

TRAFFIC IMPACT STUDY

For

**Cottages at Kettle Creek
Colorado Springs, Colorado**

October 2024

Prepared for:

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24-072210

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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 Cottages at Kettle Creek.

This proposed residential development is located at the northeast corner of the intersection of Old Ranch Road with Otero Avenue in Colorado Springs, Colorado.

Study Area Boundaries

The study area to be examined in this analysis encompasses the Old Ranch Road intersections with Otero Avenue and Voyager Parkway as well as proposed site access.

Figure 1 illustrates location of the site and study intersections.

Site Description

Land for the development is currently occupied by a single-family residence and is surrounded by a mix of residential and office land uses.

The proposed development is understood to entail the new construction of 170 single-family attached dwelling units.

Proposed access to the development is provided via one full-movement access onto Old Ranch Road aligning with the existing Otero Avenue (referred to as Site Access). Additional access is anticipated to be provided via future adjacent development to the north and west of the site. However, as it is uncertain when this additional access may be constructed, for purposes of this analysis it is assumed that site-generated trips will utilize only the proposed access onto Old Ranch Road. This assumption provides for a conservative analysis.

For purposes of this study, it is anticipated that development construction would be completed by end of Year 2026.

General site and access locations are shown on Figure 1.

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



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Figure 1
SITE LOCATION

October 2024
Page 2



Existing and Committed Surface Transportation Network

Within the study area, Old Ranch Road is the primary roadway that will accommodate traffic to and from the proposed development. The secondary roadways include Voyager Parkway and Otero Avenue. A brief description of each roadway, based on the City's Major Thoroughfare Plan (MTP)¹ and Traffic Criteria Manual (TCM)², is provided below:

Old Ranch Road is an east-west minor arterial roadway having two through lanes (one lane in each direction) with a combination of shared and exclusive turn lanes at the intersections within the study area. Old Ranch Road provides a posted speed limit of 35 MPH.

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

Otero Avenue is a north-south roadway having two through lanes (one lane in each direction) with shared turn lanes at the intersection within the study area. Otero Avenue is unclassified in the City's MTP. However, per Section 16.0 of the City's TCM and the roadway's estimated right-of-way (ROW) width, Otero Avenue is assumed to be classified as a collector roadway. Otero Avenue provides a posted speed limit of 30 MPH.

The study intersection of Old Ranch Road and Voyager Parkway is signalized. The study intersection of Old Ranch Road and Otero Avenue operates under a stop-controlled condition. A stop-controlled intersection is defined as a roadway intersection where vehicle rights-of-way are controlled by one or more "STOP" signs.

Pursuant to City's ConnectCOS, Old Ranch Road will be widened from two to four through lanes. However, the City's ConnectCOS does not mention when this will occur. Therefore, for analysis purposes, no widening was assumed to occur within the performed analysis scenarios. This provides for a conservative analysis.

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

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

² Engineering Criteria Manual, Section III: Traffic Criteria Manual, City of Colorado Springs City Engineering, July 2010.

II. Existing Traffic Conditions

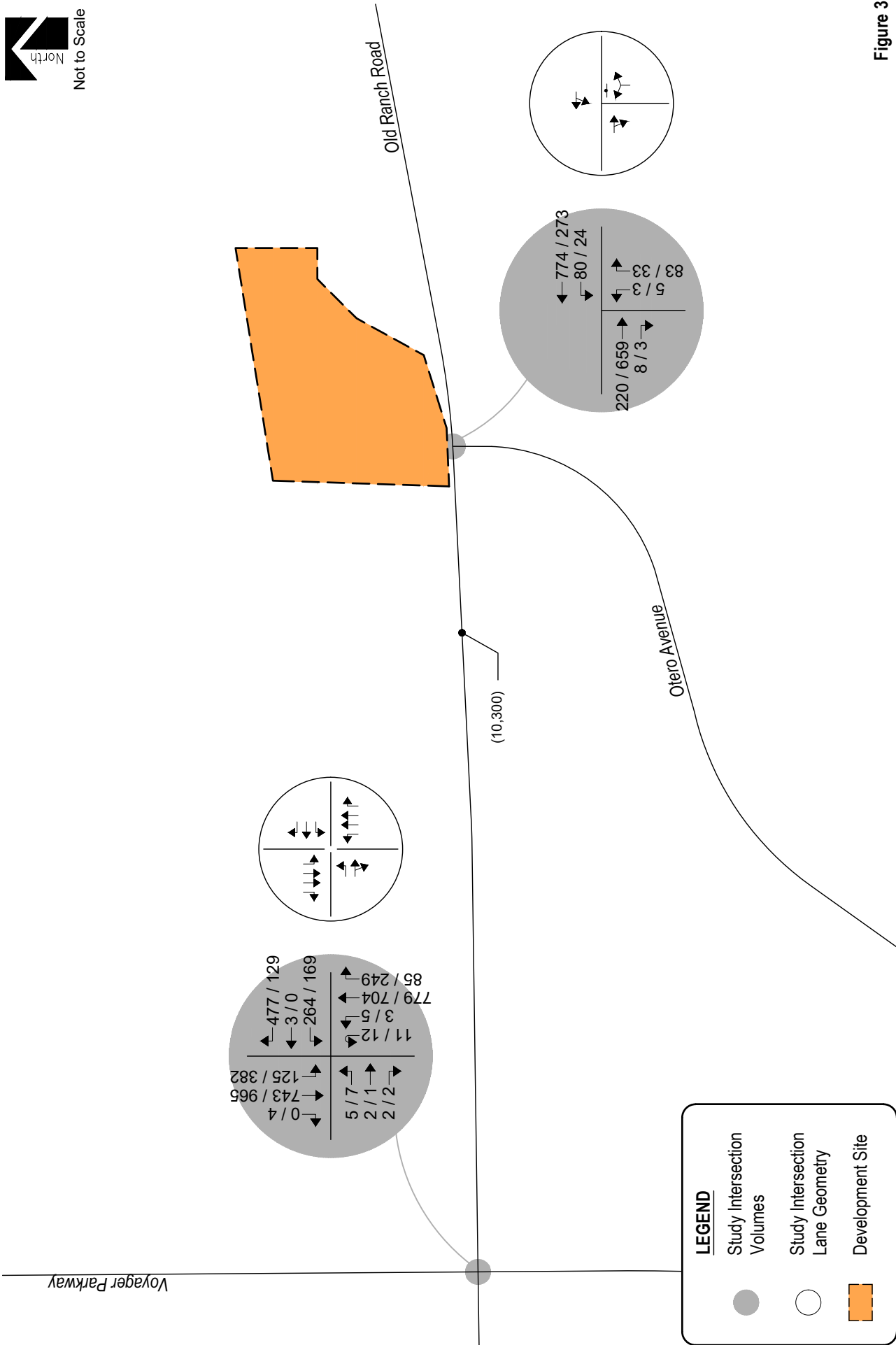
Morning (AM) and afternoon (PM) peak hour traffic counts were collected at the Old Ranch Road intersections with Otero Avenue and Voyager Parkway. Average daily traffic (ADT) volumes were collected over a 24-hour period on Old Ranch Road. Counts were collected on Wednesday, October 9, 2024, with AM peak 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.

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 Old Ranch Road and Voyager Parkway were obtained from the City 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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LEGEND

- Study Intersection
- Study Intersection Lane Geometry
- Development Site

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

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.

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
Old Ranch Road / Voyager Parkway (Signalized)	B (20.0)	B (17.4)
Old Ranch Road / Otero Avenue (Stop-Controlled)		
Westbound Left and Through	A	A
Northbound Left and Right	B	B

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 Old Ranch Road and Voyager Parkway has overall operations at LOS B during the morning and afternoon peak traffic hours.

The unsignalized intersection of Old Ranch Road and Otero Avenue has turning movement operations at LOS B or better 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 2024 and 2042, a compounded annual growth rate of approximately two percent was applied to existing traffic volumes. This annual growth rate is consistent with assumptions made in the previous Old Ranch Rezone Traffic Impact Study³.

Pursuant to the proposed area roadway improvements discussed in Section I, Year 2026 and Year 2044 background traffic conditions assume no roadway improvements to accommodate regional transportation demands. This assumption provides for a conservative analysis. Year 2044 assumes existing signal timing parameters for Old Ranch Road and Voyager Parkway with optimized intersection splits in effort to better long-term intersection performance.

Projected background traffic volumes and intersection geometry for Years 2026 and 2044 are shown on Figure 4 and Figure 5, respectively.

³ Old Ranch Road Rezone: Traffic Impact Study, SM ROCHA, LLC, April 2022.



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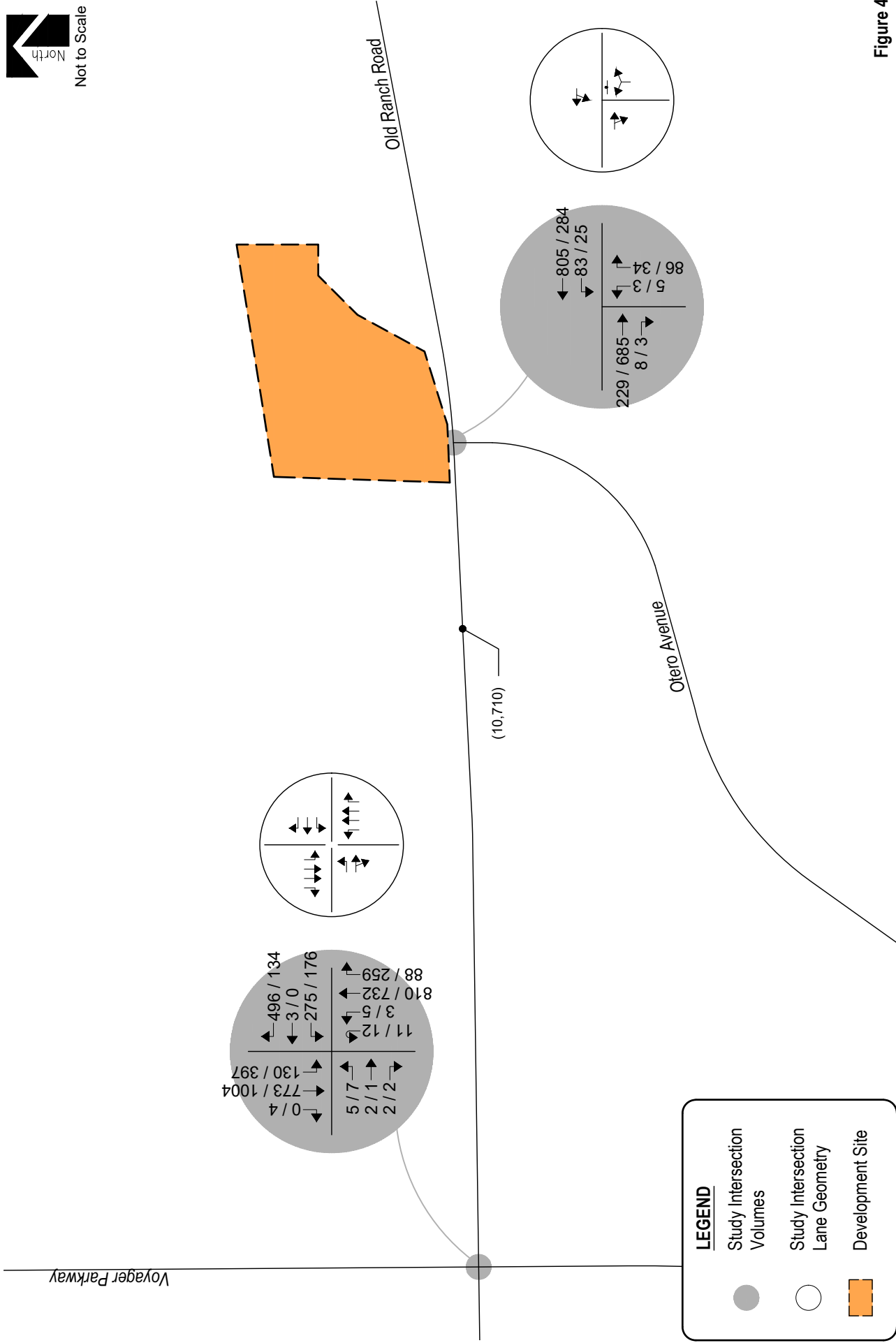
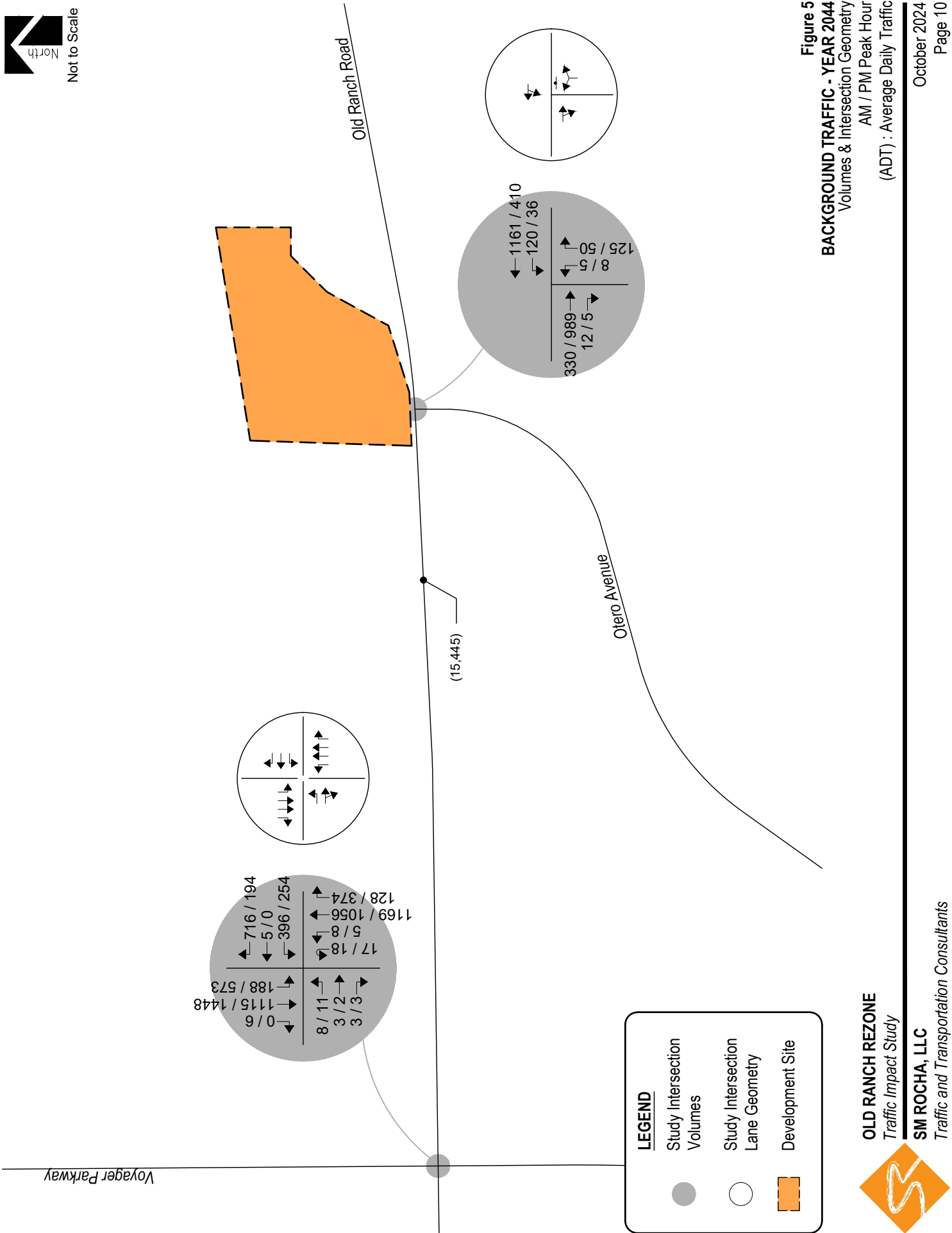


