found in the Highway Capacity Manual, Transportation Research Board, 2016:
Chapter 19 – Signalized Intersections and Chapter 20 – Two-Way Stop Controlled Intersections.

Automobile Level of Service (LOS) for Signalized Intersections

Levels of service are defined to represent reasonable ranges in control delay.

LOS A

Describes operations with a control delay of 10 s/veh or less and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is exceptionally favorable or the cycle length is very short. If it is due to favorable progression, most vehicles arrive during the green indication and travel through the intersection without stopping.

LOS B

Describes operations with control delay between 10 and 20 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is low and either progression is highly favorable or the cycle length is short. More vehicles stop than with LOS A.

LOS C

Describes operations with control delay between 20 and 35 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when progression is favorable or the cycle length is moderate. Individual *cycle failures* (i.e., one or more queued vehicles are not able to depart as a result of insufficient capacity during the cycle) may begin to appear at this level. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.

LOS D

Describes operations with control delay between 35 and 55 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high and either progression is ineffective or the cycle length is long. Many vehicles stop and individual cycle failures are noticeable.

LOS E

Describes operations with control delay between 55 and 80 s/veh and a volume-to-capacity ratio no greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is high, progression is unfavorable, and the cycle length is long. Individual cycle failures are frequent.

LOS F

Describes operations with control delay exceeding 80 s/veh or a volume-to-capacity ratio greater than 1.0. This level is typically assigned when the volume-to-capacity ratio is very high, progression is very poor, and the cycle length is long. Most cycles fail to clear the queue.

Level of Service (LOS) for Unsignalized TWSC Intersections

Level of Service ($v/c \leq 1.0$)	Average Control Delay (s/veh)
A	0 - 10
B	> 10 - 15
C	> 15 - 25
D	> 25 - 35
E	> 35 - 50
F	> 50

APPENDIX C

Capacity Worksheets

HCM 6th TWSC
1: S Marksheffel Boulevard & Drennan Road

Existing Traffic Volumes
AM Peak Hour

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	1	0	5	47	0	154	17	869	30	28	534	18
Future Vol, veh/h	1	0	5	47	0	154	17	869	30	28	534	18
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	-	-	Free	-	-	None	-	-	Free	-	-	Free
Storage Length	-	-	-	-	-	-	515	-	585	360	-	455
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	0	5	51	0	167	18	945	33	30	580	20

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1149	1621	-	1331	1621	473	580	0	-	945	0	0
Stage 1	640	640	-	981	981	-	-	-	-	-	-	-
Stage 2	509	981	-	350	640	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	-	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	-	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	153	102	0	113	102	538	990	-	0	722	-	0
Stage 1	430	468	0	268	326	-	-	-	0	-	-	0
Stage 2	515	326	0	639	468	-	-	-	0	-	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver	101	96	-	108	96	538	990	-	-	722	-	-
Mov Cap-2 Maneuver	101	96	-	108	96	-	-	-	-	-	-	-
Stage 1	422	448	-	263	320	-	-	-	-	-	-	-
Stage 2	348	320	-	612	448	-	-	-	-	-	-	-




Approach	EB	WB	NB	SB
HCM Control Delay, s		52.3	0.2	0.5
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1WBLn1	SBL	SBT
Capacity (veh/h)	990	-	- 279	722	-
HCM Lane V/C Ratio	0.019	-	- 0.783	0.042	-
HCM Control Delay (s)	8.7	-	- 52.3	10.2	-
HCM Lane LOS	A	-	- F	B	-
HCM 95th %tile Q(veh)	0.1	-	- 6	0.1	-

HCM 6th TWSC

2: Horizonview Drive & Drennan Road







Existing Traffic Volumes
AM Peak Hour

Intersection						
Int Delay, s/veh	4.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	31	28	9	82	115	1
Future Vol, veh/h	31	28	9	82	115	1
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	34	30	10	89	125	1
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	64	0	158	49
Stage 1	-	-	-	-	49	-
Stage 2	-	-	-	-	109	-
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	-	-	1538	-	833	1020
Stage 1	-	-	-	-	973	-
Stage 2	-	-	-	-	916	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1538	-	827	1020
Mov Cap-2 Maneuver	-	-	-	-	827	-
Stage 1	-	-	-	-	973	-
Stage 2	-	-	-	-	910	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.7		10.1	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	828	-	-	1538	-	
HCM Lane V/C Ratio	0.152	-	-	0.006	-	
HCM Control Delay (s)	10.1	-	-	7.4	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.5	-	-	0	-	

HCM 6th TWSC

3: Bradley Road & Horizonview Drive

Existing Traffic Volumes
AM Peak Hour

Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	84	257	119	4	19	279
Future Vol, veh/h	84	257	119	4	19	279
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Free
Storage Length	215	-	-	1000	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	91	279	129	4	21	303
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	129	0	-	0	590	-
Stage 1	-	-	-	-	129	-
Stage 2	-	-	-	-	461	-
Critical Hdwy	4.12	-	-	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	-
Pot Cap-1 Maneuver	1457	-	-	0	470	0
Stage 1	-	-	-	0	897	0
Stage 2	-	-	-	0	635	0
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1457	-	-	-	441	-
Mov Cap-2 Maneuver	-	-	-	-	441	-
Stage 1	-	-	-	-	841	-
Stage 2	-	-	-	-	635	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.9	0		13.6		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1		
Capacity (veh/h)	1457	-	-	441		
HCM Lane V/C Ratio	0.063	-	-	0.047		
HCM Control Delay (s)	7.6	-	-	13.6		
HCM Lane LOS	A	-	-	B		
HCM 95th %tile Q(veh)	0.2	-	-	0.1		

HCM 6th TWSC
1: S Marksheffel Boulevard & Drennan Road

Existing Traffic Volumes
PM Peak Hour

Intersection												
Int Delay, s/veh	4.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕	↕	↕	↕	↕
Traffic Vol, veh/h	16	3	25	27	1	77	6	838	61	130	715	3
Future Vol, veh/h	16	3	25	27	1	77	6	838	61	130	715	3
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	-	-	Free	-	-	None	-	-	Free	-	-	Free
Storage Length	-	-	-	-	-	-	515	-	585	360	-	455
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	17	3	27	29	1	84	7	911	66	141	777	3

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1529	1984	-	1597	1984	456	777	0	-	911	0	0
Stage 1	1059	1059	-	925	925	-	-	-	-	-	-	-
Stage 2	470	925	-	672	1059	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	-	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	-	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	80	61	0	71	61	551	835	-	0	743	-	0
Stage 1	240	299	0	290	346	-	-	-	0	-	-	0
Stage 2	543	346	0	412	299	-	-	-	0	-	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver	57	49	-	57	49	551	835	-	-	743	-	-
Mov Cap-2 Maneuver	57	49	-	57	49	-	-	-	-	-	-	-
Stage 1	238	242	-	288	343	-	-	-	-	-	-	-
Stage 2	455	343	-	329	242	-	-	-	-	-	-	-




Approach	EB	WB	NB	SB
HCM Control Delay, s		64.3	0.1	1.7
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1WBLn1	SBL	SBT
Capacity (veh/h)	835	-	- 166	743	-
HCM Lane V/C Ratio	0.008	-	- 0.688	0.19	-
HCM Control Delay (s)	9.3	-	- 64.3	11	-
HCM Lane LOS	A	-	- F	B	-
HCM 95th %tile Q(veh)	0	-	- 4.1	0.7	-

HCM 6th TWSC







2: Horizonview Drive & Drennan Road

Existing Traffic Volumes
PM Peak Hour

Intersection						
Int Delay, s/veh	2.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	101	105	9	46	59	4
Future Vol, veh/h	101	105	9	46	59	4
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	110	114	10	50	64	4
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	224	0	237	167
Stage 1	-	-	-	-	167	-
Stage 2	-	-	-	-	70	-
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	-	-	1345	-	751	877
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	953	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1345	-	745	877
Mov Cap-2 Maneuver	-	-	-	-	745	-
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	945	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.3		10.3	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	752	-	-	1345	-	
HCM Lane V/C Ratio	0.091	-	-	0.007	-	
HCM Control Delay (s)	10.3	-	-	7.7	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.3	-	-	0	-	

HCM 6th TWSC
3: Bradley Road & Horizonview Drive

Existing Traffic Volumes
PM Peak Hour

Intersection						
Int Delay, s/veh	3.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	217	129	243	11	4	113
Future Vol, veh/h	217	129	243	11	4	113
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Free
Storage Length	215	-	-	1000	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	236	140	264	12	4	123

