

TRAFFIC IMPACT STUDY

For

**Antlers Range
El Paso County, Colorado**

February 2025

Prepared for:

Antlers Range, LLC
PO Box 38939
Colorado Springs, Colorado 80937

Prepared by:



SM ROCHA, LLC
TRAFFIC AND TRANSPORTATION CONSULTANTS

8700 Turnpike Drive, Suite 240
Westminster, Colorado 80031
(303) 458-9798

6 South Tejon Street, Suite 618
Colorado Springs, Colorado 80903
(719) 203-6639

Project Manager:
Brandon Wilson, EIT

Project Engineer:
Zac Trotter, EIT

Engineer in Responsible Charge:
Fred Lantz, PE



24-102283

Traffic Engineer's Statement

The attached traffic report and supporting information were prepared under my responsible charge and they comport with the standard of care. So far as is consistent with the standard of care, said report was prepared in general conformance with the criteria established by the County for traffic reports.



Fred Lantz, P.E. #23410

02/03/2025

Date

Developer's Statement

I, the Developer, have read and will comply with all commitments made on my behalf within this report.

Grant Langdon
Antlers Range, LLC
PO Box 38939
Colorado Springs, Colorado 80937

Date

Table of Contents

I. Introduction 1

 Project Overview..... 1

 Study Area Boundaries 1

 Site Description..... 1

 Existing and Committed Surface Transportation Network.....4

II. Existing Traffic Conditions 6

 Peak Hour Intersection Levels of Service – Existing Traffic..... 8

 Existing Traffic Analysis Results 9

III. Future Traffic Conditions Without Proposed Development..... 10

 Peak Hour Intersection Levels of Service – Background Traffic 13

 Background Traffic Analysis Results – Year 2027 13

 Background Traffic Analysis Results – Year 2045 14

IV. Proposed Project Traffic 16

 Trip Generation..... 16

 Adjustments to Trip Generation Rates 17

 Trip Distribution..... 17

 Trip Assignment..... 17

V. Future Traffic Conditions With Proposed Developments 19

VI. Project Impacts 22

 Peak Hour Intersection Levels of Service – Total Traffic 22

 Total Traffic Analysis Results Upon Development Build-Out 23

 Total Traffic Auxiliary Lane Analysis 24

 Queue Length Analysis..... 24

 Recommended Improvements..... 26

VII. Conclusion 27

List of Figures

Figure 1 – Location.....2

Figure 2 – Conceptual Site Plan.....3

Figure 3 – Existing Traffic Volumes & Intersection Geometry7

Figure 4 – Background Traffic Volumes & Intersection Geometry – Year 2027..... 11

Figure 5 – Background Traffic Volumes & Intersection Geometry – Year 2045..... 12

Figure 6 – Distribution and Site-Generated Assignment.....18

Figure 7 – Total Traffic Volumes & Intersection Geometry – Year 2027.....20

Figure 8 – Total Traffic Volumes & Intersection Geometry – Year 2045.....21

List of Tables

Table 1 – Intersection Capacity Analysis Summary – Existing Traffic8

Table 2 – Intersection Capacity Analysis Summary – Background Traffic – Year 2027 13

Table 3 – Intersection Capacity Analysis Summary – Background Traffic – Year 2045 14

Table 4 – Trip Generation Rates 16

Table 5 – Trip Generation Summary 16

Table 6 – Intersection Capacity Analysis Summary – Total Traffic – Year 202722

Table 7 – Intersection Capacity Analysis Summary – Total Traffic – Year 204523

Table 8 – Turn Lane Queues and Storage Requirements – Total Traffic – Year 2045.....25

Appendices

APPENDIX A TRAFFIC COUNT DATA
 SIGNAL TIMING INFORMATION
 EXISTING AYER ROAD TRIP GENERATION INFORMATION

APPENDIX B LEVEL OF SERVICE DEFINITIONS

APPENDIX C CAPACITY WORKSHEETS

I. Introduction

Project Overview

This traffic impact study is provided as a planning document and addresses the capacity, geometric, and control requirements associated with the development entitled Antlers Range.

This proposed residential development is located near the northeast corner of Ayer Road and Meridian Road in El Paso County, Colorado.

Study Area Boundaries

The study area to be examined in this analysis encompasses the Meridian Road intersections with E Woodmen Road, Ayer Road, and Hodgen Road, the Ayer Road intersections with Broken Antler Court and White Antler Trail, and includes proposed site accesses.

Figure 1 illustrates location of the site and study intersections.

Site Description

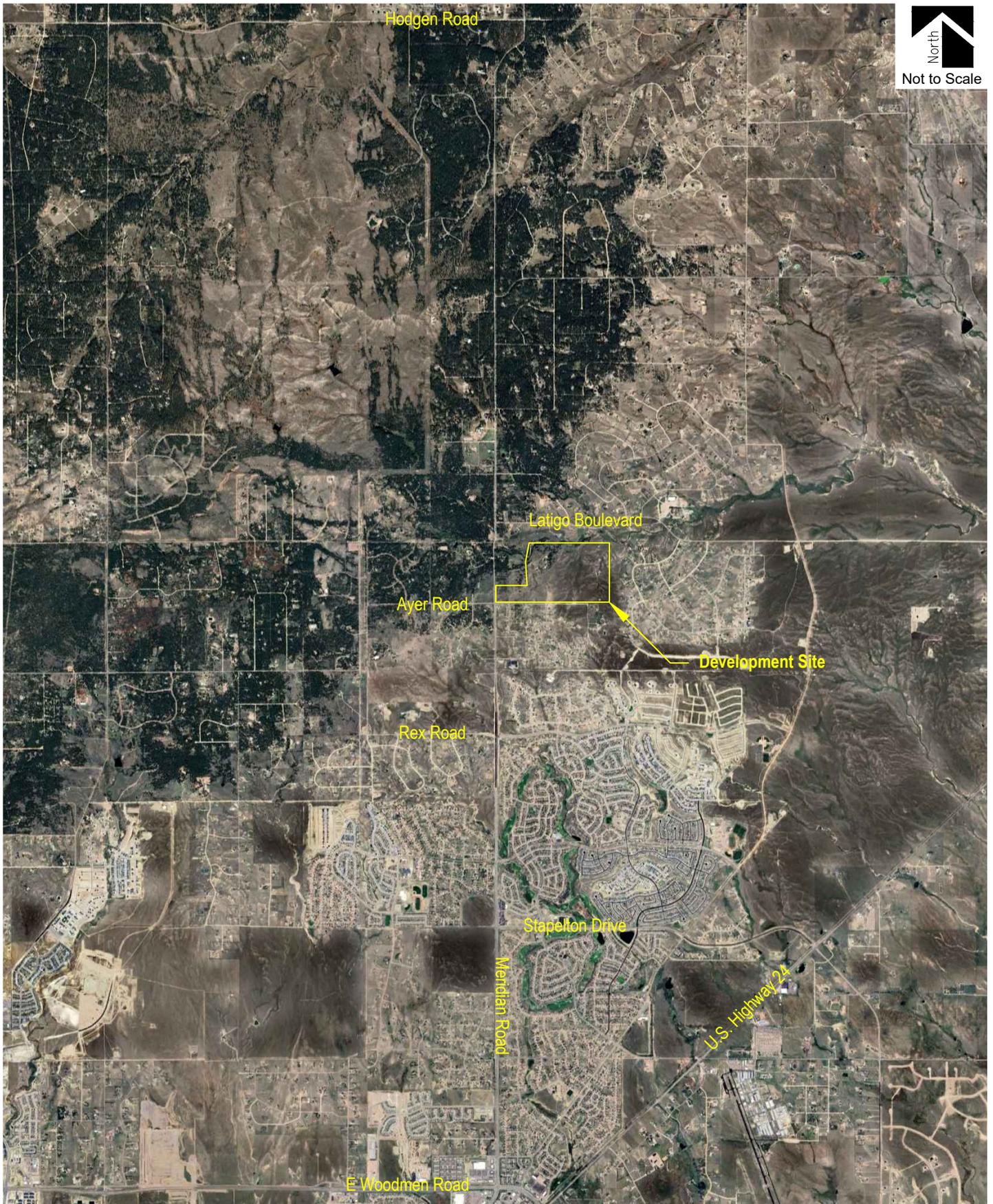
Land for the development is currently vacant and zoned as A-35 (Agricultural District). The development area is surrounded by a mix of institutional and residential land uses.

The proposed development plans to subdivide and rezone the site to RR-2.5 (Residential Rural District), a zoning district intended to accommodate low-density, rural, single-family residential homes, accommodating a proposed total of 84 lots.

Proposed access to the development is provided via two full-movement accesses onto Ayer Road (referred to as Access A and Access B). Access A will serve five single-family lots and align with Broken Antler Court. Access B will serve the remaining 79 single-family lots and align with White Antler Trail. Additionally, one emergency-only access (referred to as Emergency Access) onto Ayer Road will be provided west of Access B.

For purposes of this study, it is anticipated that development construction would be completed by end of Year 2027.

General site and access locations are shown on Figure 1. A conceptual site plan, as prepared by Vertex Consulting Services, is shown on Figure 2. This plan is provided for illustrative purposes only.



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Figure 1
SITE LOCATION



Not to Scale



Meridian Road

Access A

Broken Antler Court

Emergency Access

Access B

White Antler Trail

Ayer Road

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Figure 2
CONCEPTUAL SITE PLAN

February 2025
Page 3

Existing and Committed Surface Transportation Network

Within the study area, Ayer Road is the primary roadway that will accommodate traffic to and from the proposed development. The secondary roadways include Broken Antler Court, White Antler Trail, Meridian Road, E Woodmen Road, and Hodgen Road. A brief description of each roadway, based on the County's Major Transportation Corridors Plan (MTCP)¹ and Engineering Criteria Manual (ECM)², is provided below:

Ayer Road is an east-west roadway having two through lanes (one lane in each direction) with shared turn lanes at the intersections within the study area. East of Meridian Road, the County classifies Ayer Road as a non-County maintained roadway and provides a posted speed limit of 35 MPH.

West of Meridian Road, Ayer Road is classified as a major collector roadway and provides a posted speed limit of 40 MPH.

Broken Antler Court is a north-south rural local roadway having two through lanes (one lane in each direction) with shared turn lanes at the intersection within the study area. Broken Antler Court provides a posted speed limit of 30 MPH.

White Antler Trail is a north-south rural local roadway having two through lanes (one lane in each direction) with shared turn lanes at the intersection within the study area. White Antler Trail provides a posted speed limit of 30 MPH.

Meridian Road is a north-south minor arterial roadway having two through lanes north of Rex Road (one lane in each direction) and four through lanes south of Rex Road (two lanes in each direction) with a combination of shared and exclusive turn lanes at the intersections within the study area. Meridian Road provides a posted speed limit of 55 MPH.

E Woodmen Road is an east-west expressway roadway having four through lanes (two lanes in each direction) with exclusive turn lanes at the intersection within the study area. E Woodmen Road provides a posted speed limit of 55 MPH.

Hodgen Road is an east-west minor arterial roadway having two through lanes (one lane in each direction) with exclusive turn lanes at the intersection within the study area. Hodgen Road provides a posted speed limit of 55 MPH.

¹ El Paso County Major Transportation Corridors Plan Update, El Paso County, July 2024.

² El Paso County Engineering Criteria Manual, El Paso County, December 2016.

The study intersection of E Woodmen Road and Meridian Road is signalized. All other 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 the County’s MTCP, E Woodmen Road will be widened from four to six through lanes from Golden Sage Road to U.S. Highway 24. Additionally, it is understood Meridian Road will be widened from four to six through lanes from Woodmen Road to Stapleton Drive. The County’s MTCP does not mention when these improvements will occur. For analysis purposes, it is assumed these improvements are completed by Year 2045.

No other regional or specific improvements for the above described roadways are known to be planned or committed at this time.

II. Existing Traffic Conditions

Morning (AM) and afternoon (PM) peak hour traffic counts were collected at the Meridian Road intersections with E Woodmen Road, Ayer Road, and Hodgen Road. Average daily traffic (ADT) volumes were collected over a 24-hour period on Ayer Road and Meridian Road. Counts were collected on Wednesday, December 11, 2024, with AM peak hour counts being collected during the period of 7:00 a.m. to 9:00 a.m. and PM peak hour counts being collected during the period of 4:00 p.m. to 6:00 p.m.

Peak hour traffic counts for the Ayer Road intersections with Broken Antler Court and White Antler Trail as well as the ingress and egress traffic volumes to and from the east leg of the Meridian Road intersection with Ayer Road were estimated using standard traffic generation characteristics compiled by the Institute of Transportation Engineers (ITE) in their report entitled Trip Generation Manual, 11th Edition. ITE land use code 210 (Single-Family Detached Housing) was used for estimating trip generation because of their best fit to the existing land uses. Estimated trip generation for the existing land uses is provided for reference in Appendix A.

Existing volumes and intersection geometry are shown on Figure 3. Traffic count data is included for reference in Appendix A.

Existing signal timing parameters for E Woodmen Road and Meridian Road were obtained from the City of Colorado Springs and used throughout this study to the best extent possible in order to remain consistent with existing signal coordination plans. City signal timing information received is included for reference in Appendix A.



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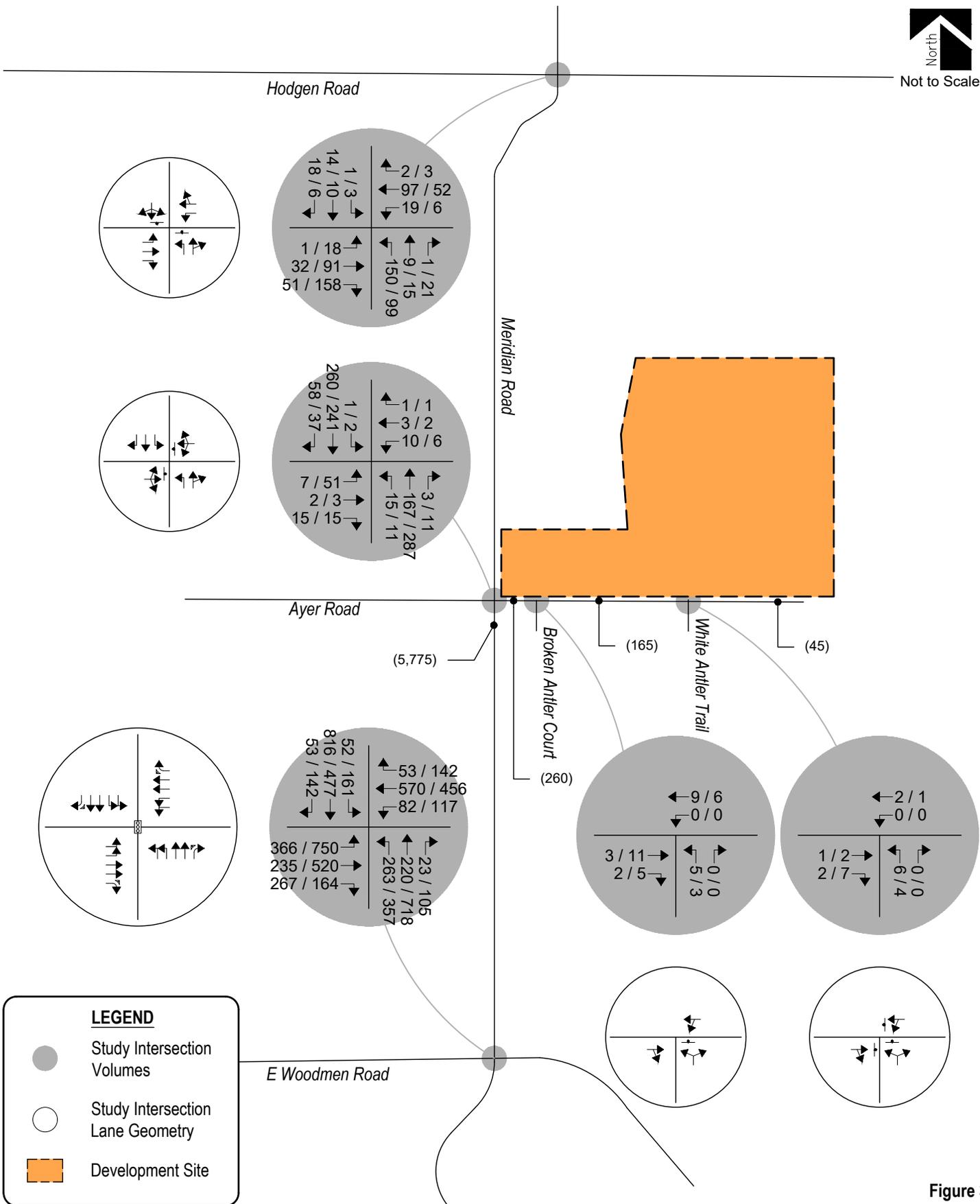


Figure 3
EXISTING TRAFFIC
Volumes & Intersection Geometry
AM / PM Peak Hour
(ADT) : Average Daily Traffic



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Peak Hour Intersection Levels of Service – Existing Traffic

The Signalized and Unsignalized Intersection Analysis techniques, as published in the Highway Capacity Manual (HCM), 7th Edition, by the Transportation Research Board and as incorporated into the SYNCHRO computer program, were used to analyze the study intersections for existing and future 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.

Pursuant to Section B.4.1.A of the County’s ECM ,the design objective or each scenario of this study shall be level of service “D”. 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
Meridian Road / E Woodmen Road (Signalized)	D (36.1)	D (46.9)
Meridian Road / Ayer Road (Stop-Controlled)		
Eastbound, Left, Through and Right	B	B
Westbound Left, Through and Right	B	B
Northbound Left	A	A
Southbound Left	A	A
Meridian Road / Hodgen Road (Stop-Controlled)		
Eastbound Left	A	A
Westbound Left	A	A
Northbound Left	B	B
Northbound Through and Right	B	A
Southbound Left, Through and Right	A	B
Ayer Road / Broken Antler Court (Stop-Controlled)		
Westbound Left and Through	A	A
Northbound Left and Right	A	A
Ayer Road / White Antler Trail (Stop-Controlled)		
Eastbound Through and Right	A	A
Westbound Left and Through	A	A
Northbound Left and Right	A	A

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

Existing Traffic Analysis Results

Under existing conditions, operational analysis shows that the signalized intersection of Meridian Road and E Woodmen Road has overall operations at LOS D during the morning and afternoon peak traffic hour.

The stop-controlled intersection of Meridian Road and Ayer Road has turning movement operations at LOS B or better during the morning and afternoon peak traffic hours.

The stop-controlled intersection of Meridian Road and Hodgen Road has turning movement operations at LOS B or better during the morning and afternoon peak traffic hours.

The stop-controlled intersection of Ayer Road and Broken Antler Court has turning movement operations at LOS A during the morning and afternoon peak traffic hours.

The stop-controlled intersection of Ayer Road and White Antler Trail has turning movement operations at LOS A during the morning and afternoon 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 2027 and 2045, a compounded annual growth rate was determined using historical traffic data for the surrounding area provided by the Colorado Department of Transportation's (CDOT) Traffic Count Database System (TCDS)³ along the adjacent segment of Meridian Road between Woodmen Hills Drive and Murphy Road, which shows average historical growth rates of one percent. Therefore, a growth rate of one percent was applied to existing traffic volumes.

It is important to note that traffic volumes at the Ayer Road intersections with Broken Antler Court and White Antler Trail as well as the ingress and egress traffic volumes to and from the east leg of the Meridian Road intersection with Ayer Road are not subject to annual growth patterns since Ayer Road does not provide connection to other roadways, therefore does not serve regional traffic.