Figure 4
BACKGROUND TRAFFIC - YEAR 2026
 Volumes & Intersection Geometry
 AM / PM Peak Hour
 (ADT) : Average Daily Traffic

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LEGEND

- Study Intersection
- Study Intersection Lane Geometry
- Development Site



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Figure 5
BACKGROUND TRAFFIC - YEAR 2044
Volumes & Intersection Geometry
AM / PM Peak Hour
(ADT) : Average Daily Traffic

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 2026 are listed in Table 2. Year 2044 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 2026

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
Old Ranch Road / Voyager Parkway (Signalized)	C (21.2)	B (19.0)
Old Ranch Road / Otero Avenue (Stop-Controlled)		
Westbound Left and Through	A	A
Northbound Left and Right	B	C

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

Background Traffic Analysis Results – Year 2026

Year 2026 background traffic analysis indicates that the signalized intersection of Old Ranch Road and Voyager Parkway anticipates overall operations at LOS B during the morning and afternoon peak traffic hours.

The stop-controlled intersection of Old Ranch Road and Otero Avenue projects 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.

Table 3 – Intersection Capacity Analysis Summary – Background Traffic – Year 2044

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
Old Ranch Road / Voyager Parkway (Signalized)	E (65.0)	D (50.5)
Old Ranch Road / Otero Avenue (Stop-Controlled)		
Westbound Left and Through	A	B
Northbound Left and Right	C	D

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

Background Traffic Analysis Results – Year 2044

By Year 2044 and without the proposed development, the study intersection of Old Ranch Road and Voyager Parkway has overall operations at LOS E during the morning peak traffic hour and LOS D during the afternoon peak traffic hours. The LOS E operation are attributed to the westbound left turning volumes and the westbound right turning volumes. One potential mitigation to the LOS E operation projected during the morning peak traffic hour is the provision of a westbound right turn overlap.

The stop-controlled intersection of Old Ranch Road and Otero Avenue has turning movement operations at LOS C or better during the morning peak traffic hour and LOS D or better during the afternoon peak traffic hour.

IV. Proposed Project Traffic

Trip Generation

Standard traffic generation characteristics compiled by the Institute of Transportation Engineers (ITE) in their report entitled Trip Generation Manual, 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 215 (Single-Family Attached 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
215	Single-Family Attached Housing	DU	7.20	0.12	0.36	0.48	0.34	0.23	0.57

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
215	Single-Family Attached Housing	170	DU	1,224	20	61	82	57	40	97
<i>Total:</i>				1,224	20	61	82	57	40	97

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 1,224 daily vehicle trips with 82 of those occurring during the morning peak hour and 97 during the afternoon peak hour.

Adjustments to Trip Generation Rates

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

Trip Distribution

The overall directional distribution of site-generated traffic was determined based on the location of development site within the City, proposed and existing area land uses, allowed turning movements, available roadway network, and in reference to the Colorado Department of Transportation's (CDOT) Traffic Count Database System (TCDS)⁴.

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

Trip Assignment

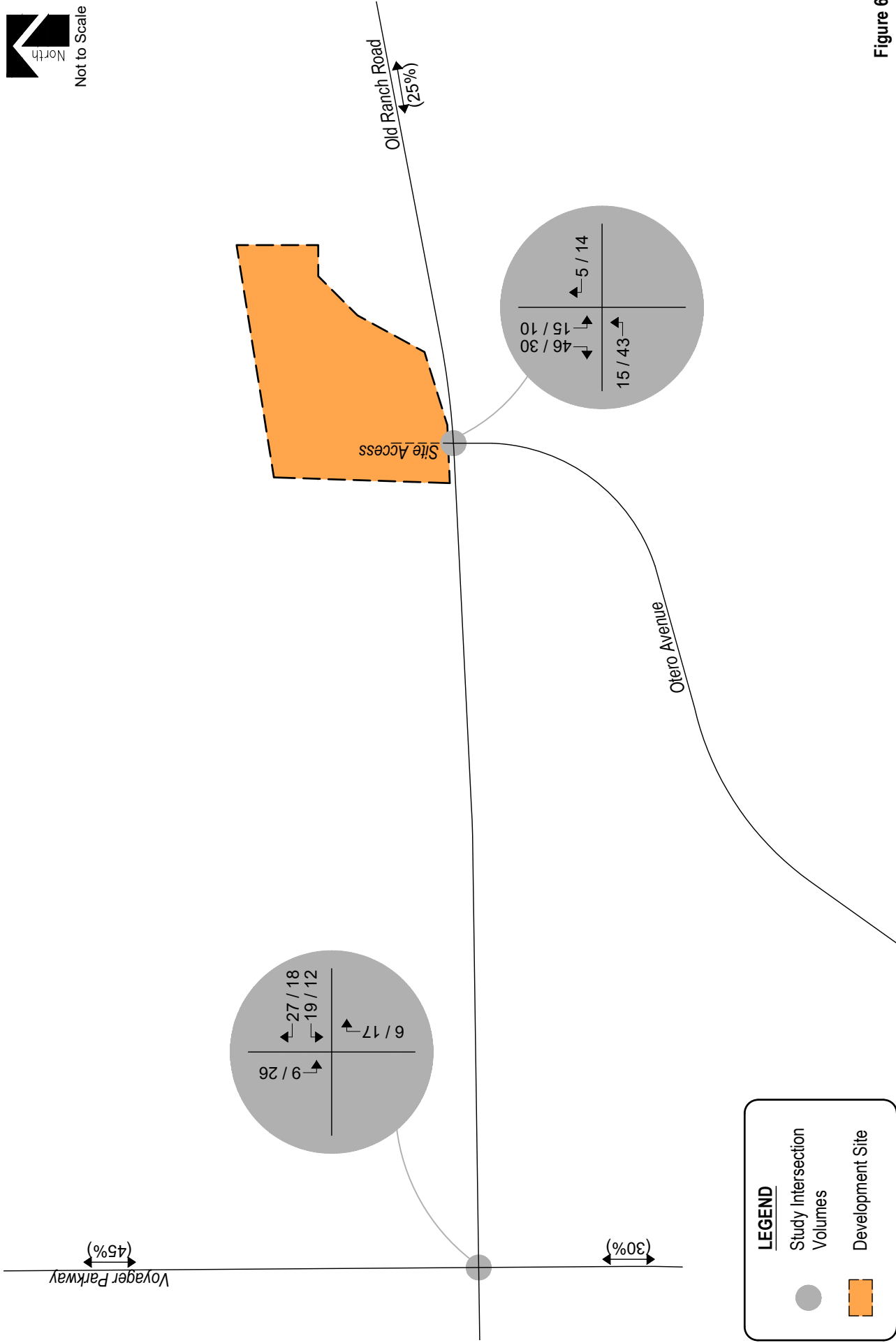
Trip assignment is how generated and distributed vehicle trips are expected to be loaded onto the available roadway network.

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

⁴ Transportation Data Management System, MS2, 2022.



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LEGEND

- Study Intersection
- Volumes
- Development Site

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

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 2026 and 2044 with consideration of site-generated traffic. For analysis purposes, it was assumed that development construction would be completed by end of Year 2026.

Pursuant to area roadway improvement discussions provided in Section III, Year 2026 and Year 2044 total traffic conditions assume the addition of eastbound and westbound left turn lanes along Old Ranch Road at its intersection with Otero Avenue and Site Access. Additional roadway improvements associated with site development are expected to be limited to site access and frontage as required by the governing agency. Similar to background conditions, Year 2044 assumes existing signal timing parameters for Old Ranch Road and Voyager Parkway with optimized intersection splits in effort to better long-term intersection performance.

Projected Year 2026 total traffic volumes and intersection geometry are shown in Figure 7.

Figure 8 shows projected total traffic volumes and intersection geometry for Year 2044.

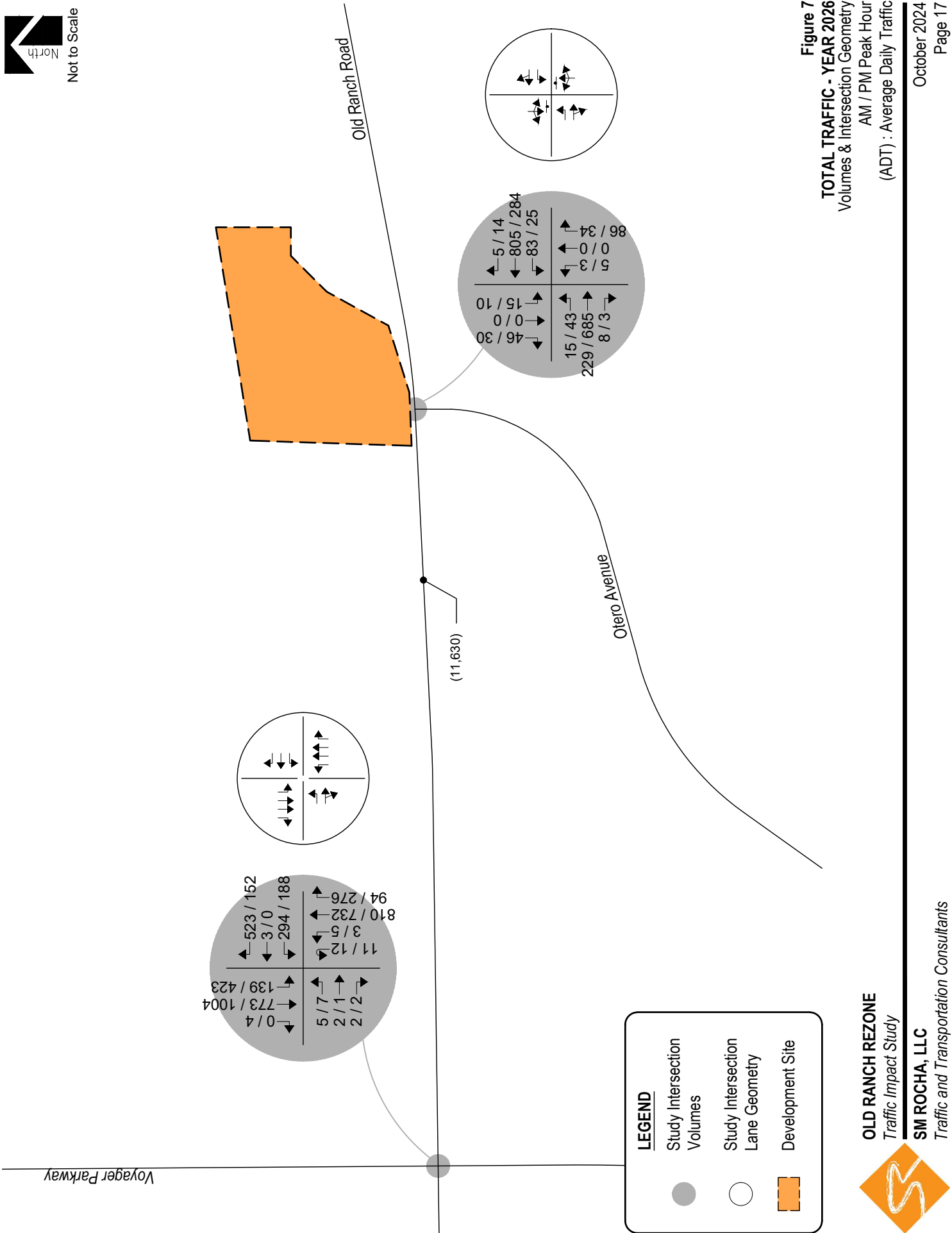


Figure 7
TOTAL TRAFFIC - YEAR 2026
 Volumes & Intersection Geometry
 AM / PM Peak Hour
 (ADT) : Average Daily Traffic