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	264	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1300	-	0
Stage 1	-	-	0
Stage 2	-	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1300	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	5.3	0	19
HCM LOS			C





















Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1
Capacity (veh/h)	1300	-	-	261
HCM Lane V/C Ratio	0.181	-	-	0.017
HCM Control Delay (s)	8.4	-	-	19
HCM Lane LOS	A	-	-	C
HCM 95th %tile Q(veh)	0.7	-	-	0.1

Timings

1: S Marksheffel Boulevard & Drennan Road

Background Traffic Volumes

Year 2024 - AM Peak Hour





												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	5	50	0	163	18	922	32	30	567	19
Future Volume (vph)	1	0	5	50	0	163	18	922	32	30	567	19
Satd. Flow (prot)	0	1639	0	0	1651	0	1770	3539	1583	1770	3539	1583
Flt Permitted		0.928			0.918		0.419			0.243		
Satd. Flow (perm)	0	1533	0	0	1534	0	780	3539	1583	453	3539	1583
Satd. Flow (RTOR)		55			75				55			55
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	0	0	231	0	20	1002	35	33	616	21
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	24.0	24.0		24.0	24.0		36.0	36.0	36.0	36.0	36.0	36.0
Total Split (%)	40.0%	40.0%		40.0%	40.0%		60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0			6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
Act Effect Green (s)		10.1			10.1		21.0	21.0	21.0	21.0	21.0	21.0
Actuated g/C Ratio		0.23			0.23		0.48	0.48	0.48	0.48	0.48	0.48
v/c Ratio		0.02			0.56		0.05	0.59	0.04	0.15	0.36	0.03
Control Delay		0.0			15.7		7.5	10.3	1.8	9.5	8.3	0.8
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		0.0			15.7		7.5	10.3	1.8	9.5	8.3	0.8
LOS		A			B		A	B	A	A	A	A
Approach Delay					15.7			10.0			8.1	
Approach LOS					B			A			A	
Queue Length 50th (ft)		0			28		2	80	0	4	42	0
Queue Length 95th (ft)		0			95		12	165	8	20	92	3
Internal Link Dist (ft)		668			506			1400			1128	
Turn Bay Length (ft)							515		585	360		455
Base Capacity (vph)		685			697		554	2516	1141	322	2516	1141
Starvation Cap Reductn		0			0		0	0	0	0	0	0
Spillback Cap Reductn		0			0		0	0	0	0	0	0
Storage Cap Reductn		0			0		0	0	0	0	0	0
Reduced v/c Ratio		0.01			0.33		0.04	0.40	0.03	0.10	0.24	0.02
Intersection Summary												
Cycle Length: 60												
Actuated Cycle Length: 43.5												
Natural Cycle: 40												

Timings
1: S Marksheffel Boulevard & Drennan Road

Background Traffic Volumes
Year 2024 - AM Peak Hour

Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 10.0	Intersection LOS: A
Intersection Capacity Utilization 55.0%	ICU Level of Service A
Analysis Period (min) 15	




Splits and Phases: 1: S Marksheffel Boulevard & Drennan Road

 Ø2	 Ø4
36 s	24 s
 Ø6	 Ø8
36 s	24 s

HCM 6th TWSC

2: Horizonview Drive & Drennan Road







Background Traffic Volumes
Year 2024 - AM Peak Hour

Intersection						
Int Delay, s/veh	4.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	33	30	10	87	122	1
Future Vol, veh/h	33	30	10	87	122	1
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	36	33	11	95	133	1
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	69	0	170	53
Stage 1	-	-	-	-	53	-
Stage 2	-	-	-	-	117	-
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	-	-	1532	-	820	1014
Stage 1	-	-	-	-	970	-
Stage 2	-	-	-	-	908	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1532	-	813	1014
Mov Cap-2 Maneuver	-	-	-	-	813	-
Stage 1	-	-	-	-	970	-
Stage 2	-	-	-	-	901	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.8		10.3	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	814	-	-	1532	-	
HCM Lane V/C Ratio	0.164	-	-	0.007	-	
HCM Control Delay (s)	10.3	-	-	7.4	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.6	-	-	0	-	

HCM 6th TWSC

3: Bradley Road & Horizonview Drive

Background Traffic Volumes
Year 2024 - AM Peak Hour





















Intersection						
Int Delay, s/veh	1.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	89	273	126	4	20	296
Future Vol, veh/h	89	273	126	4	20	296
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Free
Storage Length	215	-	-	1000	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	97	297	137	4	22	322
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	137	0	-	0	628	-
Stage 1	-	-	-	-	137	-
Stage 2	-	-	-	-	491	-
Critical Hdwy	4.12	-	-	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	-
Pot Cap-1 Maneuver	1447	-	-	0	447	0
Stage 1	-	-	-	0	890	0
Stage 2	-	-	-	0	615	0
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1447	-	-	-	417	-
Mov Cap-2 Maneuver	-	-	-	-	417	-
Stage 1	-	-	-	-	830	-
Stage 2	-	-	-	-	615	-
Approach	EB	WB		SB		
HCM Control Delay, s	1.9	0		14.1		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1		
Capacity (veh/h)	1447	-	-	417		
HCM Lane V/C Ratio	0.067	-	-	0.052		
HCM Control Delay (s)	7.7	-	-	14.1		
HCM Lane LOS	A	-	-	B		
HCM 95th %tile Q(veh)	0.2	-	-	0.2		

Timings

1: S Marksheffel Boulevard & Drennan Road

Background Traffic Volumes

Year 2024 - PM Peak Hour





												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	3	27	29	1	82	6	889	65	138	759	3
Future Volume (vph)	17	3	27	29	1	82	6	889	65	138	759	3
Satd. Flow (prot)	0	1687	0	0	1658	0	1770	3539	1583	1770	3539	1583
Flt Permitted		0.831			0.894		0.341			0.287		
Satd. Flow (perm)	0	1427	0	0	1502	0	635	3539	1583	535	3539	1583
Satd. Flow (RTOR)		29			89				71			55
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	50	0	0	122	0	7	966	71	150	825	3
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	13.0	13.0		13.0	13.0		47.0	47.0	47.0	47.0	47.0	47.0
Total Split (%)	21.7%	21.7%		21.7%	21.7%		78.3%	78.3%	78.3%	78.3%	78.3%	78.3%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0			6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
Act Effect Green (s)		6.3			6.3		24.3	24.3	24.3	24.3	24.3	24.3
Actuated g/C Ratio		0.16			0.16		0.63	0.63	0.63	0.63	0.63	0.63
v/c Ratio		0.19			0.38		0.02	0.43	0.07	0.45	0.37	0.00
Control Delay		12.3			11.3		4.3	6.0	1.6	11.3	5.6	0.0
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		12.3			11.3		4.3	6.0	1.6	11.3	5.6	0.0
LOS		B			B		A	A	A	B	A	A
Approach Delay		12.3			11.3			5.7			6.4	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		3			5		1	59	0	18	47	0
Queue Length 95th (ft)		29			46		4	93	10	57	76	0
Internal Link Dist (ft)		668			506			1400			1128	
Turn Bay Length (ft)							515		585	360		455
Base Capacity (vph)		289			352		612	3413	1529	516	3413	1528
Starvation Cap Reductn		0			0		0	0	0	0	0	0
Spillback Cap Reductn		0			0		0	0	0	0	0	0
Storage Cap Reductn		0			0		0	0	0	0	0	0
Reduced v/c Ratio		0.17			0.35		0.01	0.28	0.05	0.29	0.24	0.00
Intersection Summary												
Cycle Length: 60												
Actuated Cycle Length: 38.6												
Natural Cycle: 45												

Timings
1: S Marksheffel Boulevard & Drennan Road

Background Traffic Volumes
Year 2024 - PM Peak Hour

Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.45	
Intersection Signal Delay: 6.5	Intersection LOS: A
Intersection Capacity Utilization 55.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 1: S Marksheffel Boulevard & Drennan Road




