

Traffic Impact Study

The Shire at Old Ranch

El Paso County, Colorado

Prepared for:

KESS Properties, LLC

Kimley»Horn

T R A F F I C I M P A C T S T U D Y

The Shire at Old Ranch

El Paso County, Colorado
PDC File No. PPR2410

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1.0 EXECUTIVE SUMMARY

The Shire at Old Ranch is located on the northeast corner of the Old Ranch Road and Howells Road in El Paso County / Colorado Springs, Colorado. A previous traffic study was conducted in September of 2019 for the approval of the project. Updates to the proposed project uses and access location are analyzed in this study, specifically direct access to Old Ranch Road. The Shire at Old Ranch when fully developed is proposed to include general office space, a hotel, a campground designated area, a sit-down restaurant, and arts and craft store uses.

The purpose of this traffic study is to identify project traffic generation characteristics to determine potential project traffic related impacts on the local street system and to develop the necessary mitigation measures required for the identified traffic impacts. The purpose of this updated traffic study is to evaluate direct access to Old Ranch Road. The following intersections were incorporated into this traffic study in accordance with City of Colorado Springs standards and requirements.

- Blue Horizon View/Old Ranch Road/Cordera Crest Avenue Roundabout
- Old Ranch Road and Howells Road
- Old Ranch Road Full Movement Access

Regional access to the site is by Interstate 25 (I-25) and Powers Boulevard / State Highway 21 (SH-21). Primary access is provided by Old Ranch Road. Direct access is currently provided by access along Howells Road. However, this access will be removed in the future with the planned direct access to Old Ranch Road. This study evaluates the proposed full movement access for The Shire at Old Ranch along Old Ranch Road, approximately 330 feet east of Howells Road.

The Shire at Old Ranch is expected to generate approximately 500 daily weekday driveway trips, with 52 of these trips occurring during each of the morning and afternoon peak hours. This is consistent with the client's projection of approximately 200 visitors per day plus employees and deliveries accessing the site daily.

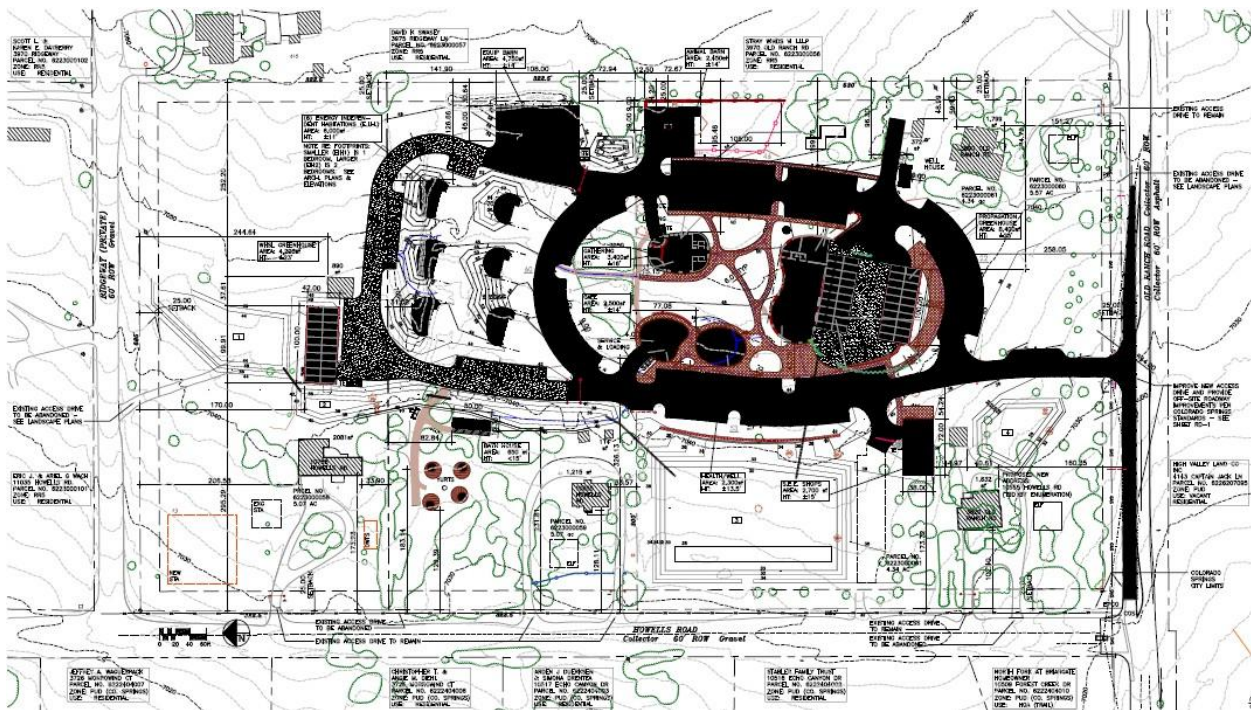
Based on the analysis presented in this report, Kimley-Horn believes The Shire at Old Ranch will be successfully incorporated into the existing and future roadway network. Analysis of the existing street network, the proposed project development, and expected traffic volumes resulted in the following recommendations:

- With completion of The Shire at Old Ranch project, one full movement access is proposed along Old Ranch Road. The access along Old Ranch Road is proposed to be located approximately 330 feet east of the Howells Road intersection to allow full turning movements. It is recommended that a R1-1 “STOP” sign be installed on the southbound approach exiting the development at this Old Ranch Road Access. The existing access along Howells Road, located approximately 350 feet north of Old Ranch Road, will be removed.
- It is expected that Old Ranch Road will be reconstructed to a three-lane roadway sometime in the near future by the City of Colorado Springs. It is recommended that a 145-foot plus 140-foot taper eastbound left turn lane be designated for The Shire at Old Ranch full movement access along Old Ranch Road. With this access being located approximately 330 feet east of Howells Road, the bay taper and turn lane will fit between Howells Road and this access. As a south leg will likely never exist at the Old Ranch Road and Howells Road intersection (existing residential properties are located along the south side of the roadway), there isn’t a need to accommodate potential back-to-back left turn lanes along Old Ranch Road within this roadway segment. This allows the full movement to be located closer than standard.
- It is understood that El Paso County charges road impact fees for developments occurring within the County. The developer of this property will work with the County to identify an appropriate fee based on actual anticipated traffic to be attracted by the Shire at Old Ranch.
- Any onsite or offsite improvements should be incorporated into the Civil Drawings and conform to standards of the City of Colorado Springs and El Paso County, as appropriate, as well as the Manual on Uniform Traffic Control Devices (MUTCD) – 11th Edition, 2023.

2.0 INTRODUCTION

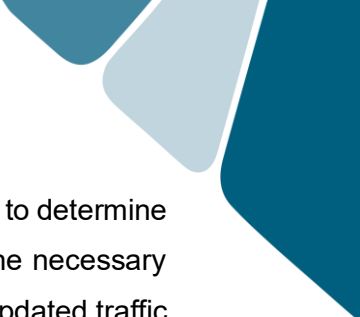
Kimley-Horn has prepared this report to document the results of a Traffic Impact Study for The Shire at Old Ranch located on the northeast corner of the Old Ranch Road and Howells Road intersection in El Paso County / Colorado Springs, Colorado. A vicinity map illustrating the project development location is shown in **Figure 1**.

A previous traffic study was conducted in September of 2019 for the approval of the project. Updates to the proposed project uses and access location are analyzed in this study, specifically direct access to Old Ranch Road. The Shire at Old Ranch when fully developed is proposed to include general office space, a hotel, a campground designated area, a sit-down restaurant, and arts and craft store uses. A conceptual site plan is shown below.



Conceptual Site Plan

It is expected that the project will be completed in the next several years; therefore, analysis was conducted for the 2027 short-term buildout horizon as well as the 2045 long-term twenty-year planning horizon.



The purpose of this traffic study is to identify project traffic generation characteristics to determine potential project traffic related impacts on the local street system and to develop the necessary mitigation measures required for the identified traffic impacts. The purpose of this updated traffic study is to evaluate direct access to Old Ranch Road. The following intersections were incorporated into this traffic study in accordance with City of Colorado Springs standards and requirements.

- Blue Horizon View/Old Ranch Road/Cordera Crest Avenue Roundabout
- Old Ranch Road and Howells Road
- Old Ranch Road Full Movement Access

Regional access to the site is by Interstate 25 (I-25) and Powers Boulevard / State Highway 21 (SH-21). Primary access is provided by Old Ranch Road. Direct access is currently provided by access along Howells Road. However, this access will be removed in the future with the planned direct access to Old Ranch Road. This study evaluates the proposed full movement access for The Shire at Old Ranch along Old Ranch Road, approximately 330 feet east of Howells Road.