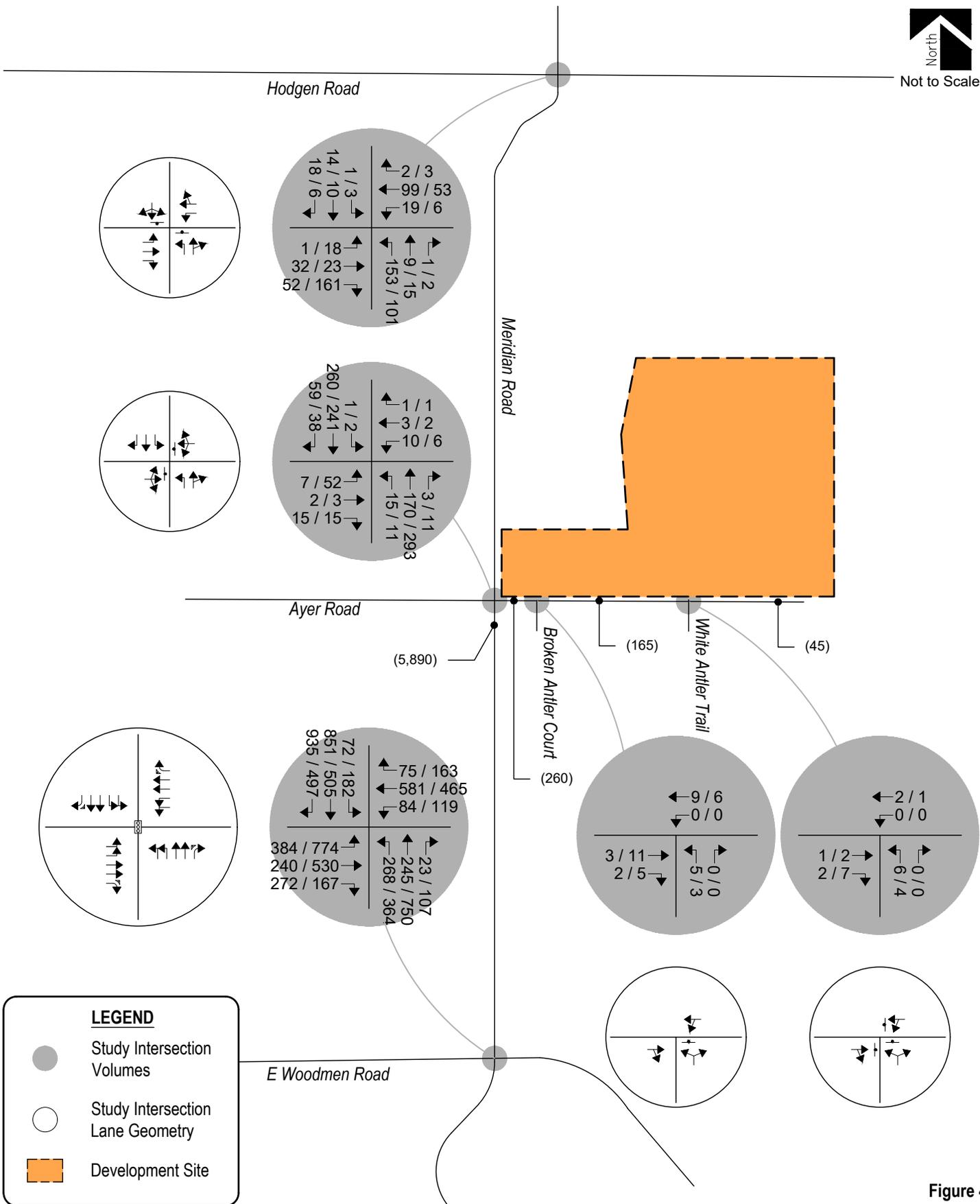
To account for projected traffic from adjacent developments not yet built, trip generations from the Owl Place Commercial Traffic Impact Study Addendum⁴ were added to background traffic volumes.

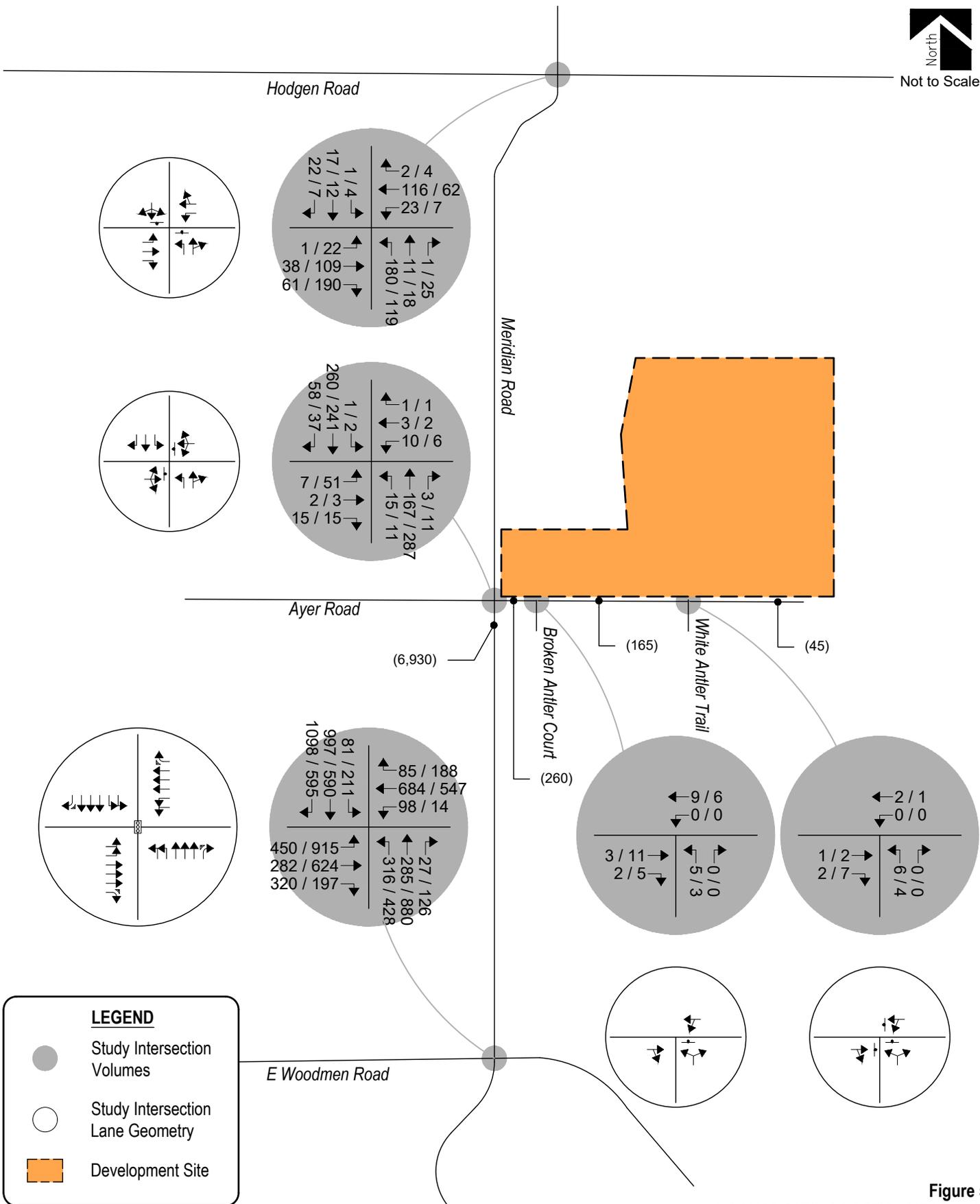
Pursuant to the area roadway improvements discussed in Section I, Year 2027 and Year 2045 background traffic conditions assume no roadway improvements to accommodate regional transportation demands. Year 2045 background traffic conditions assume the expansion of Meridian Road and E Woodmen Road to six through lanes where they currently provide four through lanes. Year 2045 assumes existing signal timing parameters for E Woodmen Road and Meridian Road with optimized intersection splits in effort to better long-term intersection performance.

Projected background traffic volumes and intersection geometry for Years 2027 and 2045 are shown on Figure 4 and Figure 5, respectively.

³ Transportation Data Management System, MS2, 2021.

⁴ Owl Place Commercial: Traffic Impact Study Addendum, SM ROCHA, LLC, May 2024.





Peak Hour Intersection Levels of Service – Background 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 2027 are listed in Table 2. Year 2045 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 2027

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
Meridian Road / E Woodmen Road (Signalized)	D (37.4)	D (49.4)
Meridian Road / Ayer Road (Stop-Controlled)		
Eastbound, Left, Through and Right	B	B
Westbound Left, Through and Right	B	B
Northbound Left	A	A
Southbound Left	A	A
Meridian Road / Hodgen Road (Stop-Controlled)		
Eastbound Left	A	A
Westbound Left	A	A
Northbound Left	B	B
Northbound Through and Right	B	A
Southbound Left, Through and Right	A	B
Ayer Road / Broken Antler Court (Stop-Controlled)		
Westbound Left and Through	A	A
Northbound Left and Right	A	A
Ayer Road / White Antler Trail (Stop-Controlled)		
Eastbound Through and Right	A	A
Westbound Left and Through	A	A
Northbound Left and Right	A	A

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

Background Traffic Analysis Results – Year 2027

Year 2027 background traffic analysis indicates that the signalized intersection of Meridian Road and E Woodmen Road continues to project overall operations at LOS D during the morning and afternoon peak traffic hours.

The unsignalized intersection of Meridian Road and Ayer Road is projected to provide turning movement operation at LOS B or better during the morning and afternoon peak traffic hours.

The unsignalized intersection of Ayer Road and Hodgen Road is expected to provide turning movement operations at LOS B or better during the morning and afternoon peak traffic hours.

The unsignalized intersection of Ayer Road and Broken Antler Court is projected to have turning movement operations at LOS A during the morning and afternoon peak traffic hours.

The unsignalized intersection of Ayer Road and White Antler Trail is projected to have turning movement operations at LOS A during the morning and afternoon peak traffic hours.

Table 3 – Intersection Capacity Analysis Summary – Background Traffic – Year 2045

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
Meridian Road / E Woodmen Road (Signalized)	D (35.1)	D (45.2)
Meridian Road / Ayer Road (Stop-Controlled)		
Eastbound, Left, Through and Right	B	C
Westbound Left, Through and Right	B	C
Northbound Left	A	A
Southbound Left	A	A
Meridian Road / Hodgen Road (Stop-Controlled)		
Eastbound Left	A	A
Westbound Left	A	A
Northbound Left	B	B
Northbound Through and Right	B	A
Southbound Left, Through and Right	B	B
Ayer Road / Broken Antler Court (Stop-Controlled)		
Westbound Left and Through	A	A
Northbound Left and Right	A	A
Ayer Road / White Antler Trail (Stop-Controlled)		
Eastbound Through and Right	A	A
Westbound Left and Through	A	A
Northbound Left and Right	A	A

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

Background Traffic Analysis Results – Year 2045

By Year 2045 and without the proposed development, the study intersection of Meridian Road and E Woodmen Road continues to expect overall operations at LOS D or better during the morning and afternoon peak traffic hours.

The study intersection of Meridian Road and Ayer Road is projected to have turning movement operations at LOS B or better during the morning peak traffic hour and LOS C or better during the afternoon peak traffic hour.

The study intersection of Meridian Road and Hodgen Road continues to anticipate turning movement operations at LOS B or better during the morning and afternoon peak traffic hours.

The stop-controlled intersection of Ayer Road and Broken Antler Court continues to project turning movement operations at LOS A during the morning and afternoon peak traffic hours.

The stop-controlled intersection of Ayer Road and White Antler Trail continues to expect turning movement operations at LOS A during the morning and afternoon peak traffic hours.

These intersection operations are similar to existing conditions.

IV. Proposed Project Traffic

Trip Generation

Standard traffic generation characteristics compiled by ITE in their report entitled Trip Generation Manual, 11th 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 conservative rates and 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 Detached Housing	DU	9.43	0.18	0.53	0.70	0.59	0.35	0.94

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 CODE	LAND USE	SIZE	DU	TOTAL TRIPS GENERATED						
				24 HOUR	AM PEAK HOUR			PM PEAK HOUR		
					ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
210	Single-Family Detached Housing	84	DU	792	15	44	59	50	29	79
<i>Total:</i>				792	15	44	59	50	29	79

Key: DU = Dwelling Units.

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 792 daily vehicle trips with 59 of those occurring during the morning peak hour and 79 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 County, proposed and existing area land uses, allowed turning movements, available roadway network, in reference to historical traffic count data provided by CDOT's TCDS, and in reference to distribution patterns of existing traffic count data.

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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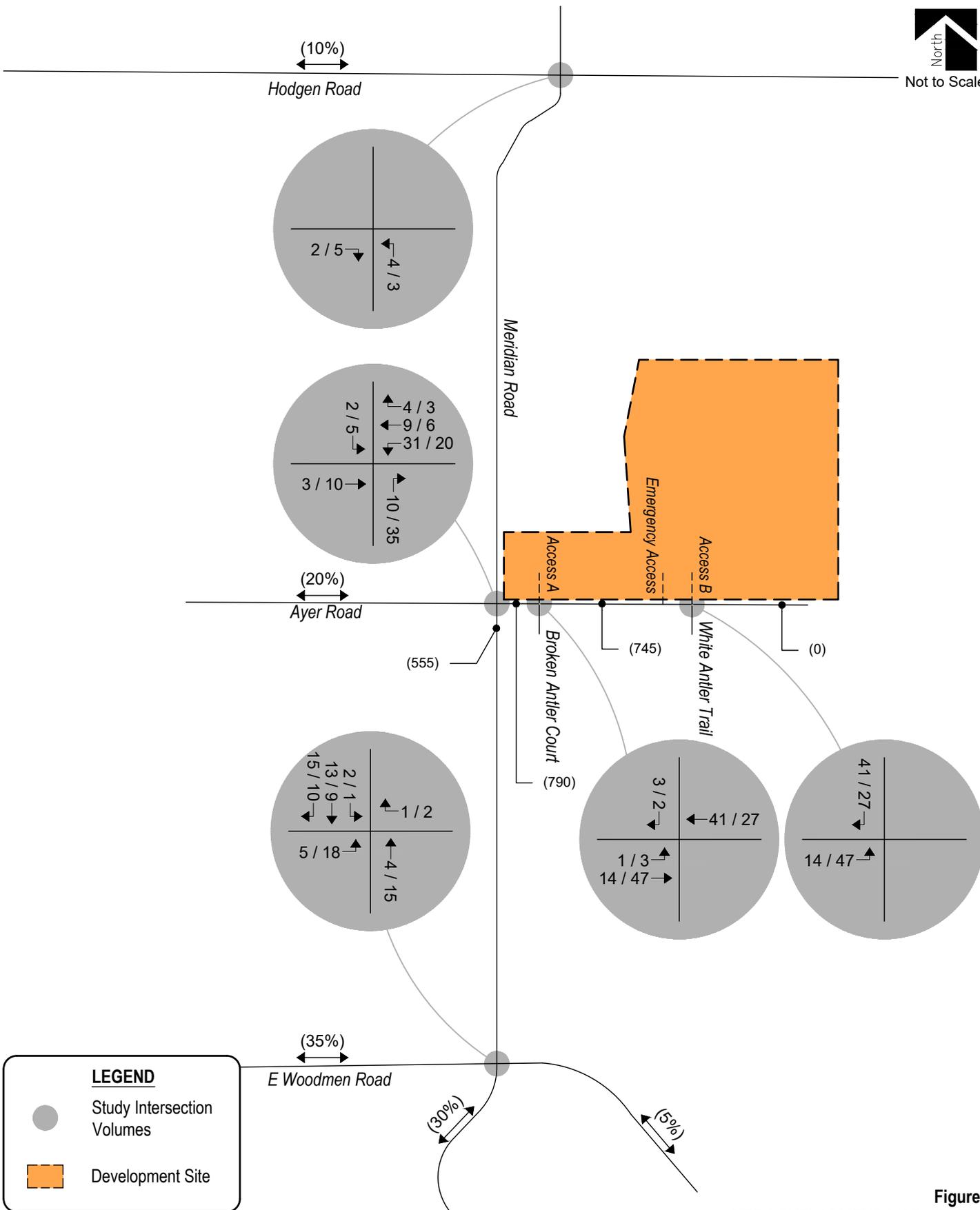


Figure 6
SITE DEVELOPMENT DISTRIBUTION
 (%): Overall
SITE-GENERATED TRIPS
 AM / PM Peak Hour



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V. Future Traffic Conditions With Proposed Developments

Total traffic is the traffic projected to be on area roadways with consideration of the proposed development. Total traffic includes background traffic projections for Years 2027 and 2045 with consideration of site-generated traffic. For analysis purposes, it was assumed that development construction would be completed by end of Year 2027.

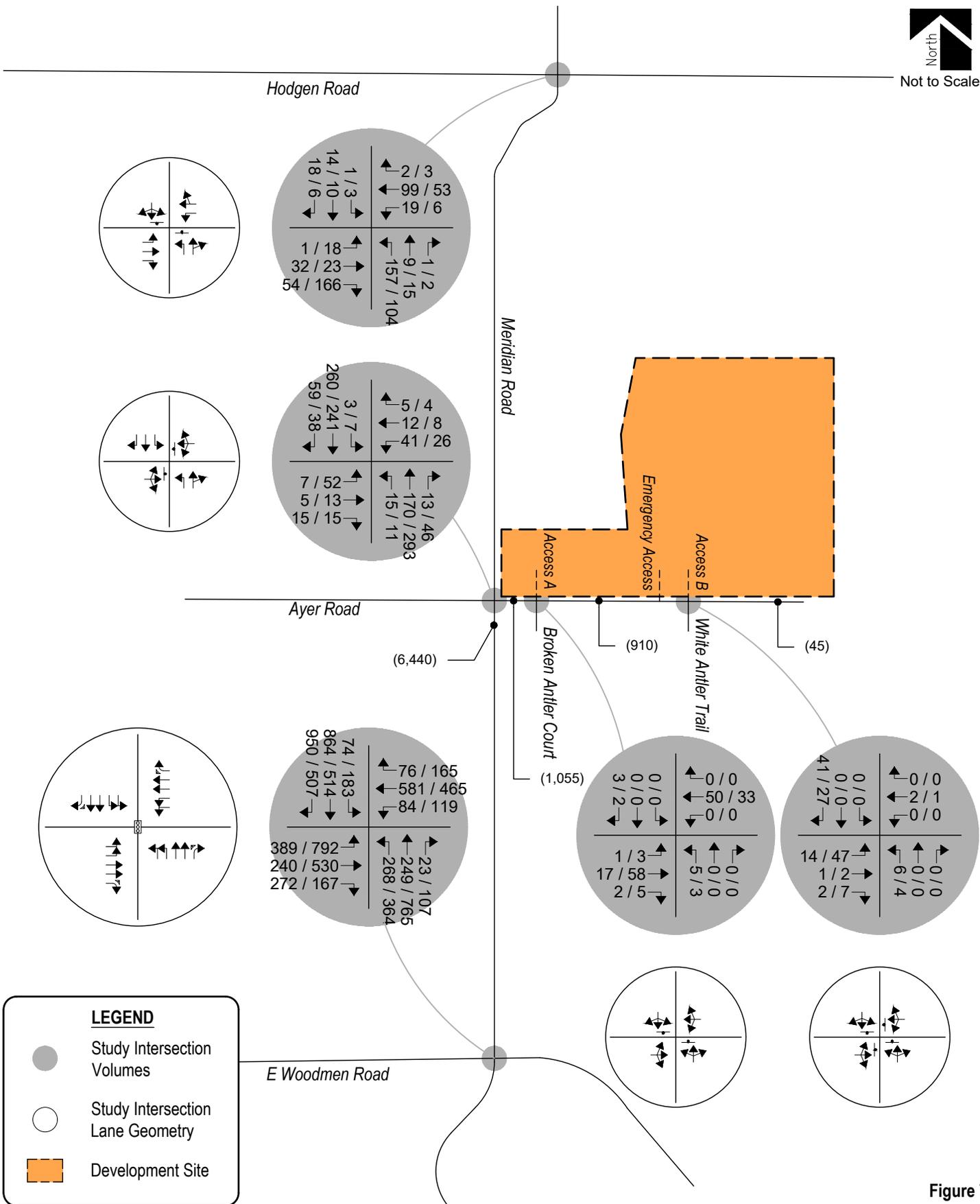
Pursuant to area roadway improvement discussions provided in Section III, Year 2027 and Year 2045 total traffic conditions assume no roadway improvements to accommodate regional transportation demands. Roadway improvements associated with site development are expected to be limited to site access and frontage as required by the governing agency.

Projected Year 2027 total traffic volumes and intersection geometry are shown in Figure 7.

Figure 8 shows projected total traffic volumes and intersection geometry for Year 2045.



