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Cathedral Rock Church  
Traffic Impact Study  
PCD File No.: PPR2436  
(LSC #S244110)

April 3, 2025 w/Minor Revision 4/22/2025

Traffic Engineer's Statement

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



**Accepted for File**

By: Gilbert LaForce, P.E.  
Engineering Manager

Date: 04/30/2025 3:23:57 PM

El Paso County Department of Public Works



Developer's Statement

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

A handwritten signature in blue ink, likely of the developer, written over a horizontal line.

4/4/25

Date

# Cathedral Rock Church

## Traffic Impact Study

Prepared for:  
Mr. Joe Butler  
Hammers Construction  
1411 Woolsey Heights  
Colorado Springs, CO 80915

APRIL 3, 2025 W/MINOR REVISION 4/22/2025

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LSC Transportation Consultants  
Prepared by: Jeffrey C. Hodsdon, P.E.

LSC #S244310  
PCD File No.: PPR2436



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Table 3

Figure 1 - Figure 10

Traffic Count Reports

Synchro LOS Reports

Queuing Reports

Appendix A from the TIS for EPC PCD File No. PPR2248

Copy of Deviation Request from PCD File No. PPR2248





**LSC TRANSPORTATION CONSULTANTS, INC.**  
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April 3, 2025 (w/Minor Revision 4/22/2025)

Mr. Joe Butler  
Hammers Construction  
1411 Woolsey Heights  
Colorado Springs, CO 80915

RE: Cathedral Rock Church  
Traffic Impact Study  
El Paso County, CO  
LSC # S244310  
PCD File No.: [PPR2436](#)

Dear Mr. Butler,

LSC Transportation Consultants, Inc. has prepared this traffic impact study for the proposed Cathedral Rock Church in El Paso County, Colorado. The 5.08-acre site is located on the northeast corner of the intersection of Struthers Road/Struthers Ranch Road (El Paso County parcel ID 7136301013).

The proposed land use for the site is an 11,375-square-foot church with 276 seats in the main worship sanctuary. The site plan also shows a 10,000 square-foot building on the site. One access is proposed to Struthers Ranch Road, located approximately 340 feet northeast of Struthers Road/Struthers Ranch Road (centerline spacing). No direct access is proposed to Struthers Road.

This report has been prepared for submittal to El Paso County.

## **REPORT CONTENTS**

The preparation of this report included the following:

- Inventory of existing adjacent and nearby area street system. This included surface conditions, functional classifications, roadway widths, lane configurations, traffic control, posted speed limits, pavement markings, intersection and access spacing, roadway and intersection alignments, auxiliary left- and right-turn lanes, sight distances, etc.;
- Summary of Sunday morning peak-hour turning-movement traffic counts at the "study-area" intersection of Struthers Road/Struthers Ranch Road.
- Estimates of average Sunday (24-hour) and weekday (24-hour) and peak-hour trip generation for the proposed development;

- Estimation of directional distribution of site-generated vehicle trips on the area street system, at the study-area intersections;
- Projections of Sunday morning peak hour site-generated turning-movement traffic volumes at the study-area intersections;
- Estimates of short- and long-term Sunday morning peak hour background traffic volumes at the study-area intersections;
- Total traffic (site-generated traffic-plus-background traffic) projections at these intersections for the short term and long term;
- Level of service (LOS) analysis at the study-area intersections for the Sunday morning peak hour;
- Queuing analysis to determine if queues on the southwest-bound approach to Struthers Road on Struthers Ranch Road will extend back from the stop sign at Struthers Road to the proposed site access intersection;
- Evaluation of short-term and long-term projected Sunday morning peak hour intersection volumes to determine the potential need for any new or improved auxiliary right-/left-turn lanes based on the criteria in El Paso County's *Engineering Criteria Manual (ECM)*;
- Identification of the El Paso County Road Impact Fee program fee amounts;
- Summary of compiled data, analysis, findings, and recommendations.

## LAND USE AND ACCESS

Figure 1 shows the site location relative to the adjacent and nearby streets. The 5.08-acre site is located on the northeast corner of the intersection of Struthers Road/Struthers Ranch Road (El Paso County parcel ID 7136301013). A copy of the site plan is depicted on Figure 2.

The proposed land use for the site is an 11,375-square-foot church with 276 seats in the main worship sanctuary. The site plan also shows a 10,000 square-foot building on the site. The total church floor area will be 21,375 square feet.

One access is proposed to Struthers Ranch Road, located approximately 340 feet northeast of Struthers Road/Struthers Ranch Road (centerline spacing). No direct access is proposed to Struthers Road.

## INTERSECTION SIGHT DISTANCE

### Struthers Road/Struthers Ranch Road

Regarding the Intersection sight distance at the intersection of Struthers Road/Struthers Ranch Road, the following has been taken from the TIS report for EPC PCD File No. [PPR2248](#). The applicable figures are 3a and 3b, which are modified copies of these same figures from the TIS report for [PPR2248](#).

*Intersection sight distance for the intersection of Struthers Road/Struthers Ranch Road has been based Table 2-21 of the Engineering Criteria Manual (ECM). This table has a footnote that special design considerations for situations other than intersecting two-lane roads are required. Please refer to **Appendix A** of this report for detailed calculations and application of criteria. [copy attached to **this** Cathedral Rock Church report]*

*Based on the calculations presented in **Appendix A** of this report,*

- 590 feet – calculated intersection sight distance to the left (south)*
- 640 feet – calculated intersection sight distance to the right (north)*

*Field-measured **sight distance to the south**, in conjunction with the site plan/grading plan, would meet the calculated 590 feet of sight distance, as shown in Figure 3a.*

*Sight distance **to the south** will be met, provided the intersection line of sight “triangle” is kept free of site improvements (that would limit the line of sight needed to maintain 590 feet of prescribed sight distance). Examples of site improvements include buildings, landscaping, monument signs, parking areas, berms, etc. Obstruction height to maintain line of sight is 18-30 inches above the flow line of the adjacent road per ECM 2.3.6.G.2. LSC reviewed the grading plan and the height of the section of the retaining wall at the point where the line-of-sight traverses across the site, is such that it would not impede the line of sight for the 590’ of sight distance.*

*Sight distance **to the north** is shown in Figure 3b. Field-measured sight distance **to the north** at this intersection is 450 feet. Given that the field-measured sight distance is less than the calculated sight distance of 640 feet, LSC recommends posting an “intersection ahead” warning sign (MUTCD W2-2) on the southbound approach to this intersection. Note: ECM (and AASHTO) **stopping** sight distance for a 50-mph design speed is 425 feet.*

*Also, consideration could be given to modifying the posted speed limit zones on Struthers Road near this intersection to shift the 40-mph zone north such that a 40-mph speed limit sign is posted for southbound traffic between Spanish Bit Drive and Struthers Ranch Road.*

Based on LSC’s field sight-distance check, temporary sight-distance line-of-sight limitations to the south are shown marked on Figure 3b. This shows parked vehicles and roadside weeds within the line-of-sight triangle, which limit sight distance to a substandard length along Struthers Road.

The required sight distance for the access point onto Struthers Ranch Road is met at 280 feet. The line of sight extends into the intersection of Struthers Road/Struthers Ranch Road. Looking east along Struthers Ranch Road, the line of sight extends beyond the intersection with Blue Wings Way, or over 600 feet.

## ROAD AND TRAFFIC CONDITIONS

### Area Roadways

Figure 1 shows the streets adjacent to and in the vicinity of the site. Adjacent streets serving the site are identified below followed by a brief description of each:

**Struthers Road** is a four-lane, median-divided road that extends north from North Gate Boulevard to the intersection of Baptist Road and Jackson Creek Parkway. Struthers Road is classified as a four-lane Urban Minor Arterial on the El Paso County Major Transportation Corridors Plan and has a speed limit of 45 miles per hour (mph) about 325 feet north of Air Garden Lane. South of this point, the posted speed limit is 40 mph.

**Struthers Ranch Road** is classified as a local roadway. Struthers Ranch Road is an east/west road that extends from Struthers Road into the Struthers Ranch residential development. The roadway has a posted speed limit of 25 mph. The intersection with Struthers Road is unsignalized. The roadway at the intersection with Struthers Road is 32.7 feet wide, which only allows for a shared westbound left/right lane on the minor street approach. Struthers Road has a 340-foot southbound left-turn deceleration lane and a 260-foot northbound right-turn deceleration lane at the intersection with Struthers Ranch Road.

### Existing Traffic Volumes

Vehicle turning-movement counts were conducted on the following dates and times:

- Struthers Road/Struthers Ranch Road
  - Sunday, September 8, 2024 from 9:00 a.m. – 11:30 a.m.
  - Tuesday, November 1, 2022 from 6:30 a.m. – 8:30 a.m.
  - Tuesday, November 1, 2022 from 4:00 p.m. – 6:00 p.m.

Figure 4 shows these turning-movement volumes, as well as the estimated current average weekday traffic volumes on the study-area streets. Raw count data is attached.

### Crash History

Three years of crash data were collected at the intersection of Struthers Road/Struthers Ranch Road (October 2021 through September 2024). Four crashes were reported during that study period. No correctable crash patterns were identified.

## TRIP GENERATION

Estimates of the vehicle trips projected to be generated by the proposed Cathedral Rock Church development have been made using the nationally published trip-generation rates from *Trip Generation, 11<sup>th</sup> Edition, 2021* by the Institute of Transportation Engineers (ITE). Corresponding trip-generation rates from ITE Land Use Category “560 – Church” have been used to develop the trip-generation estimates for the proposed site.

Table 1 below presents a summary of the estimated site trip generation during both Sunday and weekday peak hours. A detailed trip-generation estimate for the development, including ITE rates for the proposed development is presented in Table 3 (attached).

Table 1: Estimated Site Vehicle-Trip Generation			
Sunday			
Analysis Period	In	Out	Total
Church Peak Hour	69	72	141
Daily/24-hour	305	305	610
Weekday			
Analysis Period	In	Out	Total
AM Peak Hour	12	8	19
PM Peak Hour	12	15	28
Daily/24-hour	124	124	248

### Sunday

The proposed church is projected to generate about 610 total vehicle trips on the average Sunday during a 24-hour period, with approximately half entering and half exiting the site. During the church’s Sunday peak hour, approximately 69 entering and 72 exiting vehicles are estimated to be generated.

### Weekday

The proposed church is projected to generate about 324 total vehicle trips on the average weekday during a 24-hour period, with approximately half entering and half exiting the site. During the weekday morning peak hour, approximately 14 entering 9 exiting vehicles are estimated to be generated. Approximately 12 entering and 15 exiting vehicles are estimated to be generated by the site during the weekday afternoon peak hour.

## TRIP DISTRIBUTION AND ASSIGNMENT

### Trip Directional Distribution

Estimating the directional distribution of site-generated vehicle trips to the study-area roads and intersections is a necessary component in determining the site's traffic impacts. Figure 6 (attached) shows the percentages of the site-generated vehicle trips projected to be oriented to and from the site's major approaches. Estimates have been based on the following factors: the anticipated land uses, the area street and road system serving the site, the access plan, and the site's geographic location relative the greater El Paso County area.

### Site-Generated Traffic

Figure 7 shows projected site-generated traffic volumes for the proposed church. Site-generated traffic volumes at the study-area intersections have been calculated by applying directional-distribution percentages (from Figure 6) to the trip-generation estimates (from Table 3).

### Short-Term Total Traffic Volumes

Figure 8 shows the sum of existing 2024 traffic volumes (from Figure 4) and site-generated peak-hour traffic volumes (shown in Figure 7). These volumes represent the estimated short-term total traffic following completion and buildout of the development.

### Estimated Future 2044 Background Traffic Volumes

Figure 9 shows the projected 20-year background traffic volumes for the year 2044. Projected 20-year background traffic volumes do **not** include projected traffic to be generated by the proposed church development. An annual growth rate of approximately 4.5 percent per year has been assumed for Struthers Road, which is consistent with the growth rates used by LSC in recent traffic studies along Struthers Road. Approximately 10,750 square feet of retail space was assumed for the currently-vacant Lots 3 and 4 within the Struthers Ranch development. The recently-constructed ATV sales site on Lots 1 and 2 is not open on Sundays, so Sunday trips from that development were not included with future background traffic.

### Future 2044 Total Traffic Volumes

Figure 10 shows the projected 2044 total traffic volumes, which are the sum of 2044 background traffic volumes (Figure 9) plus the site-generated traffic volumes (from Figure 7).

## TRAFFIC OPERATIONS ANALYSIS

LSC has completed intersection levels of service for short- and long-term traffic scenarios for the church's Sunday peak-hour time period. The peak for entering church traffic would not likely overlap within the same hour as the peak for exiting church traffic. These peak periods would remain separate provided:

- The church continues to hold only one Sunday service.
- If multiple services are offered, the time between services would be sufficiently long enough to allow for the peak period of exiting traffic from one service to end before the peak period of entering traffic for the following service would begin.

If multiple services are scheduled too closely together, entering and exiting peak volumes could occur simultaneously or with significant overlap. As such, separate peak periods were analyzed, with a peak-hour factor (PHF) of 0.50 used for entering and exiting site-generated traffic during each of these peak periods:

- Pre-service entering peak period
- Post-service exiting peak period

Level of service (LOS) is a quantitative measure of the level of congestion or delay at an intersection and is indicated on a scale from "A" to "F." LOS A is indicative of little congestion or delay. LOS F indicates a high level of congestion or delay. Table 2 shows the level of service delay ranges for signalized and unsignalized intersections.

**Table 2: Intersection Levels of Service Delay Ranges**

Level of Service	Signalized Intersections	Unsignalized Intersections
	Average Control Delay (seconds per vehicle)	Average Control Delay (seconds per vehicle) <sup>1</sup>
A	10.0 sec or less	10.0 sec or less
B	10.1-20.0 sec	10.1-15.0 sec
C	20.1-35.0 sec	15.1-25.0 sec
D	35.1-55.0 sec	25.1-35.0 sec
E	55.1-80.0 sec	35.1-50.0 sec
F	80.1 sec or more	50.1 sec or more

<sup>1</sup> For unsignalized intersections, if V/C ratio is greater than 1.0 the level of service is LOS F, regardless of the projected average control delay per vehicle.

Detailed Synchro reports are attached. Level of service analysis results are summarized briefly below and shown in the following figures:

- Figure 4: 2024 Existing Traffic, Lane Geometry, Traffic Control, and LOS
- Figure 5: 2025 Short-Term Baseline Traffic, Lane Geometry, Traffic Control, and LOS
- Figure 8: 2025 Existing + Site Traffic, Lane Geometry, Traffic Control, and LOS
- Figure 9: 2044 Background Traffic, Lane Geometry, Traffic Control, and LOS
- Figure 10: 2044 Background + Site Traffic, Lane Geometry, Traffic Control, and LOS

### **Struthers Road/Struthers Ranch Road**

#### **Short Term**

All individual turning movements and single-lane approaches at the intersection of Struthers Road/Struthers Ranch Road currently operate at and are projected to remain at LOS B or better during the short term, with or without the addition of site-generated traffic.