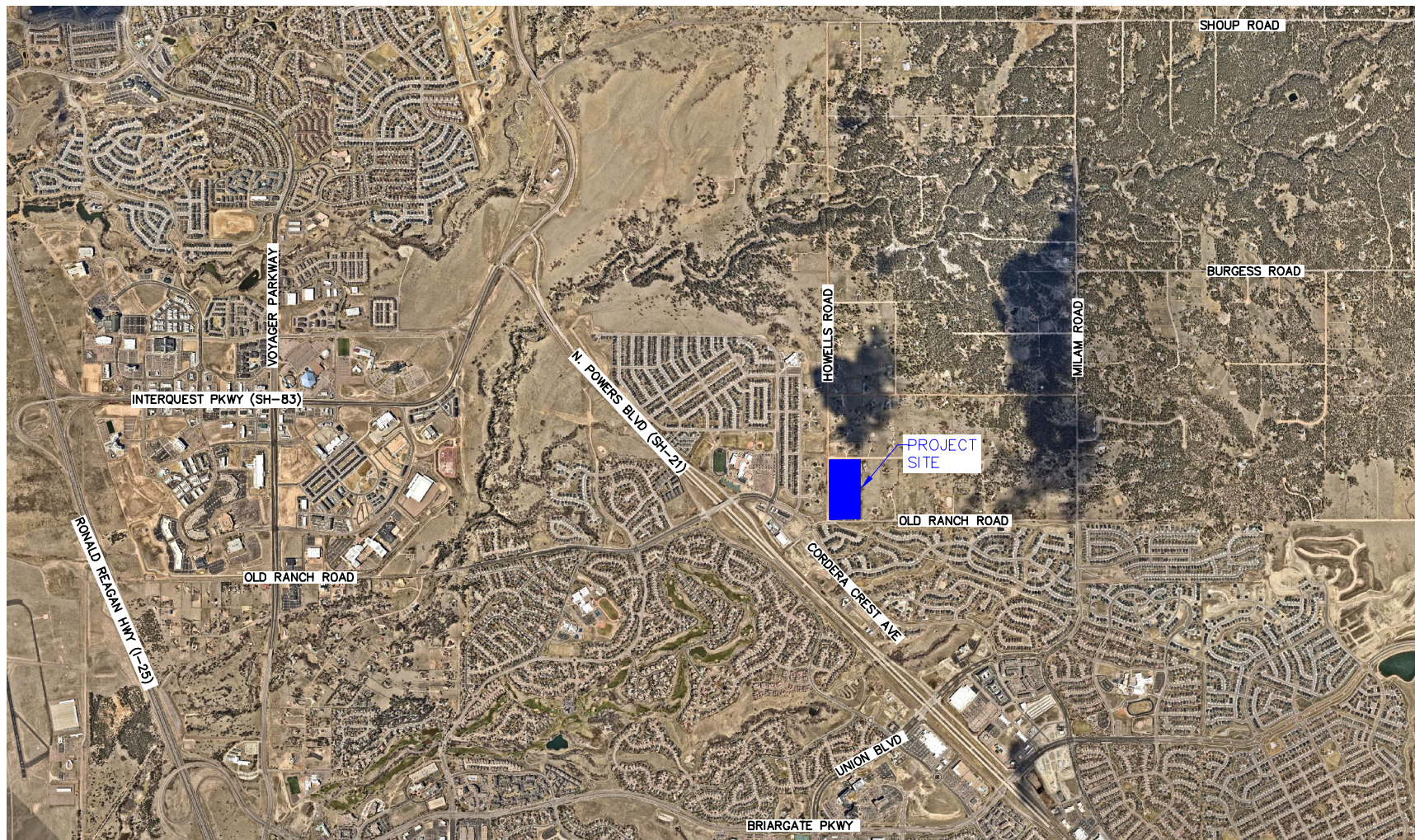


FIGURE 1
THE SHIRE AT OLD RANCH
EL PASO COUNTY, COLORADO
VICINITY MAP

3.0 EXISTING AND FUTURE CONDITIONS

3.1 Existing Study Area

The existing site was comprised of six (6) single-family residential properties. The project is bound by single family residences in all directions with rural ranch style homes located to the north and the east while typical urban single-family communities are located to the south and west. Pine Creek High School is located in the extended area further to the west.

3.2 Existing Roadway Network

Old Ranch Road is a minor arterial street providing one through lane in each direction, eastbound and westbound, with a 35 mile per hour speed limit east of Howells Road and a 30 mile per hour speed limit west of Howells Road. Old Ranch Road is expected to be constructed to a three-lane cross-section in the near-term horizon.

Howells Road extends north/south as an unpaved collector street with a 30 mile per hour posted speed limit. Howells Road extends for about 1.15 miles north of Old Ranch Road.

Ridgeway Lane is an unpaved local street extending from Howells Road to approximately 3,000 feet east of Howells Road. It provides access to residential properties along both north and south sides of the road.

Cordera Crest Avenue is a three-lane roadway with one lane in each direction and a two-way left-turn lane. It has a 30 mile per hour posted speed limit and connects Old Ranch Road to the north to Union Boulevard to the south.

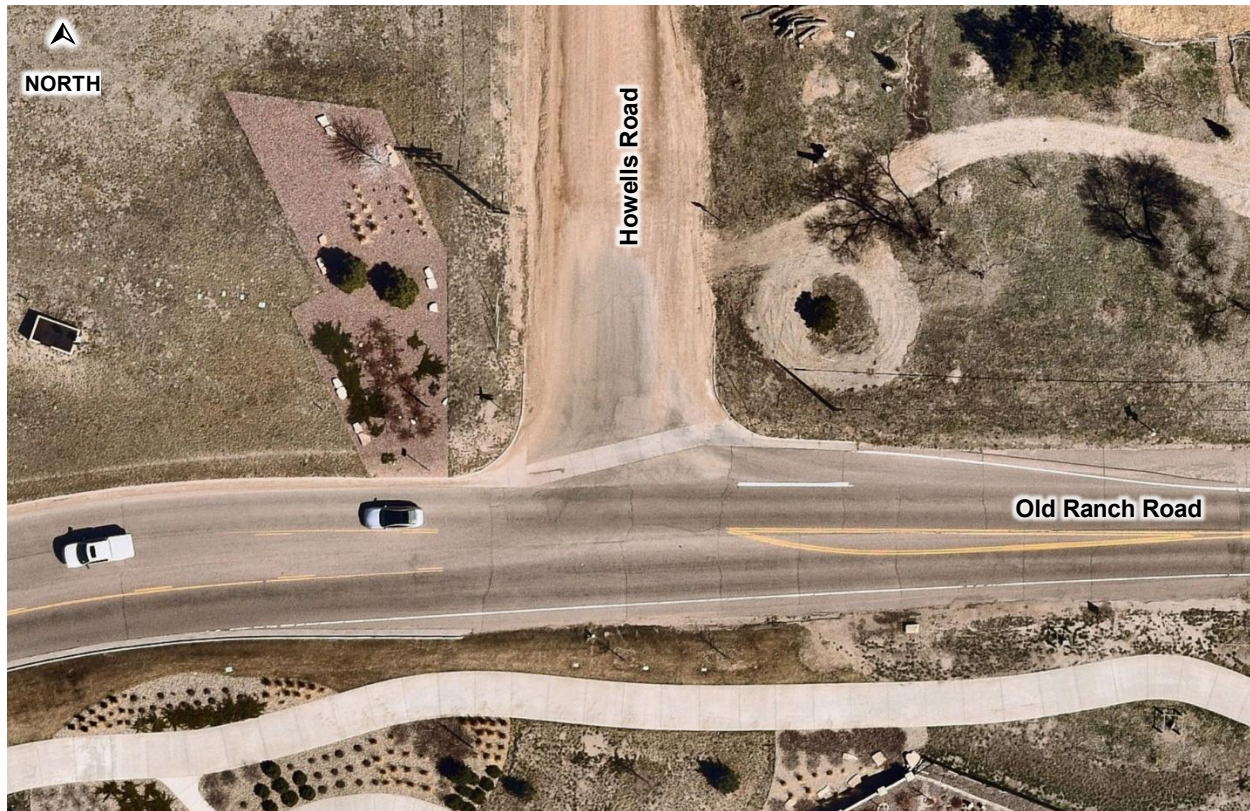
Blue Horizon View is a two-way roadway with no lane markings. It provides development access connecting to Thunder Mountain Avenue to the west and to Old Ranch Road to the east.

The single-lane roundabout at Blue Horizon View/Old Ranch Road and Old Ranch Road/Cordera Crest Avenue intersection (#1) operates with yield control on all four approaches. All four approaches provide a single lane with yield control. Pedestrian crosswalks are designated on each leg of the roundabout intersection. An aerial photo of the existing intersection configuration is below.



Blue Horizon View/Old Ranch Road and Old Ranch Road/Cordera Crest Avenue (#1)

The unsignalized 'T'-intersection of Old Ranch Road and Howells Road (#2) operates with stop control on the southbound Howells Road approach. The southbound approach lane configurations are not defined as Howells Road turns into a dirt road approximately 60 feet north of Old Ranch Road. Therefore, the southbound approach was analyzed with single shared movements lane. The eastbound Old Ranch Road approach provides a two-way left turn lane and a through lane. The westbound Old Ranch Road approach provides a through lane and a short right turn lane. An aerial photo of the existing intersection configuration is below.

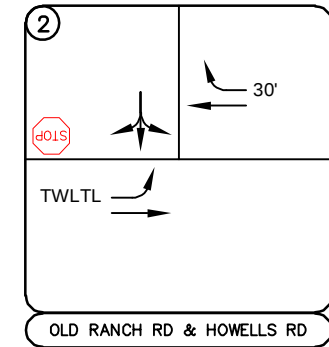
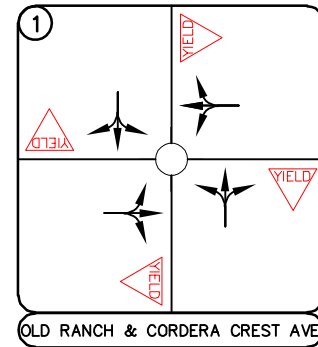


Old Ranch Road & Howells Road (#2)

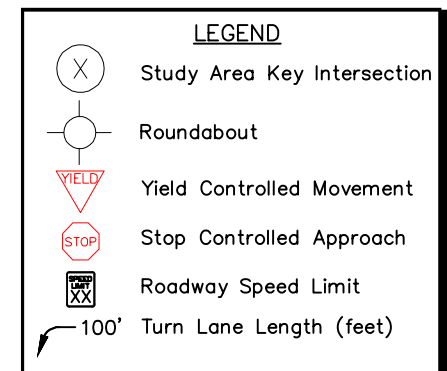
The intersection lane configuration and control for the study area intersections are shown in **Figure 2**.



FIGURE 2
THE SHIRE AT OLD RANCH
EL PASO COUNTY, COLORADO
EXISTING GEOMETRY AND CONTROL



TWLTL = TWO-WAY LEFT-TURN LANE



3.3 Existing Traffic Volumes

Existing turning movement counts were conducted at the study intersections on Wednesday, September 25, 2024, during the weekday morning and afternoon peak hours. The counts were conducted during the morning and afternoon peak hours of adjacent street traffic in 15-minute intervals from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM on this count date. The existing intersection traffic volumes are shown in **Figure 3** with count sheets provided in **Appendix A**.

3.4 Unspecified Development Traffic Growth

According to traffic projections from the Pikes Peak Area Council of Governments (PPACG) traffic model, the area surrounding the site is expected to have an average 25-year growth factor of 1.63. This growth factor equates to an annual growth rate of 1.96 percent. Future traffic volume projections and growth rate calculations are provided in **Appendix B**. To be conservative, a two percent (2%) annual growth rate was used to calculate future traffic volumes at the study area intersections. This annual growth rate was used to estimate short-term 2027 and long-term 2045 traffic volume projections at the key intersections. The calculated background traffic volumes for 2027 and 2045 are shown in **Figure 4** and **Figure 5**, respectively.