 Ø2	 Ø4
47 s	13 s
 Ø6	 Ø8
47 s	13 s

HCM 6th TWSC

2: Horizonview Drive & Drennan Road

Background Traffic Volumes







Year 2024 - PM Peak Hour

Intersection						
Int Delay, s/veh	2.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	107	111	10	49	63	4
Future Vol, veh/h	107	111	10	49	63	4
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	116	121	11	53	68	4
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	237	0	252	177
Stage 1	-	-	-	-	177	-
Stage 2	-	-	-	-	75	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1330	-	737	866
Stage 1	-	-	-	-	854	-
Stage 2	-	-	-	-	948	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1330	-	730	866
Mov Cap-2 Maneuver	-	-	-	-	730	-
Stage 1	-	-	-	-	854	-
Stage 2	-	-	-	-	939	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.3		10.4	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	737	-	-	1330	-	
HCM Lane V/C Ratio	0.099	-	-	0.008	-	
HCM Control Delay (s)	10.4	-	-	7.7	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.3	-	-	0	-	

HCM 6th TWSC

3: Bradley Road & Horizonview Drive

Background Traffic Volumes
Year 2024 - PM Peak Hour





















Intersection						
Int Delay, s/veh	3.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	230	137	258	12	4	120
Future Vol, veh/h	230	137	258	12	4	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Free
Storage Length	215	-	-	1000	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	250	149	280	13	4	130
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	280	0	-	0	929	-
Stage 1	-	-	-	-	280	-
Stage 2	-	-	-	-	649	-
Critical Hdwy	4.12	-	-	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	-
Pot Cap-1 Maneuver	1283	-	-	0	297	0
Stage 1	-	-	-	0	767	0
Stage 2	-	-	-	0	520	0
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1283	-	-	-	239	-
Mov Cap-2 Maneuver	-	-	-	-	239	-
Stage 1	-	-	-	-	617	-
Stage 2	-	-	-	-	520	-
Approach	EB	WB		SB		
HCM Control Delay, s	5.3	0		20.3		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1		
Capacity (veh/h)	1283	-	-	239		
HCM Lane V/C Ratio	0.195	-	-	0.018		
HCM Control Delay (s)	8.5	-	-	20.3		
HCM Lane LOS	A	-	-	C		
HCM 95th %tile Q(veh)	0.7	-	-	0.1		

Timings

1: S Marksheffel Boulevard & Drennan Road

Background Traffic Volumes

Year 2042 - AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	9	85	0	278	31	1570	54	51	964	33
Future Volume (vph)	2	0	9	85	0	278	31	1570	54	51	964	33
Satd. Flow (prot)	0	1639	0	0	1651	0	1770	3539	1583	1770	3539	1583
Flt Permitted		0.944			0.916		0.223			0.127		
Satd. Flow (perm)	0	1560	0	0	1531	0	415	3539	1583	237	3539	1583
Satd. Flow (RTOR)		55			55				59			55
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	394	0	34	1707	59	55	1048	36
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	21.0	21.0		21.0	21.0		39.0	39.0	39.0	39.0	39.0	39.0
Total Split (%)	35.0%	35.0%		35.0%	35.0%		65.0%	65.0%	65.0%	65.0%	65.0%	65.0%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0			6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
Act Effect Green (s)		14.8			14.8		31.6	31.6	31.6	31.6	31.6	31.6
Actuated g/C Ratio		0.25			0.25		0.54	0.54	0.54	0.54	0.54	0.54
v/c Ratio		0.03			0.92		0.15	0.89	0.07	0.43	0.55	0.04
Control Delay		0.1			49.8		8.7	19.8	2.3	20.9	10.0	1.5
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		0.1			49.8		8.7	19.8	2.3	20.9	10.0	1.5
LOS		A			D		A	B	A	C	B	A
Approach Delay		0.1			49.8			19.0			10.3	
Approach LOS		A			D			B			B	
Queue Length 50th (ft)		0			121		5	253	0	10	114	0
Queue Length 95th (ft)		0			#275		18	#385	13	#48	160	7
Internal Link Dist (ft)		668			506			1400			1128	
Turn Bay Length (ft)							515		585	360		455
Base Capacity (vph)		442			434		234	2001	921	134	2001	919
Starvation Cap Reductn		0			0		0	0	0	0	0	0
Spillback Cap Reductn		0			0		0	0	0	0	0	0
Storage Cap Reductn		0			0		0	0	0	0	0	0
Reduced v/c Ratio		0.03			0.91		0.15	0.85	0.06	0.41	0.52	0.04
Intersection Summary												
Cycle Length: 60												
Actuated Cycle Length: 58.5												
Natural Cycle: 60												

Timings 1: S Marksheffel Boulevard & Drennan Road

Background Traffic Volumes
Year 2042 - AM Peak Hour

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 19.6

Intersection LOS: B

Intersection Capacity Utilization 81.9%





ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.




Splits and Phases: 1: S Marksheffel Boulevard & Drennan Road

 Ø2	 Ø4
39 s	21 s
 Ø6	 Ø8
39 s	21 s

HCM 6th TWSC

2: Horizonview Drive & Drennan Road







Background Traffic Volumes
Year 2042 - AM Peak Hour

Intersection						
Int Delay, s/veh	5.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	56	51	16	148	208	2
Future Vol, veh/h	56	51	16	148	208	2
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	61	55	17	161	226	2
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	116	0	284	89
Stage 1	-	-	-	-	89	-
Stage 2	-	-	-	-	195	-
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	-	-	1473	-	706	969
Stage 1	-	-	-	-	934	-
Stage 2	-	-	-	-	838	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1473	-	697	969
Mov Cap-2 Maneuver	-	-	-	-	697	-
Stage 1	-	-	-	-	934	-
Stage 2	-	-	-	-	827	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.7		12.6	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	699	-	-	1473	-	
HCM Lane V/C Ratio	0.327	-	-	0.012	-	
HCM Control Delay (s)	12.6	-	-	7.5	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	1.4	-	-	0	-	

HCM 6th TWSC

3: Bradley Road & Horizonview Drive

Background Traffic Volumes
Year 2042 - AM Peak Hour





















Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	152	464	215	7	34	504
Future Vol, veh/h	152	464	215	7	34	504
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Free
Storage Length	215	-	-	1000	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	165	504	234	8	37	548
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	234	0	-	0	1068	-
Stage 1	-	-	-	-	234	-
Stage 2	-	-	-	-	834	-
Critical Hdwy	4.12	-	-	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	-
Pot Cap-1 Maneuver	1333	-	-	0	245	0
Stage 1	-	-	-	0	805	0
Stage 2	-	-	-	0	426	0
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1333	-	-	-	215	-
Mov Cap-2 Maneuver	-	-	-	-	215	-
Stage 1	-	-	-	-	705	-
Stage 2	-	-	-	-	426	-
Approach	EB	WB		SB		
HCM Control Delay, s	2	0		25.2		
HCM LOS	D					
Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1		
Capacity (veh/h)	1333	-	-	215		
HCM Lane V/C Ratio	0.124	-	-	0.172		
HCM Control Delay (s)	8.1	-	-	25.2		
HCM Lane LOS	A	-	-	D		
HCM 95th %tile Q(veh)	0.4	-	-	0.6		

Timings

1: S Marksheffel Boulevard & Drennan Road

Background Traffic Volumes

Year 2042 - PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	5	45	49	2	139	11	1514	110	235	1291	5
Future Volume (vph)	29	5	45	49	2	139	11	1514	110	235	1291	5
Satd. Flow (prot)	0	1688	0	0	1657	0	1770	3539	1583	1770	3539	1583
Flt Permitted		0.721			0.899		0.167			0.118		
Satd. Flow (perm)	0	1240	0	0	1509	0	311	3539	1583	220	3539	1583
Satd. Flow (RTOR)		49			50				120			55
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	86	0	0	206	0	12	1646	120	255	1403	5
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	11.0	11.0		11.0	11.0		49.0	49.0	49.0	49.0	49.0	49.0
Total Split (%)	18.3%	18.3%		18.3%	18.3%		81.7%	81.7%	81.7%	81.7%	81.7%	81.7%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0			6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
Act Effect Green (s)		5.0			5.0		45.9	45.9	45.9	45.9	45.9	45.9
Actuated g/C Ratio		0.08			0.08		0.73	0.73	0.73	0.73	0.73	0.73
v/c Ratio		0.60			1.24		0.05	0.64	0.10	1.59	0.54	0.00
Control Delay		34.0			173.1		3.2	5.8	0.8	315.1	4.9	0.0
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		34.0			173.1		3.2	5.8	0.8	315.1	4.9	0.0
LOS		C			F		A	A	A	F	A	A
Approach Delay		34.0			173.1			5.5			52.4	
Approach LOS		C			F			A			D	
Queue Length 50th (ft)		13			~75		1	124	0	~80	93	0
Queue Length 95th (ft)		#68			#191		5	174	9	#207	131	0
Internal Link Dist (ft)		668			506			1400			1128	
Turn Bay Length (ft)							515		585	360		455
Base Capacity (vph)		144			166		226	2576	1185	160	2576	1167
Starvation Cap Reductn		0			0		0	0	0	0	0	0
Spillback Cap Reductn		0			0		0	0	0	0	0	0
Storage Cap Reductn		0			0		0	0	0	0	0	0
Reduced v/c Ratio		0.60			1.24		0.05	0.64	0.10	1.59	0.54	0.00
Intersection Summary												
Cycle Length: 60												
Actuated Cycle Length: 63												
Natural Cycle: 130												