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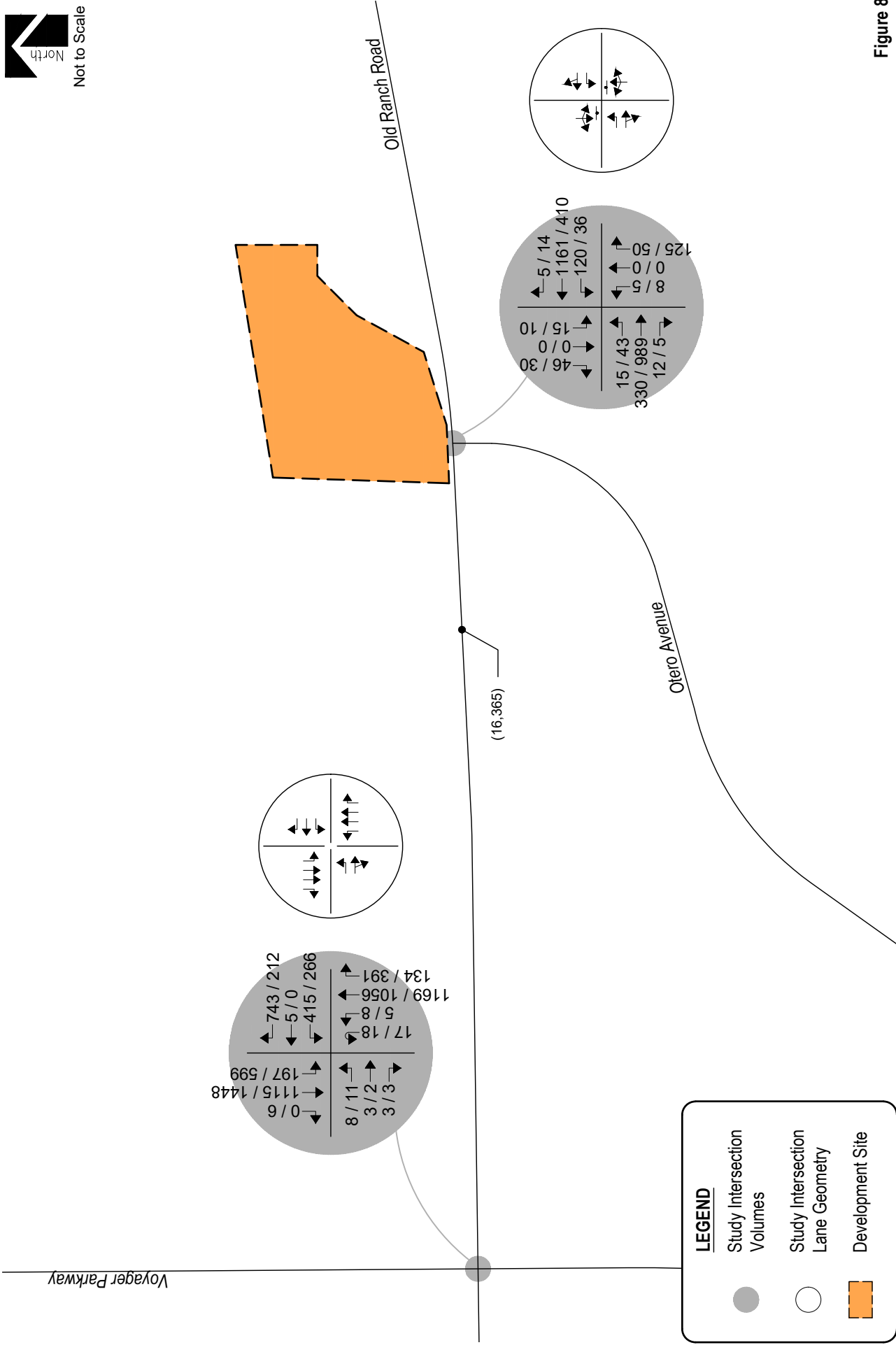


Figure 8
TOTAL TRAFFIC - YEAR 2044
 Volumes & Intersection Geometry
 AM / PM Peak Hour
 (ADT) : Average Daily Traffic

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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.

Total Traffic Auxiliary Lane Analysis

Auxiliary lanes for site development access are to be based on the City's TCM.

Considering development build-out, an evaluation of auxiliary lane requirements, pursuant to Section 8.1, Table 2 of the City's TCM, an eastbound left turn deceleration lane at Site Access along Old Ranch Road are required since the development's peak hour left turn ingress volumes exceed the City's threshold of 25 VPH.

Considering development build-out, an evaluation of auxiliary lane requirements indicates that a westbound right turn deceleration at Site Access along Old Ranch Road is not required since the development's peak hour right turn ingress volume does not exceed the City's threshold of 50 VPH.

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 2026 and 2044 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 2026

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
Old Ranch Road / Voyager Parkway (Signalized)	C (23.1)	C (21.3)
Old Ranch Road / Otero Avenue / Site Access (Stop-Controlled)		
Eastbound Left	A	A
Westbound Left	A	A
Northbound Left, Through and Right	B	C
Southbound Left, Through and Right	D	C

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 2044

INTERSECTION LANE GROUPS	LEVEL OF SERVICE	
	AM PEAK HOUR	PM PEAK HOUR
Old Ranch Road / Voyager Parkway (Signalized)	E (71.8)	D (53.9)
Old Ranch Road / Otero Avenue / Site Access (Stop-Controlled)		
Eastbound Left	B	A
Westbound Left	A	B
Northbound Left, Through and Right	D	D
Southbound Left, Through and Right	F	D

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 2044 and upon development build-out, the signalized intersection of Old Ranch Road and Voyager Parkway has overall operations at LOS E during the morning peak traffic hour and LOS D during the afternoon peak traffic hour. Similar to background traffic conditions the LOS E operations are attributed to the westbound left turning volumes and westbound right turning volumes.

The unsignalized intersection of Old Ranch Road and Site Access has turning movement operations at LOS D or better during the morning peak traffic hour and LOS D or better during the afternoon peak traffic hour. Exceptions include the southbound turning movement which has turning movement operations at LOS F during the morning peak traffic hour. It is important to note that the LOS F operation is anticipated to occur at Site Access and is not expected to provide extensive queues.

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

These intersection operations are similar to background conditions.

Queue Length Analysis

Queue lengths for the study intersections were analyzed using Year 2044 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 2044.

Table 8 – Turn Lane Queues and Storage Requirements – Total Traffic – Year 2044

Intersection	Turn Movement	Existing Turn Lane Length (feet)	Background 2044		Total 2044		Recommended Turn Lane Length (feet)	
			AM Peak Hour (feet)	PM Peak Hour (vehicles)	AM Peak Hour (feet)	PM Peak Hour (vehicles)		
Signalized Intersections								
Old Ranch Road / Voyager Parkway	EB	L	60'	12'	18'	12'	17'	60'
		T,R	-	8'	10'	8'	9'	-
	WB	L	210'	342'	279'	356'	284'	370'
		T	-	8'	0'	8'	0'	-
	NB	R	210'	576'	16'	595'	10'	610'
		L	320'	15'	10'	15'	11'	320'
	SB	T	-	438'	365'	451'	389'	-
		R	250'	33'	53'	35'	56'	250'
	SB	L	285'	143'	486'	156'	503'	515'
		T	-	408'	454'	421'	466'	-
SB	R	170'	0'	0'	0'	0'	170'	
	Stop-Controlled Intersections							
Old Ranch Road / Otero Avenue / Site Access	EB	L	-	-	-	3'	3'	155'
		T,R	-	0'	0'	0'	0'	-
	WB	L	-	-	-	10'	5'	155'
		T,R	-	10'	5'	0'	0'	-
	NB	L,T,R	-	43'	25'	58'	30'	-
	SB	L,T,R	-	-	-	88'	25'	-

Note: Turn Lane Length does not include taper length.

As Table 8 shows, turn lane lengths should be modified to meet either the City’s minimum length or the projected queue lengths, whichever is greater.

It is important to note that significant vehicle queues exist during background traffic conditions without the proposed development. As previously mentioned, the addition of a westbound right turn overlap phase is a possible mitigation to queues projected for the westbound right turn during either peak traffic hour. Additionally, provision of southbound and westbound dual lefts are also possible measures of mitigation to projected vehicle queueing. It is emphasized that the proposed development does not significantly contribute to these queues, however it is understood that the proposed development may be subject to roadway impact fees as applicable to City standard requirements.

VII. Conclusion

This traffic impact study addressed the capacity, geometric, and control requirements associated with the development entitled Cottages at Kettle Creek. This proposed residential development consists of 170 single-family attached dwelling units. The development is located at the northeast corner of the intersection of Old Ranch Road with Otero Avenue in Colorado Springs, Colorado.

The study area examined in this analysis encompassed the Old Ranch Road intersections with Otero Avenue and Voyager Parkway as well as proposed site access.

Analysis was conducted for critical AM Peak Hour and PM Peak Hour traffic operations for existing traffic conditions, Year 2026 and Year 2044 background traffic conditions, and Year 2026 and Year 2044 total traffic conditions.

Analysis of existing traffic conditions indicates that the signalized intersection of Old Ranch Road and Voyager Parkway intersection has overall operations at LOS B during the morning and afternoon peak traffic hours. The unsignalized intersection of Old Ranch Road and Otero Avenue has turning movement operations at LOS B or better during the morning and afternoon peak traffic hours.

Without the proposed development, Year 2026 background operational analysis shows that the signalized intersection of Old Ranch Road and Voyager Parkway has overall operations at LOS C during the morning peak traffic hour and LOS B during the afternoon peak traffic hour. The unsignalized intersection of Old Ranch Road and Otero Avenue has 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.

By Year 2044 and without the proposed development, the signalized intersection of Old Ranch Road and Voyager Parkway has overall operations at LOS E during the morning peak traffic hour and LOS D during the afternoon peak traffic hours. The LOS E operations are attributed to the westbound left turning volumes and the westbound right turning volumes. One potential mitigation to the LOS E operations projected during the morning peak traffic hour includes provision of a westbound right turn overlap. The unsignalized intersection of Old Ranch Road and Otero Avenue has turning movement operations at LOS C or better during the morning peak traffic hour and LOS D 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 consideration of the various 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 2044 background traffic conditions. Proposed site access has long-term operations at LOS D during peak traffic periods and upon build-out. Exceptions include the southbound turning movement which has operations at LOS F during the morning peak traffic hour. It is not uncommon for signalized intersections to or from an arterial roadway, in urban areas, to operate with noticeable delays during peak traffic hours. It is, however, likely that turning movement will operate better than the results obtained. Pursuant to performed queue analysis, although some delays are anticipated, vehicle queues can be accommodated on-site without negatively impacting the adjacent roadway network. It is recommended that City Staff continues to monitor the study intersection in order to determine when specific mitigation measures may be necessary as planned corridor improvements occur.

APPENDIX A

Traffic Count Data Signal Timing Information

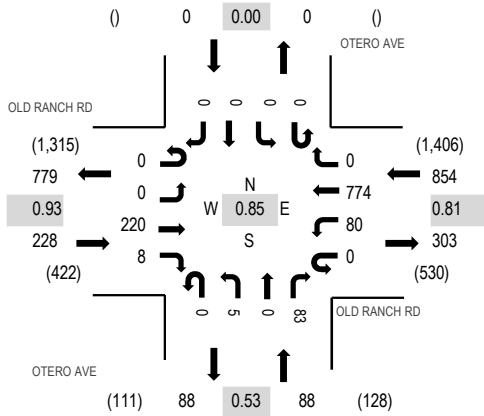
Location: 1 OTERO AVE & OLD RANCH RD AM

Date: Wednesday, October 9, 2024

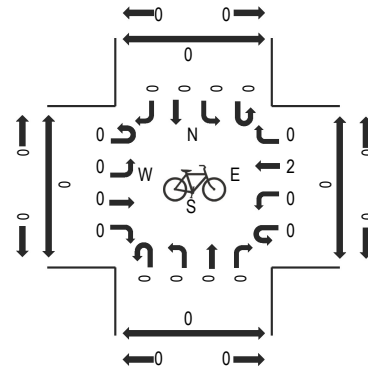
Peak Hour: 07:15 AM - 08:15 AM

Peak 15-Minutes: 07:45 AM - 08:00 AM

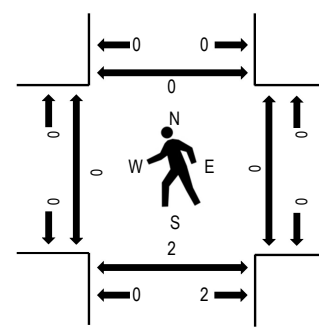
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



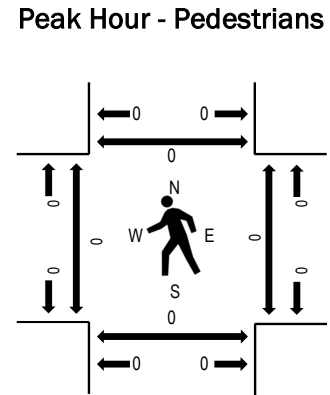
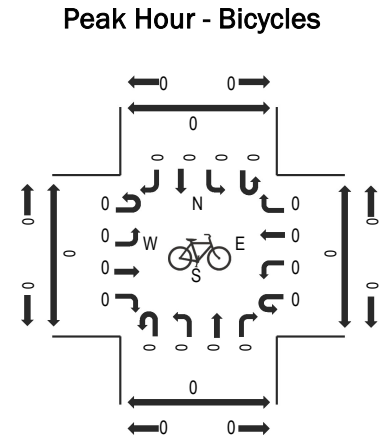
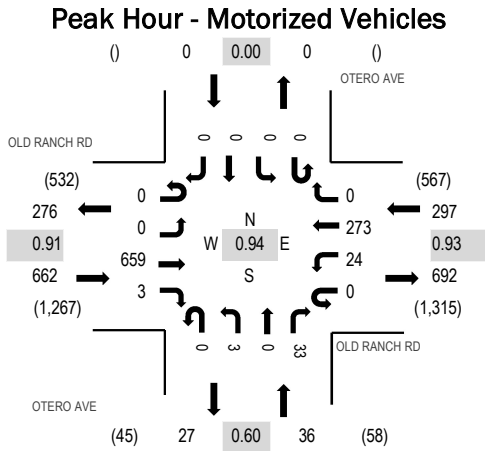
Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	OLD RANCH RD Eastbound				OLD RANCH RD Westbound				OTERO AVE Northbound				OTERO AVE 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	38	0	0	4	164	0	0	0	0	6	0	0	0	0	212	1,092	0	0	0	0
7:15 AM	0	0	54	0	0	8	174	0	0	3	0	10	0	0	0	0	249	1,170	0	0	2	0
7:30 AM	0	0	51	4	0	7	213	0	0	2	0	9	0	0	0	0	286	1,142	0	0	0	0
7:45 AM	0	0	60	2	0	39	225	0	0	0	0	19	0	0	0	0	345	1,064	0	0	0	0
8:00 AM	0	0	55	2	0	26	162	0	0	0	0	45	0	0	0	0	290	864	0	0	0	0
8:15 AM	0	0	56	0	0	4	141	0	0	2	0	18	0	0	0	0	221		0	0	0	0
8:30 AM	0	0	52	3	0	10	134	0	0	1	0	8	0	0	0	0	208		0	0	0	0
8:45 AM	0	0	45	0	0	2	93	0	0	1	0	4	0	0	0	0	145		0	0	0	0
Count Total	0	0	411	11	0	100	1,306	0	0	9	0	119	0	0	0	0	1,956		0	0	2	0
Peak Hour	0	0	220	8	0	80	774	0	0	5	0	83	0	0	0	0	1,170		0	0	2	0



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	OLD RANCH RD Eastbound				OLD RANCH RD Westbound				OTERO AVE Northbound				OTERO AVE Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	0	163	1	0	2	70	0	0	0	0	6	0	0	0	0	242	971	0	0	0	0
4:15 PM	0	0	168	2	0	7	67	0	0	1	0	14	0	0	0	0	259	995	0	0	0	0
4:30 PM	0	0	163	0	0	1	72	0	0	1	0	5	0	0	0	0	242	984	0	0	0	0
4:45 PM	0	0	145	0	0	10	70	0	0	0	0	3	0	0	0	0	228	958	0	0	0	0
5:00 PM	0	0	183	1	0	6	64	0	0	1	0	11	0	0	0	0	266	921	0	0	0	0
5:15 PM	0	0	176	1	0	2	61	0	0	1	0	7	0	0	0	0	248		0	0	0	0
5:30 PM	0	0	143	1	0	6	60	0	0	0	0	6	0	0	0	0	216		0	0	0	0
5:45 PM	0	0	120	0	0	5	64	0	0	0	0	2	0	0	0	0	191		0	0	0	0
Count Total	0	0	1,261	6	0	39	528	0	0	4	0	54	0	0	0	0	1,892		0	0	0	0
Peak Hour	0	0	659	3	0	24	273	0	0	3	0	33	0	0	0	0	995		0	0	0	0