FIGURE 3
THE SHIRE AT OLD RANCH
EL PASO COUNTY, COLORADO
2024 EXISTING TRAFFIC VOLUMES

Wednesday,
September 25, 2024
7:00 to 8:00AM
(5:00 to 6:00PM)

① 4(1) ↓ 185(181) ↓ 138(257) ↓ 10(2) → 17(8) → 24(12) →	327(158) ↗ 8(0) ← 8(7) ←
	12(1) ↖ 359(137) ↖ 5(9) ↖
OLD RANCH & CORDERA CREST AVE	

Wednesday,
September 25, 2024
7:15 to 8:15AM
(5:00 to 6:00PM)

② 32(10) ↓	0(0) ↗ 316(154) ←
11(18) ↗ 147(254) →	
OLD RANCH RD & HOWELLS RD	

LEGEND

- (X) Study Area Key Intersection
- xxx(xxx) Weekday AM(PM)
Peak Hour Traffic Volumes
- xx,x00 Estimated Daily Traffic Volume



FIGURE 4
 THE SHIRE AT OLD RANCH
 EL PASO COUNTY, COLORADO
 2027 BACKGROUND TRAFFIC VOLUMES

① ↙ 4(1) ↘ ↙ 196(192) ↘ ↙ 146(273) ↘ ↗ 347(168) ↖ 8(0) ↖ 8(7)	
↗ 11(2) ↘ ↗ 18(8) ↘ ↗ 25(13) ↘ ↖ 13(1) ↗ ↖ 381(145) ↗ ↖ 5(10) ↗	
OLD RANCH & CORDERA CREST AVE	

② ↙ 34(11) ↘ ↙ 3(0) ↘ ↗ 0(0) ↖ 335(163)	
↗ 12(19) ↘ ↗ 156(270) ↘	
OLD RANCH RD & HOWELLS RD	

LEGEND

- ⊗ Study Area Key Intersection
- xxx(xxx) Weekday AM(PM)
Peak Hour Traffic Volumes
- xx,x00 Estimated Daily Traffic Volume



FIGURE 5
 THE SHIRE AT OLD RANCH
 EL PASO COUNTY, COLORADO
 2045 BACKGROUND TRAFFIC VOLUMES

① ↙ 6(2) ↘ ↙ 280(274) ↘ ↙ 209(390) ↘ ↗ 496(239) ↖ 12(0) ↗ 12(11)	
↖ 15(3) ↗ ↖ 26(12) ↗ ↖ 36(18) ↗ ↗ 18(2) ↗ 544(208) ↗ 8(14)	
OLD RANCH & CORDERA CREST AVE	

② ↙ 49(15) ↘ ↙ 5(0) ↘ ↗ 0(0) ↖ 479(233)	
↖ 17(27) ↗ ↖ 223(385) ↗	
OLD RANCH RD & HOWELLS RD	

LEGEND

- (X) Study Area Key Intersection
- XXX(XXX) Weekday AM(PM)
Peak Hour Traffic Volumes
- XX,X00 Estimated Daily Traffic Volume

4.0 PROJECT TRAFFIC CHARACTERISTICS

4.1 Trip Generation

Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation Manual*¹ published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses.

For this study, Kimley-Horn used the ITE Trip Generation Report average rates that apply to Hotel (ITE Land Use Code 310), Campground (ITE 416), Office (ITE 710), Arts and Craft Store (ITE 879), and Sit-Down Restaurant (ITE 932) for traffic associated with the development.

Since full buildout of The Shire at Old Ranch is proposed to contain a mix of uses, internal capture trips are expected to occur on site as well. These internal capture trips are shared trips from vehicles already within the internal street network. These shared trips reduce the number of total external trips and were calculated directly per the ITE procedure. The proposed sit-down restaurant is expected to provide services for a portion of customers that represent trips for other land uses in the development. Therefore, a 50 percent internal capture reduction factor was utilized for the proposed sit-down restaurant land use.

The Shire at Old Ranch is expected to generate approximately 500 daily weekday driveway trips, with 52 of these trips occurring during each of the morning and afternoon peak hours. This is consistent with the client's projection of approximately 200 visitors per day plus employees and deliveries accessing the site daily. Calculations were based on the procedure and information provided in the ITE *Trip Generation Manual, 11th Edition – Volume 1: User's Guide and Handbook*, 2021. **Table 1** summarizes the estimated trip generation for the site. The trip generation worksheets are included in **Appendix C**.

¹ Institute of Transportation Engineers, *Trip Generation Manual*, Eleventh Edition, Washington DC, 2021.

Table 1 – The Shire at Old Ranch Traffic Generation

Land Use and Size	Weekday Vehicle Trips						
	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Site Generated Trips							
Hotel (ITE 310) – 6 Rooms	48	2	1	3	2	2	4
Campground (ITE 416) – 4 Campsites	20	0	1	1	1	0	1
General Office (ITE 710) – 8,200 Square Feet	90	11	1	12	2	10	12
Arts and Craft Store (ITE 879) – 3,670 Square Feet	208	11	12	23	11	12	23
Sit-Down Restaurant (ITE 932) – 2,500 Square Feet	268	13	11	24	14	9	23
Total Site Generate Trips	634	37	26	63	30	33	63
Internal Capture Trips							
Sit-Down Restaurant (ITE 932) – 2,500 Square Feet	134	6	5	11	7	4	11
Total External Trips after Internal Capture	500	31	21	52	23	29	52

4.2 Trip Distribution

Distribution of site traffic on the street system was based on the area street system characteristics, existing traffic patterns, existing and anticipated surrounding information, and the proposed access system for the project. The directional distribution of traffic is a means to quantify the percentage of site-generated traffic that approaches the site from a given direction and departs the site back to the original source. The project trip distribution for the proposed development is illustrated in **Figure 6**.

4.3 Traffic Assignment

The Shire at Old Ranch traffic assignment was obtained by applying the project trip distribution to the estimated traffic generation of the development shown in **Table 1**. Traffic assignment is shown in **Figure 7**.

4.4 Total (Background Plus Project) Traffic

Site traffic volumes were added to the background volumes to represent estimated traffic conditions for the short-term 2027 buildout horizon and long-term 2045 twenty-year planning horizon. These total traffic volumes for the study area are illustrated for the 2027 and 2045 horizon years in **Figures 8 and 9**, respectively.

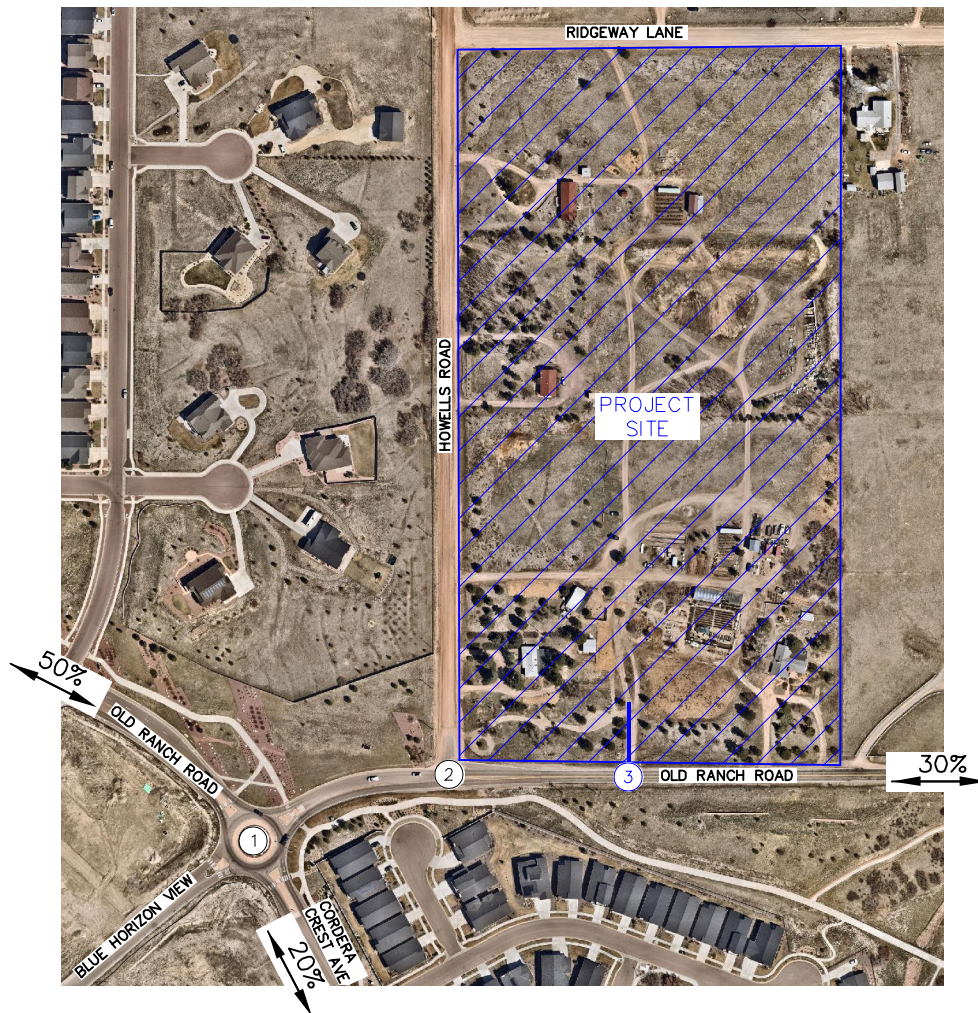


FIGURE 6
 THE SHIRE AT OLD RANCH
 EL PASO COUNTY, COLORADO
 PROJECT TRIP DISTRIBUTION

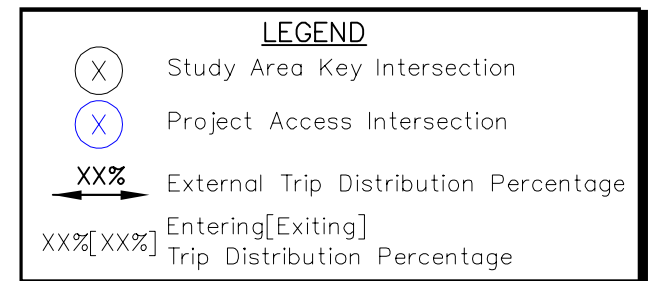
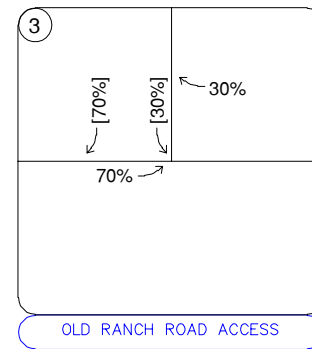
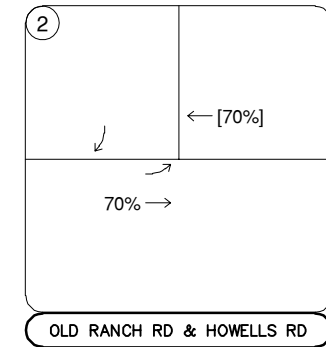
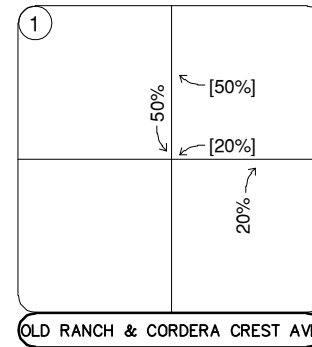
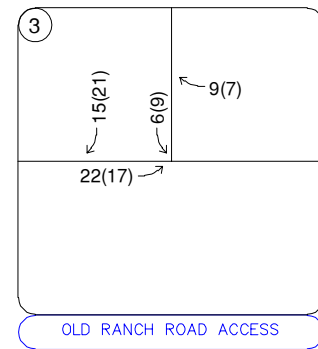
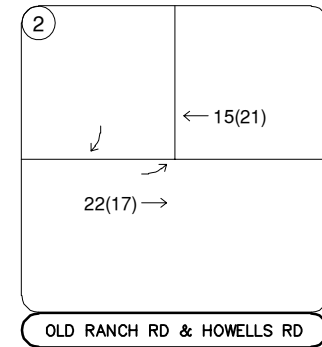
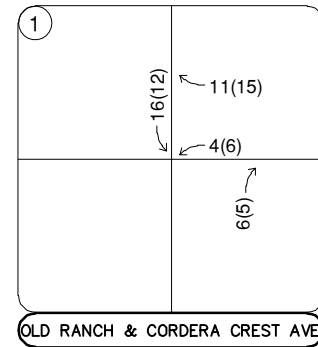