Timings

1: S Marksheffel Boulevard & Drennan Road

Background Traffic Volumes

Year 2042 - PM Peak Hour

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.59

Intersection Signal Delay: 36.3

Intersection LOS: D

Intersection Capacity Utilization 83.2%

ICU Level of Service E

Analysis Period (min) 15





~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: S Marksheffel Boulevard & Drennan Road






 Ø2	 Ø4
49 s	11 s
 Ø6	 Ø8
49 s	11 s

HCM 6th TWSC

2: Horizonview Drive & Drennan Road

Background Traffic Volumes

Year 2042 - PM Peak Hour







Intersection						
Int Delay, s/veh	2.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations				 	 	
Traffic Vol, veh/h	182	190	16	83	107	7
Future Vol, veh/h	182	190	16	83	107	7
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	198	207	17	90	116	8
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	405	0	426	302
Stage 1	-	-	-	-	302	-
Stage 2	-	-	-	-	124	-
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	-	-	1154	-	585	738
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	902	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1154	-	576	738
Mov Cap-2 Maneuver	-	-	-	-	576	-
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	888	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.3		12.8	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	584	-	-	1154	-	
HCM Lane V/C Ratio	0.212	-	-	0.015	-	
HCM Control Delay (s)	12.8	-	-	8.2	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.8	-	-	0	-	

HCM 6th TWSC

3: Bradley Road & Horizonview Drive

Background Traffic Volumes

Year 2042 - PM Peak Hour





















Intersection						
Int Delay, s/veh	4.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	392	233	439	20	7	204
Future Vol, veh/h	392	233	439	20	7	204
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Free
Storage Length	215	-	-	1000	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	426	253	477	22	8	222
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	477	0	-	0	1582	-
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	1105	-
Critical Hdwy	4.12	-	-	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	-
Pot Cap-1 Maneuver	1085	-	-	0	120	0
Stage 1	-	-	-	0	624	0
Stage 2	-	-	-	0	317	0
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1085	-	-	-	73	-
Mov Cap-2 Maneuver	-	-	-	-	73	-
Stage 1	-	-	-	-	379	-
Stage 2	-	-	-	-	317	-
Approach	EB	WB		SB		
HCM Control Delay, s	6.6	0		60		
HCM LOS	F					
Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1		
Capacity (veh/h)	1085	-	-	73		
HCM Lane V/C Ratio	0.393	-	-	0.104		
HCM Control Delay (s)	10.4	-	-	60		
HCM Lane LOS	B	-	-	F		
HCM 95th %tile Q(veh)	1.9	-	-	0.3		

Timings

1: S Marksheffel Boulevard & Drennan Road

Total Traffic Volumes

Year 2024 - AM Peak Hour





												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	0	5	50	0	203	18	922	36	43	567	19
Future Volume (vph)	1	0	5	50	0	203	18	922	36	43	567	19
Satd. Flow (prot)	0	1639	0	0	1645	0	1770	3539	1583	1770	3539	1583
Flt Permitted		0.928			0.930		0.419			0.234		
Satd. Flow (perm)	0	1533	0	0	1545	0	780	3539	1583	436	3539	1583
Satd. Flow (RTOR)		55			75				55			55
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	6	0	0	275	0	20	1002	39	47	616	21
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	24.0	24.0		24.0	24.0		36.0	36.0	36.0	36.0	36.0	36.0
Total Split (%)	40.0%	40.0%		40.0%	40.0%		60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0			6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
Act Effect Green (s)		11.2			11.2		19.8	19.8	19.8	19.8	19.8	19.8
Actuated g/C Ratio		0.26			0.26		0.46	0.46	0.46	0.46	0.46	0.46
v/c Ratio		0.01			0.61		0.06	0.62	0.05	0.24	0.38	0.03
Control Delay		0.0			17.1		8.0	11.4	2.2	11.8	9.0	0.8
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		0.0			17.1		8.0	11.4	2.2	11.8	9.0	0.8
LOS		A			B		A	B	A	B	A	A
Approach Delay					17.1			11.0			8.9	
Approach LOS					B			B			A	
Queue Length 50th (ft)		0			39		2	86	0	6	46	0
Queue Length 95th (ft)		0			119		13	173	9	28	96	3
Internal Link Dist (ft)		668			506			1400			1128	
Turn Bay Length (ft)							515		585	360		455
Base Capacity (vph)		691			707		559	2538	1151	312	2538	1151
Starvation Cap Reductn		0			0		0	0	0	0	0	0
Spillback Cap Reductn		0			0		0	0	0	0	0	0
Storage Cap Reductn		0			0		0	0	0	0	0	0
Reduced v/c Ratio		0.01			0.39		0.04	0.39	0.03	0.15	0.24	0.02
Intersection Summary												
Cycle Length: 60												
Actuated Cycle Length: 43.5												
Natural Cycle: 40												

Timings
1: S Marksheffel Boulevard & Drennan Road

Total Traffic Volumes
Year 2024 - AM Peak Hour




Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 11.1	Intersection LOS: B
Intersection Capacity Utilization 67.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 1: S Marksheffel Boulevard & Drennan Road

 Ø2	 Ø4
36 s	24 s
 Ø6	 Ø8
36 s	24 s

HCM 6th TWSC 2: Horizonview Drive & Drennan Road







Total Traffic Volumes
Year 2024 - AM Peak Hour

Intersection						
Int Delay, s/veh	5.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	33	47	10	87	162	1
Future Vol, veh/h	33	47	10	87	162	1
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	36	51	11	95	176	1
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	87	0	179	62
Stage 1	-	-	-	-	62	-
Stage 2	-	-	-	-	117	-
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	-	-	1509	-	811	1003
Stage 1	-	-	-	-	961	-
Stage 2	-	-	-	-	908	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1509	-	805	1003
Mov Cap-2 Maneuver	-	-	-	-	805	-
Stage 1	-	-	-	-	961	-
Stage 2	-	-	-	-	901	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.8		10.7	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	806	-	-	1509	-	
HCM Lane V/C Ratio	0.22	-	-	0.007	-	
HCM Control Delay (s)	10.7	-	-	7.4	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.8	-	-	0	-	

HCM 6th TWSC




3: Bradley Road & Horizonview Drive

Total Traffic Volumes
Year 2024 - AM Peak Hour

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	135	273	126	7	29	446
Future Vol, veh/h	135	273	126	7	29	446
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Free
Storage Length	215	-	-	1000	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	147	297	137	8	32	485
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	137	0	-	0	728	-
Stage 1	-	-	-	-	137	-
Stage 2	-	-	-	-	591	-
Critical Hdwy	4.12	-	-	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	-
Pot Cap-1 Maneuver	1447	-	-	0	390	0
Stage 1	-	-	-	0	890	0
Stage 2	-	-	-	0	553	0
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1447	-	-	-	350	-
Mov Cap-2 Maneuver	-	-	-	-	350	-
Stage 1	-	-	-	-	799	-
Stage 2	-	-	-	-	553	-
Approach	EB	WB		SB		
HCM Control Delay, s	2.6	0		16.3		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1		
Capacity (veh/h)	1447	-	-	350		
HCM Lane V/C Ratio	0.101	-	-	0.09		
HCM Control Delay (s)	7.8	-	-	16.3		
HCM Lane LOS	A	-	-	C		
HCM 95th %tile Q(veh)	0.3	-	-	0.3		