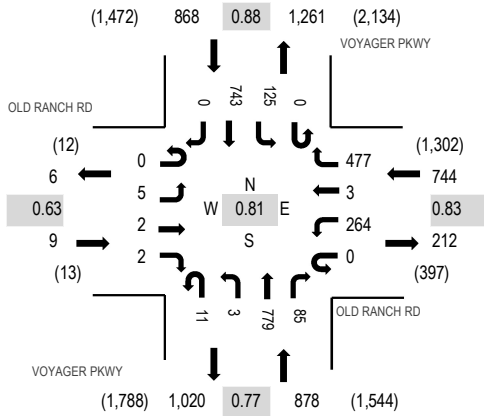
Location: 2 VOYAGER PKWY & OLD RANCH RD AM

Date: Wednesday, October 9, 2024

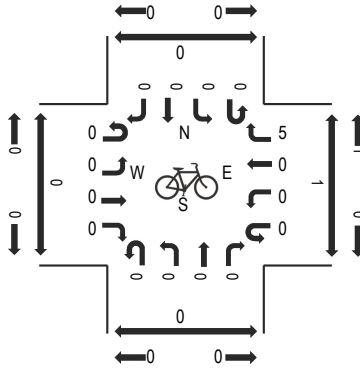
Peak Hour: 07:30 AM - 08:30 AM

Peak 15-Minutes: 07:45 AM - 08:00 AM

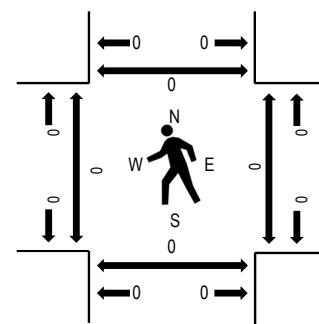
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	OLD RANCH RD Eastbound				OLD RANCH RD Westbound				VOYAGER PKWY Northbound				VOYAGER PKWY Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	0	0	0	89	0	70	2	0	122	19	0	17	86	0	405	2,278	0	0	0	0
7:15 AM	0	0	2	0	0	68	0	107	5	0	157	24	0	20	114	0	497	2,452	0	0	0	0
7:30 AM	0	2	0	1	0	84	1	115	4	1	187	16	0	19	174	0	604	2,499	0	0	0	0
7:45 AM	0	2	1	1	0	59	0	174	3	0	259	26	0	29	218	0	772	2,390	0	0	0	0
8:00 AM	0	0	1	0	0	53	2	113	1	1	181	24	0	30	173	0	579	2,053	0	0	0	0
8:15 AM	0	1	0	0	0	68	0	75	3	1	152	19	0	47	178	0	544		0	0	0	0
8:30 AM	0	1	0	0	0	52	1	80	2	0	152	23	0	30	153	1	495		0	0	0	0
8:45 AM	0	0	0	1	0	38	2	51	2	1	133	24	0	26	156	1	435		0	0	0	0
Count Total	0	6	4	3	0	511	6	785	22	4	1,343	175	0	218	1,252	2	4,331		0	0	0	0
Peak Hour	0	5	2	2	0	264	3	477	11	3	779	85	0	125	743	0	2,499		0	0	0	0

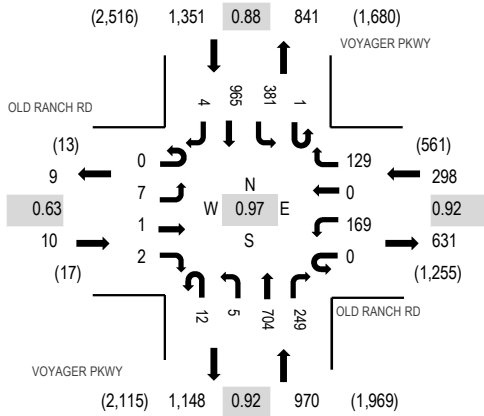
Location: 2 VOYAGER PKWY & OLD RANCH RD PM

Date: Wednesday, October 9, 2024

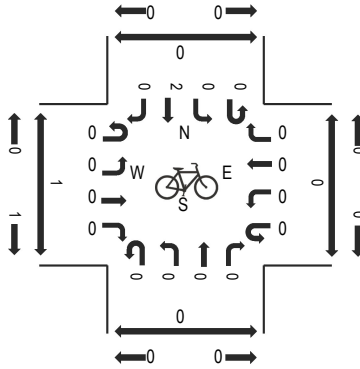
Peak Hour: 04:00 PM - 05:00 PM

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

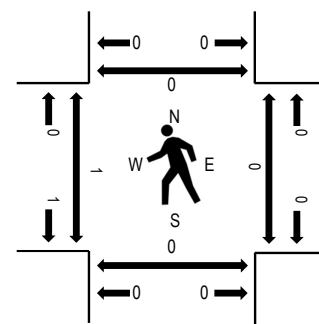
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	OLD RANCH RD Eastbound				OLD RANCH RD Westbound				VOYAGER PKWY Northbound				VOYAGER PKWY Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	0	0	0	0	43	0	24	2	2	159	62	1	111	270	2	676	2,629	0	0	0	0
4:15 PM	0	2	0	2	0	51	0	19	6	1	187	61	0	92	258	0	679	2,622	1	0	0	0
4:30 PM	0	3	0	0	0	39	0	41	1	2	148	57	0	97	217	1	606	2,610	0	0	0	0
4:45 PM	0	2	1	0	0	36	0	45	3	0	210	69	0	81	220	1	668	2,555	0	0	0	0
5:00 PM	0	0	0	0	0	36	0	28	2	1	178	66	0	118	240	0	669	2,434	0	0	0	0
5:15 PM	0	0	1	0	0	34	0	33	3	0	194	86	2	89	224	1	667		0	0	0	0
5:30 PM	0	0	1	0	0	35	0	26	2	1	168	57	0	79	182	0	551		0	0	0	0
5:45 PM	0	1	1	3	0	33	0	38	1	1	171	68	0	58	172	0	547		0	1	0	0
Count Total	0	8	4	5	0	307	0	254	20	8	1,415	526	3	725	1,783	5	5,063		1	1	0	0
Peak Hour	0	7	1	2	0	169	0	129	12	5	704	249	1	381	965	4	2,629		1	0	0	0

Start Time	09-Oct-24 Wed	EB	WB	Total
12:00 AM		19	5	24
01:00		0	1	1
02:00		3	5	8
03:00		2	28	30
04:00		7	79	86
05:00		20	138	158
06:00		75	374	449
07:00		247	834	1081
08:00		283	572	855
09:00		196	338	534
10:00		193	228	421
11:00		260	285	545
12:00 PM		259	259	518
01:00		266	264	530
02:00		387	255	642
03:00		645	397	1042
04:00		667	299	966
05:00		648	268	916
06:00		399	215	614
07:00		231	119	350
08:00		178	99	277
09:00		104	44	148
10:00		52	20	72
11:00		22	9	31
Total		5163	5135	10298
Percent		50.1%	49.9%	
AM Peak	-	08:00	07:00	-
Vol.	-	283	834	-
PM Peak	-	16:00	15:00	-
Vol.	-	667	397	-
Grand Total		5163	5135	10298
Percent		50.1%	49.9%	
ADT		ADT 10,298	ADT 10,298	AADT 10,298

Intersection 395 at Voyager Pkwy and Old Ranch Rd - Timing table, page 1

	Phases											
	1	2	3	4	5	6	7	8	9	10	11	12
Page 1	1	2	3	4	5	6	7	8	9	10	11	12
Min Green	4	23	0	4	4	23	0	4	0	0	0	0
Passage Time I	2.0	3.0	0.0	2.0	2.0	3.0	0.0	2.0	0.0	0.0	0.0	0.0
Passage Time II	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Green I	12	30	0	25	12	30	0	25	0	0	0	0
Max Green II	0	0	0	0	0	0	0	0	0	0	0	0
Yellow Clearance	3.0	5.5	0.0	4.5	3.0	5.5	0.0	4.5	0.0	0.0	0.0	0.0
Red Clearance	2.0	2.0	0.0	2.0	2.0	2.0	0.0	2.0	0.0	0.0	0.0	0.0
Added Initial	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Max Added Initial	0	0	0	0	0	0	0	0	0	0	0	0
Time Before Reduction	0	0	0	0	0	0	0	0	0	0	0	0
Cars Before Reduction	0	0	0	0	0	0	0	0	0	0	0	0
Time To Reduce	0	0	0	0	0	0	0	0	0	0	0	0
Min Passage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Recall Green Time	0	0	0	0	0	0	0	0	0	0	0	0
Red Revert Time	5.0	5.0	0.0	5.0	5.0	5.0	0.0	5.0	0.0	0.0	0.0	0.0
Advance Walk Time	0	0	0	0	0	0	0	0	0	0	0	0
Walk Time	0	7	0	0	0	7	0	7	0	0	0	0
Pedestrian Clearance	0	16	0	0	0	16	0	39	0	0	0	0
Handicap Walk	0	0	0	0	0	0	0	0	0	0	0	0
Handicap Ped Clearance	0	0	0	0	0	0	0	0	0	0	0	0
Voyager Pkwy	X	X			X	X						
Old Ranch Rd				X								
Compass Direction	S	N		E	N	S		W				
Through, Turn or XPed	Left,prt	Thru		Thru	Left,prt	Thru		Thru				

Intersection 395 at Voyager Pkwy and Old Ranch Rd - Sequence table, page 1

Page 1	Ring 1 Phases			Ring 2 Phases			Ring 3 Phases					
	1	2	3	4	5	6	7	8	9	10	11	12
State 1	Vehicle				Vehicle							
Barrier 1												
State 2		V & P				V & P						
Barrier 2	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX
State 3				Vehicle								
Barrier 3	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXX
State 4												
Barrier 4												
State 5												
Barrier 5												
State 6												
Barrier 6												
State 7												
Barrier 7												
State 8												
Barrier 8												
State 9												
Barrier 9												
State 10												
Barrier 10												
State 11												
Barrier 11												
State 12												
Barrier 12												

Intersection 395 at Voyager Pkwy and Old Ranch Rd - Spec signaling cntrl tbl, pg 1

Page 1									
Signaling Control 1					Signaling Control 2				
Function	Flashing permissive left turn	Timer 1	2.0	Function	Flashing permissive left turn	Timer 1	2.0	Function	Flashing permissive left turn
Operand	0	Timer 2	0.0	Operand	0	Timer 2	0.0	Operand	0
Trigger	Always enabled	Timer 3	0.0	Trigger	Always enabled	Timer 3	0.0	Trigger	Always enabled
	111	Output 1	25		111	Output 1	1		111
	123456789012	Output 2	34		123456789012	Output 2	35		123456789012
Phases 1	5	Output 3	41	Phases 1	1	Output 3	40	Phases 1	1
Phases 2	2 6	Output 4	1	Phases 2	2 6	Output 4	1	Phases 2	2 6
Overlaps 1				Overlaps 1				Overlaps 1	
Overlaps 2				Overlaps 2				Overlaps 2	
Signaling Control 3					Signaling Control 4				
Function	None	Timer 1	0.0	Function	None	Timer 1	0.0	Function	None
Operand	0	Timer 2	0.0	Operand	0	Timer 2	0.0	Operand	0
Trigger	Always enabled	Timer 3	0.0	Trigger	Always enabled	Timer 3	0.0	Trigger	Always enabled
	111	Output 1	1		111	Output 1	1		111
	123456789012	Output 2	1		123456789012	Output 2	1		123456789012
Phases 1		Output 3	1	Phases 1		Output 3	1	Phases 1	
Phases 2		Output 4	1	Phases 2		Output 4	1	Phases 2	
Overlaps 1				Overlaps 1				Overlaps 1	
Overlaps 2				Overlaps 2				Overlaps 2	

Intersection 395 at Voyager Pkwy and Old Ranch Rd - Phases control table, page 1

	Vehicle Phases	Ped Phases
	Page 1	111 123456789012
Min Recalls		Ped Recalls
Max Recalls	2 6	Handicap Ped Recalls
Recall If Maxed		Soft Ped Recalls
Dual Entry	4 8	Do Not Recall Ped
Do Not Skip		Allow Walk Reduction
Simultaneous Gap Out		Hold In Walk
Restricted Phases		Allow Ped Re-service
Sequential Initial Timing		Rest In Walk
Max Timer Starts For Call		No
Reduction Starts For Call		
Red To Avoid Left Turn Trap		
Rest In Red	No	

Intersection 395 at Voyager Pkwy and Old Ranch Rd - Schedule table, events 1-25

Event Num	Enabled	Event Type	Event Parameters			Start			Duration			Stop		Repetition		Priority
			Param 1	Param 2	Param 3	Mon	Day	Hour	Min	Sec	Minutes	Mon	Day	Repeat	Intervals	
1																
2																
3	Yes	Run Plan	Plan 6	Ofst #1		1	1	06	30	00	720	12	31	Weekly	MTWTF	Low
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																
21																
22																
23																
24																
25																

Intersection 395 at Voyager Pkwy and Old Ranch Rd - Coordination table, plans 1-2

Plan 1	111	Cycle Length	124	Phases	Splits	Alternate Mins	Alternate Passages	Alternate Maxes
Coordinated	123456789012	Offset 1	61	1	16	0	0.0	16
Phases	2 6	Offset 2	0	2	71	0	0.0	81
Secondary		Offset 3	0	3	0	0	0.0	0
Coordinated		Offset 4	0	4	37	0	0.0	40
Phases		Relative Secondary Offset	0	5	16	0	0.0	16
Extra Time		Permissive Period	Auto	6	71	0	0.0	81
Phases		Max Cycle Addition	31	7	0	0	0.0	0
Additional		Max Cycle Subtraction	31	8	37	0	0.0	40
Max Recalls		Coord Actuated Period	0	9	0	0	0.0	0
Units	Seconds	Top Of Cycle Green Point	End	10	0	0	0.0	0
		Big Bang Preempt Recvry	No	11	0	0	0.0	0
		Big Bang Ped Recovery	No	12	0	0	0.0	0
		Min Lagging Left Split	0%					
Plan 2	111	Cycle Length	114	Phases	Splits	Alternate Mins	Alternate Passages	Alternate Maxes
Coordinated	123456789012	Offset 1	58	1	15	0	0.0	14
Phases	2 6	Offset 2	0	2	62	0	0.0	70
Secondary		Offset 3	0	3	0	0	0.0	0
Coordinated		Offset 4	0	4	37	0	0.0	40
Phases		Relative Secondary Offset	0	5	15	0	0.0	14
Extra Time		Permissive Period	Auto	6	62	0	0.0	70
Phases		Max Cycle Addition	28	7	0	0	0.0	0
Additional		Max Cycle Subtraction	28	8	37	0	0.0	40
Max Recalls		Coord Actuated Period	0	9	0	0	0.0	0
Units	Seconds	Top Of Cycle Green Point	End	10	0	0	0.0	0
		Big Bang Preempt Recvry	No	11	0	0	0.0	0
		Big Bang Ped Recovery	No	12	0	0	0.0	0
		Min Lagging Left Split	0%					