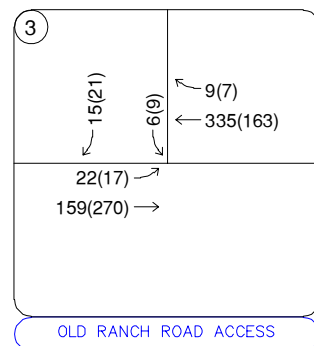
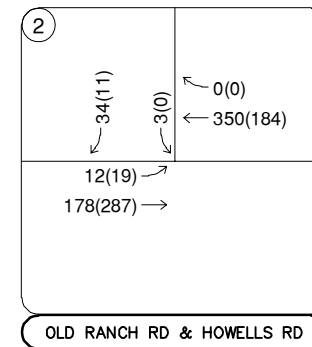
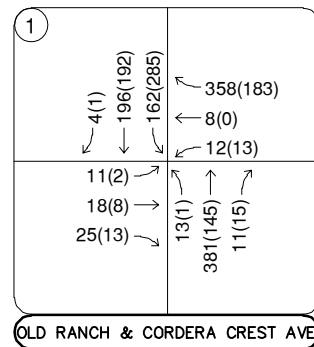
FIGURE 7
THE SHIRE AT OLD RANCH
EL PASO COUNTY, COLORADO
PROJECT TRAFFIC ASSIGNMENT VOLUMES



LEGEND	
(X)	Study Area Key Intersection
(X)	Project Access Intersection
XXX(XXX)	Weekday AM(PM)
	Peak Hour Traffic Volumes
XX,X00	Estimated Daily Traffic Volume



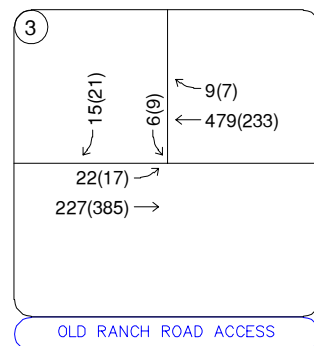
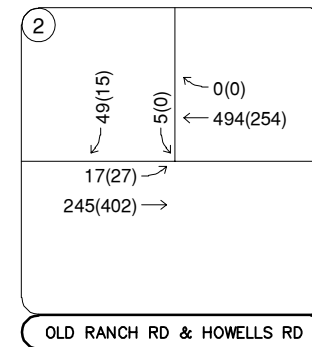
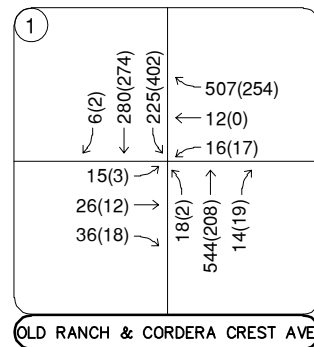
FIGURE 8
 THE SHIRE AT OLD RANCH
 EL PASO COUNTY, COLORADO
 2027 TOTAL TRAFFIC VOLUMES



LEGEND	
(X)	Study Area Key Intersection
(X)	Project Access Intersection
XXX(XXX)	Weekday AM(PM) Peak Hour Traffic Volumes
XX,X00	Estimated Daily Traffic Volume



FIGURE 9
THE SHIRE AT OLD RANCH
EL PASO COUNTY, COLORADO
2045 TOTAL TRAFFIC VOLUMES



LEGEND	
(X)	Study Area Key Intersection
(X)	Project Access Intersection
XXX(XXX)	Weekday AM(PM) Peak Hour Traffic Volumes
XX,X00	Estimated Daily Traffic Volume

5.0 TRAFFIC OPERATIONS ANALYSIS

Kimley-Horn's analysis of traffic operations in the site vicinity was conducted to determine potential capacity deficiencies in the 2027 and 2045 development horizons at the identified key intersections. The acknowledged source for determining overall capacity is the *Highway Capacity Manual (HCM)*².

5.1 Analysis Methodology

Capacity analysis results are listed in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion). For intersections and roadways in this study area, standard traffic engineering practice recommends overall intersection LOS D and movement/approach LOS E as the minimum desirable thresholds for acceptable operations. **Table 2** shows the definition of level of service for signalized and unsignalized intersections.

Table 2 – Level of Service Definitions

Level of Service	Signalized Intersection Average Total Delay (sec/veh)	Unsignalized Intersection Average Total Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Definitions provided from the Highway Capacity Manual, Sixth Edition, Transportation Research Board, 2016.

Study area intersections were analyzed based on average total delay analysis for unsignalized intersections. Under the unsignalized analysis, the LOS for a two-way stop-controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. LOS for signalized, roundabout, and all-way stop-controlled intersections are defined for each approach and for the overall intersection.

² Transportation Research Board, *Highway Capacity Manual*, Sixth Edition, Washington DC, 2016.

5.2 Key Intersection Operational Analysis

Calculations for the operational level of service at the key intersections for the study area are provided in **Appendix D**. The existing year analysis is based on the lane geometry and intersection control shown in **Figure 2**. Existing peak hour factors were utilized in the existing and 2027 horizon analysis years while the HCM urban standard of 0.92 was used for the long-term 2045 horizon analysis. Synchro traffic analysis software was used to analyze the unsignalized key intersections for HCM level of service.

Blue Horizon View/Old Ranch Road and Old Ranch Road/Cordera Crest Avenue

The single-lane roundabout at the intersection of Blue Horizon View/Old Ranch Road and Old Ranch Road/Cordera Crest Avenue is yield controlled on all four approaches. The intersection operates acceptably at LOS A during both weekday morning and afternoon peak hours under existing conditions. With project traffic, all movements are anticipated to continue operating at an acceptable level of service, C or better, throughout the 2045 horizon. Therefore, no improvements or modifications are anticipated to be needed at this intersection based on the addition of project traffic and this operational level of service analysis. **Table 3** provides the results of the LOS analysis conducted at this intersection.

Table 3 – Old Ranch Road & Cordera Crest Avenue LOS Results

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2024 Existing	8.9	A	5.3	A
2027 Background	9.8	A	5.5	A
2027 Background Plus Project	10.3	B	5.7	A
2045 Background	14.6	B	7.7	A
2045 Background Plus Project	15.6	C	7.9	A

Old Ranch Road and Howells Road

The intersection of Old Ranch Road and Howells Road is unsignalized with stop control on the southbound Howells Road approach. The intersection movements operate acceptably at LOS B or better during both peak hours under existing conditions. With project traffic, all movements are anticipated to continue operating at an acceptable level of service of B or better throughout the 2045 horizon. Therefore, no improvements or modifications are anticipated to be needed at this intersection based on the addition of project traffic and this operational level of service analysis.

Table 4 provides the results of the LOS analysis conducted at this intersection.

Table 4 – Old Ranch Road and Howells Road LOS Results

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2024 Existing				
Eastbound Left	8	A	7.6	A
Southbound Approach	10.7	B	9.1	A
2027 Background				
Eastbound Left	8.1	A	7.6	A
Southbound Approach	10.9	B	9.2	A
2027 Background Plus Project				
Eastbound Left	8.1	A	7.7	A
Southbound Approach	11.1	B	9.3	A
2045 Background				
Eastbound Left	8.5	A	7.8	A
Southbound Approach	12.4	B	9.7	A
2045 Background Plus Project				
Eastbound Left	8.5	A	7.9	A
Southbound Approach	12.6	B	9.8	A

Old Ranch Road Full Movement Access

With completion of The Shire at Old Ranch project, one full movement access is proposed along Old Ranch Road. The access along Old Ranch Road is proposed to be located approximately 330 feet east of the Howells Road intersection to allow full turning movements. It is recommended that a R1-1 "STOP" sign be installed on the southbound approach exiting the development at this Old Ranch Road Access. The existing access along Howells Road, located approximately 350 feet north of Old Ranch Road, will be removed. **Table 5** provides the results of the level of service for the Old Ranch Road Full Movement Access. As shown in the table, the project access intersection is anticipated to have all movements operating with acceptable LOS B or better during the peak hours in both the buildout year 2027 and the 2045 long-term horizons. Based on the City of Colorado Springs Criteria manual, neither an eastbound left turn lane (projected left turn volume being 22 vehicles per hour (vph) with a threshold requirement of 25 vph) nor a westbound right turn lane (projected right turn volume being 9 vph with a threshold requirement of 50 vph) are met. Therefore, turn lanes would not be anticipated to be needed at the Old Ranch Road Access intersection. Of note, the Old Ranch Road Access was evaluated with Old Ranch Road being a three-lane roadway providing an eastbound left turn lane, as that improvement project is anticipated to be completed in the near future.

Table 5 – Old Ranch Road Access Level of Service Results

Movement	2027 Total				2045 Total			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
Eastbound Left	8.1	A	7.6	A	8.6	A	7.8	A
Southbound Approach	10.9	B	10.0	B	12.3	B	10.7	B

5.3 Vehicle Queuing Analysis

A vehicle queuing analysis was conducted for the study area intersections with defined storage bays that will include project traffic. The queuing analysis was performed using Synchro presenting the results of the HCM 95th percentile queue lengths. Results are shown in the following **Table 6** with calculations provided within the level of service operational sheets of **Appendix D**.