#### **Long Term**

All individual turning movements and single-lane approaches at the intersection of Struthers Road/Struthers Ranch Road are projected to remain at LOS C or better during the long term, with or without the addition of site-generated traffic.

### **Struthers Ranch Road/Proposed Site Access**

All movements at the proposed site access on Struthers Ranch Road are projected to operate at LOS B or better during all peak hours through the 20-year horizon, based on the projected short-term total and long-term total traffic volumes.

### **VEHICLE QUEUEING ANALYSIS**

A SimTraffic queueing analysis was performed to determine if queues on the southwest-bound approach to Struthers Road on Struthers Ranch Road will extend back from the stop sign at Struthers Road to the proposed site-access intersection.

#### **Queueing Analysis Terminology**

“Upstream block time” represents the percentage of time during the peak hour in which the entry point for a turn lane upstream of the subject intersection is blocked by a queue in the adjacent through lane. “Storage block time” is the proportion of time in which the turn lane’s queue exceeds the available storage length and left-turning vehicles overspill the turn lane in the model and into the adjacent through lane.



“Maximum queue” represents the maximum queue length observed for each individual lane during the 15-minute analysis period. SimTraffic records the maximum back of queue observed for every two-minute period. In SimTraffic, a vehicle is considered queued whenever it is behind another vehicle traveling at less than 10 feet/second (approximately 7 mph) or at a stop bar. The maximum observed queue may not occur during the same interval in which the highest upstream block time (percent) or storage block time (percent) occurs. SimTraffic reports have reported the highest value for each metric for each turn lane/approach, regardless of if they occur in the same 15-minute interval.

## **Queuing Analysis Results at Struthers Road/Struthers Ranch Road**

### Westbound Approach

There are approximately 240 feet available for vehicle queueing between the stop sign at the intersection of Struthers Road/Struthers Ranch Road and the site access on Struthers Ranch Road. The worst-case queue from the church’s Sunday morning peak hour is reported below. Please refer to the attached SimTraffic queue reports for additional details. SimTraffic simulations assumed no modifications to the existing turn-lane lengths on Struthers Road or Struthers Ranch Road. Projected queues are **not** projected to extend to the site access during the 2044 Sunday exiting peak 15-minute period.

- Maximum queue – 140 feet
- 95<sup>th</sup>-percentile queue – 133 feet
- Upstream block time – 0 percent
- Storage block time – 0 percent

### Southbound Left Turn

SimTraffic analysis results show projected maximum and 95<sup>th</sup> percentile queues below the *ECM* storage length of 100 feet (from Table 2-30) for the Sunday morning peak hour. The existing turn lane can accommodate either.

## **AUXILIARY TURN-LANE NEEDS ANALYSIS**

### **Struthers Road**

#### Southbound-Left-Turn Deceleration Lane

As mentioned previously, there is a 340-foot southbound left-turn deceleration lane at the intersection of Struthers Road/Struthers Ranch Road. This lane meets the *ECM* auxiliary-lane criteria and does not need to be modified with the development.

#### Northbound-Right-Turn Deceleration Lane

There is a 385-foot northbound right-turn deceleration lane (combined lane plus taper length) at this intersection of Struthers Road/Struthers Ranch Road. This auxiliary lane, although it exists, is not currently required per the *ECM* based on existing or projected short-term total traffic.

However, the lane would be required with long-term total traffic volumes, as the 50-vph turning-volume threshold is projected to be met on Sunday mornings with long-term total (background plus church site-generated) traffic. This is based on some additional Sunday-morning background traffic for the long term. If the current RMC business remains closed on Sunday and any additional development results in background traffic less than projected, the turn lane threshold might not be met – even in the long term. The turn lane already exists and is about 405 feet (270-foot lane plus 135-foot taper). The *ECM* requirement is 435 feet (less any length adjustment for an upgrade of greater than three percent), or a 235-foot lane plus 200-foot taper (for a 50-mph design speed).

#### Westbound-Left-Turn Deceleration Lane

The westbound-left volume on Struthers Ranch Road approaching Struthers Road is projected to exceed the *ECM*'s 25-vph threshold for requiring a separate left-turn lane. However, the westbound approach is projected to operate at LOS C through 2044 with a shared left-/right-turn lane. Queues extending to the northeast on Struthers Ranch Road would also not block the proposed site access. A deviation request for *ECM* Section "2.3.7.D.1 – Turn Lanes Required, Exclusive Left-Turn Lanes Required" has been included with this submittal, as this is being required by staff. Please refer to the deviation request form (separate document).

#### Westbound-to-Northbound-Right-Turn Acceleration Lane

Struthers Road is shown on the *Major Transportation Corridors Plan (MTCP)* as a Minor Arterial. Based on this roadway classification, a northbound-right-turn acceleration lane is **not** required on Struthers Road, as acceleration lanes are not required on Minor Arterials.

#### **Struthers Ranch Road/Proposed Site Access**

Based on projected long-term total volumes, no auxiliary turn lanes are recommended at the proposed site-access intersection on Struthers Road. Traffic would mainly only be impacted on Sunday mornings before church services begin and opposing southwest-through traffic volumes would be low.

The eastbound-left volume on Struthers Ranch Road approaching the site access is projected to exceed the *ECM*'s 25-vph threshold for requiring a separate left-turn lane. However, the eastbound approach is projected to operate at LOS B or better through 2044 with a shared left/through lane. Queues extending to the west on Struthers Ranch Road would also be minimal

and would not extend to Struthers Road. A deviation request for *ECM* Section “2.3.7.D.1 – Turn Lanes Required, Exclusive Left-Turn Lanes Required” has been included with this submittal, as this is being required by staff. Please refer to the deviation request form (separate document).

## **TRAFFIC CONTROL**

LSC recommends stop-sign traffic control for the northbound approach (and the future southeast-bound approach) at the Struthers Ranch Road/site-access “intersection.”

## **PEDESTRIAN AND BICYCLE ACCOMMODATION**

A sidewalk exists along Struthers Road adjacent to the site. However, there are currently no sidewalks along Struthers Ranch Road adjacent to the site. It is recommended that a sidewalk be constructed adjacent to the site on Struthers Ranch Road.

There are no designated bike lanes on Struthers Road and the roadway is not planned to have bike lanes. However, there are sections of Struthers Road that have paved outside shoulders to accommodate cyclists.

## **COUNTY DEVIATION REQUESTS**

### **Intersection Sight Distance**

A copy of a previously-prepared deviation request (from PCD File No. [PPR2248](#)) for limited intersection sight distance to the north from Struthers Ranch Road is attached for reference.

### **Left-Turn Lanes**

A deviation request for *ECM* Section “2.3.7.D.1 – Turn Lanes Required, Exclusive Left-Turn Lanes Required” has been included with this submittal, as this is being required by staff. Please refer to the deviation request form (separate document).

## **COUNTY ROAD IMPROVEMENT FEE PROGRAM**

### **Transportation Impact Fees**

*Per ECM Appendix B: State what the current applicable Transportation Impact Fees are and what option the developer will be selecting for payment.*

The applicant intends to opt out of the PID options and will pay the full-fee amount at the time of building permit. The current “full-fee” rate is \$2,371 per 1,000 square feet of building floor area. The initial fee amount for the 11,375 square foot (11.375 KSF) church building being built (per the LOI) would be \$26,970. Additional fees would be required when the next building is built.

## Reimbursable MTCP Improvements

There are no apparent reimbursable improvements programmed in the *MTCP* in the general vicinity of this site.

## SUMMARY

- The site is projected to generate about 610 vehicle trips on the average Sunday.
- During the Sunday peak hour, approximately 69 vehicles would enter and 72 vehicles would exit the site.
- Please refer to the “Level of Service” section above for detailed LOS analysis results for individual turning movements and approaches at all studied intersections, during the peak hours through the 2044 horizon year.
- Please refer to the “Queuing Analysis” section for details regarding the vehicular queuing evaluation at the study-area intersections.
- No additional auxiliary turn lanes are required and no modifications to existing turn lanes are needed. Please refer to the “Auxiliary Turn-Lane Analysis” section for details regarding the auxiliary turn-lane needs evaluation at the study-area intersections.

\* \* \* \* \*

Please contact me if you have any questions regarding this report.

Sincerely,

LSC TRANSPORTATION CONSULTANTS, INC.

By Jeffrey C. Hodsdon, P.E.  
Principal

JCH/JAB:jas

Enclosures: Table 3  
Figure 1 - Figure 10  
Traffic Count Reports  
Synchro LOS Reports  
Queuing Reports  
Appendix A from the TIS for EPC PCD File No. PPR2248  
Copy of Deviation Request from PCD File No. PPR2248

**Table 3**

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### Table 3: Trip Generation Estimate

[illegible]

<sup>1</sup> KSF = 1,000 square feet

<sup>2</sup> Source: *Trip Generation, 11th Edition (2021)* by the Institute of Transportation Engineers (ITE)

<sup>3</sup> Average Sunday trips are likely conservative, as only 1 Sunday service is anticipated initially. Assuming 1 service initially, the peak-hour "in" and "out" trips would occur during separate hours. This estimate assumes 1 hour between 2 services. It is most likely that the peak 15-minute period of "in" trips would not overlap with the peak 15-minute period of "out" trips.

ITE		Value	Units <sup>1</sup>	Trip Generation Rates <sup>2</sup>						Trips Generated			
Code	Description			Average Daily	Weekday AM		Weekday PM		Average Daily	Weekday AM		Weekday PM	
					In	Out	In	Out		In	Out	In	Out
560	Church	276	Seats	0.90	0.04	0.03	0.05	0.06	248	12	8	12	15

<sup>1</sup> KSF = 1,000 square feet

<sup>2</sup> Source: *Trip Generation, 11th Edition (2021)* by the Institute of Transportation Engineers (ITE)

Updated: 03/24/2025

## Figures 1-10

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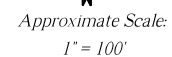




Figure 1  
**Vicinity  
Map**

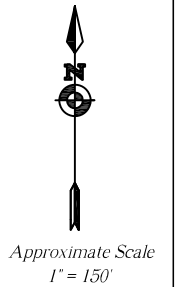
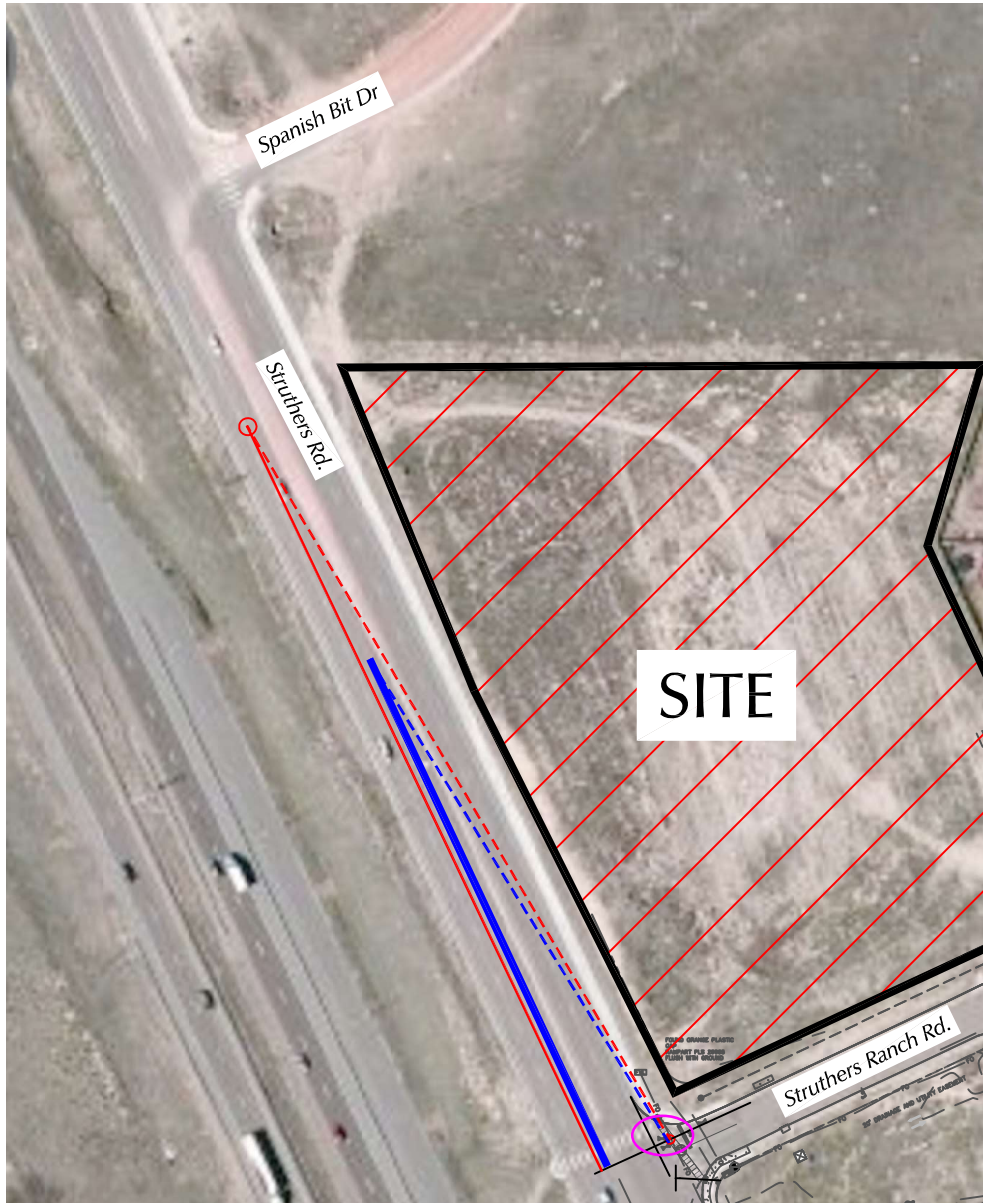
Cathedral Rock Church (LSC #244310)





**LSC**  
TRANSPORTATION  
CONSULTANTS, INC.

Cathedral Rock Church (LSC #244310)



- = 645' Required Intersection Sight Distance
- - - = Line of Sight for 590' of Intersection Sight Distance
- = 450' Field-Measured Sight Distance
- - - = Line of sight for existing field measured sight distance

