

# Struthers Ranch Subdivision Filing No. 5 Traffic Impact Study

MAY 14, 2021

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LSC Transportation Consultants  
Prepared by: Colleen Guillotte, P.E., PTOE, RSP  
Reviewed by: Jeffrey C. Hodsdon, P.E.

LSC #204110  
PCD File No. VR-2101

Revise to PPR-2248



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Provide a page before report contents begin and include signature block: "The attached traffic report and supporting information were prepared under my responsible charge and they comport with the standard of care. So far as is consistent with the standard of care, said report was prepared in general conformance with the criteria established by the County for traffic reports.

\_\_\_\_\_  
[Name, P.E. #\_\_\_\_\_ ] Date

Developer's Statement

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

\_\_\_\_\_  
[Name, Title] Date

[Business Name]

[Address] "



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May 14, 2021

Darin C Weiss, AIA  
Design and Development Consultants  
T-Bone Construction  
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RE: Struthers Ranch Subdivision Filing No. 5  
Traffic Impact Study  
El Paso County, Colorado  
LSC #204110

Dear Mr. Weiss:

Development is not  
a subdivision.  
Revise.

LSC Transportation Consultants, Inc. has prepared this traffic impact study for the proposed Struthers Ranch Subdivision Filing No. 5 development in El Paso County, Colorado. The development is planned to be located southeast of the intersection of Struthers Road/Struthers Ranch Road. The planned land use is for 19,740 square feet of retail, 5,200 square feet of office, and 5,200 square feet of restaurant. This report has been prepared for submittal to El Paso County.

## REPORT CONTENTS

The preparation of this report included the following:

- Inventory of the existing adjacent and nearby area street and roadway system. This includes functional classifications, street widths, lane configurations, intersection traffic control, posted speed limits, pavement markings, intersection and access spacing, roadway and intersection alignments, auxiliary left- and right-turn lanes, intersection sight distances, etc.;
- A review of the proposed site land use and access locations;
- Morning and evening peak-hour traffic counts at the intersection of Struthers Road/Struthers Ranch Road;
- Estimates of short- and long-term background traffic volumes and total traffic (site traffic plus background traffic). Forecasts include buildout of adjacent proposed developments;
- Estimates of the daily and peak-hour trip generation for the proposed land use;
- The estimated directional distribution of site-generated vehicle trips on the study-area street and roadway system;

- Projections of peak-hour site-generated turning-movement traffic volumes at the study area intersections, which include:
  - Site access point intersections
  - Struthers Road/Struthers Ranch Road
- Level of service (LOS) analysis at the study area intersections;
- Evaluation of the short-term and long-term projected intersection volumes to determine the potential need for any new auxiliary right-/left-turn lanes and/or the adequacy of existing lanes at the site access-point intersections and the other study-area intersections; and
- Findings and recommendations.

### PREVIOUS TRAFFIC STUDIES

Nearby properties have recently been studied in the following:

- Monument Ridge Lots 7 & 8, December 2020, LSC
- Monument Ridge Apartments
- Cathedral Rock Church, February 2016, LSC

Revise to include trip generation from Struthers Ranch Filing 4. Per plat traffic amounts are limited to what said report provided.

This report is consistent with the above reports and background traffic volumes.

Per site development plan it appears only one access point is being proposed. Revise to remove access to Struthers Road. Access to Struthers is not allowed per plat.

### LAND USE AND ACCESS

Figure 1 shows the site location relative to the adjacent and nearby roadways. The site plan is shown in Figure 2. The Cathedral Rock Church is planned for the adjacent Tract A on the north side of Struthers Ranch Road. As shown in Figure 2, two access points are proposed: a full movement access onto Struthers Ranch Road across from the proposed access to Cathedral Rock Church, and a right-in/right-out access onto Struthers Road.

Elaborate on the specific manual used and update the reference list. "A Policy on Geometric Design of Highways and Streets"

Identify the section and Intersection Case used

- Add the reference tables, charts, etc used.
- Provide the SSD computation in the appendix.
- State the vertex (decision point) in the minor road in measuring the line of sight from edge of travel lane.

been calculated using AASHTO criteria because the intersection sight distance contained in Table 2-21 of the *Engineering Criteria Manual (ECM)* only applies to two-lane roads with stop control. As Struthers Road has two through lanes in each direction plus a center median, the sight distance has been 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). The acceptable gap time has been increased from the typical 7.5 seconds for a passenger vehicle on a two-lane

Provide more information on what obstructions are on Struthers Road that limit calculated sight distances from being met.