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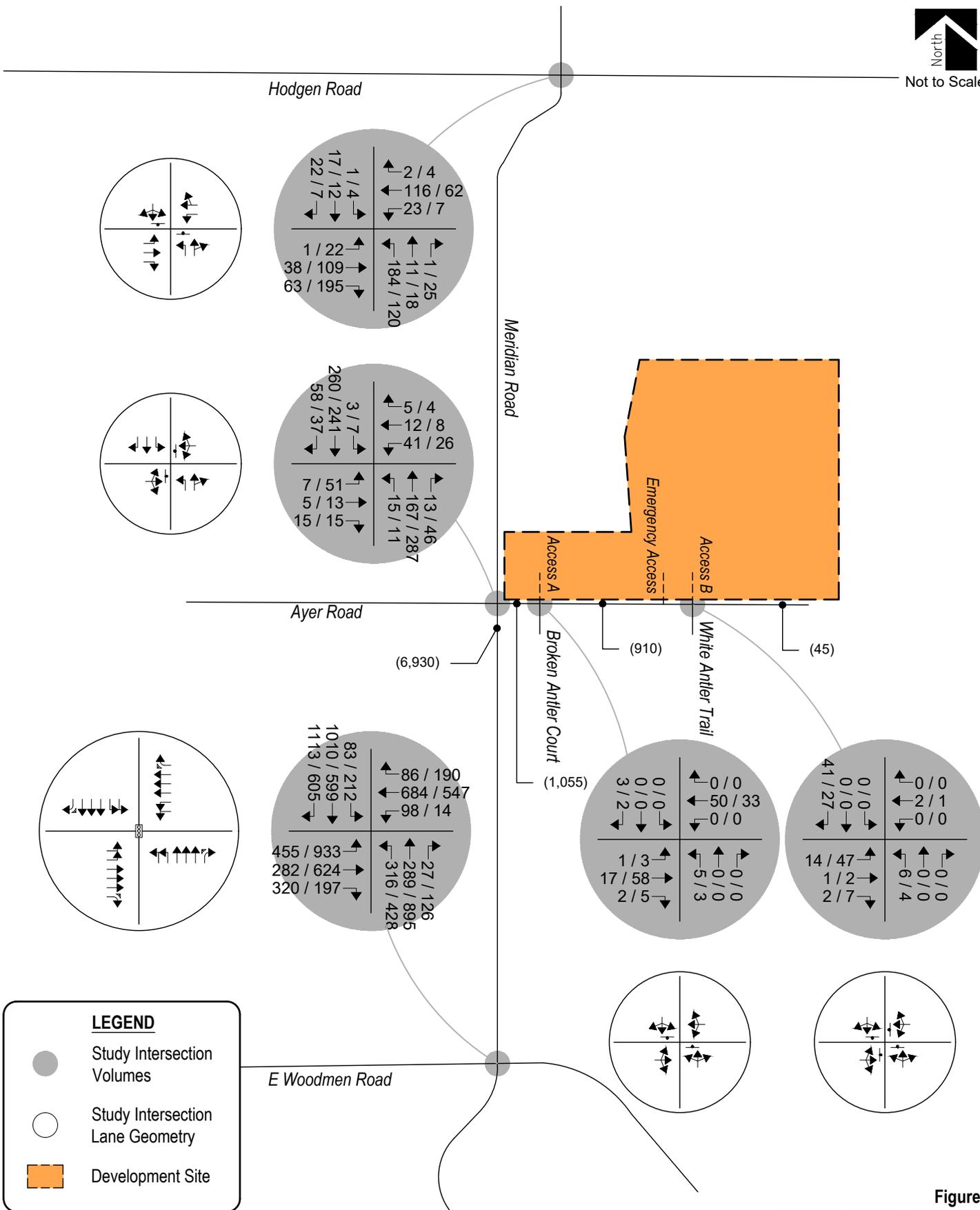
LEGEND

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

Figure 7
TOTAL TRAFFIC - YEAR 2027
 Volumes & Intersection Geometry
 AM / PM Peak Hour
 (ADT) : Average Daily Traffic



Not to Scale



LEGEND

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

Figure 8
TOTAL TRAFFIC - YEAR 2045
 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 latest 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 – Total Traffic

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 2027 and 2045 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 2027

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
Meridian Road / E Woodmen Road (Signalized)	D (37.8)	D (51.1)
Meridian Road / Ayer Road (Stop-Controlled)		
Eastbound, Left, Through and Right	B	C
Westbound Left, Through and Right	B	C
Northbound Left	A	A
Southbound Left	A	A
Meridian Road / Hodgen Road (Stop-Controlled)		
Eastbound Left	A	A
Westbound Left	A	A
Northbound Left	B	B
Northbound Through and Right	B	A
Southbound Left, Through and Right	A	B
Ayer Road / Broken Antler Court / Access A (Stop-Controlled)		
Eastbound Left, Through and Right	A	A
Westbound Left, Through and Right	A	A
Northbound Left, Through and Right	A	A
Southbound Left, Through and Right	A	A
Ayer Road / White Antler Trail / Access B (Stop-Controlled)		
Eastbound Left, Through and Right	A	A
Westbound Left, Through and Right	A	A
Northbound Left, Through and Right	A	A
Southbound Left, Through and Right	A	A

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 2045

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
Meridian Road / E Woodmen Road (Signalized)	D (35.4)	D (46.4)
Meridian Road / Ayer Road (Stop-Controlled)		
Eastbound, Left, Through and Right	B	C
Westbound Left, Through and Right	C	C
Northbound Left	A	A
Southbound Left	A	A
Meridian Road / Hodgen Road (Stop-Controlled)		
Eastbound Left	A	A
Westbound Left	A	A
Northbound Left	B	B
Northbound Through and Right	B	A
Southbound Left, Through and Right	B	B
Ayer Road / Broken Antler Court / Access A (Stop-Controlled)		
Eastbound Left, Through and Right	A	A
Westbound Left, Through and Right	A	A
Northbound Left, Through and Right	A	A
Southbound Left, Through and Right	A	A
Ayer Road / White Antler Trail / Access B (Stop-Controlled)		
Eastbound Left, Through and Right	A	A
Westbound Left, Through and Right	A	A
Northbound Left, Through and Right	A	A
Southbound Left, Through and Right	A	A

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 2045 and upon development build-out, the signalized intersection of Meridian Road and E Woodmen Road is expected to have overall operations at LOS D during the morning and afternoon peak traffic hours.

The unsignalized intersection of Meridian Road and Ayer Road is anticipated to have turning movement operations at LOS C or better during the morning and afternoon peak traffic hours.

The unsignalized intersection of Meridian Road and Hodgen Road continues to project turning movement operations at LOS B or better during the morning and afternoon peak traffic hour.

The unsignalized intersection of Ayer Road and Access A is projected to have turning movement operations at LOS A during the morning and afternoon peak traffic hours.

The unsignalized intersection of Ayer Road and Access B is expected to provide turning movement operations at LOS A during the morning and afternoon peak traffic hours.

These intersection operations are similar to existing and background traffic conditions.

Total Traffic Auxiliary Lane Analysis

Auxiliary lanes for site development accesses are to be based on the County's ECM.

Considering development build-out, an evaluation of auxiliary lane requirements, pursuant to Section 2.3.7.D.1 of the County's ECM indicates that a westbound left turn deceleration lane at Access B along Ayer Road is warranted from a vehicle-volume perspective as the development's projected peak hour left turn ingress volume exceeds the County's threshold of 25 vehicle per hour (VPH).

No additional turn lanes for the Ayer Road intersections with Access A and Access B are warranted.

Queue Length Analysis

Queue lengths for the study intersections were analyzed using Year 2045 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. An average vehicle length of 25 feet was assumed. Queue lengths were modeled and are included with the Synchro worksheets in Appendix C.

Table 8 summarizes the 95th percentile queue results in comparison to the projected storage requirements for turn movements within study area for Year 2045.

Table 8 – Turn Lane Queues and Storage Requirements – Total Traffic – Year 2045

Intersection	Turn Movement	Existing Turn Lane Length (feet)	AM Peak Hour		PM Peak Hour		Recommended Turn Lane Length (feet)	
			95th Percentile Queue Length (feet)	Vehicle Equivalent (vehicles)	95th Percentile Queue Length (feet)	Vehicle Equivalent (vehicles)		
Signalized Intersections								
Meridian Road / E Woodmen Road	EB	L	480' x2	275'	11	562'	23	480' x2
		T	-	88'	4	180'	8	-
		R	665'	0'	0	0'	0	665'
	WB	L	200' x2	72'	3	94'	4	200' x2
		T	-	245'	10	224'	9	-
		R	260'	0'	0	0'	0	260'
	NB	L	470' x2	194'	8	232'	10	470' x2
		T	-	90'	4	378'	16	-
		R	350'	0'	0	0'	0	350'
	SB	L	490' x2	62'	3	126'	6	490' x2
		T	-	358'	15	268'	11	-
		R	455'	0'	0	0'	0	455'
Stop-Controlled Intersections								
Meridian Road / Ayer Road	EB	L,T,R	-	5'	1	28'	2	-
	WB	L,T,R	-	15'	1	10'	1	-
	NB	L	360'	3'	1	0'	0	360'
		T,R	-	0'	0	0'	0	-
	SB	L	230'	0'	0	0'	0	230'
		T	-	0'	0	0'	0	-
		R	230'	0'	0	0'	0	230'
Meridian Road / Hodgen Road	EB	L	350'	0'	0	0'	0	350'
		T	-	0'	0	0'	0	-
		R	260'	0'	0	0'	0	260'
	WB	L	385'	3'	1	0'	0	385'
		T,R	-	0'	0	0'	0	-
	NB	L	285'	30'	2	18'	1	285'
		T,R	-	3'	1	5'	1	-
SB	L,T,R	-	5'	1	3'	1	-	
Ayer Road / Broken Antler Court / Access A	EB	L,T,R	-	0'	0	0'	0	-
	WB	L,T,R	-	0'	0	0'	0	-
	NB	L,T,R	-	0'	0	0'	0	-
	SB	L,T,R	-	0'	0	0'	0	-
Ayer Road / White Antler Trail / Access B	EB	L,T,R	-	3'	1	3'	1	-
	WB	L,T,R	-	0'	0	0'	0	-
	NB	L,T,R	-	0'	0	0'	0	-
	SB	L,T,R	-	3'	1	3'	1	-

Note: Turn Lane Length does not include taper length.
x2 = Dual Turn Lanes.

As Table 8 shows, all existing turn lane lengths have sufficient storage to accommodate future traffic volumes.

Recommended Improvements

In review of the existing and expected ADTs along Ayer Road, as illustrated in Figure 8, it is recommended that Ayer Road from Meridian Road to White Antler Trail provide a rural minor collector roadway classification. East of White Antler Trail it is recommended that Ayer Road be classified as a rural local roadway classification.

Based on previous discussion of intersection operations for Year 2045 build-out conditions (levels of service and projected queue lengths), no public improvements were identified to be need nor are they recommended. The signalized intersection of E Woodmen Road and Ayer Road operates within the County's minimum acceptable LOS operations and turn lane lengths have sufficient storage to accommodate future traffic demands. All stop-controlled study intersections operate within the County's minimum acceptable LOS and with minimal vehicle queuing.

Additionally, based on the auxiliary lane analysis performed in combination with projected intersection operations, an exclusive eastbound left turn lane at the intersection of Ayer Road and Access B is not recommended as part of this development. Inclusion of auxiliary lanes as warranted provides no benefit to intersection operations (vehicular delay and 95th percentile queues) and does not negatively impact other study area roadways and intersections.

VII. Conclusion

This traffic impact study addressed the capacity, geometric, and control requirements associated with the development entitled Antlers Range. This proposed residential development consists of 84 single-family detached homes. The development is located near the northeast corner of Ayer Road and Meridian Road in El Paso County, Colorado.

The study area examined in this analysis encompassed the Meridian Road intersections with E Woodmen Road, Ayer Road, and Hodgen Road, the Ayer Road intersections with Broken Antler Court and White Antler Trail, and includes proposed site accesses.

Analysis was conducted for critical AM Peak Hour and PM Peak Hour traffic operations for existing traffic conditions, Year 2027 and Year 2045 background traffic conditions, and Year 2027 and Year 2045 total traffic conditions.

Analysis of existing traffic conditions indicates that the signalized intersection of E Woodmen Road and Meridian Road has overall operations at LOS D during the morning and afternoon peak traffic hours. The stop-controlled intersections within the study area have turning movement operations at LOS B or better during the morning and afternoon peak traffic hours.

Without the proposed development, Year 2027 background operational analysis shows that the signalized intersection of E Woodmen Road and Meridian Road continues to project overall operations at LOS D during the morning and afternoon peak traffic hours. The stop-controlled intersections are expected to maintain turning movement operations at LOS B or better during the morning and afternoon peak traffic hours.

By Year 2045 and without the proposed development, the signalized intersection of E Woodmen Road and Meridian Road continues to anticipate overall operations at LOS D during the morning and afternoon peak traffic hour. The stop-controlled intersections within the study area have turning movement operations at LOS B or better during the morning peak traffic hour and LOS C or better during the afternoon peak traffic hour.

Analysis of future traffic conditions indicates that the addition of site-generated traffic is expected to create no negative impact to traffic operations for the existing and surrounding roadway system upon roadway and 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 2045 background traffic conditions. Proposed site accesses have long-term operations at LOS A during peak traffic periods and upon build-out.

This site is subject to the El Paso County Road Impact Fee Program (Resolution 19-471), as amended. An option for payment will be selected at the final land use approval stage.

APPENDIX A

Traffic Count Data
Signal Timing Information
Existing Ayer Road Trip Generation Information

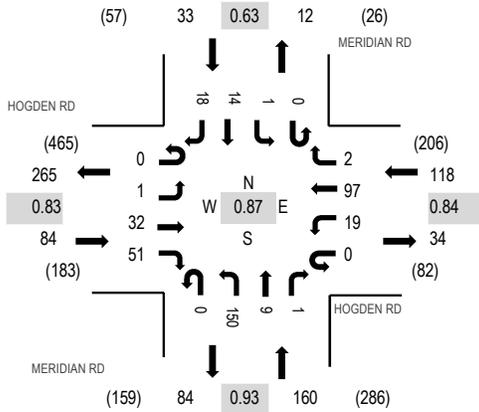
Location: 1 MERIDIAN RD & HOGDEN RD AM

Date: Wednesday, December 11, 2024

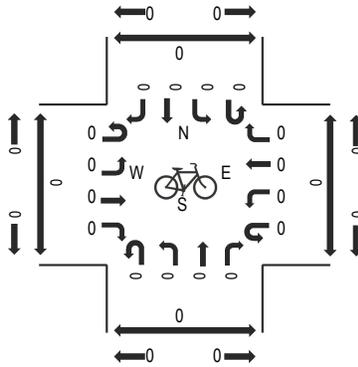
Peak Hour: 07:00 AM - 08:00 AM

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

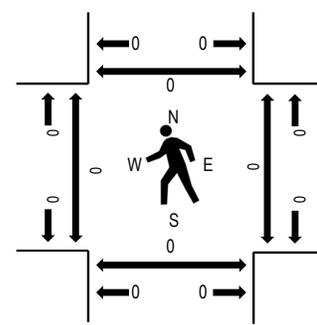
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	HOGDEN RD Eastbound				HOGDEN RD Westbound				MERIDIAN RD Northbound				MERIDIAN RD 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	11	5	0	6	28	1	0	26	3	0	0	0	5	8	93	395	0	0	0	0
7:15 AM	0	0	10	22	0	5	27	1	0	38	4	1	0	1	3	2	114	388	0	0	0	0
7:30 AM	0	0	7	11	0	2	30	0	0	42	1	0	0	0	5	5	103	369	0	0	0	0
7:45 AM	0	1	4	13	0	6	12	0	0	44	1	0	0	0	1	3	85	349	0	0	0	0
8:00 AM	0	0	8	13	0	5	17	1	0	33	3	0	0	0	3	3	86	337	0	0	0	0
8:15 AM	0	0	12	12	0	2	18	6	0	40	1	1	0	0	0	3	95		0	0	0	0
8:30 AM	0	0	14	16	0	0	21	0	0	21	1	2	0	0	4	4	83		0	0	0	0
8:45 AM	0	1	8	15	1	1	16	0	0	21	1	2	0	0	4	3	73		0	0	0	0
Count Total	0	2	74	107	1	27	169	9	0	265	15	6	0	1	25	31	732		0	0	0	0
Peak Hour	0	1	32	51	0	19	97	2	0	150	9	1	0	1	14	18	395		0	0	0	0

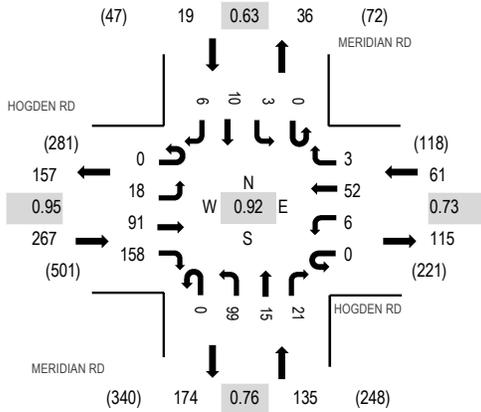
Location: 1 MERIDIAN RD & HOGDEN RD PM

Date: Wednesday, December 11, 2024

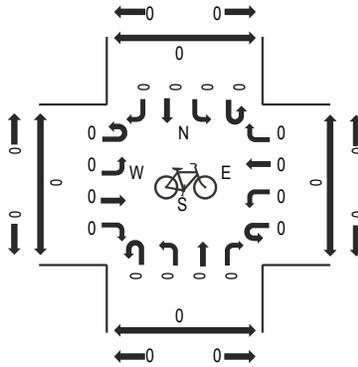
Peak Hour: 04:15 PM - 05:15 PM

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

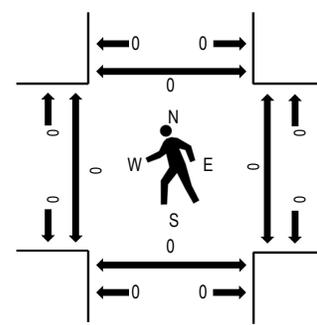
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians

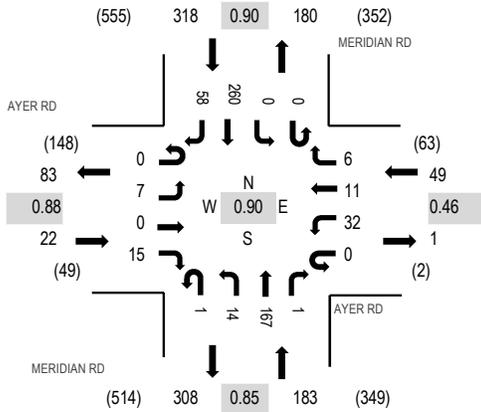


Note: Total study counts contained in parentheses.