HCM 6th TWSC 4: Horizonview Drive & Access A

Total Traffic Volumes
Year 2024 - AM Peak Hour

Intersection						
Int Delay, s/veh	0.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	10	153	0	4	53
Future Vol, veh/h	9	10	153	0	4	53
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	10	11	166	0	4	58
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	232	166	0	0	166	0
Stage 1	166	-	-	-	-	-
Stage 2	66	-	-	-	-	-
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	756	878	-	-	1412	-
Stage 1	863	-	-	-	-	-
Stage 2	957	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	754	878	-	-	1412	-
Mov Cap-2 Maneuver	754	-	-	-	-	-
Stage 1	863	-	-	-	-	-
Stage 2	954	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.5	0		0.5		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 815		1412	-	
HCM Lane V/C Ratio	-	- 0.025		0.003	-	
HCM Control Delay (s)	-	- 9.5		7.6	0	
HCM Lane LOS	-	- A		A	A	
HCM 95th %tile Q(veh)	-	- 0.1		0	-	

HCM 6th TWSC
5: Access B & Horizonview Drive

Total Traffic Volumes
Year 2024 - AM Peak Hour

Intersection						
Int Delay, s/veh	3.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	56	6	20	133	20	60
Future Vol, veh/h	56	6	20	133	20	60
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	61	7	22	145	22	65
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	68	0	254	65
Stage 1	-	-	-	-	65	-
Stage 2	-	-	-	-	189	-
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	-	-	1533	-	735	999
Stage 1	-	-	-	-	958	-
Stage 2	-	-	-	-	843	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1533	-	723	999
Mov Cap-2 Maneuver	-	-	-	-	723	-
Stage 1	-	-	-	-	958	-
Stage 2	-	-	-	-	830	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1		9.4	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	912	-	-	1533	-	
HCM Lane V/C Ratio	0.095	-	-	0.014	-	
HCM Control Delay (s)	9.4	-	-	7.4	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.3	-	-	0	-	

HCM 6th TWSC
6: Access D/Access C & Horizonview Drive

Total Traffic Volumes
Year 2024 - AM Peak Hour





















Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Vol, veh/h	0	109	7	20	143	9	10	0	70	20	0	0
Future Vol, veh/h	0	109	7	20	143	9	10	0	70	20	0	0
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	0	118	8	22	155	10	11	0	76	22	0	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	165	0	0	126	0	0	326	331	122	364	330	160
Stage 1	-	-	-	-	-	-	122	122	-	204	204	-
Stage 2	-	-	-	-	-	-	204	209	-	160	126	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1413	-	-	1460	-	-	627	588	929	592	589	885
Stage 1	-	-	-	-	-	-	882	795	-	798	733	-
Stage 2	-	-	-	-	-	-	798	729	-	842	792	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1413	-	-	1460	-	-	619	578	929	536	579	885
Mov Cap-2 Maneuver	-	-	-	-	-	-	619	578	-	536	579	-
Stage 1	-	-	-	-	-	-	882	795	-	798	721	-
Stage 2	-	-	-	-	-	-	784	717	-	773	792	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.9			9.6			12		
HCM LOS							A			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	874	1413	-	-	1460	-	-	536				
HCM Lane V/C Ratio	0.099	-	-	-	0.015	-	-	0.041				
HCM Control Delay (s)	9.6	0	-	-	7.5	0	-	12				
HCM Lane LOS	A	A	-	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0.1				

Timings

1: S Marksheffel Boulevard & Drennan Road

Total Traffic Volumes

Year 2024 - PM Peak Hour





												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	3	27	29	1	108	6	889	76	183	759	3
Future Volume (vph)	17	3	27	29	1	108	6	889	76	183	759	3
Satd. Flow (prot)	0	1687	0	0	1649	0	1770	3539	1583	1770	3539	1583
Flt Permitted		0.889			0.912		0.341			0.289		
Satd. Flow (perm)	0	1527	0	0	1520	0	635	3539	1583	538	3539	1583
Satd. Flow (RTOR)		29			117				83			55
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	50	0	0	150	0	7	966	83	199	825	3
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	13.0	13.0		13.0	13.0		47.0	47.0	47.0	47.0	47.0	47.0
Total Split (%)	21.7%	21.7%		21.7%	21.7%		78.3%	78.3%	78.3%	78.3%	78.3%	78.3%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0			6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
Act Effect Green (s)		6.5			6.5		27.8	27.8	27.8	27.8	27.8	27.8
Actuated g/C Ratio		0.15			0.15		0.66	0.66	0.66	0.66	0.66	0.66
v/c Ratio		0.19			0.45		0.02	0.41	0.08	0.56	0.35	0.00
Control Delay		14.7			12.9		3.7	5.3	1.2	13.5	4.9	0.0
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		14.7			12.9		3.7	5.3	1.2	13.5	4.9	0.0
LOS		B			B		A	A	A	B	A	A
Approach Delay		14.7			12.9			5.0			6.6	
Approach LOS		B			B			A			A	
Queue Length 50th (ft)		4			6		1	60	0	27	48	0
Queue Length 95th (ft)		34			58		4	88	9	84	73	0
Internal Link Dist (ft)		668			506			1400			1128	
Turn Bay Length (ft)							515		585	360		455
Base Capacity (vph)		291			362		580	3234	1454	491	3234	1451
Starvation Cap Reductn		0			0		0	0	0	0	0	0
Spillback Cap Reductn		0			0		0	0	0	0	0	0
Storage Cap Reductn		0			0		0	0	0	0	0	0
Reduced v/c Ratio		0.17			0.41		0.01	0.30	0.06	0.41	0.26	0.00
Intersection Summary												
Cycle Length: 60												
Actuated Cycle Length: 42.2												
Natural Cycle: 55												

Timings
1: S Marksheffel Boulevard & Drennan Road

Total Traffic Volumes
Year 2024 - PM Peak Hour

Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 6.4	Intersection LOS: A
Intersection Capacity Utilization 59.1%	ICU Level of Service B
Analysis Period (min) 15	




Splits and Phases: 1: S Marksheffel Boulevard & Drennan Road

 Ø2	 Ø4
47 s	13 s
 Ø6	 Ø8
47 s	13 s

HCM 6th TWSC

2: Horizonview Drive & Drennan Road







Total Traffic Volumes
Year 2024 - PM Peak Hour

Intersection						
Int Delay, s/veh	2.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	107	167	10	49	89	4
Future Vol, veh/h	107	167	10	49	89	4
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	116	182	11	53	97	4
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	298	0	282	207
Stage 1	-	-	-	-	207	-
Stage 2	-	-	-	-	75	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1263	-	708	833
Stage 1	-	-	-	-	828	-
Stage 2	-	-	-	-	948	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1263	-	702	833
Mov Cap-2 Maneuver	-	-	-	-	702	-
Stage 1	-	-	-	-	828	-
Stage 2	-	-	-	-	939	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.3		10.9	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	707	-	-	1263	-	
HCM Lane V/C Ratio	0.143	-	-	0.009	-	
HCM Control Delay (s)	10.9	-	-	7.9	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.5	-	-	0	-	

HCM 6th TWSC




3: Bradley Road & Horizonview Drive

Total Traffic Volumes
Year 2024 - PM Peak Hour

Intersection						
Int Delay, s/veh	5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	386	137	258	23	11	218
Future Vol, veh/h	386	137	258	23	11	218
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Free
Storage Length	215	-	-	1000	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	420	149	280	25	12	237
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	280	0	-	0	1269	-
Stage 1	-	-	-	-	280	-
Stage 2	-	-	-	-	989	-
Critical Hdwy	4.12	-	-	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	-
Pot Cap-1 Maneuver	1283	-	-	0	186	0
Stage 1	-	-	-	0	767	0
Stage 2	-	-	-	0	360	0
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1283	-	-	-	125	-
Mov Cap-2 Maneuver	-	-	-	-	125	-
Stage 1	-	-	-	-	516	-
Stage 2	-	-	-	-	360	-
Approach	EB	WB		SB		
HCM Control Delay, s	6.8	0		36.8		
HCM LOS	E					
Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1		
Capacity (veh/h)	1283	-	-	125		
HCM Lane V/C Ratio	0.327	-	-	0.096		
HCM Control Delay (s)	9.2	-	-	36.8		
HCM Lane LOS	A	-	-	E		
HCM 95th %tile Q(veh)	1.4	-	-	0.3		