Provide data to support increase in gap time for calculation.

Provide a deviation request for not meeting sight distance. Provide justification in the deviation request why sight distance is not being met and provide recommendations/alternates as well.

road to 8.75 seconds to account for multiple lanes and the median. Likewise, the acceptable gap for a combination truck has been increased from 11.5 seconds to 13.25 seconds. This calculation results in a required intersection sight distance is 645 feet for passenger vehicles and 875 feet for combination trucks. A single unit truck would require 825 feet of sight distance.

Update the line of sight exhibit to include the single unit.

The field-measured sight distance at this intersection is 450 feet for passenger vehicles and 450 feet assuming a higher "drivers' eye" for a truck. Given that the field-measured sight distance is less than the calculated AASHTO sight distance, LSC recommends posting an "intersection advance warning sign (MUTCD W2-2).

Identify the time gap used to calculate the sight distance for the single unit truck.

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, and the 45-mph sign for northbound traffic (currently located near the south end of the site) is relocated north to just north of Struthers Ranch Road. Given the sight distance for trucks compared to the AASHTO standard, it is recommended that a "Left Turn Prohibited" sign with a "Trucks" supplemental sign panel be installed at the westbound approach to the Struthers Road/Struthers Ranch Road intersection.

To the south, the sight distance only needs to cover the northbound lanes, so the sight distance calculation does not need to include the extra distance of the median. Therefore, a passenger car needs 590 feet of sight distance of, a single-unit truck would require 750 feet, and a combination truck would require 900 feet. The criterion to the south could be met for passenger cars provided the intersection line of sight "triangle" is kept free of site improvements (that would limit the line of sight needed to maintain ECM prescribed sight distance). Examples of site improvements include landscaping, monument signs, parking areas, berms, etc. Obstruction height to maintain truck line of sight is higher as the truck "driver's eye" is significantly higher than the "driver's eye" for a passenger vehicle. However, the required sight distance for single-unit and combination trucks passes over the proposed parking lot. As a result, the necessary line of sight across the inside of the horizontal curve of Struthers Road has the potential to be blocked by parked vehicles. Therefore, it is recommended that a "Left Turn Prohibited" sign with a "Trucks" supplemental sign panel be installed at the westbound approach to the Struthers Road/Struthers Ranch Road intersection. Additionally, it is recommended that internal wayfinding signs be posted that instruct combination trucks to exit the site only via the right-in/right-out.

Quantify. Identify the recommended value of truck driver eye height for design.

The required sight distance for the right-in/right-out access point onto Struthers Road is 450 feet for passenger vehicles and 765 feet for a combination truck per ECM Table 2-35. The line of sight to arriving northbound through traffic on Struthers is over one quarter mile.

The required sight distance for the access point onto Struthers Ranch Road is 250 feet for passenger vehicles and 425 feet for combination trucks. Sight distance analysis exhibits are attached.

Remove from report. Access will not be allowed from Struthers Road.

See comments on the site development plan and revise.

## ROAD AND TRAFFIC CONDITIONS

### Area Roads

Figure 1 shows the streets in the vicinity of the site. The streets adjacent to 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 (adjacent to the south portion of the site). 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 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.

### Traffic Volumes

Morning and evening peak-hour turning-movement traffic counts were conducted March 2020 at the intersection of Struthers Road/Struthers Ranch Road. It was noted that the southbound through traffic during the evening peak was unusually high. A second evening count was completed in April 2021. The morning and evening peak-hour volumes are shown in Figure 3. Traffic count reports are attached for reference.

Provide updated traffic counts.

### Crash History

Three years of crash data were collected at the intersection of Struthers Road/Struthers Ranch Road. There was only one crash during the study period. The only crash was a fixed object type crash that resulted in property damage only. No correctable crash patterns were identified.

## TRIP GENERATION

Estimates of the vehicle trips projected to be generated by the proposed development have been made using the nationally published trip-generation rates from *Trip Generation, 10<sup>th</sup> Edition, 2017* by the Institute of Transportation Engineers (ITE). Table 1, below, presents a summary of the estimated site trip generation on a typical weekday. The detailed trip-generation estimate for the development, including ITE rates for the proposed land use, is presented in Table 3.