Table 6 – Turn Lane Queuing Analysis Results

Intersection Turn Lane	Existing Turn Lane Length (feet)	2027 Calculated Queue (feet)	2027 Recommended Length (feet)	2045 Calculated Queue (feet)	2045 Recommended Length (feet)
Old Ranch & Howells (#2)					
Eastbound Left	100'/TWLTL	25'	100'/TWLTL	25'	100'/TWLTL
Westbound Right	30'	25'	30'	25'	30'
Old Ranch Access (#3)					
Eastbound Left	DNE	25'	145' + 140' T	25'	145' + 140' T

DNE = Does Not Exist; **Blue** Text = Improvement by others; T = Taper

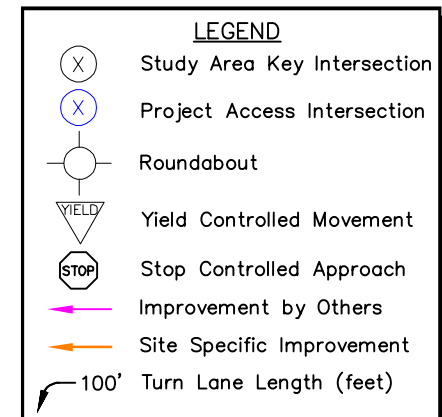
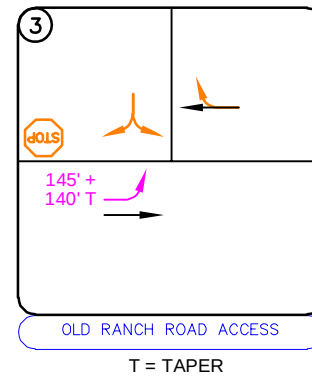
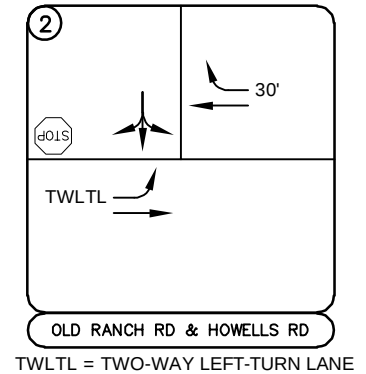
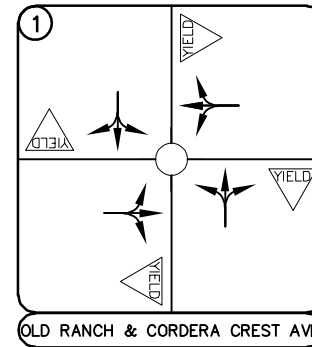
All queues are anticipated to remain within the existing or recommended turn lane lengths through 2045. It is expected that a three-lane roadway will be constructed along Old Ranch Road. This roadway can either provide a two-way left-turn lane for the Access along Old Ranch Road, or a 145-foot plus 140-foot taper defined storage bay meeting City standards with a 35-mph street needing 25 feet of storage. With this access being located approximately 330 feet east of Howells Road, the bay taper and turn lane will fit between Howells Road and this access. As a south leg will likely never exist at the Old Ranch Road and Howells Road intersection (existing residential properties are located along the south side of the roadway), there isn't a need to accommodate potential back-to-back left turn lanes along Old Ranch Road within this roadway segment. This allows the full movement to be located closer than standard.

5.4 Improvement Summary

Based on the results of the intersection operational and vehicle queuing analysis, the key intersection recommended improvements and control are shown in **Figure 10**.



FIGURE 10
THE SHIRE AT OLD RANCH
EL PASO COUNTY, COLORADO
RECOMMENDED GEOMETRY AND CONTROL



6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis presented in this report, Kimley-Horn believes The Shire at Old Ranch will be successfully incorporated into the existing and future roadway network. Analysis of the existing street network, the proposed project development, and expected traffic volumes resulted in the following recommendations:

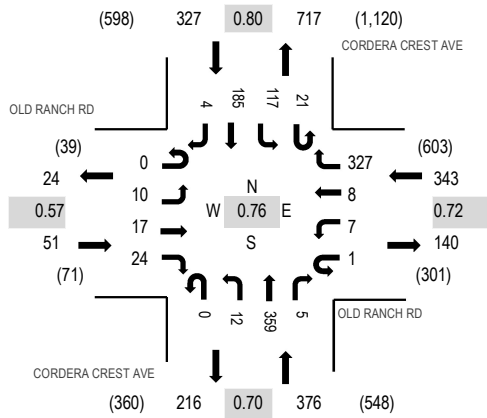
- With completion of The Shire at Old Ranch project, one full movement access is proposed along Old Ranch Road. The access along Old Ranch Road is proposed to be located approximately 330 feet east of the Howells Road intersection to allow full turning movements. It is recommended that a R1-1 “STOP” sign be installed on the southbound approach exiting the development at this Old Ranch Road Access. The existing access along Howells Road, located approximately 350 feet north of Old Ranch Road, will be removed.
- It is expected that Old Ranch Road will be reconstructed to a three-lane roadway sometime in the near future by the City of Colorado Springs. It is recommended that a 145-foot plus 140-foot taper eastbound left turn lane be designated for The Shire at Old Ranch full movement access along Old Ranch Road. With this access being located approximately 330 feet east of Howells Road, the bay taper and turn lane will fit between Howells Road and this access. As a south leg will likely never exist at the Old Ranch Road and Howells Road intersection (existing residential properties are located along the south side of the roadway), there isn’t a need to accommodate potential back-to-back left turn lanes along Old Ranch Road within this roadway segment. This allows the full movement to be located closer than standard.
- It is understood that El Paso County charges road impact fees for developments occurring within the County. The developer of this property will work with the County to identify an appropriate fee based on actual anticipated traffic to be attracted by the Shire at Old Ranch.
- Any onsite or offsite improvements should be incorporated into the Civil Drawings and conform to standards of the City of Colorado Springs and El Paso County, as appropriate, as well as the Manual on Uniform Traffic Control Devices (MUTCD) – 11th Edition, 2023.

APPENDICES

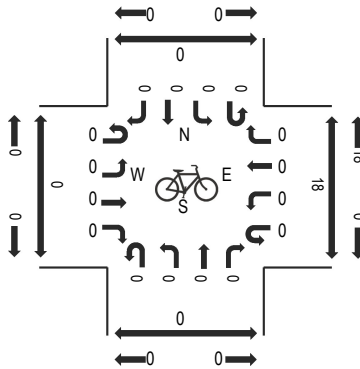
APPENDIX A

Intersection Count Sheets

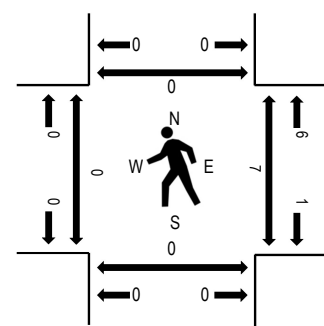
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	OLD RANCH RD				OLD RANCH RD				CORDERA CREST AVE				CORDERA CREST AVE				Total	Rolling Hour	Pedestrian Crossings			
	Eastbound				Westbound				Northbound				Southbound						West	East	South	North
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right						
7:00 AM	0	1	0	2	0	0	0	79	0	0	76	2	3	13	33	0	209	1,097	0	3	0	0
7:15 AM	0	3	5	16	0	3	7	111	0	7	126	1	9	18	53	1	360	1,094	0	2	0	0
7:30 AM	0	4	11	5	0	0	1	75	0	4	116	0	9	37	57	1	320	982	0	1	0	0
7:45 AM	0	2	1	1	1	4	0	62	0	1	41	2	0	49	42	2	208	810	0	1	0	0
8:00 AM	0	1	1	5	2	3	1	79	0	1	54	0	0	31	26	2	206	723	0	1	0	0
8:15 AM	0	0	1	4	0	2	2	81	0	1	39	1	0	60	57	0	248		0	1	0	0
8:30 AM	0	0	4	2	1	1	2	38	0	3	31	2	0	35	28	1	148		0	1	0	0
8:45 AM	0	1	1	0	2	1	1	44	0	1	35	4	0	16	15	0	121		0	0	0	0
Count Total	0	12	24	35	6	14	14	569	0	18	518	12	21	259	311	7	1,820		0	10	0	0
Peak Hour	0	10	17	24	1	7	8	327	0	12	359	5	21	117	185	4	1,097		0	7	0	0



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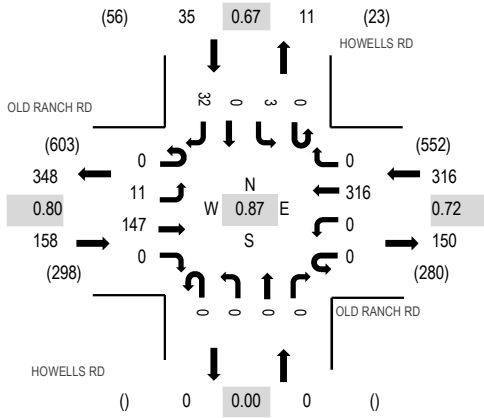
Location: 2 HOWELLS RD & OLD RANCH RD AM

Date: Wednesday, September 25, 2024

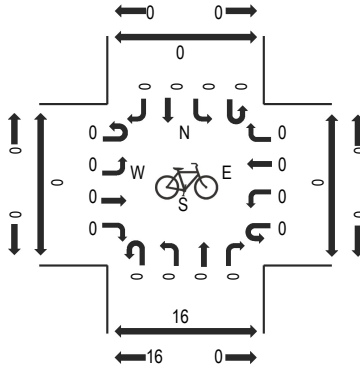
Peak Hour: 07:15 AM - 08:15 AM

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

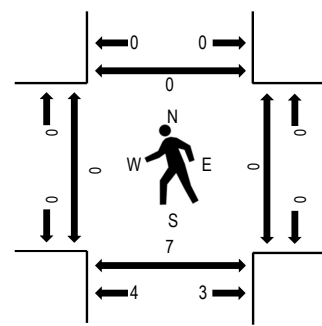
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	OLD RANCH RD Eastbound				OLD RANCH RD Westbound				HOWELLS RD Northbound				HOWELLS RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	1	14	0	0	0	76	0	0	0	0	0	0	0	0	4	95	483	0	0	2	0
7:15 AM	0	0	23	0	0	0	111	0	0	0	0	0	0	1	0	12	147	509	0	0	3	0
7:30 AM	0	4	43	0	0	0	66	0	0	0	0	0	0	0	0	8	121	508	0	0	2	0
7:45 AM	0	2	51	0	0	0	66	0	0	0	0	0	0	0	0	1	120	473	0	0	2	0
8:00 AM	0	5	30	0	0	0	73	0	0	0	0	0	0	2	0	11	121	423	0	0	0	0
8:15 AM	0	4	57	0	0	0	78	0	0	0	0	0	0	0	0	7	146		0	0	9	0
8:30 AM	0	2	40	0	0	0	38	1	0	0	0	0	0	1	0	4	86		0	0	2	0
8:45 AM	0	4	18	0	0	0	43	0	0	0	0	0	0	0	0	5	70		0	0	1	0
Count Total	0	22	276	0	0	0	551	1	0	0	0	0	0	4	0	52	906		0	0	21	0
Peak Hour	0	11	147	0	0	0	316	0	0	0	0	0	0	3	0	32	509		0	0	7	0



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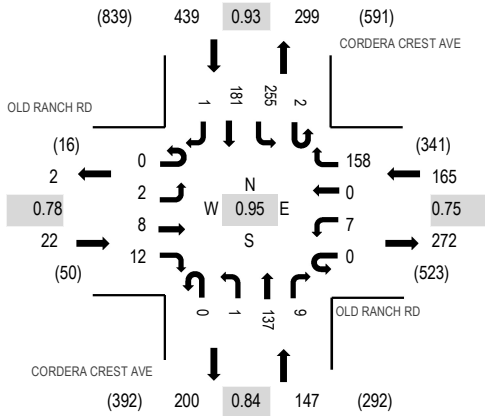
Location: 1 CORDERA CREST AVE & OLD RANCH RD PM