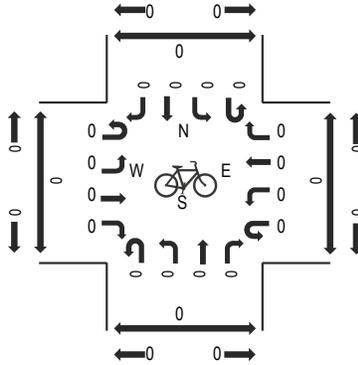
Traffic Counts - Motorized Vehicles

Interval Start Time	HOGDEN RD Eastbound				HOGDEN RD Westbound				MERIDIAN RD Northbound				MERIDIAN RD 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	31	32	0	1	11	1	0	15	4	3	0	1	5	0	107	468	0	0	0	0
4:15 PM	0	2	19	46	0	4	15	2	0	23	4	6	0	1	5	4	131	482	0	0	0	0
4:30 PM	0	5	27	36	0	1	11	1	0	17	6	7	0	2	2	0	115	468	0	0	0	0
4:45 PM	0	7	21	44	0	1	13	0	0	24	1	2	0	0	1	1	115	464	0	0	0	0
5:00 PM	0	4	24	32	0	0	13	0	0	35	4	6	0	0	2	1	121	446	0	0	0	0
5:15 PM	0	4	18	41	0	5	10	1	0	23	5	2	0	0	6	2	117		0	0	0	0
5:30 PM	0	0	23	30	0	2	15	0	0	19	7	5	0	0	8	2	111		0	0	0	0
5:45 PM	0	3	17	32	0	1	10	0	0	16	8	6	0	0	3	1	97		0	0	0	0
Count Total	0	28	180	293	0	15	98	5	0	172	39	37	0	4	32	11	914		0	0	0	0
Peak Hour	0	18	91	158	0	6	52	3	0	99	15	21	0	3	10	6	482		0	0	0	0

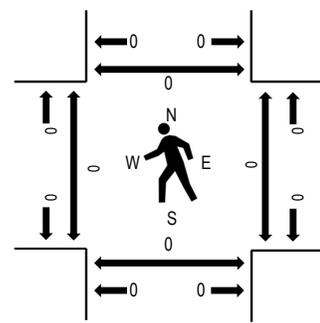
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	AYER RD Eastbound				AYER RD Westbound				MERIDIAN RD Northbound				MERIDIAN RD 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	4	0	1	0	2	0	0	0	2	31	0	0	0	69	13	122	572	0	0	0	0
7:15 AM	0	2	0	3	0	5	2	1	1	6	39	1	0	0	58	17	135	569	0	0	0	0
7:30 AM	0	1	0	5	0	2	3	2	0	5	53	0	0	0	73	15	159	544	0	0	0	0
7:45 AM	0	0	0	6	0	23	6	3	0	1	44	0	0	0	60	13	156	500	0	0	0	0
8:00 AM	0	5	0	1	0	10	2	0	0	4	43	0	0	1	45	8	119	444	0	0	0	0
8:15 AM	0	4	0	4	0	1	0	0	0	4	40	0	0	0	39	18	110		0	0	0	0
8:30 AM	0	4	0	4	0	1	0	0	0	0	40	0	0	0	47	19	115		0	0	0	0
8:45 AM	0	4	0	1	0	0	0	0	0	3	32	0	0	0	53	7	100		0	0	0	0
Count Total	0	24	0	25	0	44	13	6	1	25	322	1	0	1	444	110	1,016		0	0	0	0
Peak Hour	0	7	0	15	0	32	11	6	1	14	167	1	0	0	260	58	572		0	0	0	0

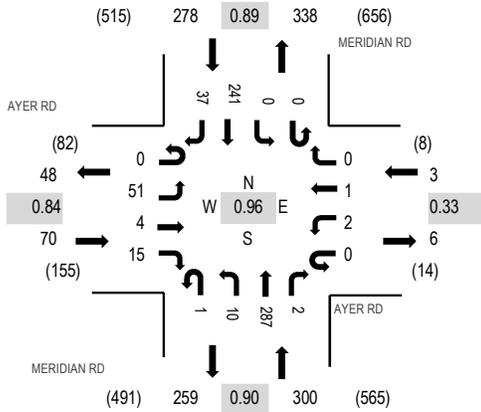
Location: 2 MERIDIAN RD & AYER RD PM

Date: Wednesday, December 11, 2024

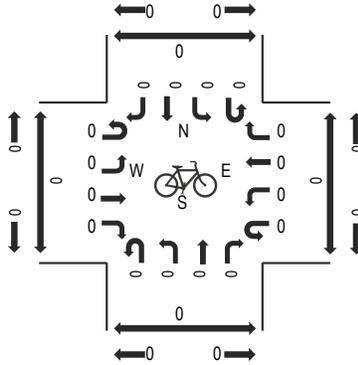
Peak Hour: 04:45 PM - 05:45 PM

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

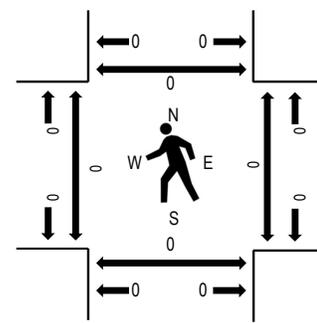
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	AYER RD Eastbound				AYER RD Westbound				MERIDIAN RD Northbound				MERIDIAN RD 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	18	0	5	0	1	0	2	0	3	59	1	0	0	46	6	141	605	0	0	0	0
4:15 PM	0	20	0	2	0	0	0	0	0	5	56	0	0	0	59	4	146	623	0	0	0	0
4:30 PM	0	18	1	6	0	1	0	0	0	0	65	1	0	1	56	8	157	646	0	0	0	0
4:45 PM	0	10	0	4	0	0	0	0	0	4	75	1	0	0	57	10	161	651	0	0	0	0
5:00 PM	0	12	1	1	0	0	0	0	1	3	79	0	0	0	53	9	159	638	0	0	0	0
5:15 PM	0	15	2	6	0	0	1	0	0	1	66	0	0	0	71	7	169	651	0	0	0	0
5:30 PM	0	14	1	4	0	2	0	0	0	2	67	1	0	0	60	11	162	638	0	0	0	0
5:45 PM	0	9	2	4	0	0	0	1	0	3	70	2	0	0	52	5	148	605	0	0	0	0
Count Total	0	116	7	32	0	4	1	3	1	21	537	6	0	1	454	60	1,243	6,051	0	0	0	0
Peak Hour	0	51	4	15	0	2	1	0	1	10	287	2	0	0	241	37	651	6,051	0	0	0	0

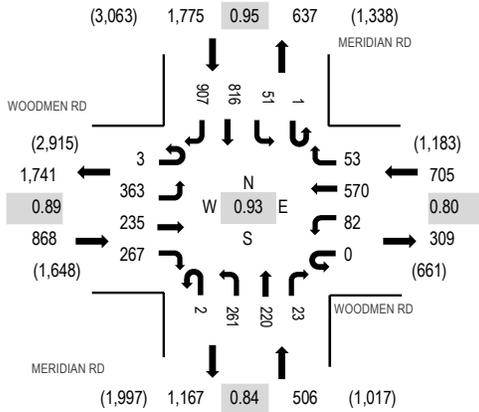
Location: 3 MERIDIAN RD & WOODMEN RD AM

Date: Wednesday, December 11, 2024

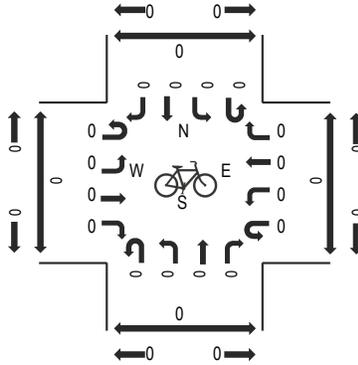
Peak Hour: 07:00 AM - 08:00 AM

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

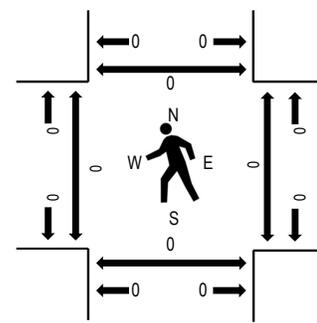
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WOODMEN RD Eastbound				WOODMEN RD Westbound				MERIDIAN RD Northbound				MERIDIAN RD 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	2	74	52	55	0	20	134	8	0	56	43	3	0	8	206	203	864	3,854	0	0	0	0
7:15 AM	0	92	57	78	0	25	147	15	1	74	73	7	0	9	208	248	1,034	3,779	0	0	0	0
7:30 AM	0	88	58	59	0	22	183	15	1	68	50	7	1	11	198	235	996	3,536	0	0	0	0
7:45 AM	1	109	68	75	0	15	106	15	0	63	54	6	0	23	204	221	960	3,276	0	0	0	0
8:00 AM	0	105	72	40	0	11	92	7	0	47	64	3	0	22	177	149	789	3,057	0	0	0	0
8:15 AM	0	98	61	46	0	24	89	13	0	54	77	9	0	14	162	144	791		0	0	0	0
8:30 AM	1	89	56	28	0	15	95	10	0	57	68	8	0	18	143	148	736		0	0	0	0
8:45 AM	0	94	57	33	0	20	92	10	0	52	66	6	0	26	131	154	741		0	0	0	0
Count Total	4	749	481	414	0	152	938	93	2	471	495	49	1	131	1,429	1,502	6,911		0	0	0	0
Peak Hour	3	363	235	267	0	82	570	53	2	261	220	23	1	51	816	907	3,854		0	0	0	0

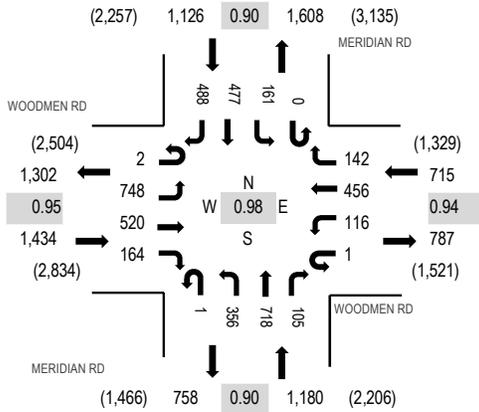
Location: 3 MERIDIAN RD & WOODMEN RD PM

Date: Wednesday, December 11, 2024

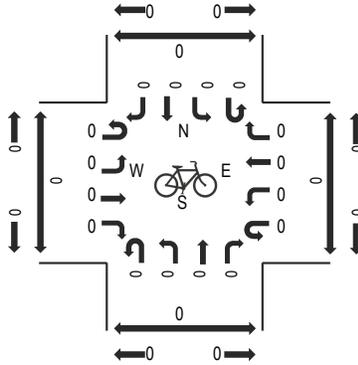
Peak Hour: 04:15 PM - 05:15 PM

Peak 15-Minutes: 05:00 PM - 05:15 PM

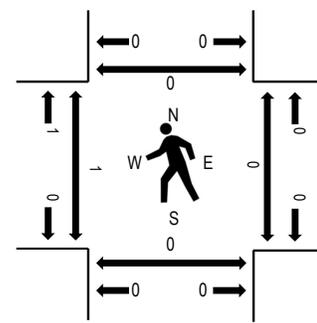
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	WOODMEN RD Eastbound				WOODMEN RD Westbound				MERIDIAN RD Northbound				MERIDIAN RD 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	1	133	141	31	0	32	92	39	1	82	163	23	0	40	135	145	1,058	4,380	0	0	0	0
4:15 PM	1	186	151	38	0	28	116	45	0	76	170	22	0	37	114	129	1,113	4,455	1	0	0	0
4:30 PM	0	196	140	40	0	29	97	26	0	99	179	28	0	43	126	107	1,110	4,355	0	0	0	0
4:45 PM	0	197	115	49	0	27	119	38	0	82	170	25	0	42	125	110	1,099	4,331	0	0	0	0
5:00 PM	1	169	114	37	1	32	124	33	1	99	199	30	0	39	112	142	1,133	4,246	0	0	0	0
5:15 PM	0	188	129	46	0	21	108	39	0	72	152	23	0	37	98	100	1,013		0	0	0	0
5:30 PM	1	208	110	55	0	18	82	39	0	75	179	14	0	47	121	137	1,086		0	0	0	0
5:45 PM	0	202	113	42	0	14	100	30	0	66	155	21	0	36	94	141	1,014		0	0	0	0
Count Total	4	1,479	1,013	338	1	201	838	289	2	651	1,367	186	0	321	925	1,011	8,626		1	0	0	0
Peak Hour	2	748	520	164	1	116	456	142	1	356	718	105	0	161	477	488	4,455		1	0	0	0

Start Time	11-Dec-24 Wed	EB	WB	Total
12:00 AM		1	0	1
01:00		0	0	0
02:00		0	0	0
03:00		0	0	0
04:00		0	0	0
05:00		0	1	1
06:00		0	11	11
07:00		1	49	50
08:00		1	14	15
09:00		2	6	8
10:00		5	7	12
11:00		2	3	5
12:00 PM		2	2	4
01:00		3	5	8
02:00		8	7	15
03:00		13	62	75
04:00		5	4	9
05:00		9	4	13
06:00		6	6	12
07:00		4	3	7
08:00		3	0	3
09:00		5	1	6
10:00		4	1	5
11:00		1	0	1
Total		75	186	261
Percent		28.7%	71.3%	
AM Peak	-	10:00	07:00	-
Vol.	-	5	49	-
PM Peak	-	15:00	15:00	-
Vol.	-	13	62	-
Grand Total		75	186	261
Percent		28.7%	71.3%	
ADT		ADT 261	ADT 261	AADT 261

Start Time	11-Dec-24 Wed	NB	SB	Total
12:00 AM		7	7	14
01:00		5	1	6
02:00		3	1	4
03:00		6	3	9
04:00		25	16	41
05:00		49	80	129
06:00		98	192	290
07:00		183	308	491
08:00		166	206	372
09:00		118	164	282
10:00		129	160	289
11:00		132	187	319
12:00 PM		154	151	305
01:00		180	165	345
02:00		193	204	397
03:00		265	245	510
04:00		270	237	507
05:00		295	254	549
06:00		201	148	349
07:00		126	77	203
08:00		107	64	171
09:00		64	49	113
10:00		21	29	50
11:00		19	9	28
Total		2816	2957	5773
Percent		48.8%	51.2%	
AM Peak	-	07:00	07:00	-
Vol.	-	183	308	-
PM Peak	-	17:00	17:00	-
Vol.	-	295	254	-
Grand Total		2816	2957	5773
Percent		48.8%	51.2%	
ADT		ADT 5,773	ADT 5,773	AADT 5,773

63

				WBLT	EB	NBLT	SB	EBLT	WB	SBLT	NB	
0 + Key			Phase + Key				Phase					
FUNCTION	KEY	12345678	FUNCTION	KEY	Ph 1	Ph 2	Ph 3	Ph 4	Ph 5	Ph 6	Ph 7	Ph 8
Vehicle Recall	0	2 6	Max I	0	25	60	25	50	50	60	40	50
Ped Recall	1		Max II/HFDW	1	25	60	25	50	50	60	40	50
Red Lock	2		Walk	2	0	5	0	5	0	5	0	5
Yellow Lock	3		Flashing DW	3	0	28	0	28	0	27	0	29
Permits	4	12345678	Max Initial	4	0	0	0	0	0	0	0	0
Ped Phases	5	2 4 6 8	Min Green	5	4	23	8	16	4	23	8	16
Lead Phases	6	1 3 5 7	TBR	6	0	0	0	0	0	0	0	0
Double Entry	7	4 8	TTR	7	0	0	0	0	0	0	0	0
Sequential Timing	8		Observe Gap	8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Startup Green	9		Passage	9	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Overlap A	A		Min Gap	A	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Overlap B	B		Added Actuation	B	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Overlap C	C		Yellow	C	4.0	5.2	4.0	5.2	4.0	5.2	4.0	5.2
Overlap D	D		Red Clear	D	3.0	2.1	3.3	2.1	3.5	2.1	2.8	2.1
Exclusive	E		Red Revert	E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Simultaneous Gap	F	2 4 6 8	Walk II	F	0	0	0	0	0	0	0	0

passage on phase 1 extended to 1.0 sec
 5
 3
 7 to .5 sec
 RO
 1-14-19

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 Detached Housing	DU	9.43	0.18	0.53	0.70	0.59	0.35	0.94

Key: DU = Dwelling Unit.

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

ITE CODE LAND USE SIZE				TOTAL TRIPS GENERATED						
				24 HOUR	AM PEAK HOUR			PM PEAK HOUR		
					ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
<u>Broken Antler CT</u>										
210	Single-Family Detached Housing	10	DU	94	2	5	7	6	3	9
<u>Single Family</u>										
210	Single-Family Detached Housing	1	DU	9	0	1	1	1	0	4
<u>Single Family</u>										
210	Single-Family Detached Housing	1	DU	9	0	1	1	1	0	4
<u>White Antler Trail & Norma Kate Lane</u>										
210	Single-Family Detached Housing	12	DU	113	2	6	8	7	4	11
<u>West of White Antler Trail</u>										
210	Single-Family Detached Housing	3	DU	28	1	2	2	2	1	5
<i>Total:</i>				255	5	14	19	16	9	33

Key: DU = Dwelling Unit.

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

APPENDIX B

Level of Service Definitions

The following information is referenced from the Highway Capacity Manual: A Guide for Multimodal Mobility Analysis, 7th Edition, Transportation Research Board, 2022: Chapter 19 – Signalized Intersections.

Motorized Vehicle 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.

Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio ^a	
	$v/c \leq 1.0$	$v/c > 1.0$
≤ 10	A	F
> 10 – 20	B	F
> 20 – 35	C	F
> 35 – 55	D	F
> 55 – 80	E	F
> 80	F	F

Note: ^a For approach-based and intersectionwide assessments, LOS is defined solely by control delay.

The following information is referenced from the Highway Capacity Manual: A Guide for Multimodal Mobility Analysis, 7th Edition, Transportation Research Board, 2022: Chapter 20 – Two-Way Stop-Controlled Intersections, Chapter 21 – All-Way Stop-Controlled Intersections, and Chapter 22 - Roundabouts.

Motorized Vehicle Level of Service (LOS) for Unsignalized & Roundabout Intersections

LOS is a quantitative stratification of performance measure(s) representing quality of service. Quality of service describes how well a transportation facility or service operates from a traveler’s perspective. LOS is measured on an A – F scale, with LOS A representing the best operating conditions from a traveler’s perspective.

Control Delay (s/veh)	LOS by Volume-to-Capacity Ratio ^a	
	v/c ≤ 1.0	v/c > 1.0
0 – 10	A	F
> 10 – 15	B	F
> 15 – 25	C	F
> 25 – 35	D	F
> 35 – 50	E	F
> 50	F	F

Note: The LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole.

^a For approaches and intersectionwide assessment, LOS is defined solely by control delay.

APPENDIX C

Capacity Worksheets

Timings
1: Meridian Road & E Woodmen Road

Existing Traffic Conditions
AM Peak Traffic Hour

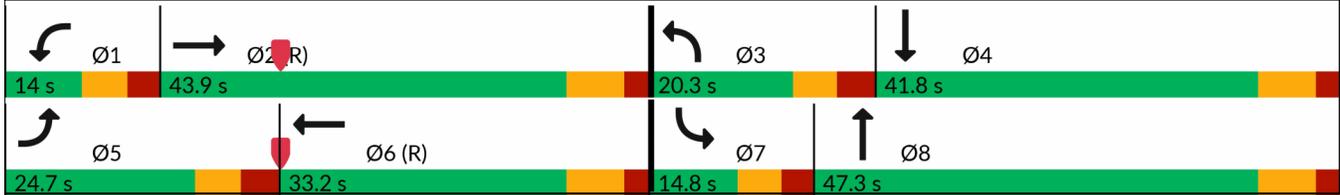
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	366	235	267	82	570	53	263	220	23	52	816	907
Future Volume (vph)	366	235	267	82	570	53	263	220	23	52	816	907
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Satd. Flow (RTOR)			299			299			299			631
Lane Group Flow (vph)	398	255	290	89	620	58	286	239	25	57	887	986
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			Free			Free			Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	23.0		4.0	23.0		8.0	16.0		8.0	16.0	
Minimum Split (s)	11.5	30.3		11.0	30.3		15.3	23.3		14.8	23.3	
Total Split (s)	24.7	43.9		14.0	33.2		20.3	47.3		14.8	41.8	
Total Split (%)	20.6%	36.6%		11.7%	27.7%		16.9%	39.4%		12.3%	34.8%	
Yellow Time (s)	4.0	5.2		4.0	5.2		4.0	5.2		4.0	5.2	
All-Red Time (s)	3.5	2.1		3.0	2.1		3.3	2.1		2.8	2.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.5	7.3		7.0	7.3		7.3	7.3		6.8	7.3	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	16.8	38.1	120.0	7.0	27.8	120.0	12.7	41.5	120.0	8.0	33.3	120.0
Actuated g/C Ratio	0.14	0.32	1.00	0.06	0.23	1.00	0.11	0.35	1.00	0.07	0.28	1.00
v/c Ratio	0.83	0.22	0.18	0.44	0.75	0.03	0.79	0.19	0.01	0.25	0.90	0.62
Control Delay (s/veh)	65.7	31.3	0.2	62.0	50.3	0.0	68.5	28.6	0.0	56.1	55.0	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	65.7	31.3	0.2	62.0	50.3	0.0	68.5	28.6	0.0	56.1	55.0	1.8
LOS	E	C	A	E	D	A	E	C	A	E	E	A
Approach Delay (s/veh)		36.3			47.9			48.1			27.9	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)	156	77	0	35	242	0	112	69	0	22	343	0
Queue Length 95th (ft)	#227	113	0	62	311	0	#172	102	0	44	#450	0
Internal Link Dist (ft)		806			485			356			1953	
Turn Bay Length (ft)	480		665	200		260	470		350	490		455
Base Capacity (vph)	494	1124	1583	203	820	1583	371	1228	1583	228	1017	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.81	0.23	0.18	0.44	0.76	0.04	0.77	0.19	0.02	0.25	0.87	0.62
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 95												
Control Type: Actuated-Coordinated												

Timings
 1: Meridian Road & E Woodmen Road

Existing Traffic Conditions
 AM Peak Traffic Hour

Maximum v/c Ratio: 0.90	
Intersection Signal Delay (s/veh): 36.1	Intersection LOS: D
Intersection Capacity Utilization 84.2%	ICU Level of Service E
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Meridian Road & E Woodmen Road



HCM 7th TWSC
2: Meridian Road & Ayer Road

Existing Traffic Conditions
AM Peak Traffic Hour

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Vol, veh/h	7	1	15	10	3	1	15	167	3	1	260	58
Future Vol, veh/h	7	1	15	10	3	1	15	167	3	1	260	58
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	360	-	-	230	-	230
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	8	1	16	11	3	1	16	182	3	1	283	63