HCM 6th TWSC 4: Horizonview Drive & Access A

Total Traffic Volumes
Year 2024 - PM Peak Hour

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	6	87	0	11	166
Future Vol, veh/h	7	6	87	0	11	166
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	7	95	0	12	180
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	299	95	0	0	95	0
Stage 1	95	-	-	-	-	-
Stage 2	204	-	-	-	-	-
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	692	962	-	-	1499	-
Stage 1	929	-	-	-	-	-
Stage 2	830	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	686	962	-	-	1499	-
Mov Cap-2 Maneuver	686	-	-	-	-	-
Stage 1	929	-	-	-	-	-
Stage 2	823	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.6	0		0.5		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 791		1499	-	
HCM Lane V/C Ratio	-	- 0.018		0.008	-	
HCM Control Delay (s)	-	- 9.6		7.4	0	
HCM Lane LOS	-	- A		A	A	
HCM 95th %tile Q(veh)	-	- 0.1		0	-	

HCM 6th TWSC
5: Access B & Horizonview Drive

Total Traffic Volumes
Year 2024 - PM Peak Hour

Intersection						
Int Delay, s/veh	2.9					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	151	22	67	74	13	39
Future Vol, veh/h	151	22	67	74	13	39
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	164	24	73	80	14	42
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	188	0	402	176
Stage 1	-	-	-	-	176	-
Stage 2	-	-	-	-	226	-
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	-	-	1386	-	604	867
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	812	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1386	-	571	867
Mov Cap-2 Maneuver	-	-	-	-	571	-
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	767	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		3.7		10.1	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	768	-	-	1386	-	
HCM Lane V/C Ratio	0.074	-	-	0.053	-	
HCM Control Delay (s)	10.1	-	-	7.7	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0.2	-	

HCM 6th TWSC
6: Access D/Access C & Horizonview Drive

Total Traffic Volumes
Year 2024 - PM Peak Hour

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	167	23	67	134	33	7	0	46	13	0	0
Future Vol, veh/h	0	167	23	67	134	33	7	0	46	13	0	0
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	0	182	25	73	146	36	8	0	50	14	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	182	0	0	207	0	0	505	523	195	530	517	164
Stage 1	-	-	-	-	-	-	195	195	-	310	310	-
Stage 2	-	-	-	-	-	-	310	328	-	220	207	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1393	-	-	1364	-	-	478	459	846	460	462	881
Stage 1	-	-	-	-	-	-	807	739	-	700	659	-
Stage 2	-	-	-	-	-	-	700	647	-	782	731	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1393	-	-	1364	-	-	456	431	846	413	434	881
Mov Cap-2 Maneuver	-	-	-	-	-	-	456	431	-	413	434	-
Stage 1	-	-	-	-	-	-	807	739	-	700	619	-
Stage 2	-	-	-	-	-	-	658	608	-	736	731	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.2	10.1	14
HCM LOS			B	B





















Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	760	1393	-	-	1364	-	-	413
HCM Lane V/C Ratio	0.076	-	-	-	0.053	-	-	0.034
HCM Control Delay (s)	10.1	0	-	-	7.8	0	-	14
HCM Lane LOS	B	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	0.2	0	-	-	0.2	-	-	0.1

Timings

1: S Marksheffel Boulevard & Drennan Road

Total Traffic Volumes

Year 2042 - AM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	9	85	0	318	31	1570	59	64	964	33
Future Volume (vph)	2	0	9	85	0	318	31	1570	59	64	964	33
Satd. Flow (prot)	0	1639	0	0	1647	0	1770	3539	1583	1770	3539	1583
Flt Permitted		0.941			0.924		0.222			0.126		
Satd. Flow (perm)	0	1555	0	0	1537	0	414	3539	1583	235	3539	1583
Satd. Flow (RTOR)		55			55				64			55
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	12	0	0	438	0	34	1707	64	70	1048	36
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	21.0	21.0		21.0	21.0		39.0	39.0	39.0	39.0	39.0	39.0
Total Split (%)	35.0%	35.0%		35.0%	35.0%		65.0%	65.0%	65.0%	65.0%	65.0%	65.0%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0			6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
Act Effect Green (s)		15.0			15.0		31.7	31.7	31.7	31.7	31.7	31.7
Actuated g/C Ratio		0.26			0.26		0.54	0.54	0.54	0.54	0.54	0.54
v/c Ratio		0.03			1.01		0.15	0.89	0.07	0.56	0.55	0.04
Control Delay		0.1			70.2		8.7	20.0	2.3	30.6	10.1	1.5
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		0.1			70.2		8.7	20.0	2.3	30.6	10.1	1.5
LOS		A			E		A	B	A	C	B	A
Approach Delay		0.1			70.2			19.1			11.1	
Approach LOS		A			E			B			B	
Queue Length 50th (ft)		0			~149		5	253	0	15	114	0
Queue Length 95th (ft)		0			#317		18	#385	13	#74	160	7
Internal Link Dist (ft)		668			506			1400			1128	
Turn Bay Length (ft)							515		585	360		455
Base Capacity (vph)		439			434		232	1992	919	132	1992	915
Starvation Cap Reductn		0			0		0	0	0	0	0	0
Spillback Cap Reductn		0			0		0	0	0	0	0	0
Storage Cap Reductn		0			0		0	0	0	0	0	0
Reduced v/c Ratio		0.03			1.01		0.15	0.86	0.07	0.53	0.53	0.04
Intersection Summary												
Cycle Length: 60												
Actuated Cycle Length: 58.7												
Natural Cycle: 70												

Timings





1: S Marksheffel Boulevard & Drennan Road

Total Traffic Volumes

Year 2042 - AM Peak Hour

Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 22.9	Intersection LOS: C
Intersection Capacity Utilization 94.2%	ICU Level of Service F
Analysis Period (min) 15	
~ Volume exceeds capacity, queue is theoretically infinite.	
Queue shown is maximum after two cycles.	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	




Splits and Phases: 1: S Marksheffel Boulevard & Drennan Road

 Ø2	 Ø4
39 s	21 s
 Ø6	 Ø8
39 s	21 s

HCM 6th TWSC

2: Horizonview Drive & Drennan Road







Total Traffic Volumes
Year 2042 - AM Peak Hour

Intersection						
Int Delay, s/veh	6.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	56	68	16	148	248	2
Future Vol, veh/h	56	68	16	148	248	2
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	61	74	17	161	270	2
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	135	0	293	98
Stage 1	-	-	-	-	98	-
Stage 2	-	-	-	-	195	-
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	-	-	1449	-	698	958
Stage 1	-	-	-	-	926	-
Stage 2	-	-	-	-	838	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1449	-	689	958
Mov Cap-2 Maneuver	-	-	-	-	689	-
Stage 1	-	-	-	-	926	-
Stage 2	-	-	-	-	827	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.7		13.5	
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	691	-	-	1449	-	
HCM Lane V/C Ratio	0.393	-	-	0.012	-	
HCM Control Delay (s)	13.5	-	-	7.5	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	1.9	-	-	0	-	

HCM 6th TWSC

3: Bradley Road & Horizonview Drive




Total Traffic Volumes
Year 2042 - AM Peak Hour

Intersection						
Int Delay, s/veh	3.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	198	464	215	10	43	654
Future Vol, veh/h	198	464	215	10	43	654
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Free
Storage Length	215	-	-	1000	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	215	504	234	11	47	711
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	234	0	-	0	1168	-
Stage 1	-	-	-	-	234	-
Stage 2	-	-	-	-	934	-
Critical Hdwy	4.12	-	-	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	-
Pot Cap-1 Maneuver	1333	-	-	0	214	0
Stage 1	-	-	-	0	805	0
Stage 2	-	-	-	0	382	0
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1333	-	-	-	180	-
Mov Cap-2 Maneuver	-	-	-	-	180	-
Stage 1	-	-	-	-	675	-
Stage 2	-	-	-	-	382	-
Approach	EB	WB		SB		
HCM Control Delay, s	2.5	0		31.9		
HCM LOS	D					
Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1		
Capacity (veh/h)	1333	-	-	180		
HCM Lane V/C Ratio	0.161	-	-	0.26		
HCM Control Delay (s)	8.2	-	-	31.9		
HCM Lane LOS	A	-	-	D		
HCM 95th %tile Q(veh)	0.6	-	-	1		

HCM 6th TWSC




4: Horizonview Drive & Access A

Total Traffic Volumes
Year 2042 - AM Peak Hour

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	10	240	0	4	80
Future Vol, veh/h	9	10	240	0	4	80
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	10	11	261	0	4	87
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	356	261	0	0	261	0
Stage 1	261	-	-	-	-	-
Stage 2	95	-	-	-	-	-
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	642	778	-	-	1303	-
Stage 1	783	-	-	-	-	-
Stage 2	929	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	640	778	-	-	1303	-
Mov Cap-2 Maneuver	640	-	-	-	-	-
Stage 1	783	-	-	-	-	-
Stage 2	926	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.3	0		0.4		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 706		1303	-	
HCM Lane V/C Ratio	-	- 0.029		0.003	-	
HCM Control Delay (s)	-	- 10.3		7.8	0	
HCM Lane LOS	-	- B		A	A	
HCM 95th %tile Q(veh)	-	- 0.1		0	-	