Intersection 395 at Voyager Pkwy and Old Ranch Rd - Coordination table, plans 3-4

Plan 3	_____111	Cycle Length	0	Phases	Splits	Alternate Mins	Alternate Passages	Alternate Maxes
Coordinated Phases	123456789012	Offset 1	0	1	0	0	0.0	0
		Offset 2	0	2	0	0	0.0	0
Secondary Coordinated Phases		Offset 3	0	3	0	0	0.0	0
		Offset 4	0	4	0	0	0.0	0
Extra Time Phases		Relative Secondary Offset	0	5	0	0	0.0	0
		Permissive Period	Auto	6	0	0	0.0	0
Additional Max Recalls		Max Cycle Addition	0	7	0	0	0.0	0
		Max Cycle Subtraction	0	8	0	0	0.0	0
Units	Seconds	Coord Actuated Period	0	9	0	0	0.0	0
		Top Of Cycle Green Point	End	10	0	0	0.0	0
		Big Bang Preempt Recvry	No	11	0	0	0.0	0
		Big Bang Ped Recovery	No	12	0	0	0.0	0
		Min Lagging Left Split	0%					
Plan 4	_____111	Cycle Length	124	Phases	Splits	Alternate Mins	Alternate Passages	Alternate Maxes
Coordinated Phases	123456789012	Offset 1	110	1	16	0	0.0	16
		Offset 2	0	2	78	0	0.0	90
Secondary Coordinated Phases	2 6	Offset 3	0	3	0	0	0.0	0
		Offset 4	0	4	30	0	0.0	31
Extra Time Phases		Relative Secondary Offset	0	5	16	0	0.0	16
		Permissive Period	Auto	6	78	0	0.0	90
Additional Max Recalls		Max Cycle Addition	31	7	0	0	0.0	0
		Max Cycle Subtraction	31	8	30	0	0.0	31
Units	Seconds	Coord Actuated Period	0	9	0	0	0.0	0
		Top Of Cycle Green Point	End	10	0	0	0.0	0
		Big Bang Preempt Recvry	No	11	0	0	0.0	0
		Big Bang Ped Recovery	No	12	0	0	0.0	0
		Min Lagging Left Split	0%					

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

HCM 7th TWSC
1: Otero Avenue & Old Ranch Road

Existing Traffic Conditions
AM Peak Traffic Hour

Intersection						
Int Delay, s/veh	1.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	220	8	80	774	5	83
Future Vol, veh/h	220	8	80	774	5	83
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	239	9	87	841	5	90

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	248	0	1259 243
Stage 1	-	-	-	-	243 -
Stage 2	-	-	-	-	1015 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1318	-	188 795
Stage 1	-	-	-	-	797 -
Stage 2	-	-	-	-	350 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1318	-	165 795
Mov Cap-2 Maneuver	-	-	-	-	165 -
Stage 1	-	-	-	-	797 -
Stage 2	-	-	-	-	307 -

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.74	11.45
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	654	-	-	169	-
HCM Lane V/C Ratio	0.146	-	-	0.066	-
HCM Control Delay (s/veh)	11.5	-	-	7.9	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.2	-

Timings
2: Old Ranch Road & Voyager Parkway

Existing Traffic Conditions
AM Peak Traffic Hour



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	5	2	2	264	3	477	11	3	779	85	125	743
Future Volume (vph)	5	2	2	264	3	477	11	3	779	85	125	743
Satd. Flow (prot)	1770	1723	0	1770	1863	1583	0	1770	3539	1583	1770	3539
Flt Permitted	0.756			0.755				0.347			0.214	
Satd. Flow (perm)	1408	1723	0	1406	1863	1583	0	646	3539	1583	399	3539
Satd. Flow (RTOR)		2				306				134		
Lane Group Flow (vph)	5	4	0	287	3	518	0	15	847	92	136	808
Turn Type	Perm	NA		Perm	NA	Perm	custom	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4			8		8	5	2		2	6	
Detector Phase	4	4		8	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	3.0	3.0	4.0	3.0
Minimum Split (s)	10.5	10.5		10.5	10.5	10.5	9.0	9.0	10.5	10.5	9.0	10.5
Total Split (s)	25.0	25.0		25.0	25.0	25.0	13.0	13.0	31.0	31.0	13.0	31.0
Total Split (%)	36.2%	36.2%		36.2%	36.2%	36.2%	18.8%	18.8%	44.9%	44.9%	18.8%	44.9%
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	3.0	3.0	5.5	5.5	3.0	5.5
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5		5.0	7.5	7.5	5.0	7.5
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	17.1	17.1		17.1	17.1	17.1		34.9	27.7	27.7	39.7	35.6
Actuated g/C Ratio	0.25	0.25		0.25	0.25	0.25		0.51	0.40	0.40	0.58	0.52
v/c Ratio	0.01	0.00		0.82	0.00	0.83		0.03	0.59	0.12	0.36	0.44
Control Delay (s/veh)	18.8	15.7		45.4	18.6	23.1		7.1	20.0	1.9	9.8	12.7
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	18.8	15.7		45.4	18.6	23.1		7.1	20.0	1.9	9.8	12.7
LOS	B	B		D	B	C		A	C	A	A	B
Approach Delay (s/veh)		17.4			31.1				18.1			12.3
Approach LOS		B			C				B			B
Queue Length 50th (ft)	2	1		112	1	79		3	160	0	25	101
Queue Length 95th (ft)	9	7		#226	7	#242		10	222	14	48	201
Internal Link Dist (ft)		514			3045				380			985
Turn Bay Length (ft)	30			210		210		320		250	285	
Base Capacity (vph)	377	463		376	499	648		472	1420	715	388	1827
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.01	0.01		0.76	0.01	0.80		0.03	0.60	0.13	0.35	0.44

Intersection Summary

Cycle Length: 69
 Actuated Cycle Length: 69
 Offset: 26 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated

Timings
2: Old Ranch Road & Voyager Parkway

Existing Traffic Conditions
AM Peak Traffic Hour



Lane Group	SBR
Lane Configurations	7
Traffic Volume (vph)	0
Future Volume (vph)	0
Satd. Flow (prot)	1863
Flt Permitted	
Satd. Flow (perm)	1863
Satd. Flow (RTOR)	
Lane Group Flow (vph)	0
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	10.5
Total Split (s)	31.0
Total Split (%)	44.9%
Yellow Time (s)	5.5
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	7.5
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	C-Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay (s/veh)	
Queue Delay	
Total Delay (s/veh)	
LOS	
Approach Delay (s/veh)	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Timings
 2: Old Ranch Road & Voyager Parkway

Existing Traffic Conditions
 AM Peak Traffic Hour

Maximum v/c Ratio: 0.83

Intersection Signal Delay (s/veh): 20.0

Intersection LOS: B

Intersection Capacity Utilization 71.5%

ICU Level of Service C

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: Old Ranch Road & Voyager Parkway



HCM 7th TWSC
 1: Otero Avenue & Old Ranch Road

Existing Traffic Conditions
 PM Peak Traffic Hour

Intersection						
Int Delay, s/veh	0.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Vol, veh/h	659	3	24	273	3	33
Future Vol, veh/h	659	3	24	273	3	33
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	716	3	26	297	3	36























Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	720	0	1067 718
Stage 1	-	-	-	-	718 -
Stage 2	-	-	-	-	349 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	882	-	246 429
Stage 1	-	-	-	-	483 -
Stage 2	-	-	-	-	714 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	882	-	237 429
Mov Cap-2 Maneuver	-	-	-	-	237 -
Stage 1	-	-	-	-	483 -
Stage 2	-	-	-	-	689 -

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.74	14.92
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	402	-	-	145	-
HCM Lane V/C Ratio	0.097	-	-	0.03	-
HCM Control Delay (s/veh)	14.9	-	-	9.2	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Timings
2: Old Ranch Road & Voyager Parkway

Existing Traffic Conditions
PM Peak Traffic Hour

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	7	1	2	169	0	129	12	5	704	249	382	965
Future Volume (vph)	7	1	2	169	0	129	12	5	704	249	382	965
Satd. Flow (prot)	1770	1676	0	1770	1863	1583	0	1770	3539	1583	1770	3539
Flt Permitted	0.757			0.756				0.273			0.227	
Satd. Flow (perm)	1410	1676	0	1408	1863	1583	0	509	3539	1583	423	3539
Satd. Flow (RTOR)		2				317				271		
Lane Group Flow (vph)	8	3	0	184	0	140	0	18	765	271	415	1049
Turn Type	Perm	NA		Perm		Perm	custom	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4			8		8	5	2		2	6	
Detector Phase	4	4		8	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	3.0	3.0	4.0	3.0
Minimum Split (s)	10.5	10.5		10.5	10.5	10.5	9.0	9.0	10.5	10.5	9.0	10.5
Total Split (s)	25.0	25.0		25.0	25.0	25.0	13.0	13.0	31.0	31.0	13.0	31.0
Total Split (%)	36.2%	36.2%		36.2%	36.2%	36.2%	18.8%	18.8%	44.9%	44.9%	18.8%	44.9%
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	3.0	3.0	5.5	5.5	3.0	5.5
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5		5.0	7.5	7.5	5.0	7.5
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	13.8	13.8		13.8		13.8		31.8	23.5	23.5	43.0	38.9
Actuated g/C Ratio	0.20	0.20		0.20		0.20		0.46	0.34	0.34	0.62	0.56
v/c Ratio	0.02	0.00		0.65		0.24		0.05	0.63	0.37	0.81	0.52
Control Delay (s/veh)	19.8	15.6		35.8		1.0		6.9	22.0	4.1	27.1	12.7
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	19.8	15.6		35.8		1.0		6.9	22.0	4.1	27.1	12.7
LOS	B	B		D		A		A	C	A	C	B
Approach Delay (s/veh)		18.7			20.8				17.2			16.8
Approach LOS		B			C				B			B
Queue Length 50th (ft)	3	0		72		0		3	141	0	74	121
Queue Length 95th (ft)	12	6		123		0		11	197	45	#290	#283
Internal Link Dist (ft)		514			3045				380			985
Turn Bay Length (ft)	30			210		210		320		250	285	
Base Capacity (vph)	378	450		377		656		397	1205	717	510	1994
Starvation Cap Reductn	0	0		0		0		0	0	0	0	0
Spillback Cap Reductn	0	0		0		0		0	0	0	0	0
Storage Cap Reductn	0	0		0		0		0	0	0	0	0
Reduced v/c Ratio	0.02	0.01		0.49		0.21		0.05	0.63	0.38	0.81	0.53

Intersection Summary

Cycle Length: 69

Actuated Cycle Length: 69

Offset: 26 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Timings
2: Old Ranch Road & Voyager Parkway

Existing Traffic Conditions
PM Peak Traffic Hour



Lane Group	SBR
Lane Configurations	7
Traffic Volume (vph)	4
Future Volume (vph)	4
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1583
Satd. Flow (RTOR)	134
Lane Group Flow (vph)	4
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	10.5
Total Split (s)	31.0
Total Split (%)	44.9%
Yellow Time (s)	5.5
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	7.5
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	C-Max
Act Effct Green (s)	38.9
Actuated g/C Ratio	0.56
v/c Ratio	0.00
Control Delay (s/veh)	0.0
Queue Delay	0.0
Total Delay (s/veh)	0.0
LOS	A
Approach Delay (s/veh)	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	170
Base Capacity (vph)	950
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.00
Intersection Summary	

Timings
 2: Old Ranch Road & Voyager Parkway

Existing Traffic Conditions
 PM Peak Traffic Hour

Maximum v/c Ratio: 0.81

Intersection Signal Delay (s/veh): 17.4

Intersection LOS: B

Intersection Capacity Utilization 72.5%

ICU Level of Service C

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: Old Ranch Road & Voyager Parkway



HCM 7th TWSC
 1: Otero Avenue & Old Ranch Road

Background Traffic Conditions
 AM Peak Traffic Hour - Year 2026

Intersection						
Int Delay, s/veh	1.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	229	8	83	805	5	86
Future Vol, veh/h	229	8	83	805	5	86
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	249	9	90	875	5	93























Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	258	0	1309
Stage 1	-	-	-	-	253
Stage 2	-	-	-	-	1055
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	-	-	1307	-	176
Stage 1	-	-	-	-	789
Stage 2	-	-	-	-	335
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1307	-	152
Mov Cap-2 Maneuver	-	-	-	-	152
Stage 1	-	-	-	-	789
Stage 2	-	-	-	-	290

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.74	11.66
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	639	-	-	168	-
HCM Lane V/C Ratio	0.155	-	-	0.069	-
HCM Control Delay (s/veh)	11.7	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.2	-