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	501	502	283	501	564	183	346	0	0	185	0	0
Stage 1	285	285	-	216	216	-	-	-	-	-	-	-
Stage 2	216	217	-	285	348	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	481	471	756	480	435	859	1213	-	-	1390	-	-
Stage 1	722	676	-	786	724	-	-	-	-	-	-	-
Stage 2	786	723	-	722	634	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	470	465	756	462	429	859	1213	-	-	1390	-	-
Mov Cap-2 Maneuver	470	465	-	462	429	-	-	-	-	-	-	-
Stage 1	722	675	-	776	714	-	-	-	-	-	-	-
Stage 2	771	713	-	705	634	-	-	-	-	-	-	-

Approach	EB		WB		NB			SB		
HCM Control Delay, s/v11.01			12.92		0.65			0.02		
HCM LOS	B		B							

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1213	-	-	624	470	1390	-	-
HCM Lane V/C Ratio	0.013	-	-	0.04	0.032	0.001	-	-
HCM Control Delay (s/veh)	8	-	-	11	12.9	7.6	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

HCM 7th TWSC
3: Meridian Road & Hodgen Road

Existing Traffic Conditions
AM Peak Traffic Hour

Intersection												
Int Delay, s/veh	5.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑	↗	↙	↗		↙	↗			↕	
Traffic Vol, veh/h	1	32	51	19	97	2	150	9	1	1	14	18
Future Vol, veh/h	1	32	51	19	97	2	150	9	1	1	14	18
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									
Storage Length	350	-	260	385	-	-	285	-	-	-	-	-
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	35	55	21	105	2	163	10	1	1	15	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	108	0	0	90	0	0	191	186	35	190	240	107
Stage 1	-	-	-	-	-	-	37	37	-	148	148	-
Stage 2	-	-	-	-	-	-	154	149	-	42	92	-
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	1483	-	-	1505	-	-	769	709	1038	770	661	948
Stage 1	-	-	-	-	-	-	978	864	-	855	775	-
Stage 2	-	-	-	-	-	-	848	774	-	973	818	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1483	-	-	1505	-	-	725	698	1038	748	652	948
Mov Cap-2 Maneuver	-	-	-	-	-	-	725	698	-	748	652	-
Stage 1	-	-	-	-	-	-	978	864	-	843	764	-
Stage 2	-	-	-	-	-	-	803	763	-	960	818	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.09			1.2			11.32			9.78		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	725	722	1483	-	-	1505	-	-	789
HCM Lane V/C Ratio	0.225	0.015	0.001	-	-	0.014	-	-	0.045
HCM Control Delay (s/veh)	11.4	10.1	7.4	-	-	7.4	-	-	9.8
HCM Lane LOS	B	B	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.9	0	0	-	-	0	-	-	0.1

HCM 7th TWSC
4: Broken Antler Court & Ayer Road

Existing Traffic Conditions
AM Peak Traffic Hour

Intersection						
Int Delay, s/veh	2.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	3	2	0	9	5	0
Future Vol, veh/h	3	2	0	9	5	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	2	0	10	5	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	5	0	14
Stage 1	-	-	-	-	4
Stage 2	-	-	-	-	10
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	-	-	1616	-	1005
Stage 1	-	-	-	-	1019
Stage 2	-	-	-	-	1013
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1616	-	1005
Mov Cap-2 Maneuver	-	-	-	-	1005
Stage 1	-	-	-	-	1019
Stage 2	-	-	-	-	1013

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1005	-	-	1616	-
HCM Lane V/C Ratio	0.005	-	-	-	-
HCM Control Delay (s/veh)	8.6	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Vol, veh/h	1	2	0	2	6	0
Future Vol, veh/h	1	2	0	2	6	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	2	0	2	7	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	6.6	7	7.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	0%
Vol Thru, %	0%	33%	100%
Vol Right, %	0%	67%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	6	3	2
LT Vol	6	0	0
Through Vol	0	1	2
RT Vol	0	2	0
Lane Flow Rate	7	3	2
Geometry Grp	1	1	1
Degree of Util (X)	0.008	0.003	0.002
Departure Headway (Hd)	4.144	3.547	3.948
Convergence, Y/N	Yes	Yes	Yes
Cap	869	1014	911
Service Time	2.144	1.551	1.952
HCM Lane V/C Ratio	0.008	0.003	0.002
HCM Control Delay, s/veh	7.2	6.6	7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	0	0

Timings
1: Meridian Road & E Woodmen Road

Existing Traffic Conditions
PM Peak Traffic Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	750	520	164	117	456	142	357	718	105	161	477	488
Future Volume (vph)	750	520	164	117	456	142	357	718	105	161	477	488
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Satd. Flow (RTOR)			299			299			299			530
Lane Group Flow (vph)	815	565	178	127	496	154	388	780	114	175	518	530
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			Free			Free			Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	23.0		4.0	23.0		8.0	16.0		8.0	16.0	
Minimum Split (s)	11.5	30.3		11.0	30.3		15.3	23.3		14.8	23.3	
Total Split (s)	38.0	54.0		15.0	31.0		22.0	36.0		15.0	29.0	
Total Split (%)	31.7%	45.0%		12.5%	25.8%		18.3%	30.0%		12.5%	24.2%	
Yellow Time (s)	4.0	5.2		4.0	5.2		4.0	5.2		4.0	5.2	
All-Red Time (s)	3.5	2.1		3.0	2.1		3.3	2.1		2.8	2.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.5	7.3		7.0	7.3		7.3	7.3		6.8	7.3	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	30.1	47.3	120.0	7.8	24.5	120.0	14.7	28.3	120.0	8.2	21.3	120.0
Actuated g/C Ratio	0.25	0.39	1.00	0.07	0.20	1.00	0.12	0.24	1.00	0.07	0.18	1.00
v/c Ratio	0.94	0.40	0.11	0.56	0.68	0.09	0.92	0.93	0.07	0.74	0.82	0.33
Control Delay (s/veh)	64.6	27.4	0.1	64.8	50.0	0.1	80.7	64.2	0.0	74.7	59.7	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	64.6	27.4	0.1	64.8	50.0	0.1	80.7	64.2	0.0	74.7	59.7	0.5
LOS	E	C	A	E	D	A	F	E	A	E	E	A
Approach Delay (s/veh)		43.8			42.6			63.6			36.3	
Approach LOS		D			D			E			D	
Queue Length 50th (ft)	319	165	0	50	190	0	155	312	0	70	204	0
Queue Length 95th (ft)	#439	215	0	82	251	0	#248	#428	0	#122	#274	0
Internal Link Dist (ft)		806			460			356			1953	
Turn Bay Length (ft)	480		665	200		260	470		350	490		455
Base Capacity (vph)	872	1395	1583	228	723	1583	420	846	1583	234	639	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.41	0.11	0.56	0.69	0.10	0.92	0.92	0.07	0.75	0.81	0.33

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 105
 Control Type: Actuated-Coordinated

Timings
 1: Meridian Road & E Woodmen Road

Existing Traffic Conditions
 PM Peak Traffic Hour

Maximum v/c Ratio: 0.95
 Intersection Signal Delay (s/veh): 46.9 Intersection LOS: D
 Intersection Capacity Utilization 91.0% ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Meridian Road & E Woodmen Road



HCM 7th TWSC
2: Meridian Road & Ayer Road

Existing Traffic Conditions
PM Peak Traffic Hour

Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↔			↕↔		↕	↔		↕	↕	↕
Traffic Vol, veh/h	51	3	15	6	2	1	11	287	11	1	241	37
Future Vol, veh/h	51	3	15	6	2	1	11	287	11	1	241	37
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	360	-	-	230	-	230
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	55	3	16	7	2	1	12	312	12	1	262	40

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	601	612	262	608	646	318	302	0	0	324	0	0
Stage 1	264	264	-	342	342	-	-	-	-	-	-	-
Stage 2	337	348	-	266	304	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	412	408	777	408	390	723	1259	-	-	1236	-	-
Stage 1	741	690	-	673	638	-	-	-	-	-	-	-
Stage 2	677	634	-	740	663	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	405	404	777	392	386	723	1259	-	-	1236	-	-
Mov Cap-2 Maneuver	405	404	-	392	386	-	-	-	-	-	-	-
Stage 1	740	689	-	667	632	-	-	-	-	-	-	-
Stage 2	668	628	-	720	662	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s/v14.54			13.96		0.28		0.03	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1259	-	-	452	412	1236	-	-
HCM Lane V/C Ratio	0.009	-	-	0.166	0.024	0.001	-	-
HCM Control Delay (s/veh)	7.9	-	-	14.5	14	7.9	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.1	0	-	-

HCM 7th TWSC
3: Meridian Road & Hodgen Road

Existing Traffic Conditions
PM Peak Traffic Hour

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑	↗	↙	↗		↙	↗			↕	
Traffic Vol, veh/h	18	91	158	6	52	3	99	15	21	3	10	6
Future Vol, veh/h	18	91	158	6	52	3	99	15	21	3	10	6
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									
Storage Length	350	-	260	385	-	-	285	-	-	-	-	-
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	20	99	172	7	57	3	108	16	23	3	11	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	60	0	0	271	0	0	213	211	99	217	381	58
Stage 1	-	-	-	-	-	-	138	138	-	71	71	-
Stage 2	-	-	-	-	-	-	75	73	-	146	310	-
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	1544	-	-	1293	-	-	744	686	957	739	552	1008
Stage 1	-	-	-	-	-	-	865	782	-	939	836	-
Stage 2	-	-	-	-	-	-	934	834	-	856	659	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1544	-	-	1293	-	-	712	674	957	692	542	1008
Mov Cap-2 Maneuver	-	-	-	-	-	-	712	674	-	692	542	-
Stage 1	-	-	-	-	-	-	854	772	-	934	831	-
Stage 2	-	-	-	-	-	-	911	830	-	808	651	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.5			0.77			10.61			10.62		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	712	815	1544	-	-	1293	-	-	661
HCM Lane V/C Ratio	0.151	0.048	0.013	-	-	0.005	-	-	0.031
HCM Control Delay (s/veh)	11	9.6	7.4	-	-	7.8	-	-	10.6
HCM Lane LOS	B	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.5	0.2	0	-	-	0	-	-	0.1

HCM 7th TWSC
4: Broken Antler Court & Ayer Road

Existing Traffic Conditions
PM Peak Traffic Hour

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	11	5	0	6	3	0
Future Vol, veh/h	11	5	0	6	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	12	5	0	7	3	0

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	17	0	21
Stage 1	-	-	-	-	15
Stage 2	-	-	-	-	7
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	-	-	1600	-	996
Stage 1	-	-	-	-	1008
Stage 2	-	-	-	-	1017
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1600	-	996
Mov Cap-2 Maneuver	-	-	-	-	996
Stage 1	-	-	-	-	1008
Stage 2	-	-	-	-	1017

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	8.63
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	996	-	-	1600	-
HCM Lane V/C Ratio	0.003	-	-	-	-
HCM Control Delay (s/veh)	8.6	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Vol, veh/h	1	2	0	2	6	0
Future Vol, veh/h	1	2	0	2	6	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	2	0	2	7	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	6.6	7	7.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	0%
Vol Thru, %	0%	33%	100%
Vol Right, %	0%	67%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	6	3	2
LT Vol	6	0	0
Through Vol	0	1	2
RT Vol	0	2	0
Lane Flow Rate	7	3	2
Geometry Grp	1	1	1
Degree of Util (X)	0.008	0.003	0.002
Departure Headway (Hd)	4.144	3.547	3.948
Convergence, Y/N	Yes	Yes	Yes
Cap	869	1014	911
Service Time	2.144	1.551	1.952
HCM Lane V/C Ratio	0.008	0.003	0.002
HCM Control Delay, s/veh	7.2	6.6	7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	0	0

Timings
1: Meridian Road & E Woodmen Road

Background Traffic Conditions
AM Peak Traffic Hour - Year 2027

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	384	240	272	84	581	75	268	245	23	72	851	935
Future Volume (vph)	384	240	272	84	581	75	268	245	23	72	851	935
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Satd. Flow (RTOR)			299			299			299			630
Lane Group Flow (vph)	417	261	296	91	632	82	291	266	25	78	925	1016
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			Free			Free			Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	23.0		4.0	23.0		8.0	16.0		8.0	16.0	
Minimum Split (s)	11.5	30.3		11.0	30.3		15.3	23.3		14.8	23.3	
Total Split (s)	24.7	43.9		14.0	33.2		20.3	47.3		14.8	41.8	
Total Split (%)	20.6%	36.6%		11.7%	27.7%		16.9%	39.4%		12.3%	34.8%	
Yellow Time (s)	4.0	5.2		4.0	5.2		4.0	5.2		4.0	5.2	
All-Red Time (s)	3.5	2.1		3.0	2.1		3.3	2.1		2.8	2.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.5	7.3		7.0	7.3		7.3	7.3		6.8	7.3	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	16.8	37.7	120.0	6.9	27.2	120.0	12.7	42.0	120.0	8.0	33.9	120.0
Actuated g/C Ratio	0.14	0.31	1.00	0.06	0.23	1.00	0.11	0.35	1.00	0.07	0.28	1.00
v/c Ratio	0.86	0.23	0.18	0.46	0.78	0.05	0.80	0.21	0.01	0.34	0.92	0.64
Control Delay (s/veh)	69.1	31.5	0.2	62.7	52.2	0.0	69.5	28.6	0.0	57.8	57.5	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	69.1	31.5	0.2	62.7	52.2	0.0	69.5	28.6	0.0	57.8	57.5	2.0
LOS	E	C	A	E	D	A	E	C	A	E	E	A
Approach Delay (s/veh)		38.2			48.2			47.9			29.6	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)	164	79	0	35	247	0	114	77	0	30	364	0
Queue Length 95th (ft)	#244	115	0	63	#323	0	#178	112	0	56	#483	0
Internal Link Dist (ft)		806			493			356			1953	
Turn Bay Length (ft)	480		665	200		260	470		350	490		455
Base Capacity (vph)	492	1110	1583	200	801	1583	371	1239	1583	228	1017	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.85	0.24	0.19	0.46	0.79	0.05	0.78	0.21	0.02	0.34	0.91	0.64
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 95												
Control Type: Actuated-Coordinated												

Timings

1: Meridian Road & E Woodmen Road

Background Traffic Conditions

AM Peak Traffic Hour - Year 2027

Maximum v/c Ratio: 0.93

Intersection Signal Delay (s/veh): 37.4

Intersection LOS: D

Intersection Capacity Utilization 85.8%

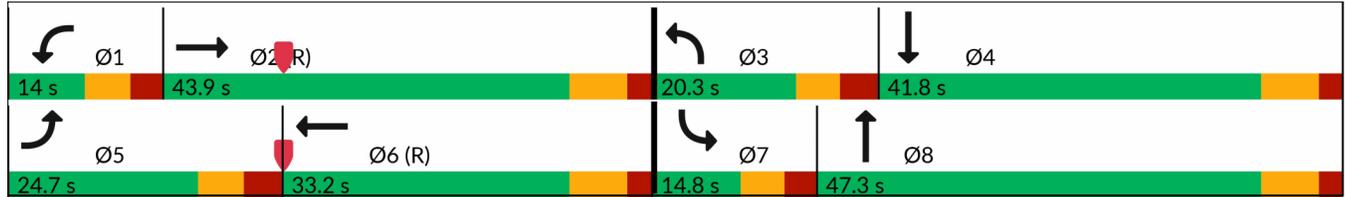
ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Meridian Road & E Woodmen Road



HCM 7th TWSC
2: Meridian Road & Ayer Road

Background Traffic Conditions
AM Peak Traffic Hour - Year 2027

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	↗
Traffic Vol, veh/h	7	2	15	10	3	1	15	170	3	2	265	59
Future Vol, veh/h	7	2	15	10	3	1	15	170	3	2	265	59
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	360	-	-	230	-	230
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	8	2	16	11	3	1	16	185	3	2	288	64

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	511	513	288	513	576	186	352	0	0	188	0	0
Stage 1	292	292	-	219	219	-	-	-	-	-	-	-
Stage 2	219	221	-	293	357	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	473	465	751	472	428	856	1207	-	-	1386	-	-
Stage 1	716	671	-	783	722	-	-	-	-	-	-	-
Stage 2	783	721	-	715	629	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	462	458	751	453	422	856	1207	-	-	1386	-	-
Mov Cap-2 Maneuver	462	458	-	453	422	-	-	-	-	-	-	-
Stage 1	715	670	-	773	712	-	-	-	-	-	-	-
Stage 2	768	711	-	696	628	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	1.19	13.08	0.64	0.05
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1207	-	-	608	461	1386	-	-
HCM Lane V/C Ratio	0.014	-	-	0.043	0.033	0.002	-	-
HCM Control Delay (s/veh)	8	-	-	11.2	13.1	7.6	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

HCM 7th TWSC
3: Meridian Road & Hodgen Road

Background Traffic Conditions
AM Peak Traffic Hour - Year 2027

Intersection												
Int Delay, s/veh	5.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑	↗	↙	↗		↙	↗			↕	
Traffic Vol, veh/h	1	32	52	19	99	2	153	9	1	1	14	18
Future Vol, veh/h	1	32	52	19	99	2	153	9	1	1	14	18
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									
Storage Length	350	-	260	385	-	-	285	-	-	-	-	-
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	35	57	21	108	2	166	10	1	1	15	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	110	0	0	91	0	0	193	188	35	192	243	109
Stage 1	-	-	-	-	-	-	37	37	-	150	150	-
Stage 2	-	-	-	-	-	-	157	151	-	42	93	-
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	1480	-	-	1504	-	-	766	707	1038	768	658	945
Stage 1	-	-	-	-	-	-	978	864	-	853	773	-
Stage 2	-	-	-	-	-	-	846	772	-	973	818	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1480	-	-	1504	-	-	722	696	1038	746	649	945
Mov Cap-2 Maneuver	-	-	-	-	-	-	722	696	-	746	649	-
Stage 1	-	-	-	-	-	-	978	864	-	841	763	-
Stage 2	-	-	-	-	-	-	801	762	-	960	817	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.09			1.18			11.38			9.8		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	722	720	1480	-	-	1504	-	-	786
HCM Lane V/C Ratio	0.23	0.015	0.001	-	-	0.014	-	-	0.046
HCM Control Delay (s/veh)	11.5	10.1	7.4	-	-	7.4	-	-	9.8
HCM Lane LOS	B	B	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.9	0	0	-	-	0	-	-	0.1

HCM 7th TWSC
4: Brokent Antler Court & Ayer Road

Background Traffic Conditions
AM Peak Traffic Hour - Year 2027

Intersection						
Int Delay, s/veh	2.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	3	2	0	9	5	0
Future Vol, veh/h	3	2	0	9	5	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	2	0	10	5	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	5	0	14
Stage 1	-	-	-	-	4
Stage 2	-	-	-	-	10
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	-	-	1616	-	1005
Stage 1	-	-	-	-	1019
Stage 2	-	-	-	-	1013
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1616	-	1005
Mov Cap-2 Maneuver	-	-	-	-	1005
Stage 1	-	-	-	-	1019
Stage 2	-	-	-	-	1013

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1005	-	-	1616	-
HCM Lane V/C Ratio	0.005	-	-	-	-
HCM Control Delay (s/veh)	8.6	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Vol, veh/h	1	2	0	2	6	0
Future Vol, veh/h	1	2	0	2	6	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	2	0	2	7	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	6.6	7	7.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	0%
Vol Thru, %	0%	33%	100%
Vol Right, %	0%	67%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	6	3	2
LT Vol	6	0	0
Through Vol	0	1	2
RT Vol	0	2	0
Lane Flow Rate	7	3	2
Geometry Grp	1	1	1
Degree of Util (X)	0.008	0.003	0.002
Departure Headway (Hd)	4.144	3.547	3.948
Convergence, Y/N	Yes	Yes	Yes
Cap	869	1014	911
Service Time	2.144	1.551	1.952
HCM Lane V/C Ratio	0.008	0.003	0.002
HCM Control Delay, s/veh	7.2	6.6	7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	0	0