Approximately 2,986 total vehicle trips are projected to enter and exit the site at the access point (“driveway trips”) on the average weekday during a 24-hour period. During the morning peak hour, approximately 170 vehicles would enter and 98 vehicles would exit the site. During the evening peak hour, approximately 101 vehicles would enter and 112 vehicles would exit the site.

The proposed development is projected to generate approximately 1,776 (new/non-pass-by or diverted) vehicle trips on the average weekday during a 24-hour period.

**Table 1: Estimated External Site Vehicle-Trip Generation (Vehicles per Hour)**

Analysis Period	Total Trips			Pass-by Trips			New Trips		
	In	Out	Total	In	Out	Total	In	Out	Total
A.M. Peak Hour	170	98	268	53	53	106	117	45	162
P.M. Peak Hour	101	112	213	43	43	86	58	69	127
Daily/24-Hour	1,493	1,493	2,986	605	605	1,210	888	888	1,776

**Internal Trips**

Internal trips are trips that occur within the site and do not impact the external roadways. Because the site is planned to have multiple retail, office, and restaurant pads, some of the generated trips will be traveling within the site. Table 3 includes estimates of internal trip capture to account for trips generated within the site as well as non-motorized trips from adjacent and nearby developments.

**Pass-by Trips**

The trips generated by the site have also been aggregated by trip type to account for the pass-by phenomenon. A pass-by trip is one made by a motorist who would already be on an adjacent road regardless of the proposed development, but who stops in at the site while passing by. The pass-by motorist would then continue on his or her way to a final destination in the original direction. For purposes of this report, pass-by trips are trips by motorists already traveling through the intersection of Struthers Road/Struthers Ranch Road. Pass-by trips are shown in Table 3 and are based on *Trip Generation Handbook - An ITE Proposed Recommended Practice*, 3rd Edition, 2014 by ITE.

**BACKGROUND TRAFFIC**

Background volumes do not include projected traffic to be generated by the proposed development. As noted in the existing conditions section, the southbound through traffic during the evening peak was unusually high. This volume was modified in the background to reflect expected volumes.



### **Short-Term Background Traffic Volumes**

Figure 4 shows the projected background traffic volumes. The projected volumes assume that the following nearby developments have been constructed:

- Monument Ridge Lots 7 & 8
- Cathedral Rock Church
- Monument Ridge Apartments

### **Long-Term Background Traffic Volumes**

Figure 5 shows the projected 20-year background traffic volumes for the year 2040. The long-term scenario includes the developments in the short-term background. In addition, the long-term background traffic assumes a growth of approximately 3 percent per year of through traffic on Struthers Road. This rate is based on growth shown in the Pikes Peak Council of Governments travel demand model and is similar to growth shown in the area in *the 2016 Major Transportation Corridors Plan (MTCP)*. No improvements to the study roads are shown in the *MTCP*.

## **TRIP DISTRIBUTION AND ASSIGNMENT**

### **Trip Directional Distribution**

Estimation of 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 shows the short-term and long-term directional distribution estimates for the proposed development. Estimates were based on the following factors: existing area development, the area roadway system, and the site's proposed land use.

### **Site-Generated Traffic**

Site-generated traffic volumes at the study intersections have been calculated by applying the directional-distribution percentages estimated by LSC (from Figure 6) to the trip-generation estimates (from Table 1). Figure 7 shows the projected site-generated traffic volumes for the proposed development.

### **Short-Term Total Traffic Volumes**

Figure 8 shows the sum of the short-term background traffic volumes (from Figure 4) and the site-generated peak-hour traffic volumes (shown in Figure 7). These volumes represent the projected short-term total traffic following construction of the development.

**Long-Term Total Traffic Volumes**

Figure 9 shows the projected 2040 total traffic volumes, which are the sum of 2040 background traffic volumes (from Figure 5) plus the site-generated traffic volumes (from Figure 7).

**LEVEL OF SERVICE ANALYSIS**

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

(1) 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

The intersections of Struthers Road/Struthers Ranch Road, as well as the site access points, have been analyzed to determine the projected control delay and corresponding levels of service for turning movements. Figure 3 provides the existing levels of service. Figure 4 and Figure 5 provide the background levels of service for the short-term and long-term scenarios, respectively. Figure 8 and Figure 9 provide the levels of service of the short-term and long-term total traffic scenarios, respectively.