Date: Wednesday, September 25, 2024

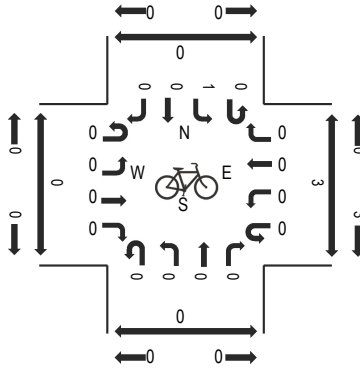
Peak Hour: 05:00 PM - 06:00 PM

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

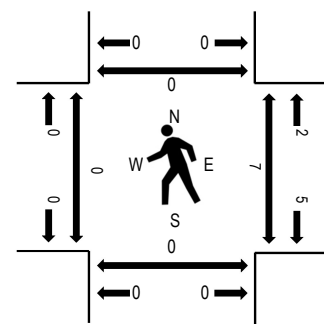
Peak Hour - Motorized Vehicles



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				CORDERA CREST AVE Northbound				CORDERA CREST 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	3	2	3	0	4	2	53	0	1	38	2	1	54	45	1	209	749	0	1	0	0
4:15 PM	0	1	2	2	0	1	2	36	0	1	21	4	0	65	44	1	180	721	0	2	0	0
4:30 PM	0	1	3	2	0	3	1	30	0	1	37	6	0	57	45	0	186	740	0	0	0	0
4:45 PM	0	0	3	6	0	1	3	40	0	1	31	2	0	51	36	0	174	757	0	0	0	0
5:00 PM	0	1	1	5	0	4	0	39	0	1	30	5	0	55	40	0	181	773	0	2	0	0
5:15 PM	0	0	1	2	0	2	0	44	0	0	32	1	1	69	47	0	199		0	4	0	0
5:30 PM	0	0	3	4	0	1	0	33	0	0	42	2	1	65	52	0	203		0	0	0	0
5:45 PM	0	1	3	1	0	0	0	42	0	0	33	1	0	66	42	1	190		0	1	0	0
Count Total	0	7	18	25	0	16	8	317	0	5	264	23	3	482	351	3	1,522		0	10	0	0
Peak Hour	0	2	8	12	0	7	0	158	0	1	137	9	2	255	181	1	773		0	7	0	0



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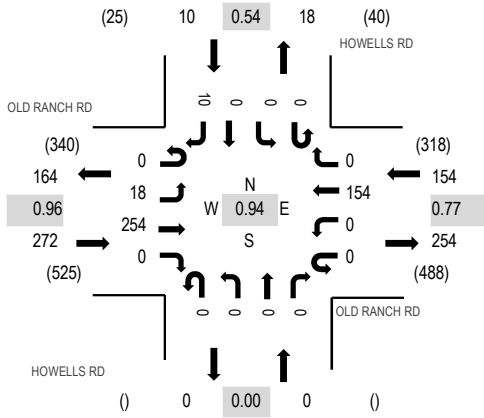
Location: 2 HOWELLS RD & OLD RANCH RD PM

Date: Wednesday, September 25, 2024

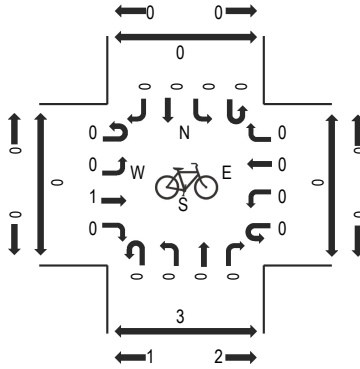
Peak Hour: 05:00 PM - 06:00 PM

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

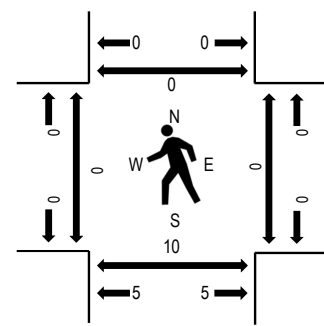
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	OLD RANCH RD Eastbound				OLD RANCH RD Westbound				HOWELLS RD Northbound				HOWELLS RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	4	56	0	0	0	52	1	0	0	0	0	0	1	0	6	120	432	0	0	1	0
4:15 PM	0	5	66	0	0	0	35	0	0	0	0	0	0	1	0	4	111	415	0	0	2	0
4:30 PM	0	6	60	0	0	0	34	0	0	0	0	0	0	0	0	1	101	420	0	0	2	0
4:45 PM	0	6	50	0	0	0	42	0	0	0	0	0	0	0	0	2	100	424	0	0	1	0
5:00 PM	0	6	54	0	0	0	38	0	0	0	0	0	0	0	0	5	103	436	0	0	3	0
5:15 PM	0	2	69	0	0	0	44	0	0	0	0	0	0	0	0	1	116		0	0	3	0
5:30 PM	0	6	65	0	0	0	31	0	0	0	0	0	0	0	0	3	105		0	0	3	0
5:45 PM	0	4	66	0	0	0	41	0	0	0	0	0	0	0	0	1	112		0	0	1	0
Count Total	0	39	486	0	0	0	317	1	0	0	0	0	0	2	0	23	868		0	0	16	0
Peak Hour	0	18	254	0	0	0	154	0	0	0	0	0	0	0	0	10	436		0	0	10	0

APPENDIX B

Future Traffic Projections

PPACG Traffic Projections: The Shire at Old Ranch

Location	2015	2040	Growth Factor	Annual Growth
Burgess Road E/O Milam Rd	3,200	5,200	1.63	1.96%
Total	3,200	5,200	1.63	1.96%

APPENDIX C

Trip Generation Worksheets

The Shire at Old Ranch Trip Generation Summary

Land Use	Quantity	Units	Vehicle Trips						
			Weekday Daily	Weekday PM Peak Hour			Weekday PM Peak Hour		
				In	Out	Total	In	Out	Total
Total Site Generated Trips									
Hotel (ITE 310)	6	Rooms	48	2	1	3	2	2	4
Campground (ITE 416)	4	Campsites	20	0	1	1	1	0	1
Office (ITE 710)	8,200	Square Feet	90	11	1	12	2	10	12
Arts and Craft Store (ITE 879)	3,670	Square Feet	208	11	12	23	11	12	23
Sit-Down Restaurant (ITE 932)	2,500	Square Feet	268	13	11	24	14	9	23
Total Site Generated Trips			634	37	26	63	30	33	63
Internal Capture Trips									
Sit-Down Restaurant (ITE 932)	2,500	Square Feet	134	6	5	11	7	4	11
Total External Trips after Internal Capture			500	31	21	52	23	29	52

Project The Shire at Old Ranch
 Subject Trip Generation for Hotel
 Designed by GAM Date October 14, 2024 Job No. 096829001
 Checked by MG October 24, 2024 Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 11th Edition, Average Rate Equations

Land Use Code - Hotel (310)

Independent Variable - Rooms (X)

$$X = 6$$

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (Page 501)

Directional Distribution: 56% ent. 44% exit.
 (T) = 0.46 (X) T = 3 Average Vehicle Trip Ends
 (T) = 0.46 * (6.0) 2 entering 1 exiting
 2 + 1 = 3

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (Page 502)

Directional Distribution: 51% ent. 49% exit.
 T = 0.59 X T = 4 Average Vehicle Trip Ends
 T = 0.59 * 6 2 entering 2 exiting
 2 + 2 = 4

Weekday (Page 500)

Average Weekday Directional Distribution: 50% entering, 50% exiting
 (T) = 7.99 (X) T = 48 Average Vehicle Trip Ends
 (T) = 7.99 * (6.0) 24 entering 24 exiting
 24 + 24 = 48

Saturday (Page 505)

Directional Distribution: 50% ent. 50% exit.
 T = 8.07 X T = 50 Average Vehicle Trip Ends
 T = 8.07 * 6 25 entering 25 exiting
 25 + 25 = 50

Saturday Peak Hour of Generator (Page 506)

Average Weekday Directional Distribution: 56% entering, 44% exiting
 (T) = 0.72 (X) T = 4 Average Vehicle Trip Ends
 (T) = 0.72 * (6.0) 2 entering 2 exiting
 2 + 2 = 4

Project The Shire at Old Ranch
 Subject Trip Generation - Campground/Recreational Vehicle Park
 Designed by GAM Date October 14, 2024 Job No. 096829001
 Checked by MG October 24, 2024 Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 11th Edition, Average Rate Equations

Land Use Code - Campground/Recreational Vehicle Park (416)

Independent Variable - Occupied Campsites (X)

Campsites 4
 $X = 4$
 T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (400 Series Page 27)

Directional Distribution: 36% ent. 64% exit.
 $(T) = 0.21 (X)$
 $(T) = 0.21 * (4.0)$
 $T = 1$ Average Vehicle Trip Ends
 0 entering 1 exiting
 0 + 1 = 1

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (400 Series Page 28)

Directional Distribution: 65% ent. 35% exit.
 $(T) = 0.27 (X)$
 $(T) = 0.27 * (4.0)$
 $T = 1$ Average Vehicle Trip Ends
 1 entering 0 exiting
 1 + 0 = 1

AM Peak Hour of Generator (400 Series Page 29)

Directional Distribution: 36% ent. 64% exit.
 $(T) = 0.25 (X)$
 $(T) = 0.25 * (4.0)$
 $T = 1$ Average Vehicle Trip Ends
 0 entering 1 exiting
 0 + 1 = 1

PM Peak Hour of Generator (400 Series Page 30)

Directional Distribution: 62% ent. 38% exit.
 $(T) = 0.41 (X)$
 $(T) = 0.41 * (4.0)$
 $T = 2$ Average Vehicle Trip Ends
 1 entering 1 exiting
 1 + 1 = 2

Project The Shire at Old Ranch
 Subject Trip Generation for General Office Building
 Designed by GAM Date October 14, 2024 Job No. 096829001
 Checked by MG October 24, 2024 Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 11th Edition, Average Rates

Land Use Code - General Office Building (710)

Independent Variable - 1000 Square Feet (X)

SF = 8,200

X = 8.200

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (700 Series Page 710)

(T) = 1.52 (X)		Directional Distribution:	88% ent.	12% exit.
(T) = 1.52 *	(8.2)	T = 12	Average Vehicle Trip Ends	
		11 entering	1 exiting	
		11 + 1 = 12		

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (700 Series Page 711)

(T) = 1.44 (X)		Directional Distribution:	17% ent.	83% exit.
(T) = 1.44 *	(8.2)	T = 12	Average Vehicle Trip Ends	
		2 entering	10 exiting	
		2 + 10 = 12		

Weekday (700 Series Page 709)

(T) = 10.84 (X)		Directional Distribution:	50% ent.	50% exit.
(T) = 10.84 *	(8.2)	T = 90	Average Vehicle Trip Ends	
		45 entering	45 exiting	
		45 + 45 = 90		