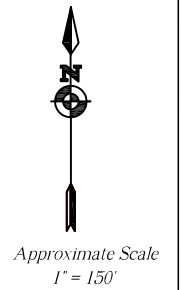
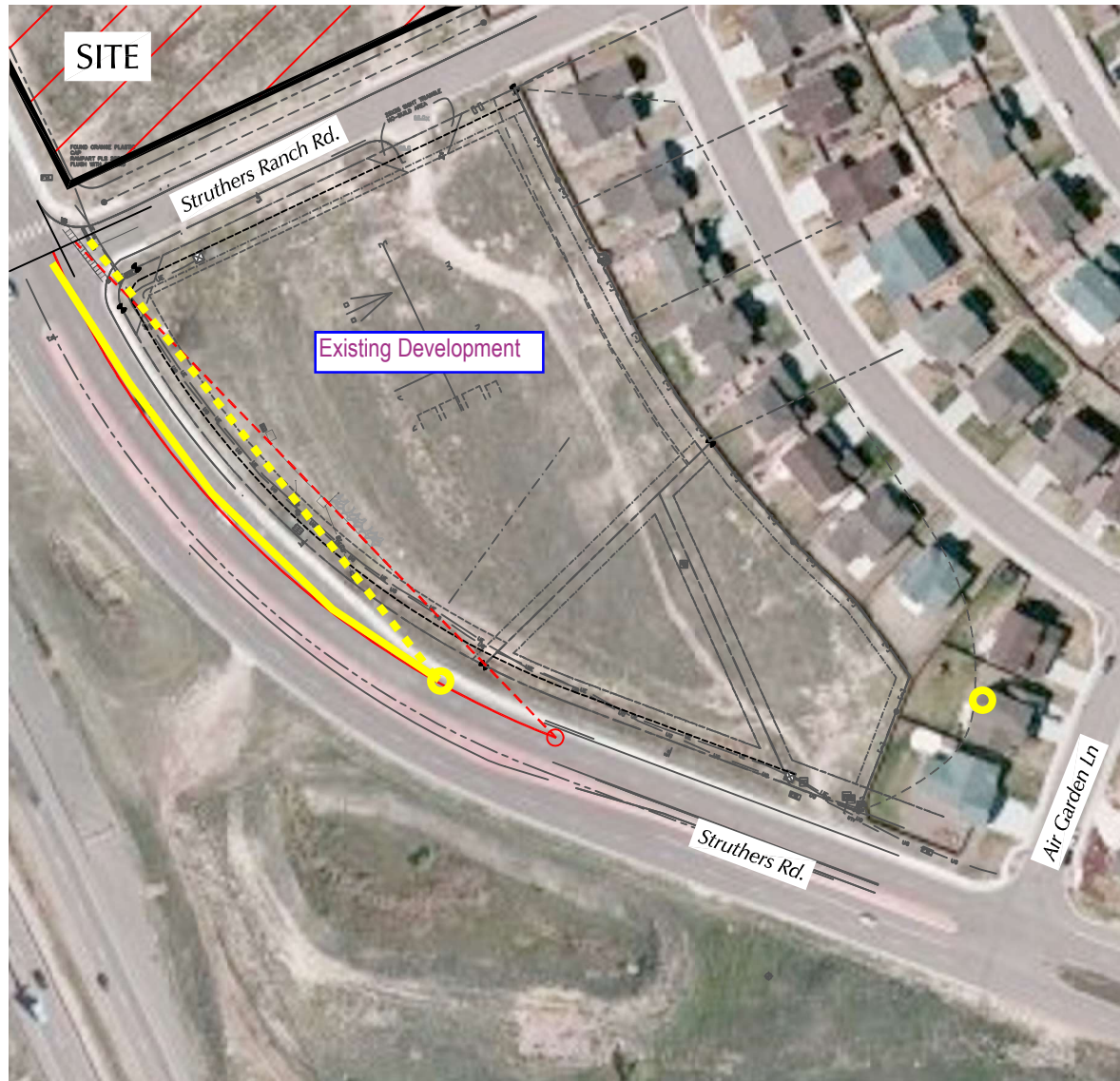
This figure has been taken from the TIS report for EPC PCD File No. PPR2248 (Exhibit 1 from that report) and modified with the Cathedral Rock Church site labeled.

Figure 3a

## Intersection Sight Distance (Struthers Ranch Rd to the North)

Cathedral Rock Church (LSC #244310)



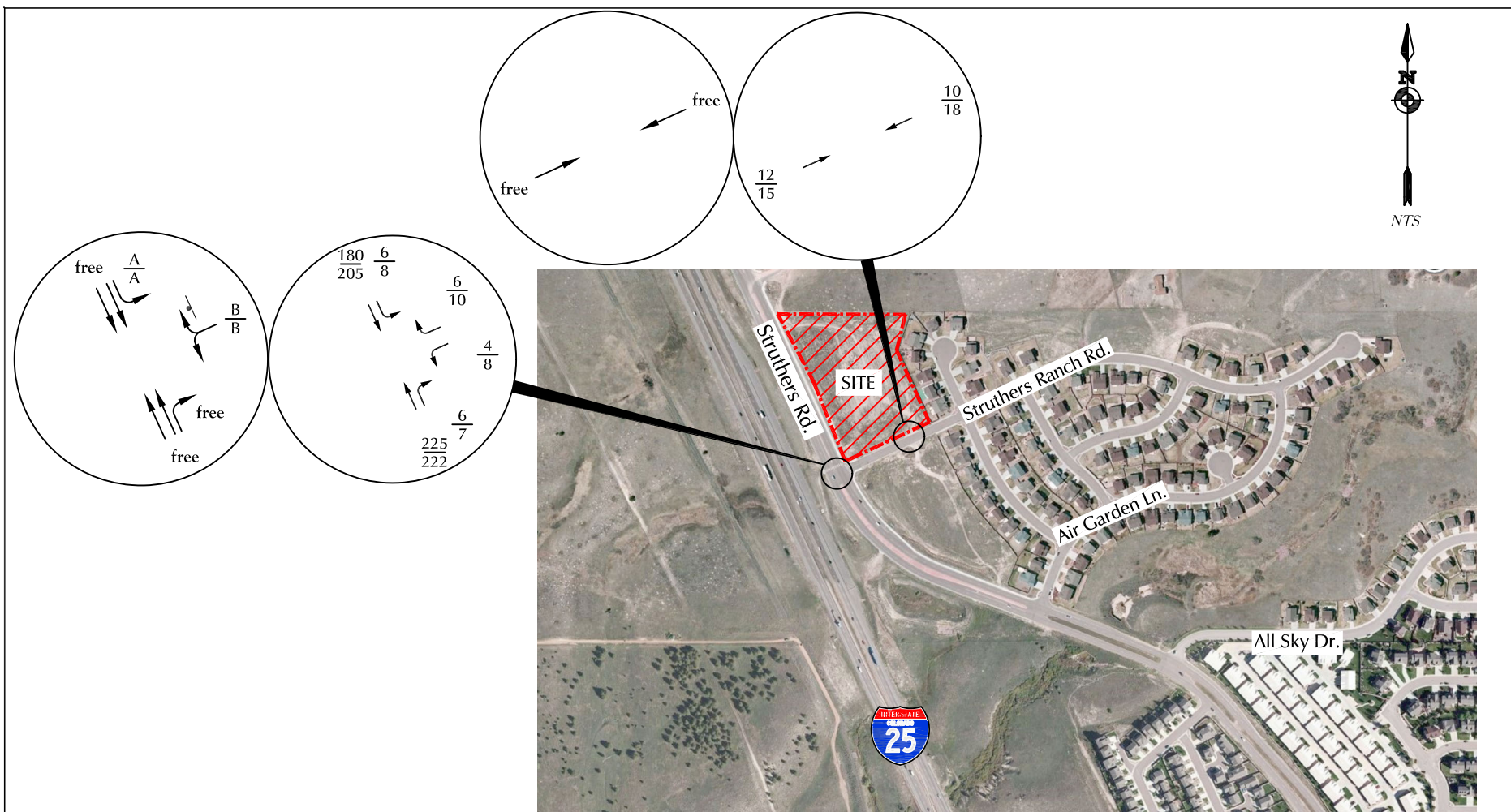


- = 590' Required Sight Distance
- - - = Line of Sight for 590' of Intersection Sight Distance
- 470' existing sight distance  
Field Measured - 10/18/2024

This figure has been taken from the TIS report for EPC PCD File No. PPR2248 (Exhibit 1 from that report) and modified with the Cathedral Rock Church site labeled. Also, the current (fall 2024) sight distance field measurement has been added.

Figure 3b  
*Intersection Sight Distance  
(Struthers Ranch Rd to the South)*

Cathedral Rock Church (LSC #244310)



# LEGEND:

└ = Stop Sign

$\frac{XX}{XX}$  = Sunday Pre-Church Service Peak-Hour Traffic (vehicles per hour) 9:45-10:45am

Sunday Post-Church Service Peak-Hour Traffic (vehicles per hour) 10:30-11:30pm

$\frac{A}{B}$  = Sunday Pre-Church Service Individual Movement Peak-Hour Level of Service

Sunday Post-Church Service Individual Movement Peak-Hour Level of Service



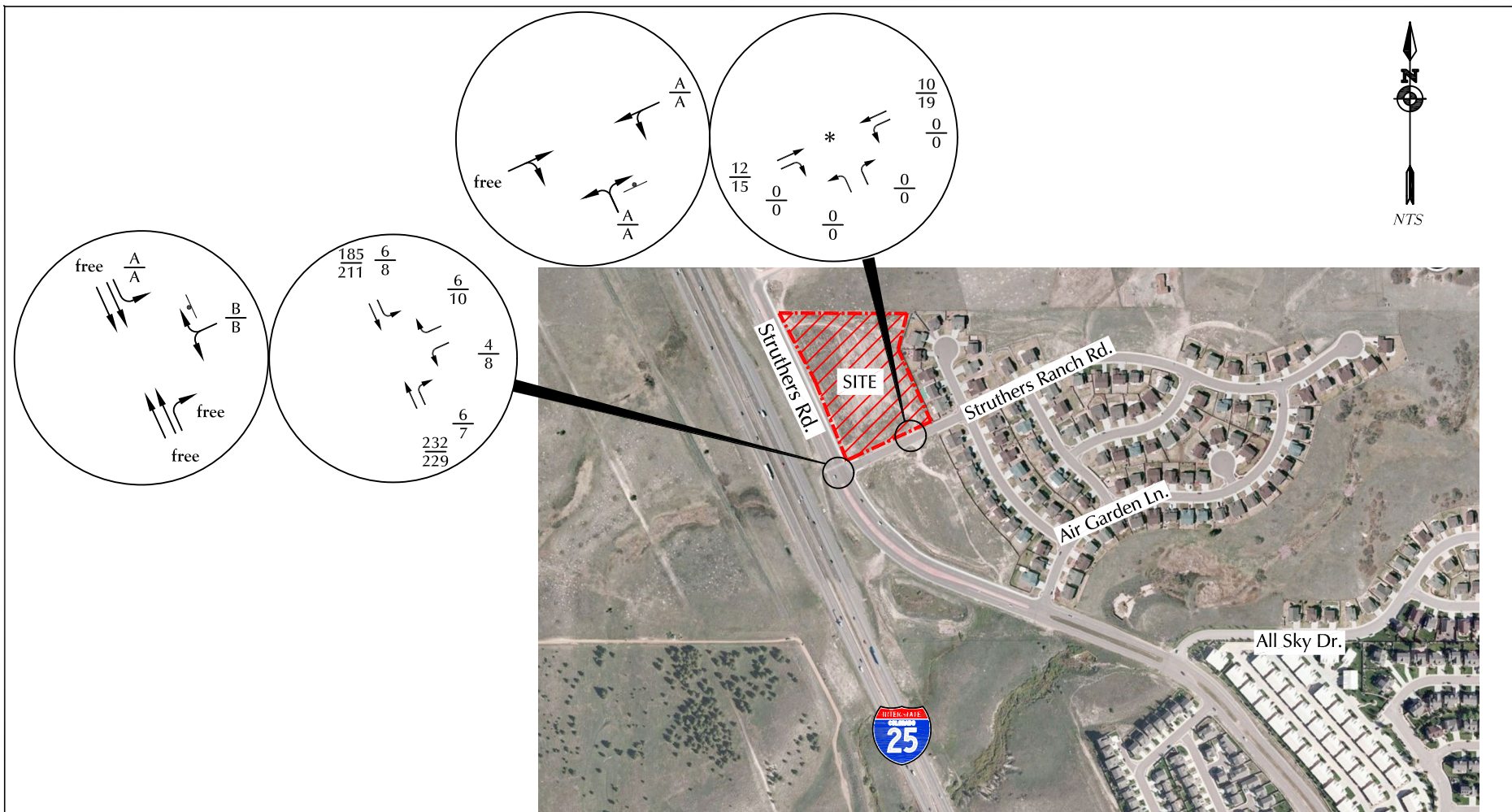
Based on counts by LSC Sept 2024

Figure 4

## Existing Sunday Morning Traffic Conditions

Cathedral Rock Church (LSC #244310)





#### LEGEND:

⌋ = Stop Sign

$\frac{XX}{XX}$  = Sunday Pre-Church Service Peak-Hour Traffic (vehicles per hour)

$\frac{XX}{XX}$  = Sunday Post-Church Service Peak-Hour Traffic (vehicles per hour)

$\frac{A}{A}$  = Sunday Pre-Church Service Individual Movement Peak-Hour Level of Service

$\frac{B}{B}$  = Sunday Post-Church Service Individual Movement Peak-Hour Level of Service

\*Note: The Rocky Mountain Cycle business on the south leg of this intersection is not open on Sundays, so LSC has assumed no traffic would be generated by this site for the Sunday church analysis



Figure 5

## 2025 Short-Term Baseline Traffic Conditions

Cathedral Rock Church (LSC #244310)



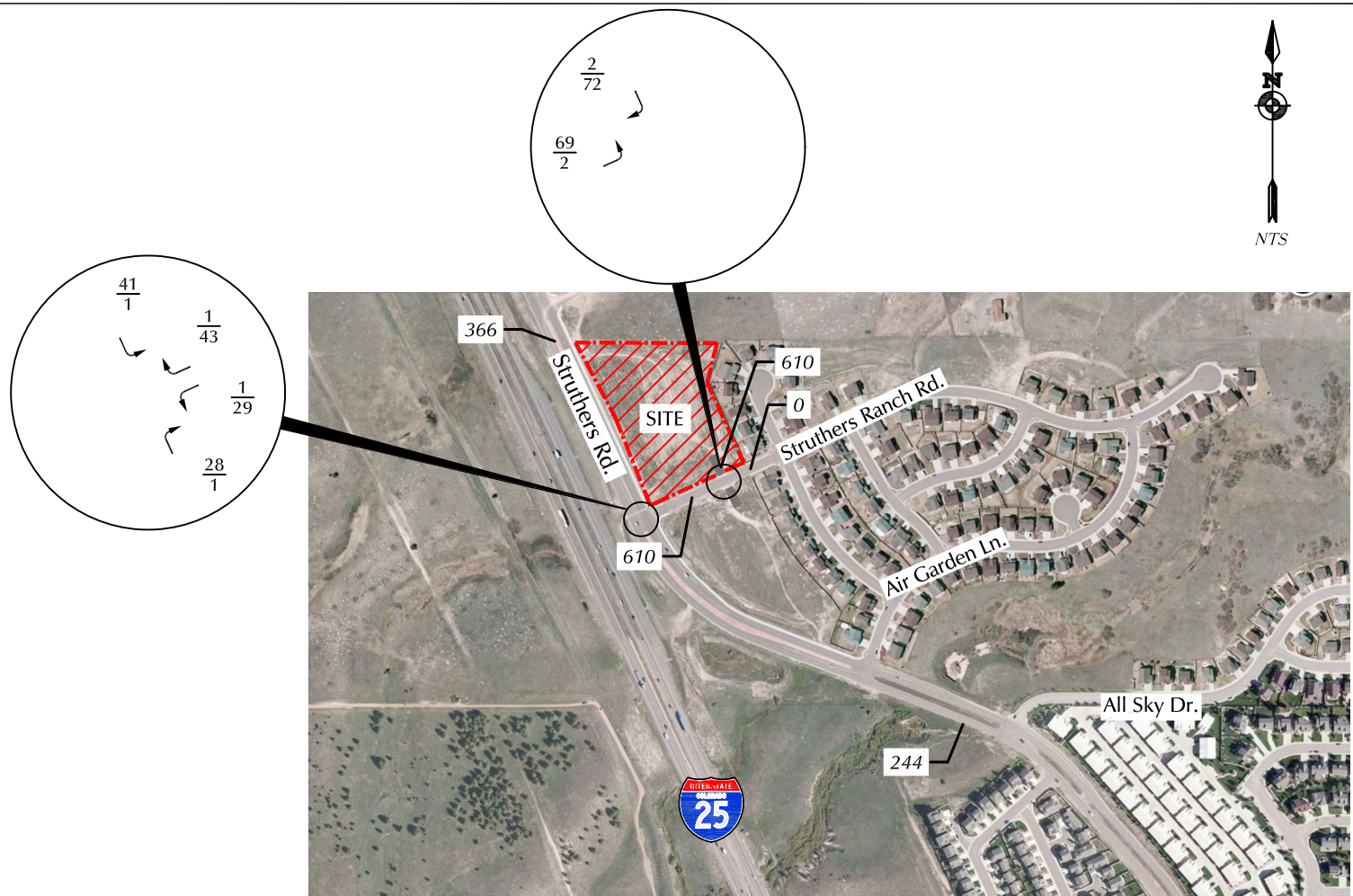
LEGEND:

XX% = Percent Directional Distribution

## *Directional Distribution of Site-Generated Traffic*

Cathedral Rock Church (LSC #244310)



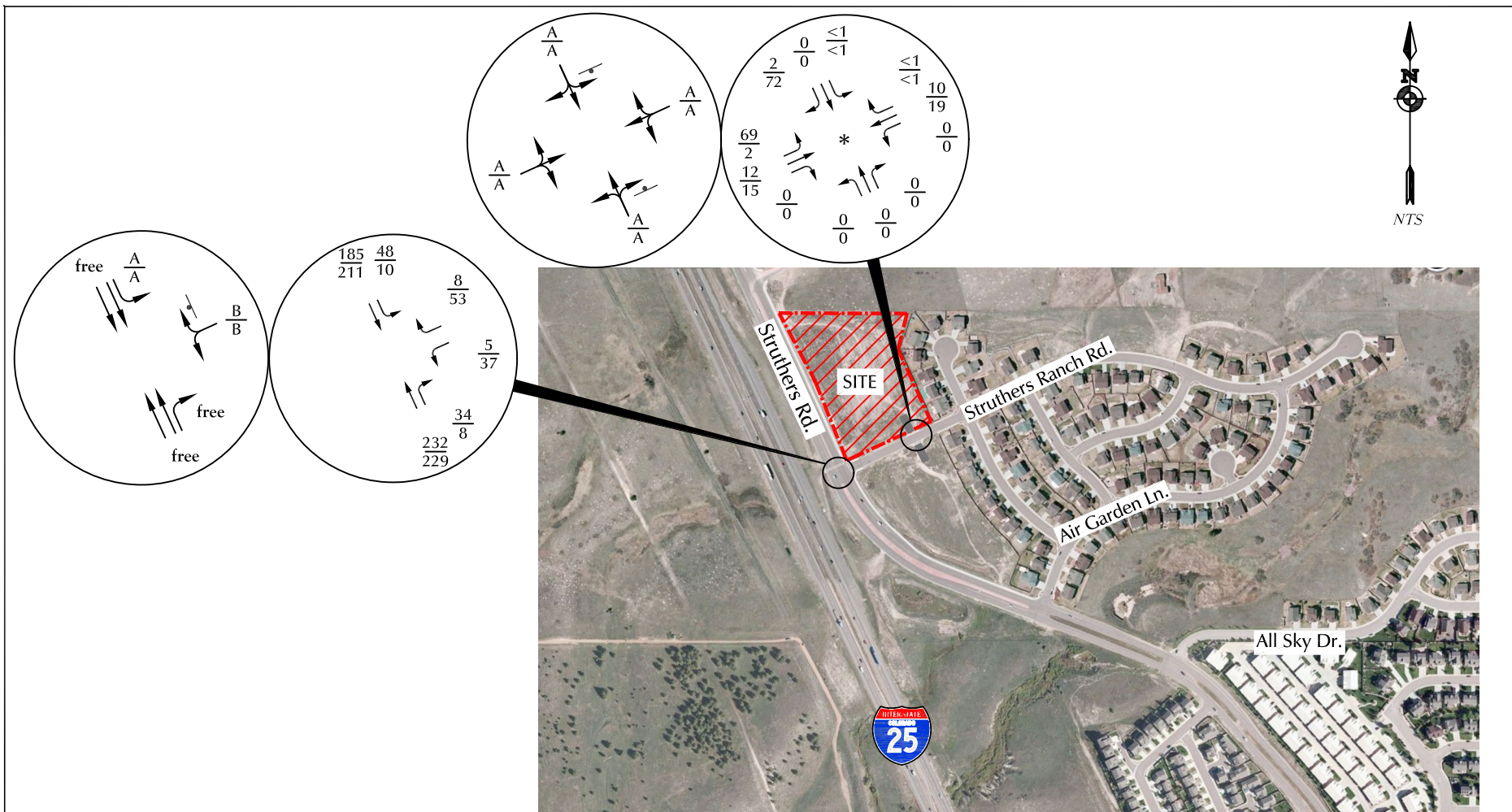


LEGEND:

$\frac{XX}{XX}$  = Sunday Pre-Church Service Peak-Hour Traffic (vehicles per hour)  
 $\frac{XX}{XX}$  = Sunday Post-Church Service Peak-Hour Traffic (vehicles per hour)  
 X,XXX = Average Sunday Traffic (vehicles per day)

Figure 7  
*Site-Generated Traffic Volumes*

Cathedral Rock Church (LSC #244310)



#### LEGEND:

⊥ = Stop Sign

$\frac{XX}{XX}$  = Sunday Pre-Church Service Peak-Hour Traffic (vehicles per hour)

$\frac{XX}{XX}$  = Sunday Post-Church Service Peak-Hour Traffic (vehicles per hour)

$\frac{A}{B}$  = Sunday Pre-Church Service Individual Movement Peak-Hour Level of Service

$\frac{A}{B}$  = Sunday Post-Church Service Individual Movement Peak-Hour Level of Service

\*Note: The Rocky Mountain Cycle business on the south leg of this intersection is not open on Sundays, so LSC has assumed no traffic would be generated by this site for the Sunday church analysis



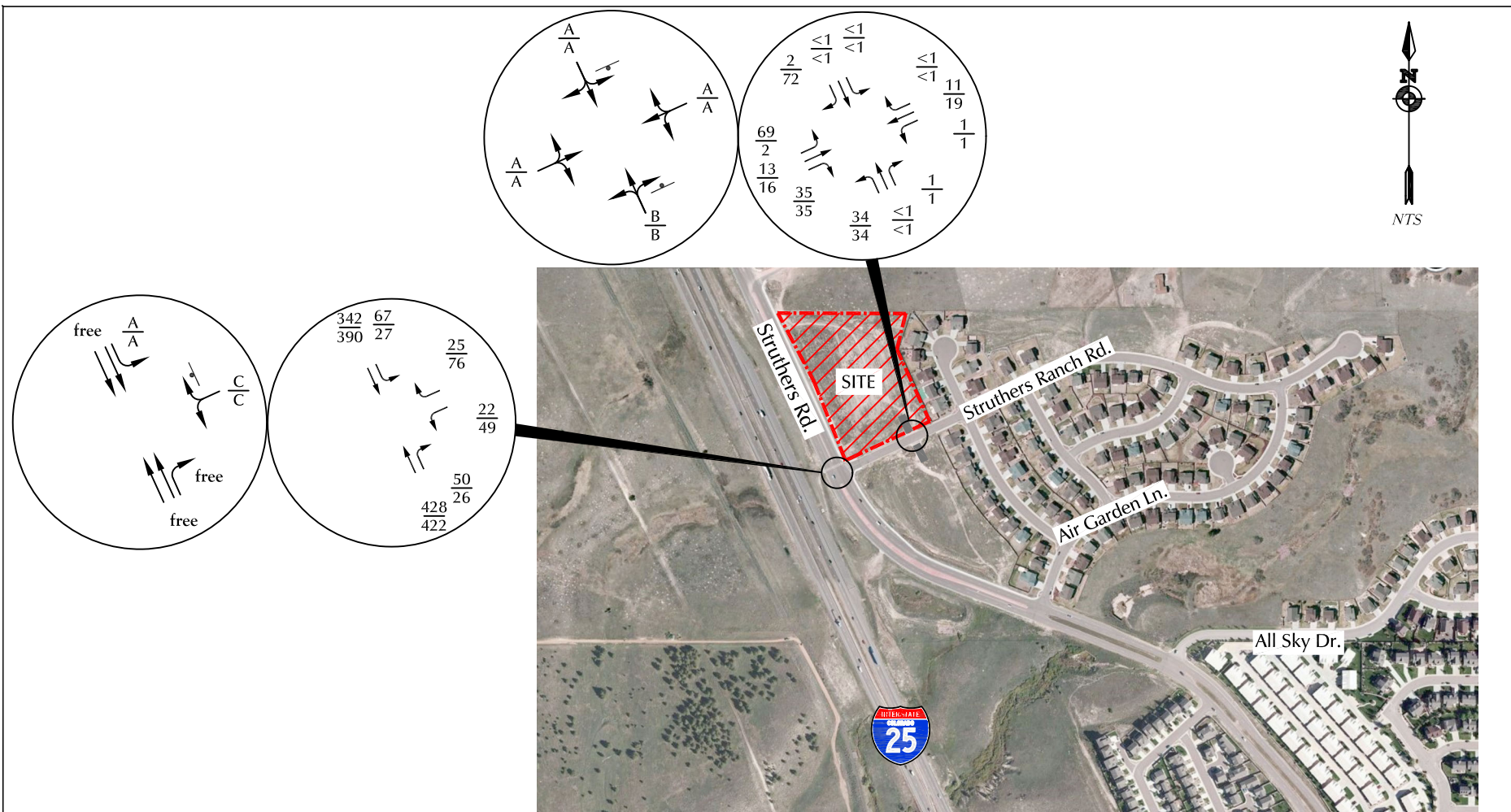
Figure 8

## 2025 Short-Term Total Traffic Conditions

Cathedral Rock Church (LSC #244310)







# LEGEND:

⊥ = Stop Sign

$\frac{XX}{XX}$  = Sunday Pre-Church Service Peak-Hour Traffic (vehicles per hour)

$\frac{XX}{XX}$  = Sunday Post-Church Service Peak-Hour Traffic (vehicles per hour)

$\frac{A}{B}$  = Sunday Pre-Church Service Individual Movement Peak-Hour Level of Service

$\frac{A}{B}$  = Sunday Post-Church Service Individual Movement Peak-Hour Level of Service

Figure 10

## Long-Term Total Traffic Conditions

Cathedral Rock Church (LSC #244310)

# Traffic Counts

---

# LSC Transportation Consultants, Inc.

2504 E. Pikes Peak Ave, Suite 304  
Colorado Springs, CO 80909  
719-633-2868

File Name : Struthers Rd - Struthers Ranch Rd Sun

Site Code : S244310

Start Date : 9/8/2024

Page No : 1

## Groups Printed- Unshifted

	Struthers Rd Southbound					Struthers Ranch Rd Westbound					Struthers Rd Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
09:00	0	3	0	0	3	1	0	0	0	1	0	10	0	0	10	0	0	0	0	0	14
09:05	0	5	0	0	5	0	0	0	0	0	0	15	0	0	15	0	0	0	0	0	20
09:10	0	5	0	0	5	0	0	0	0	0	0	6	0	0	6	0	0	0	0	0	11
09:15	0	12	0	0	12	0	0	0	0	0	0	8	0	0	8	0	0	0	0	0	20
09:20	0	9	1	0	10	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	23
09:25	0	4	0	0	4	2	0	0	0	2	0	12	0	0	12	0	0	0	0	0	18
09:30	0	8	0	0	8	0	0	0	0	0	0	22	0	1	23	0	0	0	0	0	31
09:35	0	9	0	0	9	0	0	0	0	0	0	16	0	0	16	0	0	0	0	0	25
09:40	0	18	0	0	18	1	0	1	0	2	0	11	0	0	11	0	0	0	0	0	31
09:45	0	18	0	0	18	0	0	0	0	0	0	14	0	0	14	0	0	0	0	0	32
09:50	0	13	0	0	13	1	0	0	0	1	3	18	0	0	21	0	0	0	0	0	35
09:55	0	17	0	0	17	0	0	1	0	1	0	22	0	0	22	0	0	0	0	0	40
Total	0	121	1	0	122	5	0	2	0	7	3	167	0	1	171	0	0	0	0	0	300
10:00	0	13	0	0	13	3	0	0	0	3	1	17	0	0	18	0	0	0	0	0	34
10:05	0	13	1	0	14	0	0	0	0	0	0	13	0	0	13	0	0	0	0	0	27
10:10	0	6	1	0	7	0	0	0	0	0	0	17	0	1	18	0	0	0	0	0	25
10:15	0	18	1	0	19	0	0	0	0	0	0	20	0	0	20	0	0	0	0	0	39
10:20	0	19	1	0	20	0	0	0	0	0	0	23	0	0	23	0	0	0	0	0	43
10:25	0	17	0	0	17	0	0	0	0	0	0	18	0	0	18	0	0	0	0	0	35
10:30	0	15	0	0	15	1	0	0	0	1	1	21	0	0	22	0	0	0	0	0	38
10:35	0	16	1	0	17	0	0	2	0	2	2	17	0	0	19	0	0	0	0	0	38
10:40	0	15	1	0	16	1	0	0	0	1	0	20	0	0	20	0	0	0	0	0	37
10:45	0	14	0	0	14	0	0	0	0	0	0	19	0	0	19	0	0	0	0	0	33
10:50	0	19	0	0	19	0	0	0	0	0	2	24	0	0	26	0	0	0	0	0	45
10:55	0	15	0	0	15	1	0	2	0	3	0	16	0	0	16	0	0	0	0	0	34
Total	0	180	6	0	186	6	0	4	0	10	6	225	0	1	232	0	0	0	0	0	428
11:00	0	26	1	0	27	1	0	1	0	2	1	14	0	0	15	0	0	0	0	0	44
11:05	0	7	1	0	8	1	0	1	0	2	0	13	0	0	13	0	0	0	0	0	23
11:10	0	23	0	0	23	1	0	1	0	2	1	19	0	0	20	0	0	0	0	0	45
11:15	0	20	2	0	22	1	0	0	0	1	0	20	0	0	20	0	0	0	0	0	43
11:20	0	17	1	0	18	2	0	0	0	2	0	18	0	0	18	0	0	0	0	0	38
11:25	0	18	1	0	19	1	0	1	0	2	0	21	0	0	21	0	0	0	0	0	42
Grand Total	0	412	13	0	425	18	0	10	0	28	11	497	0	2	510	0	0	0	0	0	963
Apprch %	0	96.9	3.1	0		64.3	0	35.7	0		2.2	97.5	0	0.4		0	0	0	0		
Total %	0	42.8	1.3	0	44.1	1.9	0	1	0	2.9	1.1	51.6	0	0.2	53	0	0	0	0	0	