HCM 6th TWSC 5: Access B & Horizonview Drive

Total Traffic Volumes
Year 2042 - AM Peak Hour

Intersection						
Int Delay, s/veh	2.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	83	6	20	220	20	60
Future Vol, veh/h	83	6	20	220	20	60
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	90	7	22	239	22	65
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	97	0	377	94
Stage 1	-	-	-	-	94	-
Stage 2	-	-	-	-	283	-
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	-	-	1496	-	625	963
Stage 1	-	-	-	-	930	-
Stage 2	-	-	-	-	765	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1496	-	614	963
Mov Cap-2 Maneuver	-	-	-	-	614	-
Stage 1	-	-	-	-	930	-
Stage 2	-	-	-	-	752	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.6		9.8	
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	843	-	-	1496	-	
HCM Lane V/C Ratio	0.103	-	-	0.015	-	
HCM Control Delay (s)	9.8	-	-	7.4	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.3	-	-	0	-	

HCM 6th TWSC
6: Access D/Access C & Horizonview Drive

Total Traffic Volumes
Year 2042 - AM Peak Hour





















Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Vol, veh/h	0	136	7	20	230	9	10	0	70	20	0	0
Future Vol, veh/h	0	136	7	20	230	9	10	0	70	20	0	0
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	0	148	8	22	250	10	11	0	76	22	0	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	260	0	0	156	0	0	451	456	152	489	455	255
Stage 1	-	-	-	-	-	-	152	152	-	299	299	-
Stage 2	-	-	-	-	-	-	299	304	-	190	156	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1304	-	-	1424	-	-	519	501	894	489	501	784
Stage 1	-	-	-	-	-	-	850	772	-	710	666	-
Stage 2	-	-	-	-	-	-	710	663	-	812	769	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1304	-	-	1424	-	-	512	492	894	441	492	784
Mov Cap-2 Maneuver	-	-	-	-	-	-	512	492	-	441	492	-
Stage 1	-	-	-	-	-	-	850	772	-	710	654	-
Stage 2	-	-	-	-	-	-	697	651	-	743	769	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.6			9.9			13.6		
HCM LOS							A			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	818	1304	-	-	1424	-	-	441				
HCM Lane V/C Ratio	0.106	-	-	-	0.015	-	-	0.049				
HCM Control Delay (s)	9.9	0	-	-	7.6	0	-	13.6				
HCM Lane LOS	A	A	-	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.2				

Timings

1: S Marksheffel Boulevard & Drennan Road

Total Traffic Volumes

Year 2042 - PM Peak Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	5	45	49	2	165	11	1514	121	280	1291	5
Future Volume (vph)	29	5	45	49	2	165	11	1514	121	280	1291	5
Satd. Flow (prot)	0	1688	0	0	1653	0	1770	3539	1583	1770	3539	1583
Flt Permitted		0.711			0.908		0.167			0.117		
Satd. Flow (perm)	0	1222	0	0	1517	0	311	3539	1583	218	3539	1583
Satd. Flow (RTOR)		49			50				132			55
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
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	86	0	0	234	0	12	1646	132	304	1403	5
Turn Type	Perm	NA		Perm	NA		Perm	NA	Perm	Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2		2	6		6
Detector Phase	4	4		8	8		2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	5.0		5.0	5.0		10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	11.0	11.0		11.0	11.0		16.0	16.0	16.0	16.0	16.0	16.0
Total Split (s)	11.0	11.0		11.0	11.0		49.0	49.0	49.0	49.0	49.0	49.0
Total Split (%)	18.3%	18.3%		18.3%	18.3%		81.7%	81.7%	81.7%	81.7%	81.7%	81.7%
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		6.0			6.0		6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	None	None		None	None		Min	Min	Min	Min	Min	Min
Act Effect Green (s)		5.0			5.0		45.6	45.6	45.6	45.6	45.6	45.6
Actuated g/C Ratio		0.08			0.08		0.73	0.73	0.73	0.73	0.73	0.73
v/c Ratio		0.61			1.40		0.05	0.64	0.11	1.92	0.55	0.00
Control Delay		34.8			234.6		3.2	5.8	0.8	454.9	4.9	0.0
Queue Delay		0.0			0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		34.8			234.6		3.2	5.8	0.8	454.9	4.9	0.0
LOS		C			F		A	A	A	F	A	A
Approach Delay		34.8			234.6			5.4			84.8	
Approach LOS		C			F			A			F	
Queue Length 50th (ft)		13			~98		1	124	0	~121	93	0
Queue Length 95th (ft)		#68			#220		5	174	10	#257	131	0
Internal Link Dist (ft)		668			506			1400			1128	
Turn Bay Length (ft)							515		585	360		455
Base Capacity (vph)		142			167		225	2573	1186	158	2573	1166
Starvation Cap Reductn		0			0		0	0	0	0	0	0
Spillback Cap Reductn		0			0		0	0	0	0	0	0
Storage Cap Reductn		0			0		0	0	0	0	0	0
Reduced v/c Ratio		0.61			1.40		0.05	0.64	0.11	1.92	0.55	0.00
Intersection Summary												
Cycle Length: 60												
Actuated Cycle Length: 62.7												
Natural Cycle: 150												

Timings

1: S Marksheffel Boulevard & Drennan Road

Total Traffic Volumes

Year 2042 - PM Peak Hour

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.92

Intersection Signal Delay: 55.7

Intersection LOS: E

Intersection Capacity Utilization 87.2%

ICU Level of Service E

Analysis Period (min) 15





~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Queue shown is maximum after two cycles.




Splits and Phases: 1: S Marksheffel Boulevard & Drennan Road

 Ø2	 Ø4
49 s	11 s
 Ø6	 Ø8
49 s	11 s

HCM 6th TWSC

2: Horizonview Drive & Drennan Road







Total Traffic Volumes
Year 2042 - PM Peak Hour

Intersection						
Int Delay, s/veh	3.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	182	246	16	83	133	7
Future Vol, veh/h	182	246	16	83	133	7
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	198	267	17	90	145	8
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	465	0	456	332
Stage 1	-	-	-	-	332	-
Stage 2	-	-	-	-	124	-
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	-	-	1096	-	562	710
Stage 1	-	-	-	-	727	-
Stage 2	-	-	-	-	902	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1096	-	553	710
Mov Cap-2 Maneuver	-	-	-	-	553	-
Stage 1	-	-	-	-	727	-
Stage 2	-	-	-	-	888	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.3		13.8	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	559	-	-	1096	-	
HCM Lane V/C Ratio	0.272	-	-	0.016	-	
HCM Control Delay (s)	13.8	-	-	8.3	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	1.1	-	-	0	-	

HCM 6th TWSC

3: Bradley Road & Horizonview Drive




Total Traffic Volumes
Year 2042 - PM Peak Hour

Intersection						
Int Delay, s/veh	7.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	548	233	439	31	14	302
Future Vol, veh/h	548	233	439	31	14	302
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	Free
Storage Length	215	-	-	1000	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	596	253	477	34	15	328
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	477	0	-	0	1922	-
Stage 1	-	-	-	-	477	-
Stage 2	-	-	-	-	1445	-
Critical Hdwy	4.12	-	-	-	6.42	-
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	-
Pot Cap-1 Maneuver	1085	-	-	0	74	0
Stage 1	-	-	-	0	624	0
Stage 2	-	-	-	0	217	0
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1085	-	-	-	33	-
Mov Cap-2 Maneuver	-	-	-	-	33	-
Stage 1	-	-	-	-	281	-
Stage 2	-	-	-	-	217	-
Approach	EB	WB		SB		
HCM Control Delay, s	8.6	0		186.1		
HCM LOS	F					
Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1		
Capacity (veh/h)	1085	-	-	33		
HCM Lane V/C Ratio	0.549	-	-	0.461		
HCM Control Delay (s)	12.3	-	-	186.1		
HCM Lane LOS	B	-	-	F		
HCM 95th %tile Q(veh)	3.5	-	-	1.5		