Project The Shire at Old Ranch
 Subject Trip Generation for Arts and Crafts Store
 Designed by GAM Date October 14, 2024 Job No. 096829001
 Checked by MG October 24, 2024 Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 11th Edition, Average Rates

Land Use Code - Arts and Crafts Store (879)

Independent Variable - 1000 Square Feet (X)

SF = 3,670

X = 3.670

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (800 Series Page 511)

(T) = 6.21 (X)	Directional Distribution:	46% ent.	54% exit.
(T) = 6.21 * (3.7)	T = 23	Average Vehicle Trip Ends	
	11 entering	12 exiting	
	11 + 12 = 23		

Weekday Daily (800 Series Page 513)

(T) = 56.55 (X)	Directional Distribution:	50% ent.	50% exit.
(T) = 56.55 * (22.8)	T = 208	Average Vehicle Trip Ends	
	104 entering	104 exiting	
	104 + 104 = 208		

Project The Shire at Old Ranch
 Subject Trip Generation for High Turnover Sit-Down Restaurant
 Designed by GAM Date October 14, 2024 Job No. 096829001
 Checked by MG Date October 24, 2024 Sheet No. 1 of 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 11th Edition, Average Rates

Land Use Code - High Turnover Sit-Down Restaurant (932)

Independent Variable - 1000 Square Feet (X)

SF = 2,500

X = 2.500

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series Page 674)

(T) = 9.57 (X)		Directional Distribution:	55%	ent.	45%	exit.
(T) = 9.57 *	(2.5)	T = 24	Average Vehicle Trip Ends			
		13	entering	11	exiting	
		13	+	11	=	24

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series Page 674)

(T) = 9.05 (X)		Directional Distribution:	61%	ent.	39%	exit.
(T) = 9.05 *	(2.5)	T = 23	Average Vehicle Trip Ends			
		14	entering	9	exiting	
		14	+	9	=	23

Weekday (900 Series Page 673)

(T) = 107.20 (X)		Directional Distribution:	50%	ent.	50%	exit.
(T) = 107.20 *	(2.5)	T = 268	Average Vehicle Trip Ends			
		134	entering	134	exiting	
		134	+	134	=	268

Non Pass-By Trip Volumes (Per ITE Trip Generation Manual, 11th Edition)

AM Peak Hour =	57%	Non-Pass By	PM Peak Hour =	57%	Non-Pass By
	IN	Out	Total		
AM Peak	7	6	13	PM Peak Hour Rate Applied to AM Peak Hour	
PM Peak	8	5	13		
Daily	76	76	152	PM Peak Hour Rate Applied to Daily	

Pass-By Trip Volumes (Per ITE Trip Generation Manual, 11th Edition)

AM Peak Hour =	43%	Pass By	PM Peak Hour =	43%	Pass By
	IN	Out	Total		
AM Peak	6	5	11	PM Peak Hour Rate Applied to AM Peak Hour	
PM Peak	6	4	10		
Daily	58	58	116	PM Peak Hour Rate Applied to Daily	



APPENDIX D

Intersection Analysis Worksheets

Intersection				
Intersection Delay, s/veh	8.9			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	67	452	495	430
Demand Flow Rate, veh/h	68	461	504	439
Vehicles Circulating, veh/h	445	510	221	38
Vehicles Exiting, veh/h	32	215	292	933
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.9	12.9	8.4	5.8
Approach LOS	A	B	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	68	461	504	439
Cap Entry Lane, veh/h	876	820	1101	1327
Entry HV Adj Factor	0.979	0.980	0.981	0.980
Flow Entry, veh/h	67	452	495	430
Cap Entry, veh/h	858	804	1081	1301
V/C Ratio	0.078	0.562	0.458	0.331
Control Delay, s/veh	4.9	12.9	8.4	5.8
LOS	A	B	A	A
95th %tile Queue, veh	0	4	2	1

HCM 6th Roundabout
1: Cordera Crest Avenue & Blue Horizon View & Old Ranch Road

2024 Existing PM
10/17/2024

Intersection				
Intersection Delay, s/veh	5.3			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	23	173	154	463
Demand Flow Rate, veh/h	23	176	157	472
Vehicles Circulating, veh/h	478	150	286	8
Vehicles Exiting, veh/h	2	293	215	318
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.5	4.4	5.0	5.8
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	23	176	157	472
Cap Entry Lane, veh/h	847	1184	1031	1369
Entry HV Adj Factor	0.993	0.983	0.982	0.981
Flow Entry, veh/h	23	173	154	463
Cap Entry, veh/h	842	1164	1012	1343
V/C Ratio	0.027	0.149	0.152	0.345
Control Delay, s/veh	4.5	4.4	5.0	5.8
LOS	A	A	A	A
95th %tile Queue, veh	0	1	1	2

Intersection				
Intersection Delay, s/veh	9.8			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	71	479	525	455
Demand Flow Rate, veh/h	72	488	535	464
Vehicles Circulating, veh/h	470	542	234	39
Vehicles Exiting, veh/h	33	227	308	991
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.1	14.8	9.1	6.0
Approach LOS	A	B	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	72	488	535	464
Cap Entry Lane, veh/h	854	794	1087	1326
Entry HV Adj Factor	0.980	0.981	0.981	0.980
Flow Entry, veh/h	71	479	525	455
Cap Entry, veh/h	837	779	1067	1300
V/C Ratio	0.084	0.615	0.492	0.350
Control Delay, s/veh	5.1	14.8	9.1	6.0
LOS	A	B	A	A
95th %tile Queue, veh	0	4	3	2

Intersection				
Intersection Delay, s/veh	5.5			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	24	184	165	490
Demand Flow Rate, veh/h	24	188	168	500
Vehicles Circulating, veh/h	506	159	303	8
Vehicles Exiting, veh/h	2	312	227	339
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.7	4.5	5.2	6.0
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	24	188	168	500
Cap Entry Lane, veh/h	824	1173	1013	1369
Entry HV Adj Factor	0.993	0.979	0.982	0.980
Flow Entry, veh/h	24	184	165	490
Cap Entry, veh/h	818	1148	995	1341
V/C Ratio	0.029	0.160	0.166	0.365
Control Delay, s/veh	4.7	4.5	5.2	6.0
LOS	A	A	A	A
95th %tile Queue, veh	0	1	1	2

HCM 6th Roundabout
1: Cordera Crest Avenue & Blue Horizon View & Old Ranch Road

2027 Total AM
10/17/2024

Intersection				
Intersection Delay, s/veh	10.3			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	71	498	532	476
Demand Flow Rate, veh/h	72	507	542	485
Vehicles Circulating, veh/h	496	542	255	44
Vehicles Exiting, veh/h	33	255	313	1005
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.3	15.6	9.5	6.2
Approach LOS	A	C	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	72	507	542	485
Cap Entry Lane, veh/h	832	794	1064	1319
Entry HV Adj Factor	0.980	0.982	0.982	0.981
Flow Entry, veh/h	71	498	532	476
Cap Entry, veh/h	815	779	1044	1294
V/C Ratio	0.087	0.639	0.509	0.368
Control Delay, s/veh	5.3	15.6	9.5	6.2
LOS	A	C	A	A
95th %tile Queue, veh	0	5	3	2

HCM 6th Roundabout
1: Cordera Crest Avenue & Blue Horizon View & Old Ranch Road

2027 Total PM
10/17/2024

Intersection				
Intersection Delay, s/veh	5.7			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	24	207	170	503
Demand Flow Rate, veh/h	24	211	173	513
Vehicles Circulating, veh/h	526	159	316	15
Vehicles Exiting, veh/h	2	330	234	355
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.8	4.7	5.3	6.2
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	24	211	173	513
Cap Entry Lane, veh/h	807	1173	1000	1359
Entry HV Adj Factor	0.993	0.981	0.982	0.980
Flow Entry, veh/h	24	207	170	503
Cap Entry, veh/h	802	1151	982	1332
V/C Ratio	0.030	0.180	0.173	0.378
Control Delay, s/veh	4.8	4.7	5.3	6.2
LOS	A	A	A	A
95th %tile Queue, veh	0	1	1	2

Intersection				
Intersection Delay, s/veh	14.6			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	83	565	620	538
Demand Flow Rate, veh/h	85	576	632	549
Vehicles Circulating, veh/h	555	639	277	46
Vehicles Exiting, veh/h	40	270	363	1169
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.8	26.3	11.9	6.9
Approach LOS	A	D	B	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	85	576	632	549
Cap Entry Lane, veh/h	783	719	1040	1317
Entry HV Adj Factor	0.982	0.980	0.981	0.980
Flow Entry, veh/h	83	565	620	538
Cap Entry, veh/h	769	705	1021	1290
V/C Ratio	0.108	0.801	0.608	0.417
Control Delay, s/veh	5.8	26.3	11.9	6.9
LOS	A	D	B	A
95th %tile Queue, veh	0	8	4	2

Intersection				
Intersection Delay, s/veh	7.7			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	36	272	243	724
Demand Flow Rate, veh/h	36	277	248	738
Vehicles Circulating, veh/h	748	236	448	14
Vehicles Exiting, veh/h	4	460	336	499
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.2	5.8	7.3	8.6
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	36	277	248	738
Cap Entry Lane, veh/h	643	1085	874	1360
Entry HV Adj Factor	0.993	0.982	0.982	0.981
Flow Entry, veh/h	36	272	243	724
Cap Entry, veh/h	639	1065	858	1335
V/C Ratio	0.056	0.255	0.284	0.543
Control Delay, s/veh	6.2	5.8	7.3	8.6
LOS	A	A	A	A
95th %tile Queue, veh	0	1	1	3

HCM 6th Roundabout
1: Cordera Crest Avenue & Blue Horizon View & Old Ranch Road

2045 Total AM
10/17/2024

Intersection				
Intersection Delay, s/veh	15.6			
Intersection LOS	C			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	83	581	626	556
Demand Flow Rate, veh/h	85	592	638	567
Vehicles Circulating, veh/h	577	639	295	50
Vehicles Exiting, veh/h	40	294	367	1181
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.9	28.4	12.5	7.1
Approach LOS	A	D	B	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	85	592	638	567
Cap Entry Lane, veh/h	766	719	1021	1311
Entry HV Adj Factor	0.982	0.981	0.981	0.980
Flow Entry, veh/h	83	581	626	556
Cap Entry, veh/h	752	705	1002	1286
V/C Ratio	0.111	0.823	0.625	0.432
Control Delay, s/veh	5.9	28.4	12.5	7.1
LOS	A	D	B	A
95th %tile Queue, veh	0	9	5	2