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719-633-2868

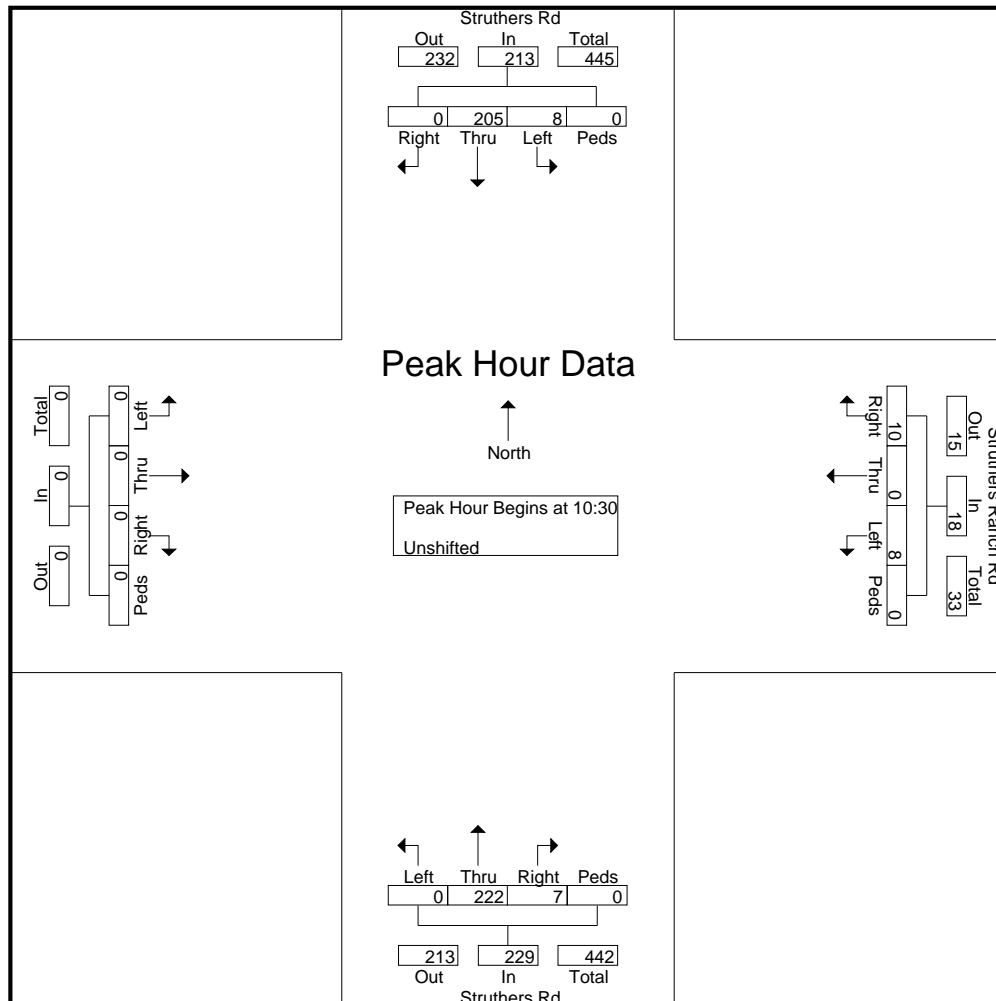
File Name : Struthers Rd - Struthers Ranch Rd Sun

Site Code : S244310

Start Date : 9/8/2024

Page No : 2

	Struthers Rd Southbound					Struthers Ranch Rd Westbound					Struthers Rd Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 09:00 to 11:25 - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 10:30																					
10:30	0	15	0	0	15	1	0	0	0	1	1	21	0	0	22	0	0	0	0	0	38
10:35	0	16	1	0	17	0	0	2	0	2	2	17	0	0	19	0	0	0	0	0	38
10:40	0	15	1	0	16	1	0	0	0	1	0	20	0	0	20	0	0	0	0	0	37
10:45	0	14	0	0	14	0	0	0	0	0	0	19	0	0	19	0	0	0	0	0	33
10:50	0	19	0	0	19	0	0	0	0	0	2	24	0	0	26	0	0	0	0	0	45
10:55	0	15	0	0	15	1	0	2	0	3	0	16	0	0	16	0	0	0	0	0	34
11:00	0	26	1	0	27	1	0	1	0	2	1	14	0	0	15	0	0	0	0	0	44
11:05	0	7	1	0	8	1	0	1	0	2	0	13	0	0	13	0	0	0	0	0	23
11:10	0	23	0	0	23	1	0	1	0	2	1	19	0	0	20	0	0	0	0	0	45
11:15	0	20	2	0	22	1	0	0	0	1	0	20	0	0	20	0	0	0	0	0	43
11:20	0	17	1	0	18	2	0	0	0	2	0	18	0	0	18	0	0	0	0	0	38
11:25	0	18	1	0	19	1	0	1	0	2	0	21	0	0	21	0	0	0	0	0	42
Total Volume	0	205	8	0	213	10	0	8	0	18	7	222	0	0	229	0	0	0	0	0	460
% App. Total	0	96.2	3.8	0		55.6	0	44.4	0		3.1	96.9	0	0		0	0	0	0		
PHF	.000	.657	.333	.000	.657	.417	.000	.333	.000	.500	.292	.771	.000	.000	.734	.000	.000	.000	.000	.000	.852



# LSC Transportation Consultants, Inc.

2504 E. Pikes Peak Ave, Suite 304  
Colorado Springs, CO 80909  
719-633-2868

File Name : Struthers Rd - Struthers Ranch Rd Sun

Site Code : S244310

Start Date : 9/8/2024

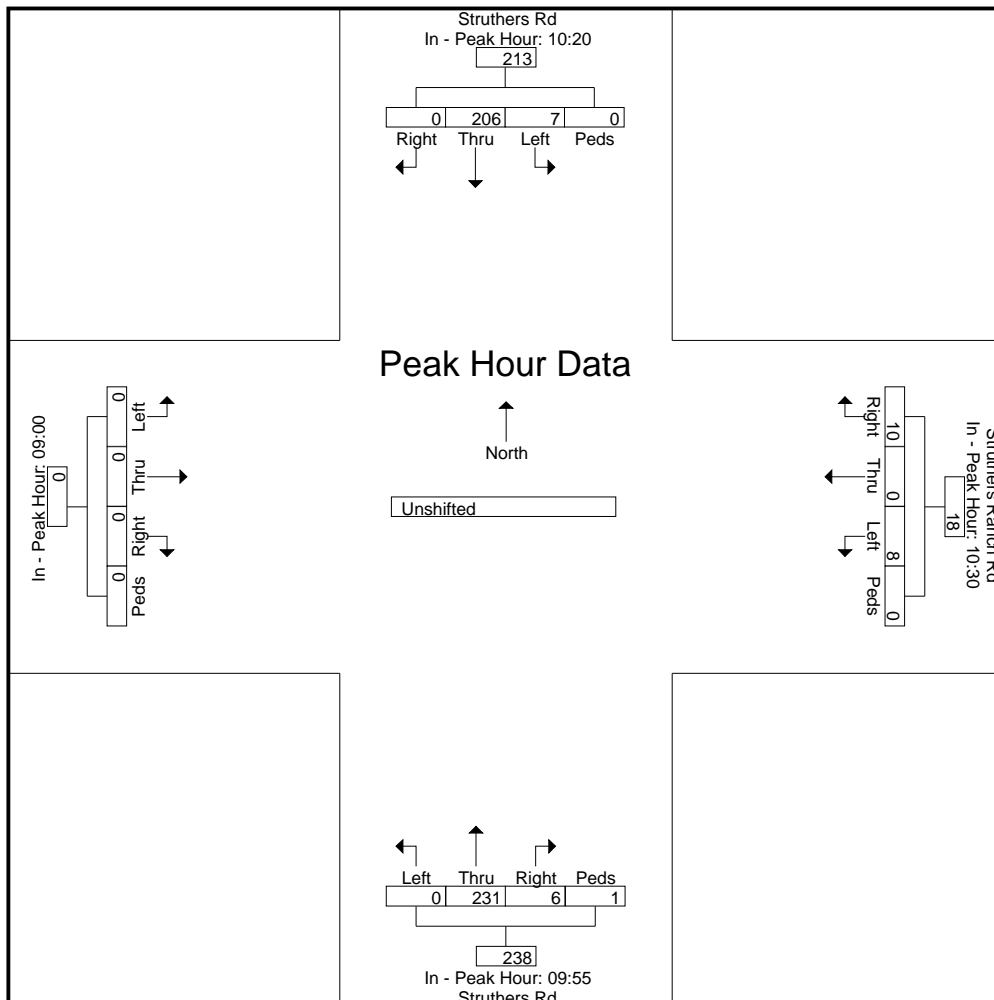
Page No : 3

	Struthers Rd Southbound					Struthers Ranch Rd Westbound					Struthers Rd Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total

Peak Hour Analysis From 09:00 to 11:25 - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	10:20					10:30					09:55					09:00				
+0 mins.	0	19	1	0	20	1	0	0	0	1	0	22	0	0	22	0	0	0	0	0
+5 mins.	0	17	0	0	17	0	0	2	0	2	1	17	0	0	18	0	0	0	0	0
+10 mins.	0	15	0	0	15	1	0	0	0	1	0	13	0	0	13	0	0	0	0	0
+15 mins.	0	16	1	0	17	0	0	0	0	0	0	17	0	1	18	0	0	0	0	0
+20 mins.	0	15	1	0	16	0	0	0	0	0	0	20	0	0	20	0	0	0	0	0
+25 mins.	0	14	0	0	14	1	0	2	0	3	0	23	0	0	23	0	0	0	0	0
+30 mins.	0	19	0	0	19	1	0	1	0	2	0	18	0	0	18	0	0	0	0	0
+35 mins.	0	15	0	0	15	1	0	1	0	2	1	21	0	0	22	0	0	0	0	0
+40 mins.	0	26	1	0	27	1	0	1	0	2	2	17	0	0	19	0	0	0	0	0
+45 mins.	0	7	1	0	8	1	0	0	0	1	0	20	0	0	20	0	0	0	0	0
+50 mins.	0	23	0	0	23	2	0	0	0	2	0	19	0	0	19	0	0	0	0	0
+55 mins.	0	20	2	0	22	1	0	1	0	2	2	24	0	0	26	0	0	0	0	0
Total Volume	0	206	7	0	213	10	0	8	0	18	6	231	0	1	238	0	0	0	0	0
% App. Total	0	96.7	3.3	0		55.6	0	44.4	0		2.5	97.1	0	0.4		0	0	0	0	
PHF	.000	.660	.292	.000	.657	.417	.000	.333	.000	.500	.250	.802	.000	.083	.763	.000	.000	.000	.000	.000



# **LSC Transportation Consultants, Inc.**

2504 E. Pikes Peak Ave, Suite 304  
Colorado Springs, CO 80909  
719-633-2868

# Level of Service Reports






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HCM 6th TWSC  
1: Struthers Rd & Struthers Ranch Rd

2024 Existing  
Sunday Pre-Church

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	6	225	6	6	180
Future Vol, veh/h	4	6	225	6	6	180
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	250	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	78	78	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	8	259	7	7	207
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	377	130	0	0	266	0
Stage 1	259	-	-	-	-	-
Stage 2	118	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	597	896	-	-	1295	-
Stage 1	761	-	-	-	-	-
Stage 2	894	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	594	896	-	-	1295	-
Mov Cap-2 Maneuver	594	-	-	-	-	-
Stage 1	761	-	-	-	-	-
Stage 2	890	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.9	0		0.3		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 745		1295	-	
HCM Lane V/C Ratio	-	- 0.017		0.005	-	
HCM Control Delay (s)	-	- 9.9		7.8	-	
HCM Lane LOS	-	- A		A	-	
HCM 95th %tile Q(veh)	-	- 0.1		0	-	

**Intersection**

Int Delay, s/veh 0

**Movement** EBT EBR WBL WBT NBL NBR

Lane Configurations

Traffic Vol, veh/h 12 0 0 10 0 0

Future Vol, veh/h 12 0 0 10 0 0

Conflicting Peds, #/hr 0 0 0 0 0 0

Sign Control Free Free Free Free Stop Stop

RT Channelized - None - None - None

Storage Length - - - - 0 -

Veh in Median Storage, # 0 - - 0 0 -

Grade, % 0 - - 0 0 -

Peak Hour Factor 78 78 78 78 78 78

Heavy Vehicles, % 2 2 2 2 2 2

Mvmt Flow 15 0 0 13 0 0

**Major/Minor** Major1 Major2 Minor1

Conflicting Flow All 0 0 15 0 28 15

Stage 1 - - - - 15 -

Stage 2 - - - - 13 -

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 - - 1603 - 987 1065

Stage 1 - - - - 1008 -

Stage 2 - - - - 1010 -

Platoon blocked, % - - - -

Mov Cap-1 Maneuver - - 1603 - 987 1065

Mov Cap-2 Maneuver - - - - 987 -

Stage 1 - - - - 1008 -

Stage 2 - - - - 1010 -

**Approach** EB WB NB

HCM Control Delay, s 0 0 0

HCM LOS A

**Minor Lane/Major Mvmt** NBLn1 EBT EBR WBL WBT

Capacity (veh/h) - - - 1603 -

HCM Lane V/C Ratio - - - - -






HCM Control Delay (s) 0 - - 0 -

HCM Lane LOS A - - A -

HCM 95th %tile Q(veh) - - - 0 -

HCM 6th TWSC  
1: Struthers Rd & Struthers Ranch Rd

2024 Existing  
Sunday Post-Church

Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	10	222	7	8	205
Future Vol, veh/h	8	10	222	7	8	205
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	250	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	78	78	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	13	255	8	9	236
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	391	128	0	0	263	0
Stage 1	255	-	-	-	-	-
Stage 2	136	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	585	898	-	-	1298	-
Stage 1	764	-	-	-	-	-
Stage 2	876	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	581	898	-	-	1298	-
Mov Cap-2 Maneuver	581	-	-	-	-	-
Stage 1	764	-	-	-	-	-
Stage 2	870	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.1	0		0.3		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 723		1298	-	
HCM Lane V/C Ratio	-	- 0.032		0.007	-	
HCM Control Delay (s)	-	- 10.1		7.8	-	
HCM Lane LOS	-	- B		A	-	
HCM 95th %tile Q(veh)	-	- 0.1		0	-	