Timings
2: Old Ranch Road & Voyager Parkway

Background Traffic Conditions
AM Peak Traffic Hour - Year 2026

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	5	2	2	275	3	496	11	3	810	88	130	773
Future Volume (vph)	5	2	2	275	3	496	11	3	810	88	130	773
Satd. Flow (prot)	1770	1723	0	1770	1863	1583	0	1770	3539	1583	1770	3539
Flt Permitted	0.756			0.755				0.336			0.197	
Satd. Flow (perm)	1408	1723	0	1406	1863	1583	0	626	3539	1583	367	3539
Satd. Flow (RTOR)		2				302				134		
Lane Group Flow (vph)	5	4	0	299	3	539	0	15	880	96	141	840
Turn Type	Perm	NA		Perm	NA	Perm	custom	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4			8		8	5	2		2	6	
Detector Phase	4	4		8	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	3.0	3.0	4.0	3.0
Minimum Split (s)	10.5	10.5		10.5	10.5	10.5	9.0	9.0	10.5	10.5	9.0	10.5
Total Split (s)	25.0	25.0		25.0	25.0	25.0	13.0	13.0	31.0	31.0	13.0	31.0
Total Split (%)	36.2%	36.2%		36.2%	36.2%	36.2%	18.8%	18.8%	44.9%	44.9%	18.8%	44.9%
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	3.0	3.0	5.5	5.5	3.0	5.5
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5		5.0	7.5	7.5	5.0	7.5
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	17.4	17.4		17.4	17.4	17.4		34.5	27.3	27.3	39.4	35.3
Actuated g/C Ratio	0.25	0.25		0.25	0.25	0.25		0.50	0.40	0.40	0.57	0.51
v/c Ratio	0.01	0.00		0.84	0.00	0.86		0.03	0.62	0.13	0.39	0.46
Control Delay (s/veh)	18.8	15.7		47.4	18.6	26.5		7.1	20.7	2.1	10.4	13.0
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	18.8	15.7		47.4	18.6	26.5		7.1	20.7	2.1	10.4	13.0
LOS	B	B		D	B	C		A	C	A	B	B
Approach Delay (s/veh)		17.4			34.0				18.8			12.7
Approach LOS		B			C				B			B
Queue Length 50th (ft)	2	1		117	1	92		3	168	0	26	106
Queue Length 95th (ft)	9	7		#240	7	#268		10	233	16	50	211
Internal Link Dist (ft)		514			3045				380			985
Turn Bay Length (ft)	30			210		210		320		250	285	
Base Capacity (vph)	377	463		376	499	645		461	1402	708	372	1811
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.01	0.01		0.80	0.01	0.84		0.03	0.63	0.14	0.38	0.46

Intersection Summary

Cycle Length: 69

Actuated Cycle Length: 69

Offset: 26 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Timings
2: Old Ranch Road & Voyager Parkway

Background Traffic Conditions
AM Peak Traffic Hour - Year 2026



Lane Group	SBR
Lane Configurations	7
Traffic Volume (vph)	0
Future Volume (vph)	0
Satd. Flow (prot)	1863
Flt Permitted	
Satd. Flow (perm)	1863
Satd. Flow (RTOR)	
Lane Group Flow (vph)	0
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	10.5
Total Split (s)	31.0
Total Split (%)	44.9%
Yellow Time (s)	5.5
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	7.5
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	C-Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay (s/veh)	
Queue Delay	
Total Delay (s/veh)	
LOS	
Approach Delay (s/veh)	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Timings

2: Old Ranch Road & Voyager Parkway

Background Traffic Conditions

AM Peak Traffic Hour - Year 2026

Maximum v/c Ratio: 0.86

Intersection Signal Delay (s/veh): 21.2

Intersection LOS: C

Intersection Capacity Utilization 73.5%

ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: Old Ranch Road & Voyager Parkway



HCM 7th TWSC
1: Otero Avenue & Old Ranch Road

Background Traffic Conditions
PM Peak Traffic Hour - Year 2026

Intersection						
Int Delay, s/veh	0.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Vol, veh/h	685	3	25	284	3	34
Future Vol, veh/h	685	3	25	284	3	34
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	745	3	27	309	3	37

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	748	0	1109
Stage 1	-	-	-	-	746
Stage 2	-	-	-	-	363
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	-	-	861	-	232
Stage 1	-	-	-	-	469
Stage 2	-	-	-	-	704
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	861	-	223
Mov Cap-2 Maneuver	-	-	-	-	223
Stage 1	-	-	-	-	469
Stage 2	-	-	-	-	677

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.75	15.39
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	387	-	-	146	-
HCM Lane V/C Ratio	0.104	-	-	0.032	-
HCM Control Delay (s/veh)	15.4	-	-	9.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

Timings
2: Old Ranch Road & Voyager Parkway

Background Traffic Conditions
PM Peak Traffic Hour - Year 2026



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	7	1	2	176	0	134	12	5	732	259	397	1004
Future Volume (vph)	7	1	2	176	0	134	12	5	732	259	397	1004
Satd. Flow (prot)	1770	1676	0	1770	1863	1583	0	1770	3539	1583	1770	3539
Flt Permitted	0.757			0.756				0.262			0.212	
Satd. Flow (perm)	1410	1676	0	1408	1863	1583	0	488	3539	1583	395	3539
Satd. Flow (RTOR)		2				312				282		
Lane Group Flow (vph)	8	3	0	191	0	146	0	18	796	282	432	1091
Turn Type	Perm	NA		Perm		Perm	custom	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4			8		8	5	2		2	6	
Detector Phase	4	4		8	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	3.0	3.0	4.0	3.0
Minimum Split (s)	10.5	10.5		10.5	10.5	10.5	9.0	9.0	10.5	10.5	9.0	10.5
Total Split (s)	25.0	25.0		25.0	25.0	25.0	13.0	13.0	31.0	31.0	13.0	31.0
Total Split (%)	36.2%	36.2%		36.2%	36.2%	36.2%	18.8%	18.8%	44.9%	44.9%	18.8%	44.9%
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	3.0	3.0	5.5	5.5	3.0	5.5
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5		5.0	7.5	7.5	5.0	7.5
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	14.1	14.1		14.1		14.1		31.8	23.5	23.5	42.8	38.7
Actuated g/C Ratio	0.20	0.20		0.20		0.20		0.46	0.34	0.34	0.62	0.56
v/c Ratio	0.02	0.00		0.66		0.25		0.05	0.66	0.38	0.87	0.55
Control Delay (s/veh)	19.7	15.6		36.3		1.0		7.0	22.5	4.1	35.3	13.3
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	19.7	15.6		36.3		1.0		7.0	22.5	4.1	35.3	13.3
LOS	B	B		D		A		A	C	A	D	B
Approach Delay (s/veh)		18.6			21.1				17.6			19.6
Approach LOS		B			C				B			B
Queue Length 50th (ft)	3	0		75		0		3	148	0	90	130
Queue Length 95th (ft)	12	6		128		0		11	206	46	#319	#328
Internal Link Dist (ft)		514			3045				380			985
Turn Bay Length (ft)	30			210		210		320		250	285	
Base Capacity (vph)	378	450		377		652		389	1205	725	492	1983
Starvation Cap Reductn	0	0		0		0		0	0	0	0	0
Spillback Cap Reductn	0	0		0		0		0	0	0	0	0
Storage Cap Reductn	0	0		0		0		0	0	0	0	0
Reduced v/c Ratio	0.02	0.01		0.51		0.22		0.05	0.66	0.39	0.88	0.55

Intersection Summary
 Cycle Length: 69
 Actuated Cycle Length: 69
 Offset: 26 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated

Timings
2: Old Ranch Road & Voyager Parkway

Background Traffic Conditions
PM Peak Traffic Hour - Year 2026



Lane Group	SBR
Lane Configurations	7
Traffic Volume (vph)	4
Future Volume (vph)	4
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1583
Satd. Flow (RTOR)	134
Lane Group Flow (vph)	4
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	10.5
Total Split (s)	31.0
Total Split (%)	44.9%
Yellow Time (s)	5.5
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	7.5
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	C-Max
Act Effct Green (s)	38.7
Actuated g/C Ratio	0.56
v/c Ratio	0.00
Control Delay (s/veh)	0.0
Queue Delay	0.0
Total Delay (s/veh)	0.0
LOS	A
Approach Delay (s/veh)	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	170
Base Capacity (vph)	946
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.00
Intersection Summary	

Timings

2: Old Ranch Road & Voyager Parkway

Background Traffic Conditions

PM Peak Traffic Hour - Year 2026

Maximum v/c Ratio: 0.88

Intersection Signal Delay (s/veh): 19.0

Intersection LOS: B

Intersection Capacity Utilization 74.5%

ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: Old Ranch Road & Voyager Parkway



HCM 7th TWSC
1: Otero Avenue & Old Ranch Road

Background Traffic Conditions
AM Peak Traffic Hour - Year 2044

Intersection						
Int Delay, s/veh	2.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Vol, veh/h	330	12	120	1161	8	125
Future Vol, veh/h	330	12	120	1161	8	125
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	359	13	130	1262	9	136

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	372	0	1888 365
Stage 1	-	-	-	-	365 -
Stage 2	-	-	-	-	1523 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1187	-	77 680
Stage 1	-	-	-	-	702 -
Stage 2	-	-	-	-	199 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1187	-	49 680
Mov Cap-2 Maneuver	-	-	-	-	49 -
Stage 1	-	-	-	-	702 -
Stage 2	-	-	-	-	126 -

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.79	20
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	383	-	-	169	-
HCM Lane V/C Ratio	0.378	-	-	0.11	-
HCM Control Delay (s/veh)	20	-	-	8.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.7	-	-	0.4	-

Timings
2: Old Ranch Road & Voyager Parkway

Background Traffic Conditions
AM Peak Traffic Hour - Year 2044



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	8	3	3	396	5	716	17	5	1169	128	188	1115
Future Volume (vph)	8	3	3	396	5	716	17	5	1169	128	188	1115
Satd. Flow (prot)	1770	1723	0	1770	1863	1583	0	1770	3539	1583	1770	3539
Flt Permitted	0.754			0.754				0.170			0.154	
Satd. Flow (perm)	1405	1723	0	1405	1863	1583	0	317	3539	1583	287	3539
Satd. Flow (RTOR)		3				164				139		
Lane Group Flow (vph)	9	6	0	430	5	778	0	23	1271	139	204	1212
Turn Type	Perm	NA		Perm	NA	Perm	custom	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4			8		8	5	2		2	6	
Detector Phase	4	4		8	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	3.0	3.0	4.0	3.0
Minimum Split (s)	10.5	10.5		10.5	10.5	10.5	9.0	9.0	10.5	10.5	9.0	10.5
Total Split (s)	29.0	29.0		29.0	29.0	29.0	9.0	9.0	31.0	31.0	9.0	31.0
Total Split (%)	42.0%	42.0%		42.0%	42.0%	42.0%	13.0%	13.0%	44.9%	44.9%	13.0%	44.9%
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	3.0	3.0	5.5	5.5	3.0	5.5
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5		5.0	7.5	7.5	5.0	7.5
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	22.5	22.5		22.5	22.5	22.5		30.0	23.5	23.5	33.0	28.9
Actuated g/C Ratio	0.33	0.33		0.33	0.33	0.33		0.43	0.34	0.34	0.48	0.42
v/c Ratio	0.01	0.01		0.93	0.00	1.24		0.10	1.05	0.22	0.91	0.81
Control Delay (s/veh)	16.0	13.0		55.1	15.8	143.5		9.7	66.4	4.3	60.8	26.1
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	16.0	13.0		55.1	15.8	143.5		9.7	66.4	4.3	60.8	26.1
LOS	B	B		E	B	F		A	E	A	E	C
Approach Delay (s/veh)		14.8			111.7				59.5			31.1
Approach LOS		B			F				E			C
Queue Length 50th (ft)	3	1		175	1	~371		5	~317	0	45	205
Queue Length 95th (ft)	12	8		#342	8	#576		15	#438	33	#143	#408
Internal Link Dist (ft)		514			3045				380			985
Turn Bay Length (ft)	30			210		210		320		250	285	
Base Capacity (vph)	458	563		458	607	626		222	1205	630	223	1482
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.02	0.01		0.94	0.01	1.24		0.10	1.05	0.22	0.91	0.82

Intersection Summary

Cycle Length: 69

Actuated Cycle Length: 69

Offset: 26 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 150

Control Type: Actuated-Coordinated

Timings
2: Old Ranch Road & Voyager Parkway

Background Traffic Conditions
AM Peak Traffic Hour - Year 2044



Lane Group	SBR
Lane Configurations	7
Traffic Volume (vph)	0
Future Volume (vph)	0
Satd. Flow (prot)	1863
Flt Permitted	
Satd. Flow (perm)	1863
Satd. Flow (RTOR)	
Lane Group Flow (vph)	0
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	10.5
Total Split (s)	31.0
Total Split (%)	44.9%
Yellow Time (s)	5.5
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	7.5
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	C-Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay (s/veh)	
Queue Delay	
Total Delay (s/veh)	
LOS	
Approach Delay (s/veh)	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Timings

2: Old Ranch Road & Voyager Parkway

Background Traffic Conditions
AM Peak Traffic Hour - Year 2044

Maximum v/c Ratio: 1.24

Intersection Signal Delay (s/veh): 65.0

Intersection LOS: E

Intersection Capacity Utilization 97.1%

ICU Level of Service F

Analysis Period (min) 15

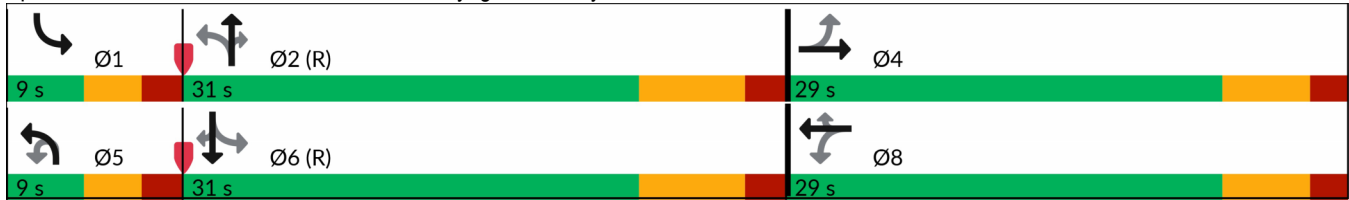
~ Volume exceeds capacity, queue is theoretically infinite.