Timings
1: Meridian Road & E Woodmen Road

Background Traffic Conditions
PM Peak Traffic Hour - Year 2027

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	774	530	167	119	465	163	364	750	107	182	505	497
Future Volume (vph)	774	530	167	119	465	163	364	750	107	182	505	497
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Satd. Flow (RTOR)			299			299			299			540
Lane Group Flow (vph)	841	576	182	129	505	177	396	815	116	198	549	540
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			Free			Free			Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	23.0		4.0	23.0		8.0	16.0		8.0	16.0	
Minimum Split (s)	11.5	30.3		11.0	30.3		15.3	23.3		14.8	23.3	
Total Split (s)	38.0	54.0		15.0	31.0		22.0	36.0		15.0	29.0	
Total Split (%)	31.7%	45.0%		12.5%	25.8%		18.3%	30.0%		12.5%	24.2%	
Yellow Time (s)	4.0	5.2		4.0	5.2		4.0	5.2		4.0	5.2	
All-Red Time (s)	3.5	2.1		3.0	2.1		3.3	2.1		2.8	2.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.5	7.3		7.0	7.3		7.3	7.3		6.8	7.3	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	30.5	46.9	120.0	7.8	23.7	120.0	14.7	28.7	120.0	8.2	21.7	120.0
Actuated g/C Ratio	0.25	0.39	1.00	0.07	0.20	1.00	0.12	0.24	1.00	0.07	0.18	1.00
v/c Ratio	0.96	0.41	0.11	0.57	0.72	0.11	0.94	0.96	0.07	0.84	0.85	0.34
Control Delay (s/veh)	67.4	27.8	0.1	65.2	51.8	0.1	84.1	68.6	0.0	85.2	62.0	0.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	67.4	27.8	0.1	65.2	51.8	0.1	84.1	68.6	0.0	85.2	62.0	0.5
LOS	E	C	A	E	D	A	F	E	A	F	E	A
Approach Delay (s/veh)		45.5			42.7			67.3			39.8	
Approach LOS		D			D			E			D	
Queue Length 50th (ft)	332	168	0	51	194	0	159	330	0	79	219	0
Queue Length 95th (ft)	#461	219	0	84	255	0	#255	#459	0	#145	#308	0
Internal Link Dist (ft)		806			496			356			1953	
Turn Bay Length (ft)	480		665	200		260	470		350	490		455
Base Capacity (vph)	872	1382	1583	228	698	1583	420	846	1583	234	639	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.96	0.42	0.11	0.57	0.72	0.11	0.94	0.96	0.07	0.85	0.86	0.34

Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 115												
Control Type: Actuated-Coordinated												

Timings
 1: Meridian Road & E Woodmen Road

Background Traffic Conditions
 PM Peak Traffic Hour - Year 2027

Maximum v/c Ratio: 0.96	
Intersection Signal Delay (s/veh): 49.4	Intersection LOS: D
Intersection Capacity Utilization 92.6%	ICU Level of Service F
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Meridian Road & E Woodmen Road



HCM 7th TWSC
2: Meridian Road & Ayer Road

Background Traffic Conditions
PM Peak Traffic Hour - Year 2027

Intersection												
Int Delay, s/veh	1.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Vol, veh/h	52	3	15	6	2	1	11	293	11	2	246	38
Future Vol, veh/h	52	3	15	6	2	1	11	293	11	2	246	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	360	-	-	230	-	230
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	57	3	16	7	2	1	12	318	12	2	267	41

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	615	626	267	622	661	324	309	0	0	330	0	0
Stage 1	272	272	-	348	348	-	-	-	-	-	-	-
Stage 2	343	354	-	273	313	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	403	401	771	399	382	717	1252	-	-	1229	-	-
Stage 1	734	685	-	668	634	-	-	-	-	-	-	-
Stage 2	672	630	-	733	657	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	396	396	771	383	378	717	1252	-	-	1229	-	-
Mov Cap-2 Maneuver	396	396	-	383	378	-	-	-	-	-	-	-
Stage 1	733	684	-	661	628	-	-	-	-	-	-	-
Stage 2	662	624	-	712	656	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s/v	14.83		14.16		0.28		0.06	
HCM LOS	B		B					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1252	-	-	442	403	1229	-	-
HCM Lane V/C Ratio	0.01	-	-	0.172	0.024	0.002	-	-
HCM Control Delay (s/veh)	7.9	-	-	14.8	14.2	7.9	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.1	0	-	-

HCM 7th TWSC
3: Meridian Road & Hodgen Road

Background Traffic Conditions
PM Peak Traffic Hour - Year 2027

Intersection												
Int Delay, s/veh	3.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑	↗	↙	↗		↙	↗			↕	
Traffic Vol, veh/h	18	23	161	6	53	3	101	15	2	3	10	6
Future Vol, veh/h	18	23	161	6	53	3	101	15	2	3	10	6
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									
Storage Length	350	-	260	385	-	-	285	-	-	-	-	-
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	20	25	175	7	58	3	110	16	2	3	11	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	61	0	0	200	0	0	140	138	25	145	311	59
Stage 1	-	-	-	-	-	-	64	64	-	72	72	-
Stage 2	-	-	-	-	-	-	76	74	-	72	239	-
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	1542	-	-	1372	-	-	830	753	1051	824	603	1006
Stage 1	-	-	-	-	-	-	947	841	-	937	835	-
Stage 2	-	-	-	-	-	-	933	833	-	937	707	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1542	-	-	1372	-	-	796	740	1051	791	593	1006
Mov Cap-2 Maneuver	-	-	-	-	-	-	796	740	-	791	593	-
Stage 1	-	-	-	-	-	-	935	831	-	933	831	-
Stage 2	-	-	-	-	-	-	910	829	-	905	699	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.66			0.74			10.19			10.19		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	796	767	1542	-	-	1372	-	-	714
HCM Lane V/C Ratio	0.138	0.024	0.013	-	-	0.005	-	-	0.029
HCM Control Delay (s/veh)	10.2	9.8	7.4	-	-	7.6	-	-	10.2
HCM Lane LOS	B	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.5	0.1	0	-	-	0	-	-	0.1

HCM 7th TWSC
4: Broken Antler Court & Ayer Road

Background Traffic Conditions
PM Peak Traffic Hour - Year 2027

Intersection						
Int Delay, s/veh	1.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	3	5	0	6	3	0
Future Vol, veh/h	3	5	0	6	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	5	0	7	3	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	9	0	13
Stage 1	-	-	-	-	6
Stage 2	-	-	-	-	7
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	-	-	1611	-	1007
Stage 1	-	-	-	-	1017
Stage 2	-	-	-	-	1017
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1611	-	1007
Mov Cap-2 Maneuver	-	-	-	-	1007
Stage 1	-	-	-	-	1017
Stage 2	-	-	-	-	1017

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	8.59
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1007	-	-	1611	-
HCM Lane V/C Ratio	0.003	-	-	-	-
HCM Control Delay (s/veh)	8.6	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Intersection Delay, s/veh	6.7
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	2	7	0	1	4	0
Future Vol, veh/h	2	7	0	1	4	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	8	0	1	4	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	6.5	7	7.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	0%
Vol Thru, %	0%	22%	100%
Vol Right, %	0%	78%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	4	9	1
LT Vol	4	0	0
Through Vol	0	2	1
RT Vol	0	7	0
Lane Flow Rate	4	10	1
Geometry Grp	1	1	1
Degree of Util (X)	0.005	0.009	0.001
Departure Headway (Hd)	4.154	3.476	3.949
Convergence, Y/N	Yes	Yes	Yes
Cap	867	1035	911
Service Time	2.154	1.478	1.951
HCM Lane V/C Ratio	0.005	0.01	0.001
HCM Control Delay, s/veh	7.2	6.5	7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	0	0

Timings
1: Meridian Road & E Woodmen Road

Background Traffic Conditions
AM Peak Traffic Hour - Year 2045

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  		 	  		 	  		 		
Traffic Volume (vph)	450	282	320	98	684	85	316	285	27	81	997	1098
Future Volume (vph)	450	282	320	98	684	85	316	285	27	81	997	1098
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3433	5085	1583	3433	5085	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3433	5085	1583	3433	5085	1583
Satd. Flow (RTOR)			365			365			365			621
Lane Group Flow (vph)	489	307	348	107	743	92	343	310	29	88	1084	1193
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			Free			Free			Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	23.0		4.0	23.0		8.0	16.0		8.0	16.0	
Minimum Split (s)	11.5	30.3		11.0	30.3		15.3	23.3		14.8	23.3	
Total Split (s)	28.1	45.0		15.0	31.9		23.0	45.2		14.8	37.0	
Total Split (%)	23.4%	37.5%		12.5%	26.6%		19.2%	37.7%		12.3%	30.8%	
Yellow Time (s)	4.0	5.2		4.0	5.2		4.0	5.2		4.0	5.2	
All-Red Time (s)	3.5	2.1		3.0	2.1		3.3	2.1		2.8	2.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.5	7.3		7.0	7.3		7.3	7.3		6.8	7.3	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	19.9	39.2	120.0	7.7	26.5	120.0	15.1	39.6	120.0	8.0	29.1	120.0
Actuated g/C Ratio	0.17	0.33	1.00	0.06	0.22	1.00	0.13	0.33	1.00	0.07	0.24	1.00
v/c Ratio	0.85	0.18	0.21	0.48	0.66	0.05	0.79	0.18	0.01	0.38	0.88	0.75
Control Delay (s/veh)	64.2	29.8	0.3	61.8	46.5	0.0	64.9	29.5	0.0	58.8	53.1	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	64.2	29.8	0.3	61.8	46.5	0.0	64.9	29.5	0.0	58.8	53.1	3.3
LOS	E	C	A	E	D	A	E	C	A	E	D	A
Approach Delay (s/veh)		35.6			43.7			46.1			28.2	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)	190	63	0	41	197	0	134	64	0	34	295	0
Queue Length 95th (ft)	#269	88	0	72	245	0	#194	89	0	61	353	0
Internal Link Dist (ft)		806			493			356			1953	
Turn Bay Length (ft)	480		665	200		260	470		350	490		455
Base Capacity (vph)	589	1661	1583	228	1122	1583	449	1680	1583	228	1259	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.18	0.22	0.47	0.66	0.06	0.76	0.18	0.02	0.39	0.86	0.75
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 95												
Control Type: Actuated-Coordinated												

Timings

1: Meridian Road & E Woodmen Road

Background Traffic Conditions
AM Peak Traffic Hour - Year 2045

Maximum v/c Ratio: 0.88

Intersection Signal Delay (s/veh): 35.1

Intersection LOS: D

Intersection Capacity Utilization 84.8%

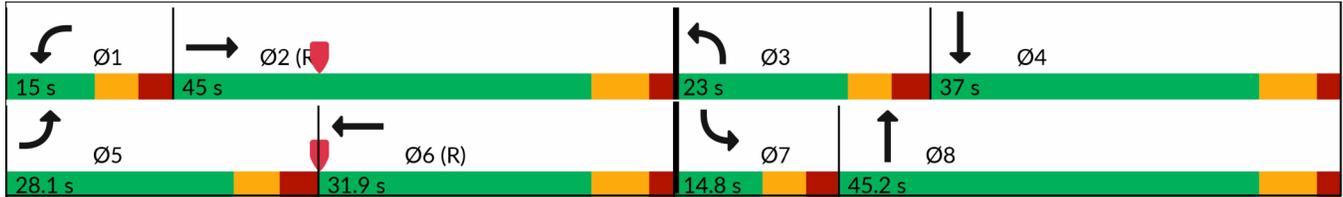
ICU Level of Service E

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 1: Meridian Road & E Woodmen Road



HCM 7th TWSC
2: Meridian Road & Ayer Road

Background Traffic Conditions
AM Peak Traffic Hour - Year 2045

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	↕
Traffic Vol, veh/h	8	2	18	10	3	1	18	200	3	1	312	70
Future Vol, veh/h	8	2	18	10	3	1	18	200	3	1	312	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	360	-	-	230	-	230
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	2	20	11	3	1	20	217	3	1	339	76

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	599	601	339	601	676	219	415	0	0	221	0	0
Stage 1	341	341	-	258	258	-	-	-	-	-	-	-
Stage 2	258	260	-	342	417	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	413	414	703	412	375	821	1144	-	-	1349	-	-
Stage 1	674	638	-	747	694	-	-	-	-	-	-	-
Stage 2	747	693	-	673	591	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	402	407	703	392	369	821	1144	-	-	1349	-	-
Mov Cap-2 Maneuver	402	407	-	392	369	-	-	-	-	-	-	-
Stage 1	673	638	-	734	682	-	-	-	-	-	-	-
Stage 2	729	681	-	651	591	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	11.86	14.32	0.67	0.02
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1144	-	-	555	401	1349	-	-
HCM Lane V/C Ratio	0.017	-	-	0.055	0.038	0.001	-	-
HCM Control Delay (s/veh)	8.2	-	-	11.9	14.3	7.7	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.1	0	-	-

HCM 7th TWSC
3: Meridian Road & Hodgen Road

Background Traffic Conditions
AM Peak Traffic Hour - Year 2045

Intersection												
Int Delay, s/veh	6.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑	↗	↙	↗		↙	↗			↕	
Traffic Vol, veh/h	1	38	61	23	116	2	180	11	1	1	17	22
Future Vol, veh/h	1	38	61	23	116	2	180	11	1	1	17	22
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									
Storage Length	350	-	260	385	-	-	285	-	-	-	-	-
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	41	66	25	126	2	196	12	1	1	18	24

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	128	0	0	108	0	0	229	222	41	227	287	127
Stage 1	-	-	-	-	-	-	43	43	-	177	177	-
Stage 2	-	-	-	-	-	-	185	178	-	49	110	-
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	1458	-	-	1483	-	-	726	677	1030	729	623	923
Stage 1	-	-	-	-	-	-	971	859	-	825	753	-
Stage 2	-	-	-	-	-	-	816	752	-	964	804	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1458	-	-	1483	-	-	674	665	1030	702	612	923
Mov Cap-2 Maneuver	-	-	-	-	-	-	674	665	-	702	612	-
Stage 1	-	-	-	-	-	-	970	858	-	811	740	-
Stage 2	-	-	-	-	-	-	762	739	-	949	804	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.07			1.22			12.37			10.07		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	674	685	1458	-	-	1483	-	-	754
HCM Lane V/C Ratio	0.29	0.019	0.001	-	-	0.017	-	-	0.058
HCM Control Delay (s/veh)	12.5	10.4	7.5	-	-	7.5	-	-	10.1
HCM Lane LOS	B	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.2	0.1	0	-	-	0.1	-	-	0.2

HCM 7th TWSC
4: Broken Antler Court & Ayer Road

Background Traffic Conditions
AM Peak Traffic Hour - Year 2045

Intersection						
Int Delay, s/veh	2.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	3	2	0	9	5	0
Future Vol, veh/h	3	2	0	9	5	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	2	0	10	5	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	5	0	14
Stage 1	-	-	-	-	4
Stage 2	-	-	-	-	10
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	-	-	1616	-	1005
Stage 1	-	-	-	-	1019
Stage 2	-	-	-	-	1013
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1616	-	1005
Mov Cap-2 Maneuver	-	-	-	-	1005
Stage 1	-	-	-	-	1019
Stage 2	-	-	-	-	1013

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	1005	-	-	1616	-
HCM Lane V/C Ratio	0.005	-	-	-	-
HCM Control Delay (s/veh)	8.6	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Intersection Delay, s/veh	7
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Vol, veh/h	1	2	0	2	6	0
Future Vol, veh/h	1	2	0	2	6	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	2	0	2	7	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	6.6	7	7.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	0%
Vol Thru, %	0%	33%	100%
Vol Right, %	0%	67%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	6	3	2
LT Vol	6	0	0
Through Vol	0	1	2
RT Vol	0	2	0
Lane Flow Rate	7	3	2
Geometry Grp	1	1	1
Degree of Util (X)	0.008	0.003	0.002
Departure Headway (Hd)	4.144	3.547	3.948
Convergence, Y/N	Yes	Yes	Yes
Cap	869	1014	911
Service Time	2.144	1.551	1.952
HCM Lane V/C Ratio	0.008	0.003	0.002
HCM Control Delay, s/veh	7.2	6.6	7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	0	0

Timings
1: Meridian Road & E Woodmen Road

Background Traffic Conditions
PM Peak Traffic Hour - Year 2045

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	915	624	197	140	547	188	428	880	126	211	590	595
Future Volume (vph)	915	624	197	140	547	188	428	880	126	211	590	595
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3433	5085	1583	3433	5085	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3433	5085	1583	3433	5085	1583
Satd. Flow (RTOR)			299			299			299			626
Lane Group Flow (vph)	995	678	214	152	595	204	465	957	137	229	641	647
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			Free			Free			Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	23.0		4.0	23.0		8.0	16.0		8.0	16.0	
Minimum Split (s)	11.5	30.3		11.0	30.3		15.3	23.3		14.8	23.3	
Total Split (s)	42.0	49.0		17.0	24.0		30.7	30.3		23.7	23.3	
Total Split (%)	35.0%	40.8%		14.2%	20.0%		25.6%	25.3%		19.8%	19.4%	
Yellow Time (s)	4.0	5.2		4.0	5.2		4.0	5.2		4.0	5.2	
All-Red Time (s)	3.5	2.1		3.0	2.1		3.3	2.1		2.8	2.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.5	7.3		7.0	7.3		7.3	7.3		6.8	7.3	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	35.2	43.0	120.0	9.4	16.7	120.0	20.7	25.9	120.0	13.3	18.0	120.0
Actuated g/C Ratio	0.29	0.36	1.00	0.08	0.14	1.00	0.17	0.22	1.00	0.11	0.15	1.00
v/c Ratio	0.98	0.37	0.13	0.56	0.84	0.12	0.78	0.87	0.08	0.60	0.84	0.40
Control Delay (s/veh)	68.4	29.5	0.1	61.7	62.2	0.1	57.2	55.5	0.1	57.3	61.1	0.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	68.4	29.5	0.1	61.7	62.2	0.1	57.2	55.5	0.1	57.3	61.1	0.7
LOS	E	C	A	E	E	A	E	E	A	E	E	A
Approach Delay (s/veh)		46.7			48.8			51.2			34.8	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)	~403	143	0	59	166	0	178	261	0	88	179	0
Queue Length 95th (ft)	#546	180	0	94	#224	0	232	#368	0	126	#261	0
Internal Link Dist (ft)		806			496			356			1953	
Turn Bay Length (ft)	480		665	200		260	470		350	490		455
Base Capacity (vph)	1006	1821	1583	286	707	1583	669	1097	1583	483	761	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.37	0.14	0.53	0.84	0.13	0.70	0.87	0.09	0.47	0.84	0.41

Intersection Summary

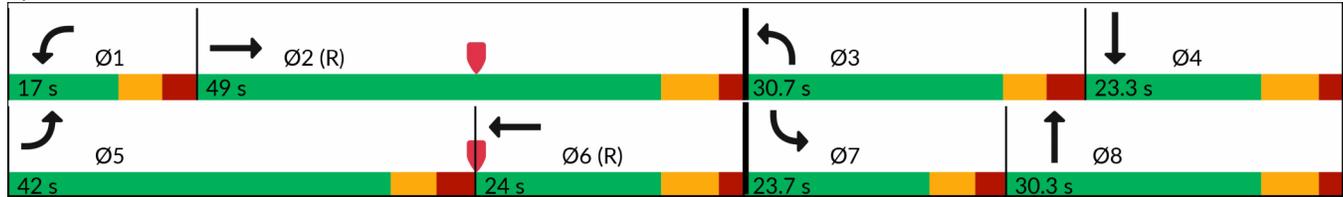
Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 115
 Control Type: Actuated-Coordinated

Timings
 1: Meridian Road & E Woodmen Road

Background Traffic Conditions
 PM Peak Traffic Hour - Year 2045

Maximum v/c Ratio: 0.99	
Intersection Signal Delay (s/veh): 45.2	Intersection LOS: D
Intersection Capacity Utilization 95.1%	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: Meridian Road & E Woodmen Road



HCM 7th TWSC
2: Meridian Road & Ayer Road

Background Traffic Conditions
PM Peak Traffic Hour - Year 2045

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	61	3	18	6	2	1	13	344	11	2	289	44
Future Vol, veh/h	61	3	18	6	2	1	13	344	11	2	289	44
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	360	-	-	230	-	230
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	66	3	20	7	2	1	14	374	12	2	314	48

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	722	733	314	728	774	380	362	0	0	386	0	0
Stage 1	318	318	-	408	408	-	-	-	-	-	-	-
Stage 2	403	414	-	320	366	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	342	348	726	339	329	667	1197	-	-	1173	-	-
Stage 1	693	653	-	620	597	-	-	-	-	-	-	-
Stage 2	624	593	-	692	622	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	335	343	726	322	325	667	1197	-	-	1173	-	-
Mov Cap-2 Maneuver	335	343	-	322	325	-	-	-	-	-	-	-
Stage 1	692	652	-	613	590	-	-	-	-	-	-	-
Stage 2	613	586	-	668	621	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s/v17.35			15.82		0.28		0.05	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1197	-	-	380	342	1173	-	-
HCM Lane V/C Ratio	0.012	-	-	0.235	0.029	0.002	-	-
HCM Control Delay (s/veh)	8	-	-	17.3	15.8	8.1	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.9	0.1	0	-	-