HCM 6th TWSC




4: Horizonview Drive & Access A

Total Traffic Volumes
Year 2042 - PM Peak Hour

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	6	134	0	11	251
Future Vol, veh/h	7	6	134	0	11	251
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	7	146	0	12	273
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	443	146	0	0	146	0
Stage 1	146	-	-	-	-	-
Stage 2	297	-	-	-	-	-
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	572	901	-	-	1436	-
Stage 1	881	-	-	-	-	-
Stage 2	754	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	566	901	-	-	1436	-
Mov Cap-2 Maneuver	566	-	-	-	-	-
Stage 1	881	-	-	-	-	-
Stage 2	746	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.4	0		0.3		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 683		1436	-	
HCM Lane V/C Ratio	-	- 0.021		0.008	-	
HCM Control Delay (s)	-	- 10.4		7.5	0	
HCM Lane LOS	-	- B		A	A	
HCM 95th %tile Q(veh)	-	- 0.1		0	-	

HCM 6th TWSC
5: Access B & Horizonview Drive

Total Traffic Volumes
Year 2042 - PM Peak Hour

Intersection						
Int Delay, s/veh	2.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	236	22	67	121	13	39
Future Vol, veh/h	236	22	67	121	13	39
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	257	24	73	132	14	42
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	281	0	547	269
Stage 1	-	-	-	-	269	-
Stage 2	-	-	-	-	278	-
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	-	-	1282	-	498	770
Stage 1	-	-	-	-	776	-
Stage 2	-	-	-	-	769	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1282	-	468	770
Mov Cap-2 Maneuver	-	-	-	-	468	-
Stage 1	-	-	-	-	776	-
Stage 2	-	-	-	-	722	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		2.8		10.9	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	663	-	-	1282	-	
HCM Lane V/C Ratio	0.085	-	-	0.057	-	
HCM Control Delay (s)	10.9	-	-	8	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.3	-	-	0.2	-	

HCM 6th TWSC
6: Access D/Access C & Horizonview Drive

Total Traffic Volumes
Year 2042 - PM Peak Hour

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Vol, veh/h	0	252	23	67	181	33	7	0	46	13	0	0
Future Vol, veh/h	0	252	23	67	181	33	7	0	46	13	0	0
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	0	274	25	73	197	36	8	0	50	14	0	0

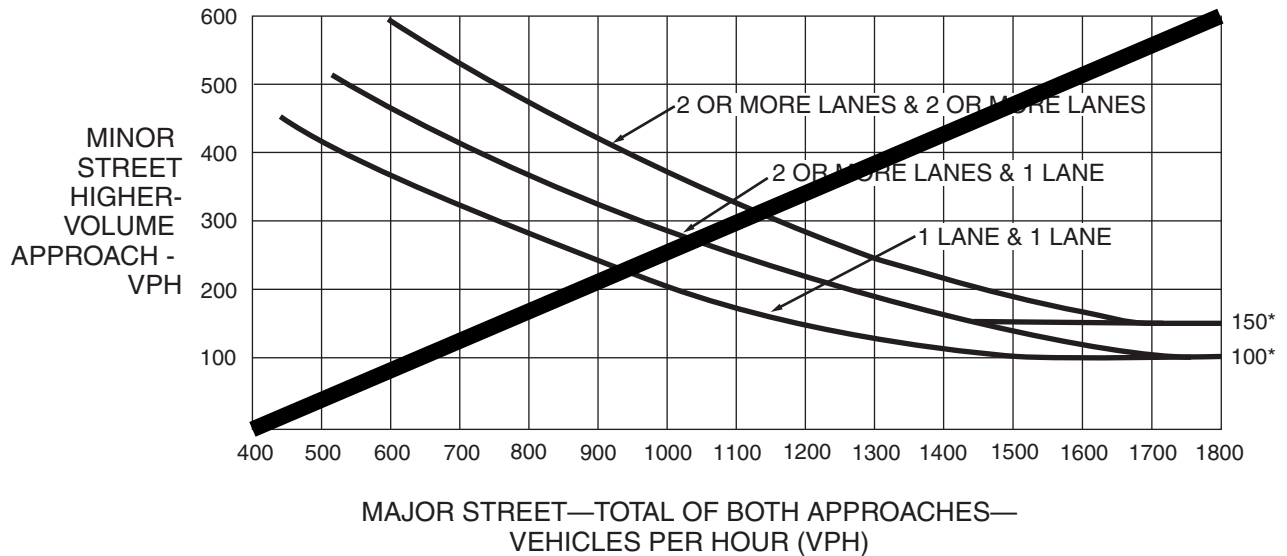
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	233	0	0	299	0	0	648	666	287	673	660	215
Stage 1	-	-	-	-	-	-	287	287	-	361	361	-
Stage 2	-	-	-	-	-	-	361	379	-	312	299	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1335	-	-	1262	-	-	383	380	752	369	383	825
Stage 1	-	-	-	-	-	-	720	674	-	657	626	-
Stage 2	-	-	-	-	-	-	657	615	-	699	666	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1335	-	-	1262	-	-	363	355	752	327	357	825
Mov Cap-2 Maneuver	-	-	-	-	-	-	363	355	-	327	357	-
Stage 1	-	-	-	-	-	-	720	674	-	657	584	-
Stage 2	-	-	-	-	-	-	613	574	-	653	666	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.9	11	16.5
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	659	1335	-	-	1262	-	-	327
HCM Lane V/C Ratio	0.087	-	-	-	0.058	-	-	0.043
HCM Control Delay (s)	11	0	-	-	8	0	-	16.5
HCM Lane LOS	B	A	-	-	A	A	-	C
HCM 95th %tile Q(veh)	0.3	0	-	-	0.2	-	-	0.1

APPENDIX D

Warrant Analysis Forms

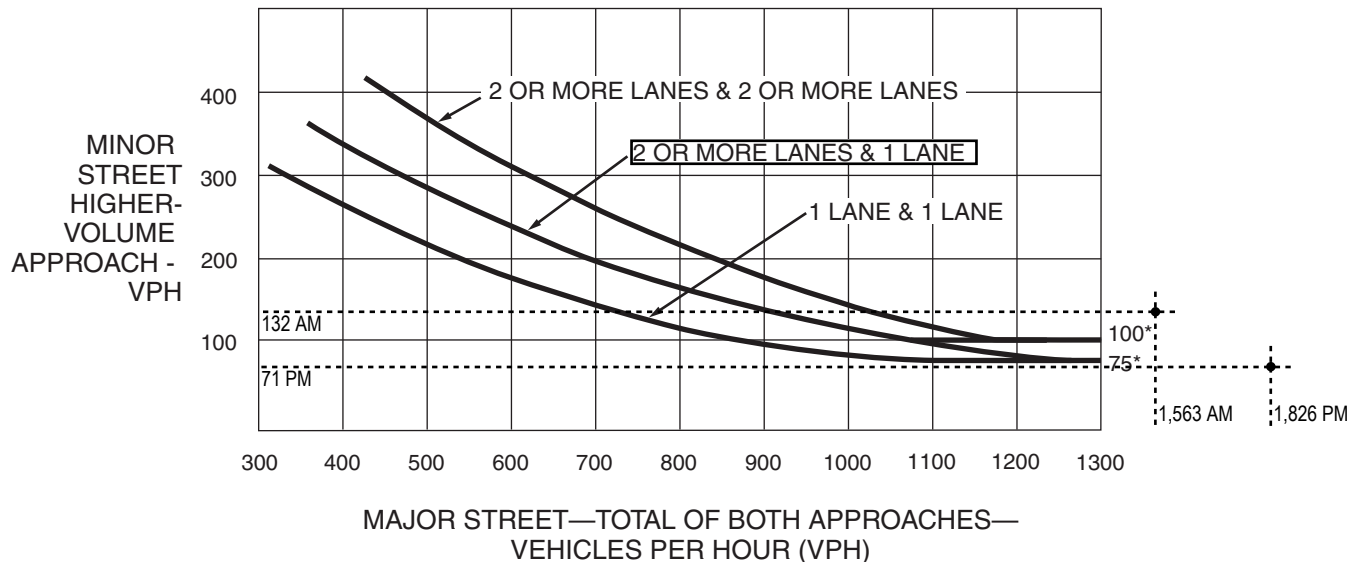
Figure 4C-3. Warrant 3, Peak Hour

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)

DRENNAN ROAD



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Note: 50% right turn reduction applied.

S MARKSHEFFEL BOULEVARD (55 MPH)