Intersection				
Intersection Delay, s/veh	7.9			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	36	294	249	737
Demand Flow Rate, veh/h	36	300	254	752
Vehicles Circulating, veh/h	768	236	462	20
Vehicles Exiting, veh/h	4	480	342	516
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	6.4	6.1	7.5	8.8
Approach LOS	A	A	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	36	300	254	752
Cap Entry Lane, veh/h	630	1085	861	1352
Entry HV Adj Factor	0.993	0.980	0.982	0.980
Flow Entry, veh/h	36	294	249	737
Cap Entry, veh/h	626	1063	846	1325
V/C Ratio	0.057	0.277	0.295	0.556
Control Delay, s/veh	6.4	6.1	7.5	8.8
LOS	A	A	A	A
95th %tile Queue, veh	0	1	1	4

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	11	147	316	0	3	32
Future Vol, veh/h	11	147	316	0	3	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	30	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	169	363	0	3	37

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	363	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1196	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1196	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.6	0	10.7
HCM LOS	B		

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1196	-	-	-	670
HCM Lane V/C Ratio	0.011	-	-	-	0.06
HCM Control Delay (s/veh)	8	-	-	-	10.7
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q (veh)	0	-	-	-	0.2

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	254	154	0	0	10
Future Vol, veh/h	18	254	154	0	0	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	30	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	19	270	164	0	0	11

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	164	0	0 472 164
Stage 1	-	-	- 164 -
Stage 2	-	-	- 308 -
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	1414	-	- 551 881
Stage 1	-	-	- 865 -
Stage 2	-	-	- 745 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1414	-	- 544 881
Mov Cap-2 Maneuver	-	-	- 608 -
Stage 1	-	-	- 854 -
Stage 2	-	-	- 745 -

Approach	EB	WB	SB
HCM Control Delay, s/v	0.5	0	9.1
HCM LOS	A		

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1414	-	-	-	881
HCM Lane V/C Ratio	0.014	-	-	-	0.012
HCM Control Delay (s/veh)	7.6	-	-	-	9.1
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q (veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	156	335	0	3	34
Future Vol, veh/h	12	156	335	0	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	100	-	-	30	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	179	385	0	3	39

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	385	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1173	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1173	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.6	0	10.9
HCM LOS	B		

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1173	-	-	-	652
HCM Lane V/C Ratio	0.012	-	-	-	0.065
HCM Control Delay (s/veh)	8.1	-	-	-	10.9
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q (veh)	0	-	-	-	0.2

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	270	163	0	0	11
Future Vol, veh/h	19	270	163	0	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	30	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	287	173	0	0	12
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	173	0	-	0	500	173
Stage 1	-	-	-	-	173	-
Stage 2	-	-	-	-	327	-
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	1404	-	-	-	530	871
Stage 1	-	-	-	-	857	-
Stage 2	-	-	-	-	731	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1404	-	-	-	523	871
Mov Cap-2 Maneuver	-	-	-	-	593	-
Stage 1	-	-	-	-	845	-
Stage 2	-	-	-	-	731	-
Approach	EB	WB		SB		
HCM Control Delay, s/v	0.5	0		9.2		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1404	-	-	-	871	
HCM Lane V/C Ratio	0.014	-	-	-	0.013	
HCM Control Delay (s/veh)	7.6	-	-	-	9.2	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q (veh)	0	-	-	-	0	

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	178	350	0	3	34
Future Vol, veh/h	12	178	350	0	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	100	-	-	30	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	14	205	402	0	3	39

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	402	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1157	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1157	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.5	0	11.1
HCM LOS	B		

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1157	-	-	-	636
HCM Lane V/C Ratio	0.012	-	-	-	0.067
HCM Control Delay (s/veh)	8.1	-	-	-	11.1
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q (veh)	0	-	-	-	0.2

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	287	184	0	0	11
Future Vol, veh/h	19	287	184	0	0	11
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	30	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	305	196	0	0	12

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	196	0	0 541 196
Stage 1	-	-	- 196 -
Stage 2	-	-	- 345 -
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	1377	-	- 502 845
Stage 1	-	-	- 837 -
Stage 2	-	-	- 717 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1377	-	- 494 845
Mov Cap-2 Maneuver	-	-	- 572 -
Stage 1	-	-	- 824 -
Stage 2	-	-	- 717 -

Approach	EB	WB	SB
HCM Control Delay, s/v	0.5	0	9.3
HCM LOS	A		

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1377	-	-	-	845
HCM Lane V/C Ratio	0.015	-	-	-	0.014
HCM Control Delay (s/veh)	7.7	-	-	-	9.3
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q (veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	223	479	0	5	49
Future Vol, veh/h	17	223	479	0	5	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	30	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	242	521	0	5	53
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	521	0	-	0	799	521
Stage 1	-	-	-	-	521	-
Stage 2	-	-	-	-	278	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1045	-	-	-	355	555
Stage 1	-	-	-	-	596	-
Stage 2	-	-	-	-	769	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1045	-	-	-	349	555
Mov Cap-2 Maneuver	-	-	-	-	457	-
Stage 1	-	-	-	-	586	-
Stage 2	-	-	-	-	769	-
Approach	EB	WB		SB		
HCM Control Delay, s/v	0.6	0		12.4		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1045	-	-	-	544	
HCM Lane V/C Ratio	0.018	-	-	-	0.108	
HCM Control Delay (s/veh)	8.5	-	-	-	12.4	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q (veh)	0.1	-	-	-	0.4	

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	385	233	0	0	15
Future Vol, veh/h	27	385	233	0	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	30	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	29	418	253	0	0	16

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	253	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1312	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1312	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s/v	0.5	0	9.7
HCM LOS	A		

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1312	-	-	-	786
HCM Lane V/C Ratio	0.022	-	-	-	0.021
HCM Control Delay (s/veh)	7.8	-	-	-	9.7
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q (veh)	0.1	-	-	-	0.1

HCM 6th TWSC
2: Old Ranch Road & Howells Road

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Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	245	490	0	5	49
Future Vol, veh/h	17	245	490	0	5	49
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	30	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	266	533	0	5	53
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	533	0	-	0	835	533
Stage 1	-	-	-	-	533	-
Stage 2	-	-	-	-	302	-
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	1035	-	-	-	338	547
Stage 1	-	-	-	-	588	-
Stage 2	-	-	-	-	750	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1035	-	-	-	332	547
Mov Cap-2 Maneuver	-	-	-	-	444	-
Stage 1	-	-	-	-	578	-
Stage 2	-	-	-	-	750	-
Approach	EB	WB		SB		
HCM Control Delay, s/v	0.6	0		12.6		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1035	-	-	-	535	
HCM Lane V/C Ratio	0.018	-	-	-	0.11	
HCM Control Delay (s/veh)	8.5	-	-	-	12.6	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q (veh)	0.1	-	-	-	0.4	

HCM 6th TWSC
2: Old Ranch Road & Howells Road

2045 Total PM
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Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	402	254	0	0	15
Future Vol, veh/h	27	402	254	0	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	30	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	29	437	276	0	0	16
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	276	0	-	0	771	276
Stage 1	-	-	-	-	276	-
Stage 2	-	-	-	-	495	-
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	1287	-	-	-	368	763
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	613	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1287	-	-	-	360	763
Mov Cap-2 Maneuver	-	-	-	-	469	-
Stage 1	-	-	-	-	753	-
Stage 2	-	-	-	-	613	-
Approach	EB	WB		SB		
HCM Control Delay, s/v	0.5	0		9.8		
HCM LOS	A					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1287	-	-	-	763	
HCM Lane V/C Ratio	0.023	-	-	-	0.021	
HCM Control Delay (s/veh)	7.9	-	-	-	9.8	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q (veh)	0.1	-	-	-	0.1	

HCM 6th TWSC
3: Old Ranch Road & Full Access

2027 Total AM
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Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	159	335	9	6	15
Future Vol, veh/h	22	159	335	9	6	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	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	24	173	364	10	7	16

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	374	0	0 590 369
Stage 1	-	-	- - 369 -
Stage 2	-	-	- - 221 -
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	1184	-	- - 470 677
Stage 1	-	-	- - 699 -
Stage 2	-	-	- - 816 -
Platoon blocked, %		-	- -
Mov Cap-1 Maneuver	1184	-	- - 461 677
Mov Cap-2 Maneuver	-	-	- - 546 -
Stage 1	-	-	- - 685 -
Stage 2	-	-	- - 816 -

Approach	EB	WB	SB
HCM Control Delay, s/v	1	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1184	-	-	-	634
HCM Lane V/C Ratio	0.02	-	-	-	0.036
HCM Control Delay (s/veh)	8.1	-	-	-	10.9
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q (veh)	0.1	-	-	-	0.1

HCM 6th TWSC
3: Old Ranch Road & Full Access

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Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	270	163	7	9	21
Future Vol, veh/h	17	270	163	7	9	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	293	177	8	10	23

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	185	0	0 510 181
Stage 1	-	-	- 181 -
Stage 2	-	-	- 329 -
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	1390	-	- 523 862
Stage 1	-	-	- 850 -
Stage 2	-	-	- 729 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1390	-	- 516 862
Mov Cap-2 Maneuver	-	-	- 588 -
Stage 1	-	-	- 839 -
Stage 2	-	-	- 729 -

Approach	EB	WB	SB
HCM Control Delay, s/v	0.5	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1390	-	-	-	756
HCM Lane V/C Ratio	0.013	-	-	-	0.043
HCM Control Delay (s/veh)	7.6	-	-	-	10
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q (veh)	0	-	-	-	0.1

HCM 6th TWSC
3: Old Ranch Road & Full Access

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Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	227	479	9	6	15
Future Vol, veh/h	22	227	479	9	6	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	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	24	247	521	10	7	16

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	531	0	821
Stage 1	-	-	526
Stage 2	-	-	295
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	1036	-	344
Stage 1	-	-	593
Stage 2	-	-	755
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1036	-	336
Mov Cap-2 Maneuver	-	-	447
Stage 1	-	-	579
Stage 2	-	-	755

Approach	EB	WB	SB
HCM Control Delay, s/v	0.8	0	12.3
HCM LOS	B		

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1036	-	-	-	517
HCM Lane V/C Ratio	0.023	-	-	-	0.044
HCM Control Delay (s/veh)	8.6	-	-	-	12.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q (veh)	0.1	-	-	-	0.1

HCM 6th TWSC
3: Old Ranch Road & Full Access

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Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	385	233	7	9	21
Future Vol, veh/h	17	385	233	7	9	21
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	418	253	8	10	23
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	261	0	-	0	711	257
Stage 1	-	-	-	-	257	-
Stage 2	-	-	-	-	454	-
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	1303	-	-	-	400	782
Stage 1	-	-	-	-	786	-
Stage 2	-	-	-	-	640	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1303	-	-	-	394	782
Mov Cap-2 Maneuver	-	-	-	-	496	-
Stage 1	-	-	-	-	775	-
Stage 2	-	-	-	-	640	-
Approach	EB	WB		SB		
HCM Control Delay, s/v	0.3	0		10.7		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1303	-	-	-	667	
HCM Lane V/C Ratio	0.014	-	-	-	0.049	
HCM Control Delay (s/veh)	7.8	-	-	-	10.7	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q (veh)	0	-	-	-	0.2	