HCM 7th TWSC
3: Meridian Road & Hodgen Road

Background Traffic Conditions
PM Peak Traffic Hour - Year 2045

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑	↗	↙	↗		↙	↗			↕	
Traffic Vol, veh/h	22	109	190	7	62	4	119	18	25	4	12	7
Future Vol, veh/h	22	109	190	7	62	4	119	18	25	4	12	7
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									
Storage Length	350	-	260	385	-	-	285	-	-	-	-	-
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	24	118	207	8	67	4	129	20	27	4	13	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	72	0	0	325	0	0	255	253	118	261	458	70
Stage 1	-	-	-	-	-	-	166	166	-	85	85	-
Stage 2	-	-	-	-	-	-	89	87	-	176	373	-
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	1528	-	-	1235	-	-	698	650	933	692	500	993
Stage 1	-	-	-	-	-	-	836	761	-	923	825	-
Stage 2	-	-	-	-	-	-	918	823	-	826	618	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1528	-	-	1235	-	-	660	636	933	637	489	993
Mov Cap-2 Maneuver	-	-	-	-	-	-	660	636	-	637	489	-
Stage 1	-	-	-	-	-	-	823	749	-	917	819	-
Stage 2	-	-	-	-	-	-	891	818	-	769	609	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.51	0.76	11.29	11.18
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	660	781	1528	-	-	1235	-	-	607
HCM Lane V/C Ratio	0.196	0.06	0.016	-	-	0.006	-	-	0.041
HCM Control Delay (s/veh)	11.8	9.9	7.4	-	-	7.9	-	-	11.2
HCM Lane LOS	B	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.7	0.2	0	-	-	0	-	-	0.1

HCM 7th TWSC
4: Broken Antler Court & Ayer Road

Background Traffic Conditions
PM Peak Traffic Hour - Year 2045

Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔			↔	↔	
Traffic Vol, veh/h	11	5	0	6	3	0
Future Vol, veh/h	11	5	0	6	3	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
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	12	5	0	7	3	0

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	17	0	21
Stage 1	-	-	-	-	15
Stage 2	-	-	-	-	7
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	-	-	1600	-	996
Stage 1	-	-	-	-	1008
Stage 2	-	-	-	-	1017
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1600	-	996
Mov Cap-2 Maneuver	-	-	-	-	996
Stage 1	-	-	-	-	1008
Stage 2	-	-	-	-	1017

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	8.63
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	996	-	-	1600	-
HCM Lane V/C Ratio	0.003	-	-	-	-
HCM Control Delay (s/veh)	8.6	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Intersection Delay, s/veh	6.7
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↶			↷	↶	↷
Traffic Vol, veh/h	2	7	0	1	4	0
Future Vol, veh/h	2	7	0	1	4	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	8	0	1	4	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay, s/veh	6.5	7	7.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	0%
Vol Thru, %	0%	22%	100%
Vol Right, %	0%	78%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	4	9	1
LT Vol	4	0	0
Through Vol	0	2	1
RT Vol	0	7	0
Lane Flow Rate	4	10	1
Geometry Grp	1	1	1
Degree of Util (X)	0.005	0.009	0.001
Departure Headway (Hd)	4.154	3.476	3.949
Convergence, Y/N	Yes	Yes	Yes
Cap	867	1035	911
Service Time	2.154	1.478	1.951
HCM Lane V/C Ratio	0.005	0.01	0.001
HCM Control Delay, s/veh	7.2	6.5	7
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	0	0

Timings
1: Meridian Road & E Woodmen Road

Total Traffic Conditions
AM Peak Traffic Hour - Year 2027

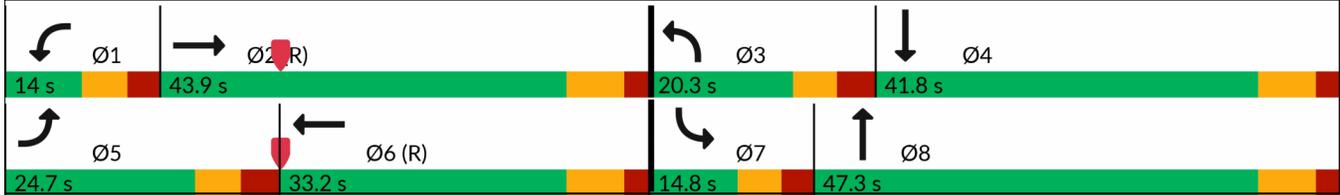
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	389	240	272	84	581	76	268	249	23	74	864	950
Future Volume (vph)	389	240	272	84	581	76	268	249	23	74	864	950
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Satd. Flow (RTOR)			299			299			299			630
Lane Group Flow (vph)	423	261	296	91	632	83	291	271	25	80	939	1033
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			Free			Free			Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	23.0		4.0	23.0		8.0	16.0		8.0	16.0	
Minimum Split (s)	11.5	30.3		11.0	30.3		15.3	23.3		14.8	23.3	
Total Split (s)	24.7	43.9		14.0	33.2		20.3	47.3		14.8	41.8	
Total Split (%)	20.6%	36.6%		11.7%	27.7%		16.9%	39.4%		12.3%	34.8%	
Yellow Time (s)	4.0	5.2		4.0	5.2		4.0	5.2		4.0	5.2	
All-Red Time (s)	3.5	2.1		3.0	2.1		3.3	2.1		2.8	2.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.5	7.3		7.0	7.3		7.3	7.3		6.8	7.3	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	16.9	37.5	120.0	6.9	27.0	120.0	12.7	42.2	120.0	8.0	34.0	120.0
Actuated g/C Ratio	0.14	0.31	1.00	0.06	0.23	1.00	0.11	0.35	1.00	0.07	0.28	1.00
v/c Ratio	0.87	0.23	0.18	0.46	0.79	0.05	0.80	0.21	0.01	0.35	0.93	0.65
Control Delay (s/veh)	70.1	31.6	0.2	62.7	52.7	0.0	69.5	28.6	0.0	58.0	58.9	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	70.1	31.6	0.2	62.7	52.7	0.0	69.5	28.6	0.0	58.0	58.9	2.1
LOS	E	C	A	E	D	A	E	C	A	E	E	A
Approach Delay (s/veh)		38.8			48.4			47.7			30.3	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)	167	79	0	35	247	0	114	79	0	30	371	0
Queue Length 95th (ft)	#250	115	0	63	#323	0	#178	114	0	57	#496	0
Internal Link Dist (ft)		806			493			356			1953	
Turn Bay Length (ft)	480		665	200		260	470		350	490		455
Base Capacity (vph)	492	1106	1583	200	795	1583	371	1243	1583	228	1017	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.86	0.24	0.19	0.46	0.79	0.05	0.78	0.22	0.02	0.35	0.92	0.65
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 105												
Control Type: Actuated-Coordinated												

Timings
 1: Meridian Road & E Woodmen Road

Total Traffic Conditions
 AM Peak Traffic Hour - Year 2027

Maximum v/c Ratio: 0.94	
Intersection Signal Delay (s/veh): 37.8	Intersection LOS: D
Intersection Capacity Utilization 86.3%	ICU Level of Service E
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Meridian Road & E Woodmen Road



HCM 7th TWSC
2: Meridian Road & Ayer Road

Total Traffic Conditions
AM Peak Traffic Hour - Year 2027

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	7	5	15	41	12	5	15	170	13	3	265	59
Future Vol, veh/h	7	5	15	41	12	5	15	170	13	3	265	59
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	360	-	-	230	-	230
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	8	5	16	45	13	5	16	185	14	3	288	64

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	518	526	288	522	583	192	352	0	0	199	0	0
Stage 1	295	295	-	224	224	-	-	-	-	-	-	-
Stage 2	224	232	-	297	359	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	468	457	751	465	424	850	1207	-	-	1373	-	-
Stage 1	714	669	-	778	718	-	-	-	-	-	-	-
Stage 2	779	713	-	711	627	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	443	450	751	443	417	850	1207	-	-	1373	-	-
Mov Cap-2 Maneuver	443	450	-	443	417	-	-	-	-	-	-	-
Stage 1	712	668	-	768	708	-	-	-	-	-	-	-
Stage 2	749	703	-	689	626	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v11.59		14.16	0.61	0.07
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1207	-	-	576	456	1373	-	-
HCM Lane V/C Ratio	0.014	-	-	0.051	0.138	0.002	-	-
HCM Control Delay (s/veh)	8	-	-	11.6	14.2	7.6	-	-
HCM Lane LOS	A	-	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.5	0	-	-

HCM 7th TWSC
3: Meridian Road & Hodgen Road

Total Traffic Conditions
AM Peak Traffic Hour - Year 2027

Intersection												
Int Delay, s/veh	5.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑	↗	↙	↗		↙	↗			↕	
Traffic Vol, veh/h	1	32	54	19	99	2	157	9	1	1	14	18
Future Vol, veh/h	1	32	54	19	99	2	157	9	1	1	14	18
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									
Storage Length	350	-	260	385	-	-	285	-	-	-	-	-
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	35	59	21	108	2	171	10	1	1	15	20

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	110	0	0	93	0	0	193	188	35	192	246	109
Stage 1	-	-	-	-	-	-	37	37	-	150	150	-
Stage 2	-	-	-	-	-	-	157	151	-	42	96	-
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	1480	-	-	1501	-	-	766	707	1038	768	657	945
Stage 1	-	-	-	-	-	-	978	864	-	853	773	-
Stage 2	-	-	-	-	-	-	846	772	-	973	816	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1480	-	-	1501	-	-	722	696	1038	746	647	945
Mov Cap-2 Maneuver	-	-	-	-	-	-	722	696	-	746	647	-
Stage 1	-	-	-	-	-	-	978	864	-	841	762	-
Stage 2	-	-	-	-	-	-	801	762	-	960	815	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.09			1.18			11.43			9.8		
HCM LOS							B			A		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	722	720	1480	-	-	1501	-	-	785
HCM Lane V/C Ratio	0.236	0.015	0.001	-	-	0.014	-	-	0.046
HCM Control Delay (s/veh)	11.5	10.1	7.4	-	-	7.4	-	-	9.8
HCM Lane LOS	B	B	A	-	-	A	-	-	A
HCM 95th %tile Q(veh)	0.9	0	0	-	-	0	-	-	0.1

HCM 7th TWSC
4: Brokent Antler Court/Access A & Ayer Road

Total Traffic Conditions
AM Peak Traffic Hour - Year 2027

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	17	2	0	50	0	5	0	0	0	0	3
Future Vol, veh/h	1	17	2	0	50	0	5	0	0	0	0	3
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									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	18	2	0	54	0	5	0	0	0	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	54	0	0	21	0	0	76	76	20	75	77	54
Stage 1	-	-	-	-	-	-	22	22	-	54	54	-
Stage 2	-	-	-	-	-	-	54	54	-	21	23	-
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	1551	-	-	1595	-	-	913	814	1058	915	813	1013
Stage 1	-	-	-	-	-	-	997	877	-	958	850	-
Stage 2	-	-	-	-	-	-	958	850	-	998	876	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1551	-	-	1595	-	-	910	814	1058	914	813	1013
Mov Cap-2 Maneuver	-	-	-	-	-	-	910	814	-	914	813	-
Stage 1	-	-	-	-	-	-	996	877	-	958	850	-
Stage 2	-	-	-	-	-	-	955	850	-	997	876	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.37	0	8.98	8.57
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	910	88	-	-	1595	-	-	1013
HCM Lane V/C Ratio	0.006	0.001	-	-	-	-	-	0.003
HCM Control Delay (s/veh)	9	7.3	0	-	0	-	-	8.6
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

HCM 7th AWSC
5: White Antler Trail/Access B & Ayer Road

Total Traffic Conditions
AM Peak Traffic Hour - Year 2027

Intersection	
Intersection Delay, s/veh	6.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	14	1	2	0	2	0	6	0	0	0	0	41
Future Vol, veh/h	14	1	2	0	2	0	6	0	0	0	0	41
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	1	2	0	2	0	7	0	0	0	0	45
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	7.2	7.1	7.2	6.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	82%	0%	0%
Vol Thru, %	0%	6%	100%	0%
Vol Right, %	0%	12%	0%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	6	17	2	41
LT Vol	6	14	0	0
Through Vol	0	1	2	0
RT Vol	0	2	0	41
Lane Flow Rate	7	18	2	45
Geometry Grp	1	1	1	1
Degree of Util (X)	0.008	0.021	0.002	0.042
Departure Headway (Hd)	4.203	4.12	4.038	3.374
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	854	872	889	1064
Service Time	2.215	2.128	2.05	1.386
HCM Lane V/C Ratio	0.008	0.021	0.002	0.042
HCM Control Delay, s/veh	7.2	7.2	7.1	6.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.1	0	0.1

Timings
1: Meridian Road & E Woodmen Road

Total Traffic Conditions
PM Peak Traffic Hour - Year 2027

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	792	530	167	119	465	165	364	765	107	183	514	507
Future Volume (vph)	792	530	167	119	465	165	364	765	107	183	514	507
Satd. Flow (prot)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	3539	1583	3433	3539	1583	3433	3539	1583	3433	3539	1583
Satd. Flow (RTOR)			299			299			299			551
Lane Group Flow (vph)	861	576	182	129	505	179	396	832	116	199	559	551
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			Free			Free			Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	23.0		4.0	23.0		8.0	16.0		8.0	16.0	
Minimum Split (s)	11.5	30.3		11.0	30.3		15.3	23.3		14.8	23.3	
Total Split (s)	38.0	54.0		15.0	31.0		22.0	36.0		15.0	29.0	
Total Split (%)	31.7%	45.0%		12.5%	25.8%		18.3%	30.0%		12.5%	24.2%	
Yellow Time (s)	4.0	5.2		4.0	5.2		4.0	5.2		4.0	5.2	
All-Red Time (s)	3.5	2.1		3.0	2.1		3.3	2.1		2.8	2.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.5	7.3		7.0	7.3		7.3	7.3		6.8	7.3	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	30.5	46.9	120.0	7.8	23.7	120.0	14.7	28.7	120.0	8.2	21.7	120.0
Actuated g/C Ratio	0.25	0.39	1.00	0.07	0.20	1.00	0.12	0.24	1.00	0.07	0.18	1.00
v/c Ratio	0.98	0.41	0.11	0.57	0.72	0.11	0.94	0.98	0.07	0.85	0.87	0.34
Control Delay (s/veh)	72.3	27.8	0.1	65.2	51.8	0.1	84.1	72.8	0.0	85.7	63.6	0.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	72.3	27.8	0.1	65.2	51.8	0.1	84.1	72.8	0.0	85.7	63.6	0.6
LOS	E	C	A	E	D	A	F	E	A	F	E	A
Approach Delay (s/veh)		48.4			42.6			69.9			40.5	
Approach LOS		D			D			E			D	
Queue Length 50th (ft)	343	168	0	51	194	0	159	339	0	79	224	0
Queue Length 95th (ft)	#479	219	0	84	255	0	#255	#474	0	#145	#317	0
Internal Link Dist (ft)		806			496			356			1953	
Turn Bay Length (ft)	480		665	200		260	470		350	490		455
Base Capacity (vph)	872	1382	1583	228	698	1583	420	846	1583	234	639	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.42	0.11	0.57	0.72	0.11	0.94	0.98	0.07	0.85	0.87	0.35

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green
 Natural Cycle: 115
 Control Type: Actuated-Coordinated

Timings
 1: Meridian Road & E Woodmen Road

Total Traffic Conditions
 PM Peak Traffic Hour - Year 2027

Maximum v/c Ratio: 0.99	
Intersection Signal Delay (s/veh): 51.1	Intersection LOS: D
Intersection Capacity Utilization 93.5%	ICU Level of Service F
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Meridian Road & E Woodmen Road



HCM 7th TWSC
2: Meridian Road & Ayer Road

Total Traffic Conditions
PM Peak Traffic Hour - Year 2027

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↗	↘		↗	↘	↗
Traffic Vol, veh/h	52	13	15	26	8	4	11	293	46	7	246	38
Future Vol, veh/h	52	13	15	26	8	4	11	293	46	7	246	38
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	360	-	-	230	-	230
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	57	14	16	28	9	4	12	318	50	8	267	41

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	629	675	267	657	691	343	309	0	0	368	0	0
Stage 1	283	283	-	367	367	-	-	-	-	-	-	-
Stage 2	347	392	-	290	324	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	395	376	771	378	368	699	1252	-	-	1190	-	-
Stage 1	724	677	-	652	622	-	-	-	-	-	-	-
Stage 2	669	606	-	718	650	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	377	370	771	351	362	699	1252	-	-	1190	-	-
Mov Cap-2 Maneuver	377	370	-	351	362	-	-	-	-	-	-	-
Stage 1	720	673	-	646	616	-	-	-	-	-	-	-
Stage 2	649	600	-	684	646	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v15.95		15.87	0.25	0.19
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1252	-	-	415	373	1190	-	-
HCM Lane V/C Ratio	0.01	-	-	0.209	0.111	0.006	-	-
HCM Control Delay (s/veh)	7.9	-	-	15.9	15.9	8	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8	0.4	0	-	-

HCM 7th TWSC
3: Meridian Road & Hodgen Road

Total Traffic Conditions
PM Peak Traffic Hour - Year 2027

Intersection												
Int Delay, s/veh	3.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑	↗	↙	↗		↙	↗			↕	
Traffic Vol, veh/h	18	23	166	6	53	3	104	15	2	3	10	6
Future Vol, veh/h	18	23	166	6	53	3	104	15	2	3	10	6
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									
Storage Length	350	-	260	385	-	-	285	-	-	-	-	-
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	20	25	180	7	58	3	113	16	2	3	11	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	61	0	0	205	0	0	140	138	25	145	317	59
Stage 1	-	-	-	-	-	-	64	64	-	72	72	-
Stage 2	-	-	-	-	-	-	76	74	-	72	245	-
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	1542	-	-	1366	-	-	830	753	1051	824	599	1006
Stage 1	-	-	-	-	-	-	947	841	-	937	835	-
Stage 2	-	-	-	-	-	-	933	833	-	937	704	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1542	-	-	1366	-	-	795	740	1051	791	589	1006
Mov Cap-2 Maneuver	-	-	-	-	-	-	795	740	-	791	589	-
Stage 1	-	-	-	-	-	-	935	831	-	933	831	-
Stage 2	-	-	-	-	-	-	910	829	-	905	695	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.64			0.74			10.21			10.22		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	795	767	1542	-	-	1366	-	-	711
HCM Lane V/C Ratio	0.142	0.024	0.013	-	-	0.005	-	-	0.029
HCM Control Delay (s/veh)	10.3	9.8	7.4	-	-	7.6	-	-	10.2
HCM Lane LOS	B	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.5	0.1	0	-	-	0	-	-	0.1

HCM 7th TWSC
4: Broken Antler Court/Access A & Ayer Road

Total Traffic Conditions
PM Peak Traffic Hour - Year 2027

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	58	5	0	33	0	3	0	0	0	0	2
Future Vol, veh/h	3	58	5	0	33	0	3	0	0	0	0	2
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									
Storage Length	-	-	-	-	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	63	5	0	36	0	3	0	0	0	0	2

Major/Minor	Major1		Major2			Minor1			Minor2			
Conflicting Flow All	36	0	0	68	0	0	108	108	66	105	111	36
Stage 1	-	-	-	-	-	-	72	72	-	36	36	-
Stage 2	-	-	-	-	-	-	36	36	-	70	75	-
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	1575	-	-	1533	-	-	871	782	998	874	779	1037
Stage 1	-	-	-	-	-	-	937	835	-	980	865	-
Stage 2	-	-	-	-	-	-	980	865	-	940	833	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1575	-	-	1533	-	-	867	780	998	872	778	1037
Mov Cap-2 Maneuver	-	-	-	-	-	-	867	780	-	872	778	-
Stage 1	-	-	-	-	-	-	935	833	-	980	865	-
Stage 2	-	-	-	-	-	-	978	865	-	938	831	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.33	0	9.17	8.48
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	867	81	-	-	1533	-	-	1037
HCM Lane V/C Ratio	0.004	0.002	-	-	-	-	-	0.002
HCM Control Delay (s/veh)	9.2	7.3	0	-	0	-	-	8.5
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