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: 2: Old Ranch Road & Voyager Parkway



HCM 7th TWSC
1: Otero Avenue & Old Ranch Road

Background Traffic Conditions
PM Peak Traffic Hour - Year 2044

Intersection						
Int Delay, s/veh	1.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↑	
Traffic Vol, veh/h	989	5	36	410	5	50
Future Vol, veh/h	989	5	36	410	5	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1075	5	39	446	5	54

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	1080	0	1602
Stage 1	-	-	-	-	1078
Stage 2	-	-	-	-	524
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	-	-	645	-	116
Stage 1	-	-	-	-	327
Stage 2	-	-	-	-	594
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	645	-	107
Mov Cap-2 Maneuver	-	-	-	-	107
Stage 1	-	-	-	-	327
Stage 2	-	-	-	-	546

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.88	25.55
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	234	-	-	145	-
HCM Lane V/C Ratio	0.255	-	-	0.061	-
HCM Control Delay (s/veh)	25.5	-	-	10.9	0
HCM Lane LOS	D	-	-	B	A
HCM 95th %tile Q(veh)	1	-	-	0.2	-

Timings
2: Old Ranch Road & Voyager Parkway

Background Traffic Conditions
PM Peak Traffic Hour - Year 2044



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	11	2	3	254	0	194	18	8	1056	374	573	1448
Future Volume (vph)	11	2	3	254	0	194	18	8	1056	374	573	1448
Satd. Flow (prot)	1770	1695	0	1770	1863	1583	0	1770	3539	1583	1770	3539
Flt Permitted	0.757			0.754				0.163			0.136	
Satd. Flow (perm)	1410	1695	0	1405	1863	1583	0	304	3539	1583	253	3539
Satd. Flow (RTOR)		3				303				407		
Lane Group Flow (vph)	12	5	0	276	0	211	0	29	1148	407	623	1574
Turn Type	Perm	NA		Perm		Perm	custom	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4			8		8	5	2		2	6	
Detector Phase	4	4		8	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	3.0	3.0	4.0	3.0
Minimum Split (s)	10.5	10.5		10.5	10.5	10.5	9.0	9.0	10.5	10.5	9.0	10.5
Total Split (s)	18.0	18.0		18.0	18.0	18.0	9.0	9.0	32.0	32.0	19.0	42.0
Total Split (%)	26.1%	26.1%		26.1%	26.1%	26.1%	13.0%	13.0%	46.4%	46.4%	27.5%	60.9%
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	3.0	3.0	5.5	5.5	3.0	5.5
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5		5.0	7.5	7.5	5.0	7.5
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	11.5	11.5		11.5		11.5		31.0	24.5	24.5	46.0	39.9
Actuated g/C Ratio	0.17	0.17		0.17		0.17		0.45	0.36	0.36	0.67	0.58
v/c Ratio	0.05	0.01		1.17		0.40		0.13	0.91	0.49	1.30	0.76
Control Delay (s/veh)	24.9	19.4		146.6		3.4		7.1	34.3	4.2	174.2	15.9
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	24.9	19.4		146.6		3.4		7.1	34.3	4.2	174.2	15.9
LOS	C	B		F		A		A	C	A	F	B
Approach Delay (s/veh)		23.3			84.6				26.1			60.6
Approach LOS		C			F				C			E
Queue Length 50th (ft)	4	1		~144		0		4	239	0	~295	202
Queue Length 95th (ft)	18	10		#279		16		10	#365	53	#486	#454
Internal Link Dist (ft)		514			3045				380			985
Turn Bay Length (ft)	30			210		210		320		250	285	
Base Capacity (vph)	235	285		234		516		221	1256	824	476	2046
Starvation Cap Reductn	0	0		0		0		0	0	0	0	0
Spillback Cap Reductn	0	0		0		0		0	0	0	0	0
Storage Cap Reductn	0	0		0		0		0	0	0	0	0
Reduced v/c Ratio	0.05	0.02		1.18		0.41		0.13	0.91	0.49	1.31	0.77

Intersection Summary

Cycle Length: 69

Actuated Cycle Length: 69

Offset: 26 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Timings
2: Old Ranch Road & Voyager Parkway

Background Traffic Conditions
PM Peak Traffic Hour - Year 2044



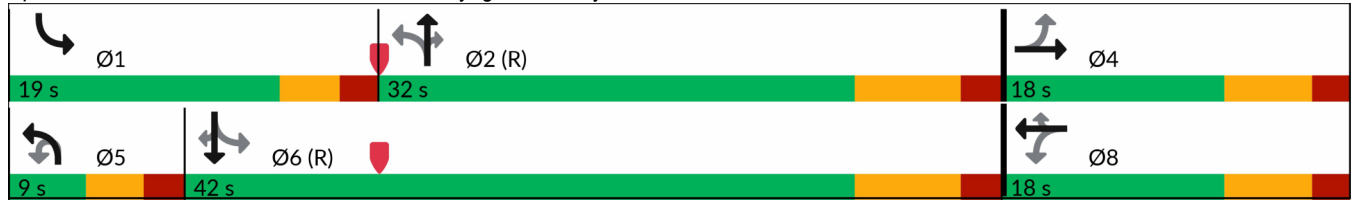
Lane Group	SBR
Lane Configurations	7
Traffic Volume (vph)	6
Future Volume (vph)	6
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1583
Satd. Flow (RTOR)	134
Lane Group Flow (vph)	7
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	10.5
Total Split (s)	42.0
Total Split (%)	60.9%
Yellow Time (s)	5.5
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	7.5
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	C-Max
Act Effct Green (s)	39.9
Actuated g/C Ratio	0.58
v/c Ratio	0.00
Control Delay (s/veh)	0.0
Queue Delay	0.0
Total Delay (s/veh)	0.0
LOS	A
Approach Delay (s/veh)	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	170
Base Capacity (vph)	971
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.01
Intersection Summary	

Timings
 2: Old Ranch Road & Voyager Parkway

Background Traffic Conditions
 PM Peak Traffic Hour - Year 2044

Maximum v/c Ratio: 1.31	
Intersection Signal Delay (s/veh): 50.5	Intersection LOS: D
Intersection Capacity Utilization 97.5%	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: 2: Old Ranch Road & Voyager Parkway



HCM 7th TWSC
 1: Otero Avenue/Site Access & Old Ranch Road

Total Traffic Conditions
 AM Peak Traffic Hour - Year 2026

Intersection												
Int Delay, s/veh	2.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷			↕			↕	
Traffic Vol, veh/h	15	229	8	83	805	5	5	0	86	15	0	46
Future Vol, veh/h	15	229	8	83	805	5	5	0	86	15	0	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	155	-	-	155	-	-	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	16	249	9	90	875	5	5	0	93	16	0	50

Major/Minor	Major1		Major2		Minor1			Minor2				
Conflicting Flow All	880	0	0	258	0	0	1341	1347	253	1340	1348	878
Stage 1	-	-	-	-	-	-	286	286	-	1058	1058	-
Stage 2	-	-	-	-	-	-	1055	1061	-	282	290	-
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	768	-	-	1307	-	-	129	151	785	130	151	347
Stage 1	-	-	-	-	-	-	721	675	-	272	301	-
Stage 2	-	-	-	-	-	-	273	301	-	725	672	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	768	-	-	1307	-	-	101	138	785	104	137	347
Mov Cap-2 Maneuver	-	-	-	-	-	-	101	138	-	104	137	-
Stage 1	-	-	-	-	-	-	706	661	-	253	281	-
Stage 2	-	-	-	-	-	-	217	280	-	625	658	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s/v	0.58		0.74		12.6		28.18	
HCM LOS					B		D	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	572	768	-	-	1307	-	-	221
HCM Lane V/C Ratio	0.173	0.021	-	-	0.069	-	-	0.301
HCM Control Delay (s/veh)	12.6	9.8	-	-	8	-	-	28.2
HCM Lane LOS	B	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	0.6	0.1	-	-	0.2	-	-	1.2

Timings
2: Old Ranch Road & Voyager Parkway

Total Traffic Conditions
AM Peak Traffic Hour - Year 2026



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	5	2	2	294	3	523	11	3	810	94	139	773
Future Volume (vph)	5	2	2	294	3	523	11	3	810	94	139	773
Satd. Flow (prot)	1770	1723	0	1770	1863	1583	0	1770	3539	1583	1770	3539
Flt Permitted	0.756			0.755				0.336			0.194	
Satd. Flow (perm)	1408	1723	0	1406	1863	1583	0	626	3539	1583	361	3539
Satd. Flow (RTOR)		2				302				134		
Lane Group Flow (vph)	5	4	0	320	3	568	0	15	880	102	151	840
Turn Type	Perm	NA		Perm	NA	Perm	custom	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4			8		8	5	2		2	6	
Detector Phase	4	4		8	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	3.0	3.0	4.0	3.0
Minimum Split (s)	10.5	10.5		10.5	10.5	10.5	9.0	9.0	10.5	10.5	9.0	10.5
Total Split (s)	25.0	25.0		25.0	25.0	25.0	13.0	13.0	31.0	31.0	13.0	31.0
Total Split (%)	36.2%	36.2%		36.2%	36.2%	36.2%	18.8%	18.8%	44.9%	44.9%	18.8%	44.9%
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	3.0	3.0	5.5	5.5	3.0	5.5
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5		5.0	7.5	7.5	5.0	7.5
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	17.7	17.7		17.7	17.7	17.7		34.2	27.0	27.0	39.1	35.0
Actuated g/C Ratio	0.26	0.26		0.26	0.26	0.26		0.50	0.39	0.39	0.57	0.51
v/c Ratio	0.01	0.00		0.88	0.00	0.90		0.03	0.63	0.14	0.42	0.46
Control Delay (s/veh)	18.8	15.7		53.0	18.6	31.5		7.2	20.9	2.5	10.9	13.2
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	18.8	15.7		53.0	18.6	31.5		7.2	20.9	2.5	10.9	13.2
LOS	B	B		D	B	C		A	C	A	B	B
Approach Delay (s/veh)		17.4			39.3				18.9			12.9
Approach LOS		B			D				B			B
Queue Length 50th (ft)	2	1		128	1	109		3	168	0	28	106
Queue Length 95th (ft)	9	7		#263	7	#298		10	233	19	53	211
Internal Link Dist (ft)		514			3045				380			985
Turn Bay Length (ft)	30			210		210		320		250	285	
Base Capacity (vph)	377	463		376	499	645		458	1384	701	368	1795
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.01	0.01		0.85	0.01	0.88		0.03	0.64	0.15	0.41	0.47

Intersection Summary

Cycle Length: 69
 Actuated Cycle Length: 69
 Offset: 26 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated

Timings
2: Old Ranch Road & Voyager Parkway

Total Traffic Conditions
AM Peak Traffic Hour - Year 2026



Lane Group	SBR
Lane Configurations	7
Traffic Volume (vph)	0
Future Volume (vph)	0
Satd. Flow (prot)	1863
Flt Permitted	
Satd. Flow (perm)	1863
Satd. Flow (RTOR)	
Lane Group Flow (vph)	0
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	10.5
Total Split (s)	31.0
Total Split (%)	44.9%
Yellow Time (s)	5.5
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	7.5
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	C-Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay (s/veh)	
Queue Delay	
Total Delay (s/veh)	
LOS	
Approach Delay (s/veh)	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Timings
2: Old Ranch Road & Voyager Parkway

Total Traffic Conditions
 AM Peak Traffic Hour - Year 2026

Maximum v/c Ratio: 0.90

Intersection Signal Delay (s/veh): 23.1

Intersection LOS: C

Intersection Capacity Utilization 75.2%

ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: Old Ranch Road & Voyager Parkway



HCM 7th TWSC
 1: Otero Avenue/Site Access & Old Ranch Road

Total Traffic Conditions
 PM Peak Traffic Hour - Year 2026

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷			↕			↕	
Traffic Vol, veh/h	43	685	3	25	284	14	3	0	34	10	0	30
Future Vol, veh/h	43	685	3	25	284	14	3	0	34	10	0	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	155	-	-	155	-	-	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	47	745	3	27	309	15	3	0	37	11	0	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	324	0	0	748	0	0	1203	1218	746	1209	1212	316
Stage 1	-	-	-	-	-	-	840	840	-	371	371	-
Stage 2	-	-	-	-	-	-	363	378	-	838	841	-
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	1236	-	-	861	-	-	161	181	413	160	182	724
Stage 1	-	-	-	-	-	-	360	381	-	650	620	-
Stage 2	-	-	-	-	-	-	656	615	-	361	380	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1236	-	-	861	-	-	143	168	413	136	170	724
Mov Cap-2 Maneuver	-	-	-	-	-	-	143	168	-	136	170	-
Stage 1	-	-	-	-	-	-	346	367	-	629	600	-
Stage 2	-	-	-	-	-	-	606	596	-	316	366	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.47	0.72	16.3	16.85
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	359	1236	-	-	861	-	-	347
HCM Lane V/C Ratio	0.112	0.038	-	-	0.032	-	-	0.125
HCM Control Delay (s/veh)	16.3	8	-	-	9.3	-	-	16.8
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0.1	-	-	0.4

Timings
2: Old Ranch Road & Voyager Parkway

Total Traffic Conditions
PM Peak Traffic Hour - Year 2026



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	7	1	2	188	0	152	12	5	732	276	423	1004
Future Volume (vph)	7	1	2	188	0	152	12	5	732	276	423	1004
Satd. Flow (prot)	1770	1676	0	1770	1863	1583	0	1770	3539	1583	1770	3539
Flt Permitted	0.757			0.756				0.262			0.212	
Satd. Flow (perm)	1410	1676	0	1408	1863	1583	0	488	3539	1583	395	3539
Satd. Flow (RTOR)		2				312				300		
Lane Group Flow (vph)	8	3	0	204	0	165	0	18	796	300	460	1091
Turn Type	Perm	NA		Perm		Perm	custom	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4			8		8	5	2		2	6	
Detector Phase	4	4		8	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	3.0	3.0	4.0	3.0
Minimum Split (s)	10.5	10.5		10.5	10.5	10.5	9.0	9.0	10.5	10.5	9.0	10.5
Total Split (s)	25.0	25.0		25.0	25.0	25.0	13.0	13.0	31.0	31.0	13.0	31.0
Total Split (%)	36.2%	36.2%		36.2%	36.2%	36.2%	18.8%	18.8%	44.9%	44.9%	18.8%	44.9%
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	3.0	3.0	5.5	5.5	3.0	5.5
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5		5.0	7.5	7.5	5.0	7.5
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	14.5	14.5		14.5		14.5		31.8	23.5	23.5	42.3	38.2
Actuated g/C Ratio	0.21	0.21		0.21		0.21		0.46	0.34	0.34	0.61	0.55
v/c Ratio	0.02	0.00		0.68		0.28		0.05	0.66	0.40	0.95	0.55
Control Delay (s/veh)	19.5	15.3		36.9		1.2		7.0	22.5	4.1	49.6	13.7
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	19.5	15.3		36.9		1.2		7.0	22.5	4.1	49.6	13.7
LOS	B	B		D		A		A	C	A	D	B
Approach Delay (s/veh)		18.4			21.0				17.4			24.3
Approach LOS		B			C				B			C
Queue Length 50th (ft)	3	0		79		0		3	148	0	108	133
Queue Length 95th (ft)	12	6		137		0		11	206	47	#350	#328
Internal Link Dist (ft)		514			3045				380			985
Turn Bay Length (ft)	30			210		210		320		250	285	
Base Capacity (vph)	378	450		377		652		389	1205	736	480	1958
Starvation Cap Reductn	0	0		0		0		0	0	0	0	0
Spillback Cap Reductn	0	0		0		0		0	0	0	0	0
Storage Cap Reductn	0	0		0		0		0	0	0	0	0
Reduced v/c Ratio	0.02	0.01		0.54		0.25		0.05	0.66	0.41	0.96	0.56

Intersection Summary

Cycle Length: 69

Actuated Cycle Length: 69

Offset: 26 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Timings
2: Old Ranch Road & Voyager Parkway

Total Traffic Conditions
PM Peak Traffic Hour - Year 2026



Lane Group	SBR
Lane Configurations	7
Traffic Volume (vph)	4
Future Volume (vph)	4
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1583
Satd. Flow (RTOR)	134
Lane Group Flow (vph)	4
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	10.5
Total Split (s)	31.0
Total Split (%)	44.9%
Yellow Time (s)	5.5
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	7.5
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	C-Max
Act Effct Green (s)	38.2
Actuated g/C Ratio	0.55
v/c Ratio	0.00
Control Delay (s/veh)	0.0
Queue Delay	0.0
Total Delay (s/veh)	0.0
LOS	A
Approach Delay (s/veh)	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	170
Base Capacity (vph)	935
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.00
Intersection Summary	

Timings
 2: Old Ranch Road & Voyager Parkway

Total Traffic Conditions
 PM Peak Traffic Hour - Year 2026

Maximum v/c Ratio: 0.96

Intersection Signal Delay (s/veh): 21.3

Intersection LOS: C

Intersection Capacity Utilization 76.6%

ICU Level of Service D

Analysis Period (min) 15

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

Queue shown is maximum after two cycles.