**Intersection**

Int Delay, s/veh 0

**Movement** EBT EBR WBL WBT NBL NBRLane Configurations 

Traffic Vol, veh/h 15 0 0 18 0 0

Future Vol, veh/h 15 0 0 18 0 0

Conflicting Peds, #/hr 0 0 0 0 0 0

Sign Control Free Free Free Free Stop Stop

RT Channelized - None - None - None

Storage Length - - - - 0 -

Veh in Median Storage, # 0 - - 0 0 -

Grade, % 0 - - 0 0 -

Peak Hour Factor 78 78 78 78 78 78

Heavy Vehicles, % 2 2 2 2 2 2

Mvmt Flow 19 0 0 23 0 0

**Major/Minor** Major1 Major2 Minor1

Conflicting Flow All 0 0 19 0 42 19

Stage 1 - - - - 19 -

Stage 2 - - - - 23 -

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 - - 1597 - 969 1059

Stage 1 - - - - 1004 -

Stage 2 - - - - 1000 -

Platoon blocked, % - - - - -

Mov Cap-1 Maneuver - - 1597 - 969 1059

Mov Cap-2 Maneuver - - - - 969 -

Stage 1 - - - - 1004 -

Stage 2 - - - - 1000 -

**Approach** EB WB NB

HCM Control Delay, s 0 0 0

HCM LOS A

**Minor Lane/Major Mvmt** NBLn1 EBT EBR WBL WBT

Capacity (veh/h) - - - 1597 -

HCM Lane V/C Ratio - - - - -






HCM Control Delay (s) 0 - - 0 -

HCM Lane LOS A - - A -

HCM 95th %tile Q(veh) - - - 0 -




HCM 6th TWSC  
1: Struthers Rd & Struthers Ranch Rd

2025 ST Baseline  
Sunday Pre-Church

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	6	232	6	6	185
Future Vol, veh/h	4	6	232	6	6	185
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	250	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	78	78	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	8	267	7	7	213
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	388	134	0	0	274	0
Stage 1	267	-	-	-	-	-
Stage 2	121	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	588	890	-	-	1286	-
Stage 1	754	-	-	-	-	-
Stage 2	891	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	585	890	-	-	1286	-
Mov Cap-2 Maneuver	585	-	-	-	-	-
Stage 1	754	-	-	-	-	-
Stage 2	887	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10	0		0.2		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	736	1286	-	
HCM Lane V/C Ratio	-	-	0.017	0.005	-	
HCM Control Delay (s)	-	-	10	7.8	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	






HCM 6th TWSC  
2: Site Access & Struthers Ranch




2025 ST Baseline  
Sunday Pre-Church

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	12	0	0	10	0	0
Future Vol, veh/h	12	0	0	10	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	0	0	13	0	0
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	15	0	28	15
Stage 1	-	-	-	-	15	-
Stage 2	-	-	-	-	13	-
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	-	-	1603	-	987	1065
Stage 1	-	-	-	-	1008	-
Stage 2	-	-	-	-	1010	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1603	-	987	1065
Mov Cap-2 Maneuver	-	-	-	-	987	-
Stage 1	-	-	-	-	1008	-
Stage 2	-	-	-	-	1010	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		0	
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	-	-	-	1603	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	-	0	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	-	-	-	0	-	

HCM 6th TWSC  
1: Struthers Rd & Struthers Ranch Rd

2025 Baseline  
Sunday Post-Church






Intersection						
Int Delay, s/veh	0.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	8	10	229	7	8	211
Future Vol, veh/h	8	10	229	7	8	211
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	250	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	78	78	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	13	263	8	9	243
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	403	132	0	0	271	0
Stage 1	263	-	-	-	-	-
Stage 2	140	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	575	893	-	-	1289	-
Stage 1	757	-	-	-	-	-
Stage 2	872	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	571	893	-	-	1289	-
Mov Cap-2 Maneuver	571	-	-	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	866	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	10.2	0		0.3		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	- 714		1289	-	
HCM Lane V/C Ratio	-	- 0.032		0.007	-	
HCM Control Delay (s)	-	- 10.2		7.8	-	
HCM Lane LOS	-	- B		A	-	
HCM 95th %tile Q(veh)	-	- 0.1		0	-	

Intersection						
Int Delay, s/veh	3.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	12	35	34	1	1	10
Future Vol, veh/h	12	35	34	1	1	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	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	45	44	1	1	13
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	60	0	127	38
Stage 1	-	-	-	-	38	-
Stage 2	-	-	-	-	89	-
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	-	-	1544	-	868	1034
Stage 1	-	-	-	-	984	-
Stage 2	-	-	-	-	934	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1544	-	843	1034
Mov Cap-2 Maneuver	-	-	-	-	843	-
Stage 1	-	-	-	-	984	-
Stage 2	-	-	-	-	907	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		7.2		8.6	
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	1013	-	-	1544	-	
HCM Lane V/C Ratio	0.014	-	-	0.028	-	
HCM Control Delay (s)	8.6	-	-	7.4	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0	-	-	0.1	-	







HCM 6th TWSC  
1: Struthers Rd & Struthers Ranch Rd

2025 Baseline + Site  
Sunday Pre-Church

Intersection						
Int Delay, s/veh	1.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	8	232	34	48	185
Future Vol, veh/h	5	8	232	34	48	185
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	250	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	78	78	87	57	55	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	10	267	60	87	213
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	548	134	0	0	327	0
Stage 1	267	-	-	-	-	-
Stage 2	281	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	466	890	-	-	1229	-
Stage 1	754	-	-	-	-	-
Stage 2	741	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	433	890	-	-	1229	-
Mov Cap-2 Maneuver	433	-	-	-	-	-
Stage 1	754	-	-	-	-	-
Stage 2	688	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10.8	0	2.4			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	633	1229	-	
HCM Lane V/C Ratio	-	-	0.026	0.071	-	
HCM Control Delay (s)	-	-	10.8	8.2	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.1	0.2	-	






HCM 6th TWSC  
3: Site Access & Struthers Ranch Rd

2025 Baseline + Site  
Sunday Pre-Church

Intersection												
Int Delay, s/veh	6.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	69	12	35	1	10	0	34	0	1	0	0	2
Future Vol, veh/h	69	12	35	1	10	0	34	0	1	0	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	83	83	83	83	50	78	50	78	50	50	50
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	138	14	42	1	12	0	44	0	1	0	0	4
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	12	0	0	56	0	0	327	325	35	326	346	12
Stage 1	-	-	-	-	-	-	311	311	-	14	14	-
Stage 2	-	-	-	-	-	-	16	14	-	312	332	-
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	1607	-	-	1549	-	-	626	593	1038	627	577	1069
Stage 1	-	-	-	-	-	-	699	658	-	1006	884	-
Stage 2	-	-	-	-	-	-	1004	884	-	699	644	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1607	-	-	1549	-	-	581	540	1038	583	525	1069
Mov Cap-2 Maneuver	-	-	-	-	-	-	581	540	-	583	525	-
Stage 1	-	-	-	-	-	-	637	599	-	916	883	-
Stage 2	-	-	-	-	-	-	999	883	-	636	587	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	5.3			0.7			11.6			8.4		
HCM LOS							B			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	588	1607	-	-	1549	-	-	1069				
HCM Lane V/C Ratio	0.076	0.086	-	-	0.001	-	-	0.004				
HCM Control Delay (s)	11.6	7.5	0	-	7.3	0	-	8.4				
HCM Lane LOS	B	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.2	0.3	-	-	0	-	-	0				

HCM 6th TWSC  
1: Struthers Rd & Struthers Ranch Rd

2025 Baseline + Site  
Sunday Post-Church

Intersection						
Int Delay, s/veh	2.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	37	53	229	8	10	211
Future Vol, veh/h	37	53	229	8	10	211
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	250	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	56	55	87	83	82	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	66	96	263	10	12	243
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	409	132	0	0	273	0
Stage 1	263	-	-	-	-	-
Stage 2	146	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	570	893	-	-	1287	-
Stage 1	757	-	-	-	-	-
Stage 2	866	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	565	893	-	-	1287	-
Mov Cap-2 Maneuver	565	-	-	-	-	-
Stage 1	757	-	-	-	-	-
Stage 2	858	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	11.4	0		0.4		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-	722	1287	-	
HCM Lane V/C Ratio	-	-	0.225	0.009	-	
HCM Control Delay (s)	-	-	11.4	7.8	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.9	0	-	






HCM 6th TWSC  
3: Site Access & Struthers Ranch Rd

2025 Baseline + Site  
Sunday Post-Church

Intersection												
Int Delay, s/veh	6.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	2	15	35	1	19	0	34	0	1	0	0	72
Future Vol, veh/h	2	15	35	1	19	0	34	0	1	0	0	72
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	83	83	83	83	50	78	50	78	50	50	50
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	18	42	1	23	0	44	0	1	0	0	144
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	23	0	0	60	0	0	144	72	39	73	93	23
Stage 1	-	-	-	-	-	-	47	47	-	25	25	-
Stage 2	-	-	-	-	-	-	97	25	-	48	68	-
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	1592	-	-	1544	-	-	825	818	1033	918	797	1054
Stage 1	-	-	-	-	-	-	967	856	-	993	874	-
Stage 2	-	-	-	-	-	-	910	874	-	965	838	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1592	-	-	1544	-	-	710	815	1033	914	794	1054
Mov Cap-2 Maneuver	-	-	-	-	-	-	710	815	-	914	794	-
Stage 1	-	-	-	-	-	-	964	853	-	990	873	-
Stage 2	-	-	-	-	-	-	785	873	-	961	835	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.4			10.4			9		
HCM LOS							B			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	716	1592	-	-	1544	-	-	1054				
HCM Lane V/C Ratio	0.063	0.003	-	-	0.001	-	-	0.137				
HCM Control Delay (s)	10.4	7.3	0	-	7.3	0	-	9				
HCM Lane LOS	B	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.5				

HCM 6th TWSC  
1: Struthers Rd & Struthers Ranch Rd




2044 Background  
Sunday Pre-Church

Intersection						
Int Delay, s/veh	1.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	22	24	428	22	26	342
Future Vol, veh/h	22	24	428	22	26	342
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	250	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	78	78	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	31	465	24	28	372
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	707	233	0	0	489	0
Stage 1	465	-	-	-	-	-
Stage 2	242	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	370	769	-	-	1070	-
Stage 1	599	-	-	-	-	-
Stage 2	776	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	360	769	-	-	1070	-
Mov Cap-2 Maneuver	360	-	-	-	-	-
Stage 1	599	-	-	-	-	-
Stage 2	756	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	13.2	0		0.6		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	498	1070	-	
HCM Lane V/C Ratio	-	-	0.118	0.026	-	
HCM Control Delay (s)	-	-	13.2	8.5	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-	

## HCM 6th TWSC

### 2: Site Access & Struthers Ranch

2044 Background  
Sunday Pre-Church

Intersection						
Int Delay, s/veh	3.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	13	35	1	11	34	1
Future Vol, veh/h	13	35	1	11	34	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	45	1	14	44	1
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	62	0	56	40
Stage 1	-	-	-	-	40	-
Stage 2	-	-	-	-	16	-
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	-	-	1541	-	952	1031
Stage 1	-	-	-	-	982	-
Stage 2	-	-	-	-	1007	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1541	-	951	1031
Mov Cap-2 Maneuver	-	-	-	-	951	-
Stage 1	-	-	-	-	982	-
Stage 2	-	-	-	-	1006	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.6		9	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	953	-	-	1541	-	
HCM Lane V/C Ratio	0.047	-	-	0.001	-	
HCM Control Delay (s)	9	-	-	7.3	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0	-	




HCM 6th TWSC  
1: Struthers Rd & Struthers Ranch Rd

2044 Background  
Sunday Post-Church






Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	YY		↑↑	↑	↑	↑↑
Traffic Vol, veh/h	20	33	422	25	26	390
Future Vol, veh/h	20	33	422	25	26	390
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	250	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	83	83	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	40	459	27	28	424
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	727	230	0	0	486	0
Stage 1	459	-	-	-	-	-
Stage 2	268	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	359	772	-	-	1073	-
Stage 1	603	-	-	-	-	-
Stage 2	753	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	350	772	-	-	1073	-
Mov Cap-2 Maneuver	350	-	-	-	-	-
Stage 1	603	-	-	-	-	-
Stage 2	733	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	12.7	0		0.5		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	531	1073	-	
HCM Lane V/C Ratio	-	-	0.12	0.026	-	
HCM Control Delay (s)	-	-	12.7	8.4	-	
HCM Lane LOS	-	-	B	A	-	
HCM 95th %tile Q(veh)	-	-	0.4	0.1	-	






HCM 6th TWSC  
2: Site Access & Struthers Ranch




2044 Background  
Sunday Post-Church






Intersection						
Int Delay, s/veh	3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	16	35	1	19	34	1
Future Vol, veh/h	16	35	1	19	34	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	45	1	24	44	1
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	66	0	70	44
Stage 1	-	-	-	-	44	-
Stage 2	-	-	-	-	26	-
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	-	-	1536	-	934	1026
Stage 1	-	-	-	-	978	-
Stage 2	-	-	-	-	997	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1536	-	933	1026
Mov Cap-2 Maneuver	-	-	-	-	933	-
Stage 1	-	-	-	-	978	-
Stage 2	-	-	-	-	996	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0.4		9		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	935	-	-	1536	-	
HCM Lane V/C Ratio	0.048	-	-	0.001	-	
HCM Control Delay (s)	9	-	-	7.3	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	



Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	22	25	428	50	67	342
Future Vol, veh/h	22	25	428	50	67	342
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	250	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	75	87	62	60	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	33	492	81	112	393
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	913	246	0	0	573	0
Stage 1	492	-	-	-	-	-
Stage 2	421	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	273	754	-	-	996	-
Stage 1	580	-	-	-	-	-
Stage 2	630	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	242	754	-	-	996	-
Mov Cap-2 Maneuver	242	-	-	-	-	-
Stage 1	580	-	-	-	-	-
Stage 2	559	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	16.3	0		2		
HCM LOS	C					
Minor Lane/Major Mvmt		NBT	NBRWBLn1	SBL	SBT	
Capacity (veh/h)		-	-	380	996	-
HCM Lane V/C Ratio		-	-	0.164	0.112	-
HCM Control Delay (s)		-	-	16.3	9.1	-
HCM Lane LOS		-	-	C	A	-
HCM 95th %tile Q(veh)		-	-	0.6	0.4	-





Intersection						
Int Delay, s/veh	1.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	22	25	428	50	67	342
Future Vol, veh/h	22	25	428	50	67	342
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	250	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	76	75	87	62	60	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	33	492	81	112	393
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	913	246	0	0	573	0
Stage 1	492	-	-	-	-	-
Stage 2	421	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	273	754	-	-	996	-
Stage 1	580	-	-	-	-	-
Stage 2	630	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	242	754	-	-	996	-
Mov Cap-2 Maneuver	242	-	-	-	-	-
Stage 1	580	-	-	-	-	-
Stage 2	559	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	16.3	0		2		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-	380	996	-	
HCM Lane V/C Ratio	-	-	0.164	0.112	-	
HCM Control Delay (s)	-	-	16.3	9.1	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	0.6	0.4	-	