HCM 7th AWSC
5: White Antler Trail/Access B & Ayer Road

Total Traffic Conditions
PM Peak Traffic Hour - Year 2027

Intersection	
Intersection Delay, s/veh	7.1
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	47	2	7	0	1	0	4	0	0	0	0	27
Future Vol, veh/h	47	2	7	0	1	0	4	0	0	0	0	27
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	51	2	8	0	1	0	4	0	0	0	0	29
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	7.4	7.1	7.3	6.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	84%	0%	0%
Vol Thru, %	0%	4%	100%	0%
Vol Right, %	0%	13%	0%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	56	1	27
LT Vol	4	47	0	0
Through Vol	0	2	1	0
RT Vol	0	7	0	27
Lane Flow Rate	4	61	1	29
Geometry Grp	1	1	1	1
Degree of Util (X)	0.005	0.069	0.001	0.028
Departure Headway (Hd)	4.264	4.086	4.038	3.445
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	838	881	887	1036
Service Time	2.296	2.092	2.057	1.475
HCM Lane V/C Ratio	0.005	0.069	0.001	0.028
HCM Control Delay, s/veh	7.3	7.4	7.1	6.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.2	0	0.1

Timings
1: Meridian Road & E Woodmen Road

Total Traffic Conditions
AM Peak Traffic Hour - Year 2045

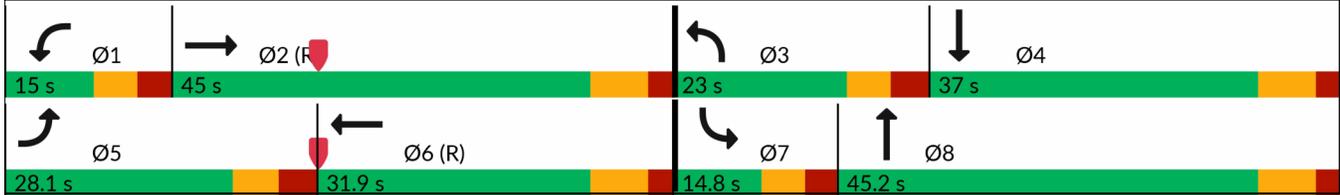
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	455	282	320	98	684	86	316	289	27	83	1010	1113
Future Volume (vph)	455	282	320	98	684	86	316	289	27	83	1010	1113
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3433	5085	1583	3433	5085	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3433	5085	1583	3433	5085	1583
Satd. Flow (RTOR)			365			365			365			621
Lane Group Flow (vph)	495	307	348	107	743	93	343	314	29	90	1098	1210
Turn Type	Prot	NA	Free									
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			Free			Free			Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	23.0		4.0	23.0		8.0	16.0		8.0	16.0	
Minimum Split (s)	11.5	30.3		11.0	30.3		15.3	23.3		14.8	23.3	
Total Split (s)	28.1	45.0		15.0	31.9		23.0	45.2		14.8	37.0	
Total Split (%)	23.4%	37.5%		12.5%	26.6%		19.2%	37.7%		12.3%	30.8%	
Yellow Time (s)	4.0	5.2		4.0	5.2		4.0	5.2		4.0	5.2	
All-Red Time (s)	3.5	2.1		3.0	2.1		3.3	2.1		2.8	2.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.5	7.3		7.0	7.3		7.3	7.3		6.8	7.3	
Lead/Lag	Lead	Lag										
Lead-Lag Optimize?	Yes	Yes										
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	20.0	39.1	120.0	7.7	26.4	120.0	15.1	36.7	120.0	8.0	29.1	120.0
Actuated g/C Ratio	0.17	0.33	1.00	0.06	0.22	1.00	0.13	0.31	1.00	0.07	0.24	1.00
v/c Ratio	0.86	0.18	0.21	0.48	0.66	0.05	0.79	0.20	0.01	0.39	0.89	0.76
Control Delay (s/veh)	64.9	29.8	0.3	61.8	46.6	0.0	64.9	30.8	0.0	59.0	53.8	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	64.9	29.8	0.3	61.8	46.6	0.0	64.9	30.8	0.0	59.0	53.8	3.5
LOS	E	C	A	E	D	A	E	C	A	E	D	A
Approach Delay (s/veh)		36.0			43.8			46.6			28.7	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)	193	63	0	41	197	0	134	64	0	35	300	0
Queue Length 95th (ft)	#275	88	0	72	245	0	#194	90	0	62	358	0
Internal Link Dist (ft)		806			493			356			1953	
Turn Bay Length (ft)	480		665	200		260	470		350	490		455
Base Capacity (vph)	589	1658	1583	228	1117	1583	449	1606	1583	228	1259	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.19	0.22	0.47	0.67	0.06	0.76	0.20	0.02	0.39	0.87	0.76
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 95												
Control Type: Actuated-Coordinated												

Timings
 1: Meridian Road & E Woodmen Road

Total Traffic Conditions
 AM Peak Traffic Hour - Year 2045

Maximum v/c Ratio: 0.89	
Intersection Signal Delay (s/veh): 35.4	Intersection LOS: D
Intersection Capacity Utilization 85.2%	ICU Level of Service E
Analysis Period (min) 15	
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 1: Meridian Road & E Woodmen Road



HCM 7th TWSC
2: Meridian Road & Ayer Road

Total Traffic Conditions
AM Peak Traffic Hour - Year 2045

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	8	5	18	41	12	5	18	200	13	3	312	70
Future Vol, veh/h	8	5	18	41	12	5	18	200	13	3	312	70
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	360	-	-	230	-	230
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	5	20	45	13	5	20	217	14	3	339	76

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	609	616	339	612	685	224	415	0	0	232	0	0
Stage 1	346	346	-	264	264	-	-	-	-	-	-	-
Stage 2	263	271	-	348	422	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	407	406	703	405	371	815	1144	-	-	1336	-	-
Stage 1	670	636	-	742	690	-	-	-	-	-	-	-
Stage 2	742	685	-	668	588	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	383	398	703	381	363	815	1144	-	-	1336	-	-
Mov Cap-2 Maneuver	383	398	-	381	363	-	-	-	-	-	-	-
Stage 1	668	634	-	729	679	-	-	-	-	-	-	-
Stage 2	711	674	-	642	587	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s/v12.33			15.83		0.64		0.06	
HCM LOS	B		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1144	-	-	525	395	1336	-	-
HCM Lane V/C Ratio	0.017	-	-	0.064	0.159	0.002	-	-
HCM Control Delay (s/veh)	8.2	-	-	12.3	15.8	7.7	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.6	0	-	-

HCM 7th TWSC
3: Meridian Road & Hodgen Road

Total Traffic Conditions
AM Peak Traffic Hour - Year 2045

Intersection												
Int Delay, s/veh	6.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑	↗	↙	↑	↗	↙	↑			↕	
Traffic Vol, veh/h	1	38	63	23	116	2	184	11	1	1	17	22
Future Vol, veh/h	1	38	63	23	116	2	184	11	1	1	17	22
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									
Storage Length	350	-	260	385	-	-	285	-	-	-	-	-
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	41	68	25	126	2	200	12	1	1	18	24

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	128	0	0	110	0	0	229	222	41	227	289	127
Stage 1	-	-	-	-	-	-	43	43	-	177	177	-
Stage 2	-	-	-	-	-	-	185	178	-	49	112	-
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	1458	-	-	1480	-	-	726	677	1030	729	621	923
Stage 1	-	-	-	-	-	-	971	859	-	825	753	-
Stage 2	-	-	-	-	-	-	816	752	-	964	803	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1458	-	-	1480	-	-	674	665	1030	702	610	923
Mov Cap-2 Maneuver	-	-	-	-	-	-	674	665	-	702	610	-
Stage 1	-	-	-	-	-	-	970	858	-	811	740	-
Stage 2	-	-	-	-	-	-	762	739	-	949	802	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.07			1.22			12.44			10.07		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	674	685	1458	-	-	1480	-	-	753
HCM Lane V/C Ratio	0.297	0.019	0.001	-	-	0.017	-	-	0.058
HCM Control Delay (s/veh)	12.6	10.4	7.5	-	-	7.5	-	-	10.1
HCM Lane LOS	B	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1.2	0.1	0	-	-	0.1	-	-	0.2

HCM 7th TWSC
4: Broken Antler Court/Access A & Ayer Road

Total Traffic Conditions
AM Peak Traffic Hour - Year 2045

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	17	2	0	50	0	5	0	0	0	0	3
Future Vol, veh/h	1	17	2	0	50	0	5	0	0	0	0	3
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									
Storage Length	-	-	-	-	-	-	0	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	18	2	0	54	0	5	0	0	0	0	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	54	0	0	21	0	0	76	76	20	75	77	54
Stage 1	-	-	-	-	-	-	22	22	-	54	54	-
Stage 2	-	-	-	-	-	-	54	54	-	21	23	-
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	1551	-	-	1595	-	-	913	814	1058	915	813	1013
Stage 1	-	-	-	-	-	-	997	877	-	958	850	-
Stage 2	-	-	-	-	-	-	958	850	-	998	876	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1551	-	-	1595	-	-	910	814	1058	914	813	1013
Mov Cap-2 Maneuver	-	-	-	-	-	-	910	814	-	914	813	-
Stage 1	-	-	-	-	-	-	996	877	-	958	850	-
Stage 2	-	-	-	-	-	-	955	850	-	997	876	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.37	0	8.98	8.57
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	910	88	-	-	1595	-	-	1013
HCM Lane V/C Ratio	0.006	0.001	-	-	-	-	-	0.003
HCM Control Delay (s/veh)	9	7.3	0	-	0	-	-	8.6
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

HCM 7th AWSC
5: White Antler Trail/Access B & Ayer Road

Total Traffic Conditions
AM Peak Traffic Hour - Year 2045

Intersection	
Intersection Delay, s/veh	6.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	14	1	2	0	2	0	6	0	0	0	0	41
Future Vol, veh/h	14	1	2	0	2	0	6	0	0	0	0	41
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	1	2	0	2	0	7	0	0	0	0	45
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	7.2	7.1	7.2	6.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	82%	0%	0%
Vol Thru, %	0%	6%	100%	0%
Vol Right, %	0%	12%	0%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	6	17	2	41
LT Vol	6	14	0	0
Through Vol	0	1	2	0
RT Vol	0	2	0	41
Lane Flow Rate	7	18	2	45
Geometry Grp	1	1	1	1
Degree of Util (X)	0.008	0.021	0.002	0.042
Departure Headway (Hd)	4.203	4.12	4.038	3.374
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	854	872	889	1064
Service Time	2.215	2.128	2.05	1.386
HCM Lane V/C Ratio	0.008	0.021	0.002	0.042
HCM Control Delay, s/veh	7.2	7.2	7.1	6.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.1	0	0.1

Timings
1: Meridian Road & E Woodmen Road

Total Traffic Conditions
PM Peak Traffic Hour - Year 2045

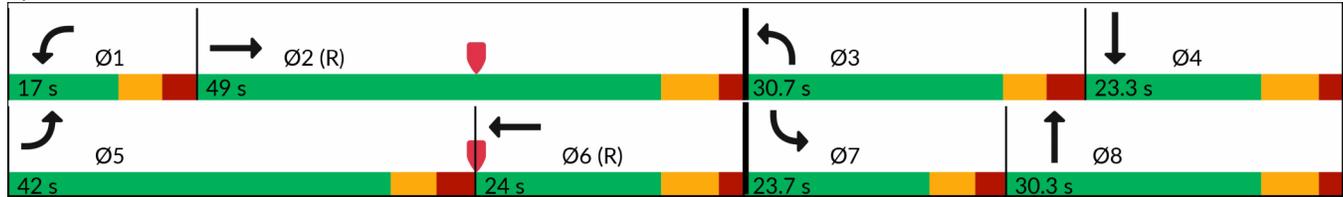
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  		 	  		 	  				
Traffic Volume (vph)	933	624	197	140	547	190	428	895	126	212	599	605
Future Volume (vph)	933	624	197	140	547	190	428	895	126	212	599	605
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	3433	5085	1583	3433	5085	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	3433	5085	1583	3433	5085	1583
Satd. Flow (RTOR)			299			299			299			626
Lane Group Flow (vph)	1014	678	214	152	595	207	465	973	137	230	651	658
Turn Type	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free	Prot	NA	Free
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			Free			Free			Free			Free
Detector Phase	5	2		1	6		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	23.0		4.0	23.0		8.0	16.0		8.0	16.0	
Minimum Split (s)	11.5	30.3		11.0	30.3		15.3	23.3		14.8	23.3	
Total Split (s)	42.0	49.0		17.0	24.0		30.7	30.3		23.7	23.3	
Total Split (%)	35.0%	40.8%		14.2%	20.0%		25.6%	25.3%		19.8%	19.4%	
Yellow Time (s)	4.0	5.2		4.0	5.2		4.0	5.2		4.0	5.2	
All-Red Time (s)	3.5	2.1		3.0	2.1		3.3	2.1		2.8	2.1	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Lost Time (s)	7.5	7.3		7.0	7.3		7.3	7.3		6.8	7.3	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	
Recall Mode	None	C-Max		None	C-Max		None	None		None	None	
Act Effct Green (s)	34.8	42.6	120.0	9.4	16.7	120.0	20.7	26.3	120.0	13.3	18.3	120.0
Actuated g/C Ratio	0.29	0.36	1.00	0.08	0.14	1.00	0.17	0.22	1.00	0.11	0.15	1.00
v/c Ratio	1.01	0.37	0.13	0.56	0.84	0.13	0.78	0.87	0.08	0.60	0.83	0.41
Control Delay (s/veh)	75.7	29.7	0.1	61.7	62.2	0.1	57.2	55.4	0.1	57.4	60.5	0.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	75.7	29.7	0.1	61.7	62.2	0.1	57.2	55.4	0.1	57.4	60.5	0.8
LOS	E	C	A	E	E	A	E	E	A	E	E	A
Approach Delay (s/veh)		50.9			48.7			51.2			34.5	
Approach LOS		D			D			D			C	
Queue Length 50th (ft)	~432	143	0	59	166	0	178	267	0	88	182	0
Queue Length 95th (ft)	#562	180	0	94	#224	0	232	#378	0	126	#268	0
Internal Link Dist (ft)		806			496			356			1953	
Turn Bay Length (ft)	480		665	200		260	470		350	490		455
Base Capacity (vph)	995	1805	1583	286	707	1583	669	1113	1583	483	777	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.02	0.38	0.14	0.53	0.84	0.13	0.70	0.87	0.09	0.48	0.84	0.42
Intersection Summary												
Cycle Length: 120												
Actuated Cycle Length: 120												
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green												
Natural Cycle: 125												
Control Type: Actuated-Coordinated												

Timings
 1: Meridian Road & E Woodmen Road

Total Traffic Conditions
 PM Peak Traffic Hour - Year 2045

Maximum v/c Ratio: 1.02	
Intersection Signal Delay (s/veh): 46.4	Intersection LOS: D
Intersection Capacity Utilization 95.7%	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: Meridian Road & E Woodmen Road



HCM 7th TWSC
2: Meridian Road & Ayer Road

Total Traffic Conditions
PM Peak Traffic Hour - Year 2045

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	61	13	18	26	8	4	13	344	46	7	289	44
Future Vol, veh/h	61	13	18	26	8	4	13	344	46	7	289	44
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	360	-	-	230	-	230
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	66	14	20	28	9	4	14	374	50	8	314	48

Major/Minor	Minor2		Minor1		Major1			Major2				
Conflicting Flow All	736	782	314	764	804	399	362	0	0	424	0	0
Stage 1	329	329	-	427	427	-	-	-	-	-	-	-
Stage 2	407	452	-	336	377	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	335	326	726	321	316	651	1197	-	-	1135	-	-
Stage 1	684	646	-	606	585	-	-	-	-	-	-	-
Stage 2	621	570	-	678	616	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	317	320	726	293	310	651	1197	-	-	1135	-	-
Mov Cap-2 Maneuver	317	320	-	293	310	-	-	-	-	-	-	-
Stage 1	679	642	-	598	578	-	-	-	-	-	-	-
Stage 2	601	564	-	641	612	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s/v18.95			18.15		0.26		0.17	
HCM LOS	C		C					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1197	-	-	357	315	1135	-	-
HCM Lane V/C Ratio	0.012	-	-	0.28	0.131	0.007	-	-
HCM Control Delay (s/veh)	8	-	-	19	18.1	8.2	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.1	0.4	0	-	-

HCM 7th TWSC
3: Meridian Road & Hodgen Road

Total Traffic Conditions
PM Peak Traffic Hour - Year 2045

Intersection												
Int Delay, s/veh	4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↑	↗	↙	↗		↙	↗			↕	
Traffic Vol, veh/h	22	109	195	7	62	4	120	18	25	4	12	7
Future Vol, veh/h	22	109	195	7	62	4	120	18	25	4	12	7
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									
Storage Length	350	-	260	385	-	-	285	-	-	-	-	-
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	24	118	212	8	67	4	130	20	27	4	13	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	72	0	0	330	0	0	255	253	118	261	463	70
Stage 1	-	-	-	-	-	-	166	166	-	85	85	-
Stage 2	-	-	-	-	-	-	89	87	-	176	378	-
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	1528	-	-	1229	-	-	698	650	933	692	496	993
Stage 1	-	-	-	-	-	-	836	761	-	923	825	-
Stage 2	-	-	-	-	-	-	918	823	-	826	615	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1528	-	-	1229	-	-	660	636	933	637	485	993
Mov Cap-2 Maneuver	-	-	-	-	-	-	660	636	-	637	485	-
Stage 1	-	-	-	-	-	-	823	749	-	917	819	-
Stage 2	-	-	-	-	-	-	891	818	-	769	605	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.5	0.76	11.3	11.21
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	660	781	1528	-	-	1229	-	-	604
HCM Lane V/C Ratio	0.198	0.06	0.016	-	-	0.006	-	-	0.041
HCM Control Delay (s/veh)	11.8	9.9	7.4	-	-	7.9	-	-	11.2
HCM Lane LOS	B	A	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.7	0.2	0	-	-	0	-	-	0.1

HCM 7th TWSC
4: Broken Antler Court/Access A & Ayer Road

Total Traffic Conditions
PM Peak Traffic Hour - Year 2045

Intersection												
Int Delay, s/veh	0.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	3	58	5	0	33	0	3	0	0	0	0	2
Future Vol, veh/h	3	58	5	0	33	0	3	0	0	0	0	2
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									
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	3	63	5	0	36	0	3	0	0	0	0	2

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	36	0	0	68	0	0	108	108	66	105	111	36
Stage 1	-	-	-	-	-	-	72	72	-	36	36	-
Stage 2	-	-	-	-	-	-	36	36	-	70	75	-
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	1575	-	-	1533	-	-	871	782	998	874	779	1037
Stage 1	-	-	-	-	-	-	937	835	-	980	865	-
Stage 2	-	-	-	-	-	-	980	865	-	940	833	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1575	-	-	1533	-	-	867	780	998	872	778	1037
Mov Cap-2 Maneuver	-	-	-	-	-	-	867	780	-	872	778	-
Stage 1	-	-	-	-	-	-	935	833	-	980	865	-
Stage 2	-	-	-	-	-	-	978	865	-	938	831	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.33	0	9.17	8.48
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	867	81	-	-	1533	-	-	1037
HCM Lane V/C Ratio	0.004	0.002	-	-	-	-	-	0.002
HCM Control Delay (s/veh)	9.2	7.3	0	-	0	-	-	8.5
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0

HCM 7th AWSC
5: White Antler Trail/Access B & Ayer Road

Total Traffic Conditions
PM Peak Traffic Hour - Year 2045

Intersection	
Intersection Delay, s/veh	6.8
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	14	1	2	0	2	0	6	0	0	0	0	41
Future Vol, veh/h	14	1	2	0	2	0	6	0	0	0	0	41
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	15	1	2	0	2	0	7	0	0	0	0	45
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay, s/veh	7.2	7.1	7.2	6.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	100%	82%	0%	0%
Vol Thru, %	0%	6%	100%	0%
Vol Right, %	0%	12%	0%	100%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	6	17	2	41
LT Vol	6	14	0	0
Through Vol	0	1	2	0
RT Vol	0	2	0	41
Lane Flow Rate	7	18	2	45
Geometry Grp	1	1	1	1
Degree of Util (X)	0.008	0.021	0.002	0.042
Departure Headway (Hd)	4.203	4.12	4.038	3.374
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	854	872	889	1064
Service Time	2.215	2.128	2.05	1.386
HCM Lane V/C Ratio	0.008	0.021	0.002	0.042
HCM Control Delay, s/veh	7.2	7.2	7.1	6.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.1	0	0.1