**Struthers Road/Struthers Ranch Road**

The yielding turning movements at the unsignalized intersection of Struthers Road/Struthers Ranch Road currently operate at LOS B or better during both the morning and evening peak hours. In the short-term future, the yielding turning movements are forecast to operate at LOS C or better during both peak hours, with and without the proposed development.

In the long-term future, the yielding turning movements are also forecast to operate at LOS C or better without the proposed development. With the addition of the site-generated traffic, the

outbound movement is projected to operate at LOS C during the morning peak and LOS E during the evening peak. During the evening peak, the outbound movement is expected to experience an average of 64 seconds of delay. This intersection is not anticipated to meet signal warrants.

### Site Accesses

In all scenarios, the yielding turning movements operate at LOS B or better during both peak hours.

### AUXILIARY TURN LANES

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.

There is a 400-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* and is not expected to be required in the future with added site-generated traffic. The turning-volume threshold could potentially be met on Sunday mornings with addition of future church traffic. The turn lane already exists and is about 400 feet (lane plus taper). The *ECM* requirement is 435 feet.

The right-in/right-out access on Struthers Road is anticipated to require a right-turn deceleration lane. This criterion calls for 370-foot-long deceleration distance (lane plus taper) based on a 45-mph design speed and a 435-foot-long deceleration distance (lane plus taper) for a 50-mph design speed. The speed limit currently changes just south of the access location. LSC recommends an approximately 200-foot-long lane plus a 75-foot-long reverse curve bay taper. This would likely allow the lane to be installed, given the limited space adjacent to the developed property to the south. No acceleration lanes are required on Struthers Road.

The access on Struthers Ranch Road meets the threshold for requiring an eastbound right-turn lane per the *ECM* because the turning volume exceeds the 50-vph threshold. However, the eastbound left and through volumes are low enough that the location does not need a turn lane. Per section 3.5 in the *CDOT State Highway Access Code*, right-turn deceleration lanes may be dropped if volume in the travel lane is predicted to be less than 150 DHV.

Although not anticipated to be required based on projected volumes or levels of service, It is recommended that right-of-way be reserved in case Struthers Ranch Road needs minor widening in the future to allow for separate right- and left-turn lanes in the westbound direction at the intersection with Struthers Road.

Update the site plan to include the turn lane or submit a deviation request for the right turn lane exclusion for the *ECM* Administrator's consideration.

## VEHICLE QUEUING

At the intersection of Struthers Road/Struthers Ranch Road, there are 250 feet available for vehicle queuing to the east, prior to the site access. The 95<sup>th</sup> percentile queue length for the westbound approach at the intersection is anticipated to be 125 feet, which will not impact the site access. If Struthers Ranch Road were widened in the future to provide separate right- and left-turn lanes on the westbound approach the intersection, then the 95<sup>th</sup> percentile queue for the westbound left is forecast to be 75 feet, which also would not impact the access to the east.

## 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 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

A deviation request is included with this application. Please refer to the deviation request form (separate document) for access to a Minor Arterial.

Remove. Access to Struthers Road was denied with the vacate replat application VR211. VR211 project has since been cancelled by the applicant.

## 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" is \$4,958 per 1,000 square feet of building floor area. The total fee amount for the 30,140 square foot of commercial buildings is \$149,434.

List deviations the applicant plans to submit with the site plan application.

## Reimbursable MTCP Improvements

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

**FINDINGS AND CONCLUSIONS**

- The site is projected to generate approximately 2,986 external vehicle trips on the average weekday. Approximately half of this traffic is expected to be pass-by traffic.
- During the morning peak hour, approximately 170 vehicles would enter and 98 vehicles would exit the site. During the evening peak hour, approximately 101 vehicles would enter and 112 vehicles would exit the site at the access points.
- The site improvements, landscaping, signage etc. will need to accommodate the driver sight distance lines of sight necessary to meet the prescribed intersection sight distance at Struthers Road/Struthers Ranch Road. Please refer to the Sight Distance section for details.
- Turning movements at the site accesses are projected to operate at acceptable levels of service in all scenarios.
- The westbound approach at the intersection of Struthers Road/Struthers Ranch Road is projected to operate at LOS C in the long-term morning peak hour and LOS E during the long-term evening peak hour.
- The 95<sup>th</sup> percentile queues at all study intersection are not projected to impact adjacent intersections.
- Please refer to the sight distance section for recommendations based on the sight-distance analysis.
- See Table 4 for a summary of recommended improvements. Delete.