Intersection						
Int Delay, s/veh	3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	16	35	1	19	34	1
Future Vol, veh/h	16	35	1	19	34	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	45	1	24	44	1
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	66	0	70	44
Stage 1	-	-	-	-	44	-
Stage 2	-	-	-	-	26	-
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	-	-	1536	-	934	1026
Stage 1	-	-	-	-	978	-
Stage 2	-	-	-	-	997	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1536	-	933	1026
Mov Cap-2 Maneuver	-	-	-	-	933	-
Stage 1	-	-	-	-	978	-
Stage 2	-	-	-	-	996	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.4		9	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	935	-	-	1536	-	
HCM Lane V/C Ratio	0.048	-	-	0.001	-	
HCM Control Delay (s)	9	-	-	7.3	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

Intersection						
Int Delay, s/veh	3.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	49	76	422	26	27	390
Future Vol, veh/h	49	76	422	26	27	390
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	250	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	58	58	87	85	84	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	84	131	485	31	32	448
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	773	243	0	0	516	0
Stage 1	485	-	-	-	-	-
Stage 2	288	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	336	758	-	-	1046	-
Stage 1	585	-	-	-	-	-
Stage 2	735	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	326	758	-	-	1046	-
Mov Cap-2 Maneuver	326	-	-	-	-	-
Stage 1	585	-	-	-	-	-
Stage 2	712	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	17.6	0		0.6		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	499	1046	-	
HCM Lane V/C Ratio	-	-	0.432	0.031	-	
HCM Control Delay (s)	-	-	17.6	8.6	-	
HCM Lane LOS	-	-	C	A	-	
HCM 95th %tile Q(veh)	-	-	2.1	0.1	-	

HCM 6th TWSC  
3: Site Access & Struthers Ranch Rd

2044 Background + Site  
Sunday Post-Church

Intersection												
Int Delay, s/veh	6.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	16	35	1	19	0	34	0	1	0	0	72
Future Vol, veh/h	2	16	35	1	19	0	34	0	1	0	0	72
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	50	83	83	83	83	50	78	50	78	50	50	50
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	19	42	1	23	0	44	0	1	0	0	144
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	23	0	0	61	0	0	145	73	40	74	94	23
Stage 1	-	-	-	-	-	-	48	48	-	25	25	-
Stage 2	-	-	-	-	-	-	97	25	-	49	69	-
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	1592	-	-	1542	-	-	824	817	1031	916	796	1054
Stage 1	-	-	-	-	-	-	965	855	-	993	874	-
Stage 2	-	-	-	-	-	-	910	874	-	964	837	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1592	-	-	1542	-	-	709	814	1031	912	793	1054
Mov Cap-2 Maneuver	-	-	-	-	-	-	709	814	-	912	793	-
Stage 1	-	-	-	-	-	-	962	852	-	990	873	-
Stage 2	-	-	-	-	-	-	785	873	-	960	834	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.4			0.4			10.4			9		
HCM LOS							B			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	715	1592	-	-	1542	-	-	1054				
HCM Lane V/C Ratio	0.063	0.003	-	-	0.001	-	-	0.137				
HCM Control Delay (s)	10.4	7.3	0	-	7.3	0	-	9				
HCM Lane LOS	B	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.2	0	-	-	0	-	-	0.5				

# Queuing Reports

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## Intersection: 1: Struthers Rd &amp; Struthers Ranch Rd, Interval #1

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	23	27
Average Queue (ft)	8	9
95th Queue (ft)	26	32
Link Distance (ft)	237	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		340
Storage Blk Time (%)		
Queuing Penalty (veh)		

## Intersection: 1: Struthers Rd &amp; Struthers Ranch Rd, Interval #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	22	22
Average Queue (ft)	8	8
95th Queue (ft)	25	28
Link Distance (ft)	237	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		340
Storage Blk Time (%)		
Queuing Penalty (veh)		

## Intersection: 1: Struthers Rd &amp; Struthers Ranch Rd, Interval #3

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	23	35
Average Queue (ft)	6	19
95th Queue (ft)	21	43
Link Distance (ft)	237	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		340
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Intersection: 1: Struthers Rd & Struthers Ranch Rd, Interval #4

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Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	14	23
Average Queue (ft)	4	9
95th Queue (ft)	19	29
Link Distance (ft)	237	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		340
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Intersection: 1: Struthers Rd & Struthers Ranch Rd, All Intervals

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Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	23	40
Average Queue (ft)	6	11
95th Queue (ft)	23	34
Link Distance (ft)	237	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		340
Storage Blk Time (%)		
Queuing Penalty (veh)		



## Intersection: 3: Site Access &amp; Struthers Ranch Rd, Interval #1

Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	6	40	18
Average Queue (ft)	1	22	3
95th Queue (ft)	9	50	16
Link Distance (ft)	237	178	273
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

## Intersection: 3: Site Access &amp; Struthers Ranch Rd, Interval #2

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	49	12
Average Queue (ft)	22	2
95th Queue (ft)	54	15
Link Distance (ft)	178	273
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

## Intersection: 3: Site Access &amp; Struthers Ranch Rd, Interval #3

Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	12	55	18
Average Queue (ft)	2	25	3
95th Queue (ft)	13	52	19
Link Distance (ft)	237	178	273
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

## Intersection: 3: Site Access &amp; Struthers Ranch Rd, Interval #4

Movement	EB	NB
Directions Served	LTR	LTR
Maximum Queue (ft)	6	39
Average Queue (ft)	1	22
95th Queue (ft)	8	47
Link Distance (ft)	237	178
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

## Intersection: 3: Site Access &amp; Struthers Ranch Rd, All Intervals

Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	18	60	24
Average Queue (ft)	1	23	2
95th Queue (ft)	9	51	14
Link Distance (ft)	237	178	273
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

## Intersection: 1: Struthers Rd &amp; Struthers Ranch Rd, Interval #1

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	48	6
Average Queue (ft)	22	2
95th Queue (ft)	40	12
Link Distance (ft)	237	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		340
Storage Blk Time (%)		
Queuing Penalty (veh)		

## Intersection: 1: Struthers Rd &amp; Struthers Ranch Rd, Interval #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	44	10
Average Queue (ft)	22	1
95th Queue (ft)	47	11
Link Distance (ft)	237	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		340
Storage Blk Time (%)		
Queuing Penalty (veh)		

## Intersection: 1: Struthers Rd &amp; Struthers Ranch Rd, Interval #3

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	48	16
Average Queue (ft)	31	2
95th Queue (ft)	49	14
Link Distance (ft)	237	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		340
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Intersection: 1: Struthers Rd & Struthers Ranch Rd, Interval #4

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Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	47	11
Average Queue (ft)	25	2
95th Queue (ft)	45	15
Link Distance (ft)	237	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		340
Storage Blk Time (%)		
Queuing Penalty (veh)		

---

Intersection: 1: Struthers Rd & Struthers Ranch Rd, All Intervals

---

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	71	27
Average Queue (ft)	25	2
95th Queue (ft)	46	13
Link Distance (ft)	237	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		340
Storage Blk Time (%)		
Queuing Penalty (veh)		

---

Intersection: 3: Site Access & Struthers Ranch Rd, Interval #1

---

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	43	44
Average Queue (ft)	22	28
95th Queue (ft)	52	50
Link Distance (ft)	178	273
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

---

Intersection: 3: Site Access & Struthers Ranch Rd, Interval #2

---

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	39	39
Average Queue (ft)	18	24
95th Queue (ft)	46	47
Link Distance (ft)	178	273
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

---

Intersection: 3: Site Access & Struthers Ranch Rd, Interval #3

---

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	34	56
Average Queue (ft)	21	36
95th Queue (ft)	46	54
Link Distance (ft)	178	273
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

---

Intersection: 3: Site Access & Struthers Ranch Rd, Interval #4

---

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	39	41
Average Queue (ft)	23	26
95th Queue (ft)	47	47
Link Distance (ft)	178	273
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

---

Intersection: 3: Site Access & Struthers Ranch Rd, All Intervals

---

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	56	63
Average Queue (ft)	21	28
95th Queue (ft)	48	51
Link Distance (ft)	178	273
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		



## Intersection: 1: Struthers Rd &amp; Struthers Ranch Rd, Interval #1

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	35	32
Average Queue (ft)	17	14
95th Queue (ft)	39	38
Link Distance (ft)	237	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		340
Storage Blk Time (%)		
Queuing Penalty (veh)		

## Intersection: 1: Struthers Rd &amp; Struthers Ranch Rd, Interval #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	38	38
Average Queue (ft)	18	20
95th Queue (ft)	41	44
Link Distance (ft)	237	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		340
Storage Blk Time (%)		
Queuing Penalty (veh)		

## Intersection: 1: Struthers Rd &amp; Struthers Ranch Rd, Interval #3

Movement	WB	NB	SB
Directions Served	LR	R	L
Maximum Queue (ft)	52	4	52
Average Queue (ft)	30	1	32
95th Queue (ft)	54	7	62
Link Distance (ft)	237		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		250	340
Storage Blk Time (%)			
Queuing Penalty (veh)			

## Intersection: 1: Struthers Rd &amp; Struthers Ranch Rd, Interval #4

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	30	31
Average Queue (ft)	17	14
95th Queue (ft)	36	35
Link Distance (ft)	237	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		340
Storage Blk Time (%)		
Queuing Penalty (veh)		

## Intersection: 1: Struthers Rd &amp; Struthers Ranch Rd, All Intervals

Movement	WB	NB	SB
Directions Served	LR	R	L
Maximum Queue (ft)	53	4	56
Average Queue (ft)	20	0	20
95th Queue (ft)	44	3	48
Link Distance (ft)	237		
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		250	340
Storage Blk Time (%)			
Queuing Penalty (veh)			

## Intersection: 3: Site Access &amp; Struthers Ranch Rd, Interval #1

Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	6	48	6
Average Queue (ft)	1	22	0
95th Queue (ft)	9	54	0
Link Distance (ft)	237	178	273
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

## Intersection: 3: Site Access &amp; Struthers Ranch Rd, Interval #2

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	49	6
Average Queue (ft)	21	1
95th Queue (ft)	53	9
Link Distance (ft)	178	273
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

## Intersection: 3: Site Access &amp; Struthers Ranch Rd, Interval #3

Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	12	48	18
Average Queue (ft)	2	31	2
95th Queue (ft)	13	54	16
Link Distance (ft)	237	178	273
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

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Intersection: 3: Site Access & Struthers Ranch Rd, Interval #4

---

Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	6	44	12
Average Queue (ft)	1	18	2
95th Queue (ft)	9	48	16
Link Distance (ft)	237	178	273
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

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Intersection: 3: Site Access & Struthers Ranch Rd, All Intervals

---

Movement	EB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	18	63	29
Average Queue (ft)	1	23	1
95th Queue (ft)	9	53	12
Link Distance (ft)	237	178	273
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

## Intersection: 1: Struthers Rd &amp; Struthers Ranch Rd, Interval #1

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	53	22
Average Queue (ft)	27	8
95th Queue (ft)	49	28
Link Distance (ft)	237	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		340
Storage Blk Time (%)		
Queuing Penalty (veh)		

## Intersection: 1: Struthers Rd &amp; Struthers Ranch Rd, Interval #2

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	48	27
Average Queue (ft)	28	6
95th Queue (ft)	53	27
Link Distance (ft)	237	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		340
Storage Blk Time (%)		
Queuing Penalty (veh)		

## Intersection: 1: Struthers Rd &amp; Struthers Ranch Rd, Interval #3

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	140	39
Average Queue (ft)	64	11
95th Queue (ft)	133	44
Link Distance (ft)	237	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		340
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Intersection: 1: Struthers Rd & Struthers Ranch Rd, Interval #4

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Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	102	32
Average Queue (ft)	42	10
95th Queue (ft)	97	33
Link Distance (ft)	237	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		340
Storage Blk Time (%)		
Queuing Penalty (veh)		

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Intersection: 1: Struthers Rd & Struthers Ranch Rd, All Intervals

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Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	140	40
Average Queue (ft)	40	9
95th Queue (ft)	93	34
Link Distance (ft)	237	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		340
Storage Blk Time (%)		
Queuing Penalty (veh)		

## Intersection: 3: Site Access &amp; Struthers Ranch Rd, Interval #1

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	35	37
Average Queue (ft)	24	24
95th Queue (ft)	46	44
Link Distance (ft)	178	273
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

## Intersection: 3: Site Access &amp; Struthers Ranch Rd, Interval #2

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	6	44	35
Average Queue (ft)	1	23	23
95th Queue (ft)	9	49	45
Link Distance (ft)	193	178	273
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

## Intersection: 3: Site Access &amp; Struthers Ranch Rd, Interval #3

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	36	54
Average Queue (ft)	24	37
95th Queue (ft)	51	58
Link Distance (ft)	178	273
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		



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Intersection: 3: Site Access & Struthers Ranch Rd, Interval #4

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Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (ft)	50	43
Average Queue (ft)	30	25
95th Queue (ft)	56	50
Link Distance (ft)	178	273
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

---

Intersection: 3: Site Access & Struthers Ranch Rd, All Intervals

---

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (ft)	6	60	58
Average Queue (ft)	0	25	27
95th Queue (ft)	4	51	52
Link Distance (ft)	193	178	273
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

## Appendix A from the TIS for EPC PCD File No. PPR2248

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## Appendix A - Intersection Sight Distance Calculations

Intersection sight distance contained in Table 2-21 in section 2.3.6.G of the *Engineering Criteria Manual (ECM)* reads:

***“Intersection sight distance.*** *This section applies to intersections where one public road meets a second public road. The intersection sight distance provides for vehicles to enter traffic and accelerate to the average running speed. Intersection sight distances shall be measured as shown on Figure 2-23. The intersection sight distance shall be as shown in Table 2-21.”*

Table 2.21 shows Intersection sight distance of 555' for design speed of 50 mph. However, Table 2.21 contains a footnote No. 3 which reads: *“<sup>3</sup>These values only apply to two-lane roads with stop control, all other situations require special design considerations.”*

As the 555' in the ECM for 50 mph along an intersecting two-lane roadway is based on the criteria in *“A Policy on Geometric Design of Highways and Streets” (The Green Book)* 2018, 7th Edition, published by the American Association of State Highway & Transportation Officials (AASHTO), LSC has utilized this same criteria for this “other situation” requiring special design consideration.

Note: Section 1.5 of the ECM Standards Adopted by Reference: American Association of State Highway & Transportation Officials (AASHTO) including Roadway Design Guide and Bicycle Design.

Section 9.5 of The Green Book contains **Intersection Sight Distance and Section 9.5.3.2.1 Case B1-Left Turn from the Minor Road (p 9.43)** applies.

Intersection sight distance is calculated using the formula  $d = 1.47 * V_m * t_c$ , where  $V_m$  is the design speed in miles per hour and  $t_c$  is the gap for drivers entering the major roadway (in seconds).

Table 9-6 identifies a time gap of 7.5 sec. for a two-lane highway (same as the case in the ECM table 2-21).