Splits and Phases: 2: Old Ranch Road & Voyager Parkway



HCM 7th TWSC
 1: Otero Avenue/Site Access & Old Ranch Road

Total Traffic Conditions
 AM Peak Traffic Hour - Year 2044

Intersection												
Int Delay, s/veh	6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷			↕			↕	
Traffic Vol, veh/h	15	330	12	120	1161	5	8	0	125	15	0	46
Future Vol, veh/h	15	330	12	120	1161	5	8	0	125	15	0	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	155	-	-	155	-	-	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	16	359	13	130	1262	5	9	0	136	16	0	50

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	1267	0	0	372	0	0	1921	1926	365	1917	1930	1265
Stage 1	-	-	-	-	-	-	398	398	-	1526	1526	-
Stage 2	-	-	-	-	-	-	1523	1528	-	391	404	-
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	548	-	-	1187	-	-	51	67	680	51	66	207
Stage 1	-	-	-	-	-	-	628	603	-	147	180	-
Stage 2	-	-	-	-	-	-	148	179	-	633	599	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	548	-	-	1187	-	-	33	58	680	35	57	207
Mov Cap-2 Maneuver	-	-	-	-	-	-	33	58	-	35	57	-
Stage 1	-	-	-	-	-	-	609	585	-	131	160	-
Stage 2	-	-	-	-	-	-	100	160	-	492	581	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0.49	0.78	25.95	105.1
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	313	548	-	-	1187	-	-	94
HCM Lane V/C Ratio	0.461	0.03	-	-	0.11	-	-	0.704
HCM Control Delay (s/veh)	26	11.8	-	-	8.4	-	-	105.1
HCM Lane LOS	D	B	-	-	A	-	-	F
HCM 95th %tile Q(veh)	2.3	0.1	-	-	0.4	-	-	3.5

Timings
2: Old Ranch Road & Voyager Parkway

Total Traffic Conditions
AM Peak Traffic Hour - Year 2044



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	8	3	3	415	5	743	17	5	1169	134	197	1115
Future Volume (vph)	8	3	3	415	5	743	17	5	1169	134	197	1115
Satd. Flow (prot)	1770	1723	0	1770	1863	1583	0	1770	3539	1583	1770	3539
Flt Permitted	0.754			0.754				0.178			0.161	
Satd. Flow (perm)	1405	1723	0	1405	1863	1583	0	332	3539	1583	300	3539
Satd. Flow (RTOR)		3				169				146		
Lane Group Flow (vph)	9	6	0	451	5	808	0	23	1271	146	214	1212
Turn Type	Perm	NA		Perm	NA	Perm	custom	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4			8		8	5	2		2	6	
Detector Phase	4	4		8	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	3.0	3.0	4.0	3.0
Minimum Split (s)	10.5	10.5		10.5	10.5	10.5	9.0	9.0	10.5	10.5	9.0	10.5
Total Split (s)	30.0	30.0		30.0	30.0	30.0	9.0	9.0	30.0	30.0	9.0	30.0
Total Split (%)	43.5%	43.5%		43.5%	43.5%	43.5%	13.0%	13.0%	43.5%	43.5%	13.0%	43.5%
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	3.0	3.0	5.5	5.5	3.0	5.5
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5		5.0	7.5	7.5	5.0	7.5
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	23.5	23.5		23.5	23.5	23.5		29.0	22.5	22.5	32.0	27.9
Actuated g/C Ratio	0.34	0.34		0.34	0.34	0.34		0.42	0.33	0.33	0.46	0.40
v/c Ratio	0.01	0.01		0.94	0.00	1.24		0.10	1.10	0.23	0.95	0.84
Control Delay (s/veh)	15.3	12.5		54.6	15.2	142.9		10.2	83.8	4.5	69.5	28.5
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	15.3	12.5		54.6	15.2	142.9		10.2	83.8	4.5	69.5	28.5
LOS	B	B		D	B	F		B	F	A	E	C
Approach Delay (s/veh)		14.2			111.0				74.6			34.7
Approach LOS		B			F				E			C
Queue Length 50th (ft)	2	1		182	1	~387		5	~330	0	49	212
Queue Length 95th (ft)	12	8		#356	8	#595		15	#451	35	#156	#421
Internal Link Dist (ft)		514			3045				380			985
Turn Bay Length (ft)	30			210		210		320		250	285	
Base Capacity (vph)	478	588		478	634	650		222	1154	614	224	1431
Starvation Cap Reductn	0	0		0	0	0		0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	0
Reduced v/c Ratio	0.02	0.01		0.94	0.01	1.24		0.10	1.10	0.24	0.96	0.85

Intersection Summary

Cycle Length: 69

Actuated Cycle Length: 69

Offset: 26 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Timings
2: Old Ranch Road & Voyager Parkway

Total Traffic Conditions
AM Peak Traffic Hour - Year 2044

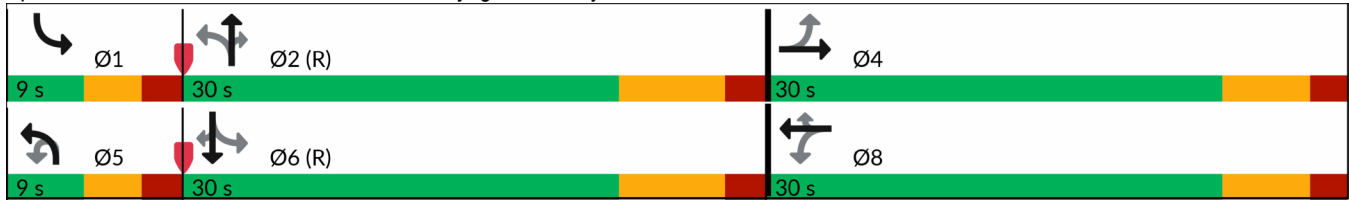
Lane Group	SBR
Lane Configurations	7
Traffic Volume (vph)	0
Future Volume (vph)	0
Satd. Flow (prot)	1863
Flt Permitted	
Satd. Flow (perm)	1863
Satd. Flow (RTOR)	
Lane Group Flow (vph)	0
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	10.5
Total Split (s)	30.0
Total Split (%)	43.5%
Yellow Time (s)	5.5
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	7.5
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	C-Max
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Control Delay (s/veh)	
Queue Delay	
Total Delay (s/veh)	
LOS	
Approach Delay (s/veh)	
Approach LOS	
Queue Length 50th (ft)	
Queue Length 95th (ft)	
Internal Link Dist (ft)	
Turn Bay Length (ft)	
Base Capacity (vph)	
Starvation Cap Reductn	
Spillback Cap Reductn	
Storage Cap Reductn	
Reduced v/c Ratio	
Intersection Summary	

Timings
 2: Old Ranch Road & Voyager Parkway

Total Traffic Conditions
 AM Peak Traffic Hour - Year 2044

Maximum v/c Ratio: 1.24	
Intersection Signal Delay (s/veh): 71.8	Intersection LOS: E
Intersection Capacity Utilization 98.7%	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: 2: Old Ranch Road & Voyager Parkway



HCM 7th TWSC
 1: Otero Avenue/Site Access & Old Ranch Road

Total Traffic Conditions
 PM Peak Traffic Hour - Year 2044

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷			↕			↕	
Traffic Vol, veh/h	43	989	5	36	410	14	5	0	50	10	0	30
Future Vol, veh/h	43	989	5	36	410	14	5	0	50	10	0	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	155	-	-	155	-	-	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	47	1075	5	39	446	15	5	0	54	11	0	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	461	0	0	1080	0	0	1695	1710	1078	1700	1705	453
Stage 1	-	-	-	-	-	-	1171	1171	-	532	532	-
Stage 2	-	-	-	-	-	-	524	539	-	1168	1174	-
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	1100	-	-	645	-	-	73	91	266	73	91	607
Stage 1	-	-	-	-	-	-	235	267	-	531	526	-
Stage 2	-	-	-	-	-	-	537	522	-	235	266	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1100	-	-	645	-	-	62	82	266	52	82	607
Mov Cap-2 Maneuver	-	-	-	-	-	-	62	82	-	52	82	-
Stage 1	-	-	-	-	-	-	225	255	-	499	494	-
Stage 2	-	-	-	-	-	-	477	490	-	179	254	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.35			0.86			29.62			34.31		
HCM LOS							D			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	205	1100	-	-	645	-	-	166
HCM Lane V/C Ratio	0.291	0.042	-	-	0.061	-	-	0.263
HCM Control Delay (s/veh)	29.6	8.4	-	-	10.9	-	-	34.3
HCM Lane LOS	D	A	-	-	B	-	-	D
HCM 95th %tile Q(veh)	1.2	0.1	-	-	0.2	-	-	1

Timings
2: Old Ranch Road & Voyager Parkway

Total Traffic Conditions
PM Peak Traffic Hour - Year 2044



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	11	2	3	266	0	212	18	8	1056	391	599	1448
Future Volume (vph)	11	2	3	266	0	212	18	8	1056	391	599	1448
Satd. Flow (prot)	1770	1695	0	1770	1863	1583	0	1770	3539	1583	1770	3539
Flt Permitted	0.757			0.754				0.178			0.145	
Satd. Flow (perm)	1410	1695	0	1405	1863	1583	0	332	3539	1583	270	3539
Satd. Flow (RTOR)		3				342				425		
Lane Group Flow (vph)	12	5	0	289	0	230	0	29	1148	425	651	1574
Turn Type	Perm	NA		Perm		Perm	custom	pm+pt	NA	Perm	pm+pt	NA
Protected Phases		4			8			5	2		1	6
Permitted Phases	4			8		8	5	2		2	6	
Detector Phase	4	4		8	8	8	5	5	2	2	1	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	3.0	3.0	4.0	3.0
Minimum Split (s)	10.5	10.5		10.5	10.5	10.5	9.0	9.0	10.5	10.5	9.0	10.5
Total Split (s)	19.0	19.0		19.0	19.0	19.0	9.0	9.0	30.0	30.0	20.0	41.0
Total Split (%)	27.5%	27.5%		27.5%	27.5%	27.5%	13.0%	13.0%	43.5%	43.5%	29.0%	59.4%
Yellow Time (s)	4.5	4.5		4.5	4.5	4.5	3.0	3.0	5.5	5.5	3.0	5.5
All-Red Time (s)	2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.5	6.5		6.5	6.5	6.5		5.0	7.5	7.5	5.0	7.5
Lead/Lag							Lead	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None		None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	12.5	12.5		12.5		12.5		29.0	22.5	22.5	45.0	38.9
Actuated g/C Ratio	0.18	0.18		0.18		0.18		0.42	0.33	0.33	0.65	0.56
v/c Ratio	0.04	0.01		1.13		0.40		0.13	0.99	0.52	1.29	0.78
Control Delay (s/veh)	24.0	18.6		129.5		2.7		7.7	50.6	4.8	168.4	17.3
Queue Delay	0.0	0.0		0.0		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay (s/veh)	24.0	18.6		129.5		2.7		7.7	50.6	4.8	168.4	17.3
LOS	C	B		F		A		A	D	A	F	B
Approach Delay (s/veh)		22.4			73.3				37.7			61.3
Approach LOS		C			E				D			E
Queue Length 50th (ft)	4	1		~146		0		4	252	0	~309	213
Queue Length 95th (ft)	17	9		#284		10		11	#389	56	#503	#466
Internal Link Dist (ft)		514			3045				380			985
Turn Bay Length (ft)	30			210		210		320		250	285	
Base Capacity (vph)	255	309		254		566		222	1154	802	502	1995
Starvation Cap Reductn	0	0		0		0		0	0	0	0	0
Spillback Cap Reductn	0	0		0		0		0	0	0	0	0
Storage Cap Reductn	0	0		0		0		0	0	0	0	0
Reduced v/c Ratio	0.05	0.02		1.14		0.41		0.13	0.99	0.53	1.30	0.79

Intersection Summary

Cycle Length: 69

Actuated Cycle Length: 69

Offset: 26 (38%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Timings
2: Old Ranch Road & Voyager Parkway

Total Traffic Conditions
PM Peak Traffic Hour - Year 2044



Lane Group	SBR
Lane Configurations	7
Traffic Volume (vph)	6
Future Volume (vph)	6
Satd. Flow (prot)	1583
Flt Permitted	
Satd. Flow (perm)	1583
Satd. Flow (RTOR)	134
Lane Group Flow (vph)	7
Turn Type	Perm
Protected Phases	
Permitted Phases	6
Detector Phase	6
Switch Phase	
Minimum Initial (s)	3.0
Minimum Split (s)	10.5
Total Split (s)	41.0
Total Split (%)	59.4%
Yellow Time (s)	5.5
All-Red Time (s)	2.0
Lost Time Adjust (s)	0.0
Total Lost Time (s)	7.5
Lead/Lag	Lag
Lead-Lag Optimize?	Yes
Recall Mode	C-Max
Act Effct Green (s)	38.9
Actuated g/C Ratio	0.56
v/c Ratio	0.00
Control Delay (s/veh)	0.0
Queue Delay	0.0
Total Delay (s/veh)	0.0
LOS	A
Approach Delay (s/veh)	
Approach LOS	
Queue Length 50th (ft)	0
Queue Length 95th (ft)	0
Internal Link Dist (ft)	
Turn Bay Length (ft)	170
Base Capacity (vph)	950
Starvation Cap Reductn	0
Spillback Cap Reductn	0
Storage Cap Reductn	0
Reduced v/c Ratio	0.01
Intersection Summary	

Timings
 2: Old Ranch Road & Voyager Parkway

Total Traffic Conditions
 PM Peak Traffic Hour - Year 2044

Maximum v/c Ratio: 1.30	
Intersection Signal Delay (s/veh): 53.9	Intersection LOS: D
Intersection Capacity Utilization 99.6%	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: 2: Old Ranch Road & Voyager Parkway