**Table 4: Recommended Improvements**

Item #	Location	Improvement	Timing
1	Struthers Ranch Road - Adjacent to the site	Sidewalk	With development of the site
2	Struthers Road/Struthers Ranch Road	Reserve half-ROW or at least a "reservation" strip along the south side of Struthers Ranch Road to allow for potential future widening on the east leg/westbound approach to accommodate separate left/right turn lanes if these ever become necessary.	With the Site Development Plan
<del>3</del>	<del>Struthers Road/South Site Access</del>	<del>Northbound Right Turn Deceleration Lane</del>	<del>With development of the site</del>
4	Site	Install signing instructing trucks to use the right-in/right-out to exit the site	With development of the site

Source: LSC Transportation Consultants, Inc. (4-22-2021)

Add the left turn prohibited sign w/ trucks from pg 6.

\* \* \* \* \*

of Struthers Ranch Road. Given the sight distance for trucks compared to the AASHTO standard, it is recommended that a "Left Turn Prohibited" sign with a "Trucks" supplemental sign panel be installed at the westbound approach to the Struthers Road/Struthers Ranch Road intersection.

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

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.

By Colleen Guillotte, P.E., PTOE, RSP  
Project Manager

JCH:jas

Enclosures: Table 3  
Figures 1-9  
Line of Sight Exhibits  
Traffic Count Reports  
Level of Service Reports  
NCHRP Report 684 Internal Capture Worksheets

References:

*Trip Generation Handbook - An ITE Proposed Recommended Practice*, Third Edition September 2017, Institute of Transportation Engineers  
*Trip Generation, 10<sup>th</sup> Edition, 2017*, Institute of Transportation Engineers  
*El Paso County Major Transportation Corridors Plan, 2016*  
*NCHRP Report 684 Enhancing Internal Trip Capture Estimation for Mixed-Use Developments, 2011*, Transportation Research Board  
*State Highway Access Code, Volume Two, 2002*, Colorado Department of Transportation

# Table 3



**Table 3: Detailed Trip-Generation Estimate**

Land Use Code	Land Use Description	Trip Generation Units	Total Trips Generated					Internal Trips Generated <sup>(2)</sup>					External Trips Generated					New External Trips Generated						
			Average Weekday Traffic	Morning Peak Hour In	Morning Peak Hour Out	Afternoon Peak Hour In	Afternoon Peak Hour Out	Internal Trips	Average Weekday Traffic	Morning Peak Hour In	Morning Peak Hour Out	Afternoon Peak Hour In	Afternoon Peak Hour Out	Average Weekday Traffic	Morning Peak Hour In	Morning Peak Hour Out	Afternoon Peak Hour In	Afternoon Peak Hour Out	Pass-By Trips <sup>(3)</sup>	Average Weekday Traffic	Morning Peak Hour In	Morning Peak Hour Out	Afternoon Peak Hour In	Afternoon Peak Hour Out
820	Shopping Center	19.74 KSF <sup>(4)</sup>	1,995	100	61	79	85	21%	423	7	8	32	22	1,571	93	53	47	63	34%	1,037	68	28	28	44
712	Small Office Building	5.2 KSF	84	8	2	4	9	26%	22	1	1	2	2	62	7	1	2	7	0%	62	7	1	2	7
933	Fast Food w/o Drive-Thru	5.2 KSF	1,800	78	52	74	74	25%	447	9	8	21	31	1,353	69	44	53	43	50%	677	41	16	29	19
<b>Total Trip Generation Estimate</b>			<b>3,879</b>	<b>187</b>	<b>115</b>	<b>156</b>	<b>167</b>		<b>892</b>	<b>17</b>	<b>17</b>	<b>55</b>	<b>55</b>	<b>2,987</b>	<b>170</b>	<b>98</b>	<b>101</b>	<b>112</b>		<b>1,776</b>	<b>117</b>	<b>45</b>	<b>58</b>	<b>69</b>

Notes:

(1) Source: "Trip Generation, 10th Edition, 2017" by the Institute of Transportation Engineers (ITE)

(2) NCHRP 684 Internal Trip Capture Estimate Tool Sheets

(3) Source: "Trip Generation Handbook - An ITE Proposed Recommended Practice, Third Edition September 2017" by ITE

(4) KSF = one thousand square feet of floor space

Source: LSC Transportation Consultants, Inc.