However, as Struthers Road has two through lanes in each direction plus a center median of about 18 feet, the time gap has been adjusted based on the following note in Table 9-6:

*For multilane roadways or medians—For left turns onto two-way roadways with more than two lanes, including turn lanes, add 0.5 s for passenger cars or 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle. Median widths should be converted to an equivalent number of lanes in applying the 0.5 and 0.7 s criteria presented above; for example, an 18-ft [5.5-m] median is equivalent to one and a half lanes, and would require an additional 0.75 s for a passenger to cross and an additional 1.05 s for a truck to cross.*

Also, on page 9-44,

*In applying Table 9-6, it can usually be assumed that the minor-road vehicle is a passenger car. However, where substantial volumes of heavy vehicles enter the major road, such as from a ramp terminal, the use of tabulated values for single-unit or combination trucks should be considered.*

This intersection sight-distance analysis for passenger vehicles will be sufficient:

- Given the example in AASHTO of a situation with “substantial volumes” of heavy vehicles, Struthers Ranch Road and the proposed non-residential uses would not generate the level of truck traffic such that a vehicle other than a passenger car should be assumed when applying Table 9-6.
- Table 2-21 does not call out the need for specific analysis of Single and Multi-unit trucks at intersections. AASHTO used as the *ECM* does not provide sufficient detail for sight distance along a four-lane road.
- Truck drivers on the side street will have a higher drivers eye (about 7.5 feet above the roadway) and except in unusual circumstances, truck drivers will be able to see to the north or to the south across the site parking area to the oncoming traffic in the northbound lanes.
- Not even considering the bullet above, trucks on the side street and turning from the side street are much larger and easier to spot than passenger vehicles. There is sufficient stopping sight distance for drivers along the roadway to slow or stop for the infrequent truck entering the roadway.

### **Sight Distance to the south**

Based on Figure 9-17 on page 9-38, the departure sight triangle to the left at Struthers Ranch Road requires an increase in the “base” time gap of an additional 0.5 seconds as there is one additional lane in excess of one to be crossed in the northbound direction by the left-turning vehicle. Thus, the time gap is adjusted to 8.0 seconds for the sight distance calculation looking left.

Using the formula above, **the calculated intersection sight distance is 590 feet to the left.**

### **Sight Distance to the north**

Looking north, the sight distance needs to cover the northbound lanes plus the width of the median. Based on Figure 9-17 on page 9-38, the departure sight triangle to the right at Struthers Ranch Road requires an increase in the “base” time gap of an additional 1.25 seconds to account for:

- 0.5 seconds for **one** additional lane in excess of one to be crossed in the northbound direction by the left-turning vehicle plus
- 0.75 seconds for the width of the median (1.5 lanes equivalent)

Thus, the time gap is adjusted to 1.25 seconds for the sight distance calculation looking right ( $0.5 \text{ sec} + (1.5 * 0.5 \text{ sec})$ ). The acceptable gap time has been increased from the typical 7.5 seconds for a passenger vehicle on a two-lane road to 8.75 seconds to account for multiple lanes and the median.

Using the formula above, **the calculated intersection sight distance is 640 feet to the right.**

**Regarding the decision point (“driver’s eye” location), the following is AASHTO guidance:** *“The vertex (decision point) of the departure sight triangle on the minor road should be 14.5 ft [4.4 m] from the edge of the major-road traveled way. This represents the typical position of the minor-road driver’s eye when a vehicle is stopped relatively close to the major road.” (p. 9-43)*

# Copy of Deviation Request from PCD File No. PPR2248

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Planning and Community  
Development Department  
2880 International Circle  
Colorado Springs, Colorado 80910  
Phone: 719.520.6300  
Fax: 719.520.6695  
Website www.elpasoco.com

## DEVIATION REQUEST AND DECISION FORM

Updated: 6/26/2019

### PROJECT INFORMATION

Project Name : Struthers Ranch  
Schedule No.(s) : 7136303010 and 7136303011  
Legal Description : Lots 1 and 2 STRUTHERS RANCH SUB FIL NO 4

### APPLICANT INFORMATION

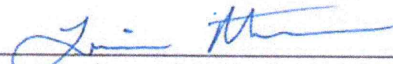
Company : Hammers Construction  
Name : Lisa Peterson  
☐ Owner ☐ Consultant ☒ Contractor  
Mailing Address : 1411 Woolsey Heights  
Colorado Springs, CO 80915  
Phone Number : 719-570-1599  
FAX Number : 719-570-7008  
Email Address : LPeterson@hammersconstruction.com

### ENGINEER INFORMATION

Company : LSC Transportation Consultants, Inc.  
Name : Jeffrey C. Hodsdon  
Colorado P.E. Number : 31684  
Mailing Address : 2504 E. Pikes Peak Ave, Suite 304  
Colorado Springs, CO 80909  
Phone Number : 719-633-2868  
FAX Number : 719-633-5430  
Email Address : jeff@LSCtrans.com

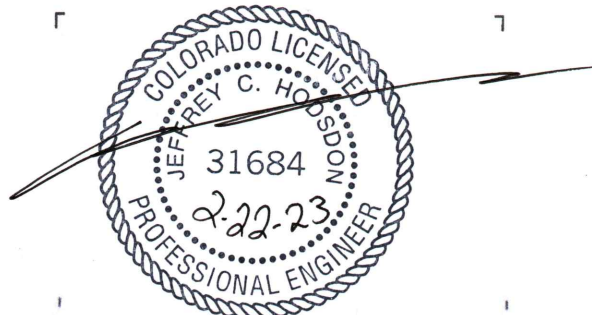
### OWNER, APPLICANT, AND ENGINEER DECLARATION

To the best of my knowledge, the information on this application and all additional or supplemental documentation is true, factual and complete. I am fully aware that any misrepresentation of any information on this application may be grounds for denial. I have familiarized myself with the rules, regulations and procedures with respect to preparing and filing this application. I also understand that an incorrect submittal will be cause to have the project removed from the agenda of the Planning Commission, Board of County Commissioners and/or Board of Adjustment or delay review until corrections are made, and that any approval of this application is based on the representations made in the application and may be revoked on any breach of representation or condition(s) of approval.

  
Signature of owner (or authorized representative)

2/22/23  
Date

Engineer's Seal, Signature  
And Date of Signature





## DEVIATION REQUEST (Attach diagrams, figures, and other documentation to clarify request)

A deviation from the standards of or in Sections **2.3.6 (G)** of the Engineering Criteria Manual (ECM) is requested. Two exhibits are included with this deviation. Please refer to the TIS report dated February 21, 2023 for additional details.

Identify the specific ECM standard which a deviation is requested:

2.3.6.G Intersection Sight Distance  
Table 2-21

State the reason for the requested deviation:

- The crest vertical curve on Struthers Road just north of Struthers Ranch Road limits intersection line of sight needed for intersection sight distance to the north for passenger vehicles making a left turn from westbound Struthers Ranch Road to southbound Struthers Road.
- The roadway design speed is assumed to be 50 mph (based on the southbound posted speed limit of 45 mph). Please refer to Exhibit 1 showing the subject location.
- Please refer to the TIS report dated February 21, 2023 for additional details.

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

- This is an existing roadway, an existing intersection, and an existing deficiency.
- Table 2-21 Indicates a required intersection sight distance of 555' for a design speed of 50 mph. However, a footnote in the table indicates "*These values only apply to two-lane roads with stop control, all other situations require special design considerations.*" As Struthers Road is a four-lane road, not a two-lane road, special design consideration is required.
- The sight distance to the north is shown in Exhibit 2. The field-measured sight distance to the north at this intersection is 450 feet. Given that the field-measured sight distance is less than the calculated sight distance of 640 feet, LSC recommends posting an "intersection ahead" warning sign (MUTCD W2-2) on the southbound approach to this intersection
- Note: 425 feet of **stopping** sight distance is required for 50 mph (design speed) roadways (ECM Section 2.3.6)
- Please refer to the TIS report dated February 21, 2023 for additional details.

## LIMITS OF CONSIDERATION

(At least one of the conditions listed below must be met for this deviation request to be considered.)

- ☐ The ECM standard is inapplicable to the particular situation.
- ☒ Topography, right-of-way, or other geographical conditions or impediments impose an undue hardship and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety or accessibility.
- ☐ A change to a standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.

Provide justification:

- A vertical curve exists on Struthers Road just north of the Struthers Ranch Road intersection (existing intersection). This project must use Struthers Ranch Road for access to Struthers Road.

## CRITERIA FOR APPROVAL

Per ECM section 5.8.7 the request for a deviation may be considered if the request is **not based exclusively on financial considerations**. The deviation must not be detrimental to public safety or surrounding property. The applicant must include supporting information demonstrating compliance with **all of the following criteria**:

The deviation will achieve the intended result with a comparable or superior design and quality of improvement.

- LSC recommends posting an “intersection ahead” warning sign (MUTCD W2-2) on the southbound approach to this intersection.
- Also, consideration could be given to modifying the posted speed limit zones on Struthers Road near this intersection to shift the 40-mph zone north such that a 40-mph speed limit sign is posted for southbound traffic between Spanish Bit and Struthers Ranch Road.

The deviation will not adversely affect safety or operations.

- The proposed “intersection ahead” warning sign (MUTCD W2-2) would alert motorists of the limited intersection sight distance for traffic entering the roadway from Struthers Ranch Road (turning left onto southbound Struthers) to anticipate the potential need to slow and/or change lanes.
- Although the intersection sight distance is less than the calculated requirement, there would be sufficient stopping sight distance to allow a southbound motorist to slow (to a stop, if necessary) to avoid a collision. The ECM (and AASHTO) **stopping** sight distance for a 50-mph design speed is 425 feet.

The deviation will not adversely affect maintenance and its associated cost.

- The only potential maintenance cost would be associated with the proposed warning sign.

The deviation will not adversely affect aesthetic appearance.

- Traffic signs are associated with any roadway – so no change in aesthetic appearance.

The deviation meets the design intent and purpose of the ECM standards.

- Struthers Road/Struthers Ranch Road is an existing intersection and this is an existing deficiency. A common method of mitigating a substandard condition is with the use of signage/markings. Although the intersection sight distance is less than the calculated requirement, there would be sufficient stopping sight distance to allow a southbound motorist to slow (to a stop, if necessary) to avoid a collision.

The deviation meets the control measure requirements of Part I.E.3 and Part I.E.4 of the County’s MS4 permit, as applicable.

- Water quality will be provided.

**REVIEW AND RECOMMENDATION:**

**Approved by the ECM Administrator**

This request has been determined to have met the criteria for approval. A deviation from Section \_\_\_\_\_ of the ECM is hereby granted based on the justification provided.

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**Denied by the ECM Administrator**

This request has been determined not to have met criteria for approval. A deviation from Section \_\_\_\_\_ of the ECM is hereby denied.

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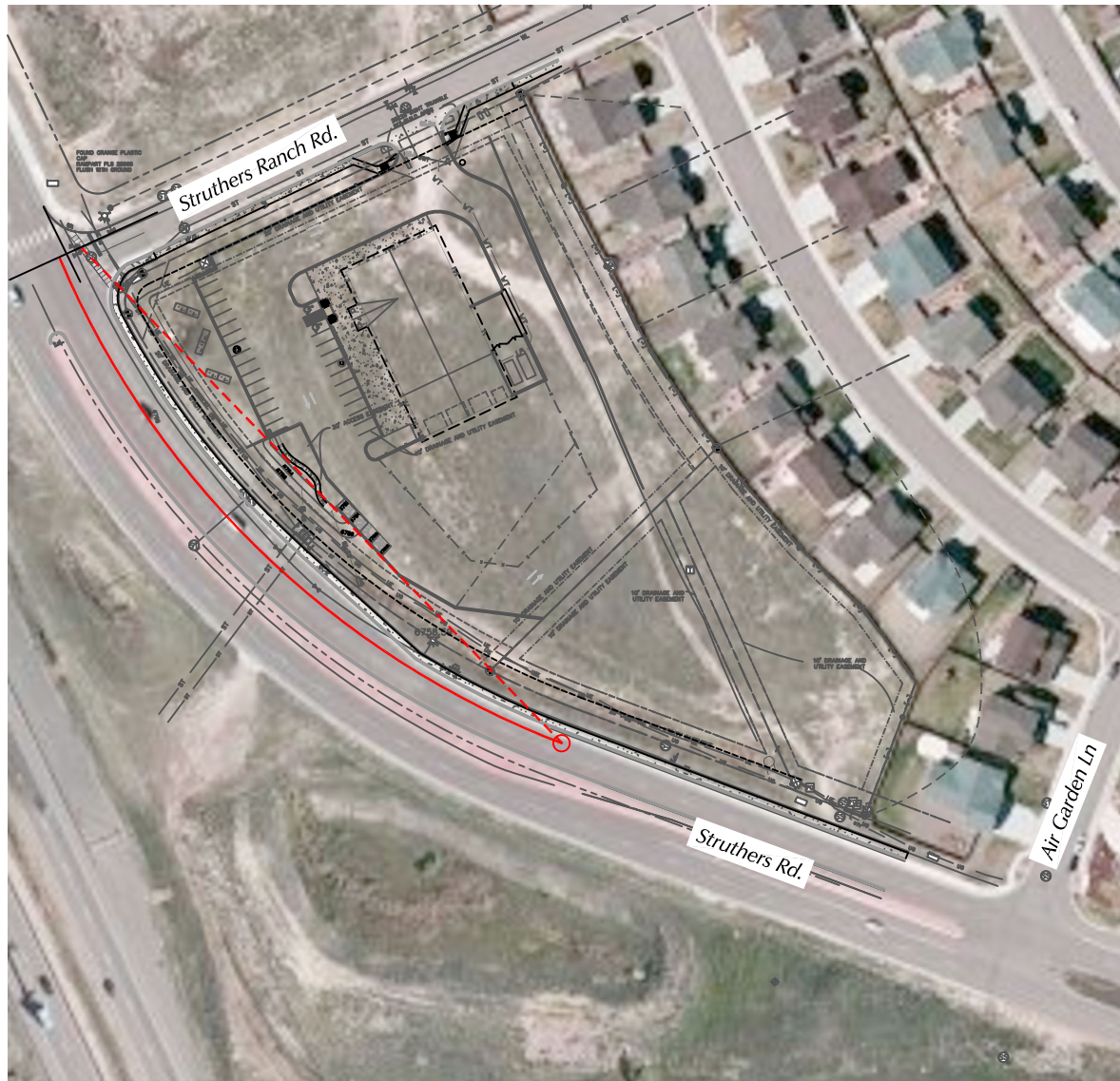
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ECM ADMINISTRATOR COMMENTS/CONDITIONS:

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Approximate Scale  
1" = 150'

— = 590' Required Sight Distance

- - - = Line of Sight for 590' of Intersection  
Sight Distance

Exhibit 1

## Intersection Sight Distance (Struthers Ranch Rd to the South)

Struthers - Polaris RMC (LSC #204111)



Approximate Scale  
1" = 150'

- = 645' Required Intersection Sight Distance
- = Line of Sight for 590' of Intersection Sight Distance
- = Stopping Sight Distance
- = 450' Field-Measured Sight Distance

Exhibit 2

## Intersection Sight Distance (Struthers Ranch Rd to the North)

Struthers - Polaris RMC (LSC #204111)