# Figures

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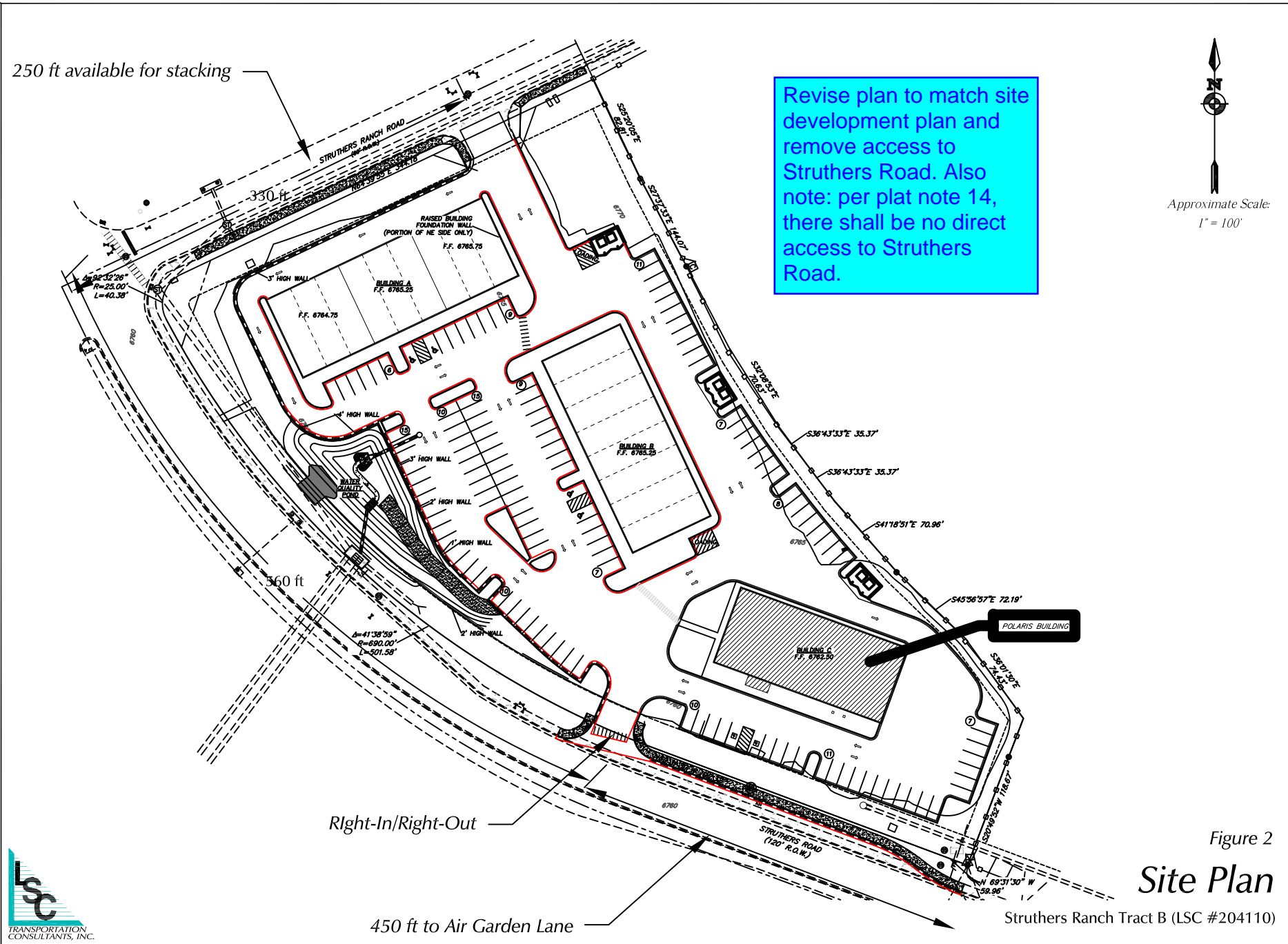


Figure 1  
**Vicinity  
Map**

Struthers Ranch Tract B (LSC #204110)



250 ft available for stacking



Revise plan to match site development plan and remove access to Struthers Road. Also note: per plat note 14, there shall be no direct access to Struthers Road.

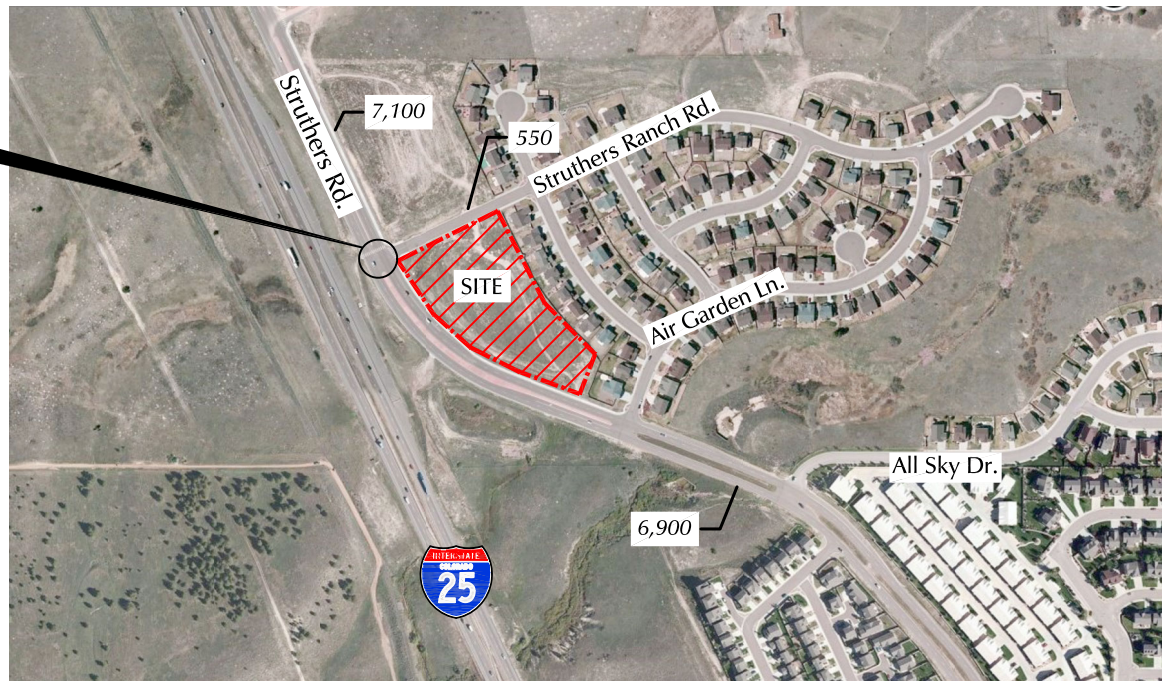
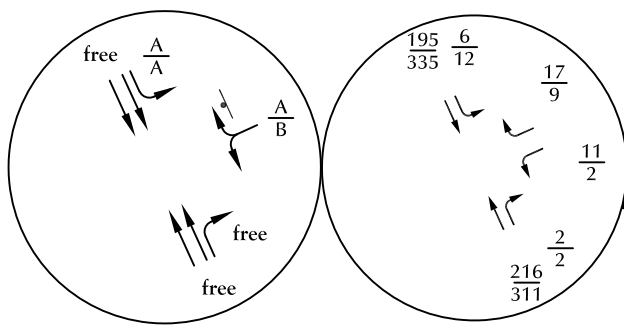
Approximate Scale:  
1" = 100'

Figure 2

# Site Plan

Struthers Ranch Tract B (LSC #204110)





LEGEND:

- ⊥ = Stop Sign
- $\frac{XX}{XX}$  =  $\frac{\text{AM Weekday Peak-Hour Traffic (vehicles per hour)}}{\text{PM Weekday Peak-Hour Traffic (vehicles per hour)}}$
- $\frac{A}{B}$  =  $\frac{\text{AM Individual Movement Peak-Hour Level of Service}}{\text{PM Individual Movement Peak-Hour Level of Service}}$
- X,XXX = Average Weekday Traffic (vehicles per day)

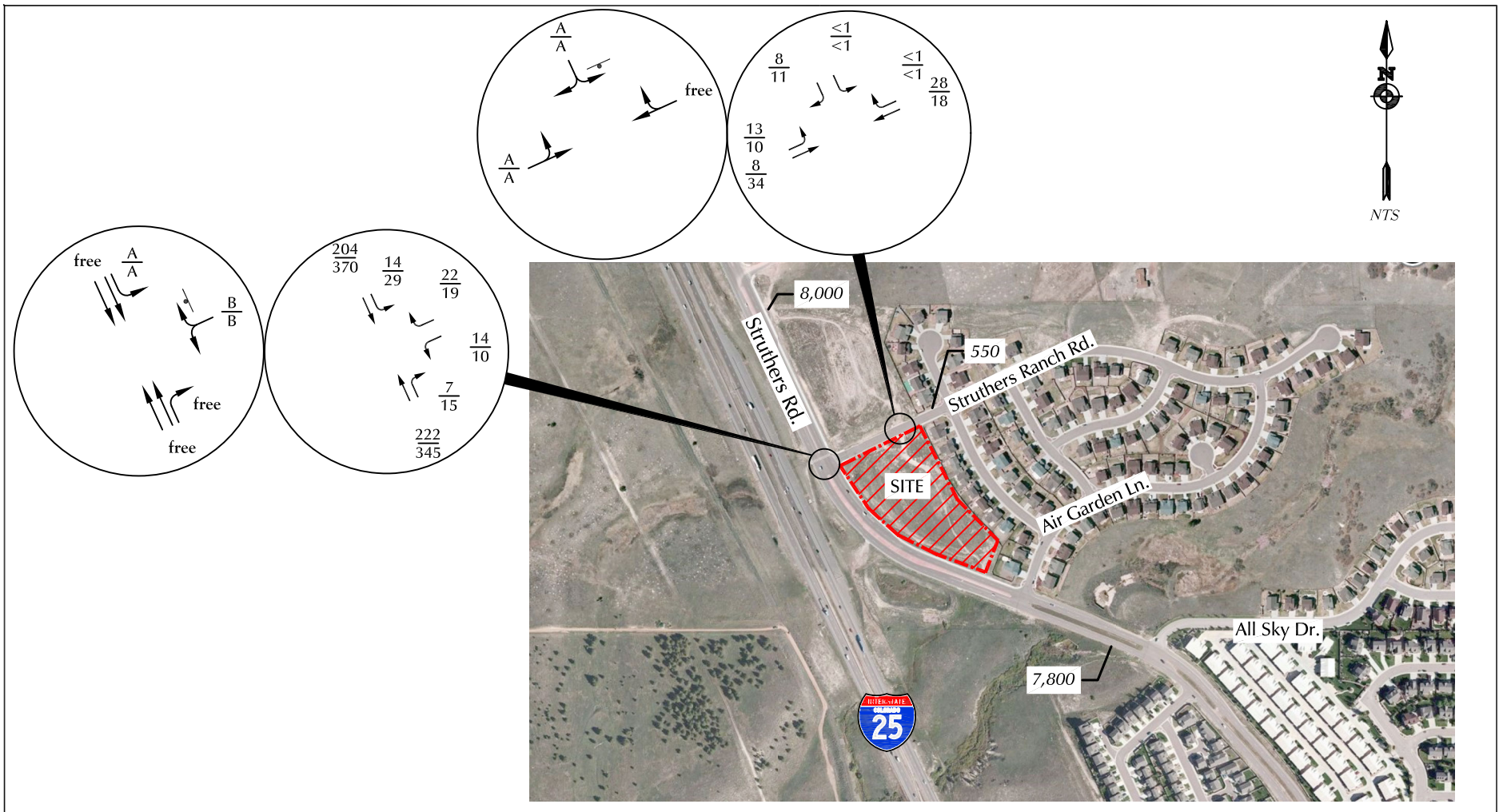
Figure 3

# Existing Traffic Conditions

Struthers Ranch Tract B (LSC #204110)

Based on counts by LSC March 2020 and April 2021





LEGEND:

⊥ = Stop Sign

$\frac{XX}{XX}$  = AM Weekday Peak-Hour Traffic (vehicles per hour)  
 PM Weekday Peak-Hour Traffic (vehicles per hour)

$\frac{A}{B}$  = AM Individual Movement Peak-Hour Level of Service  
 PM Individual Movement Peak-Hour Level of Service

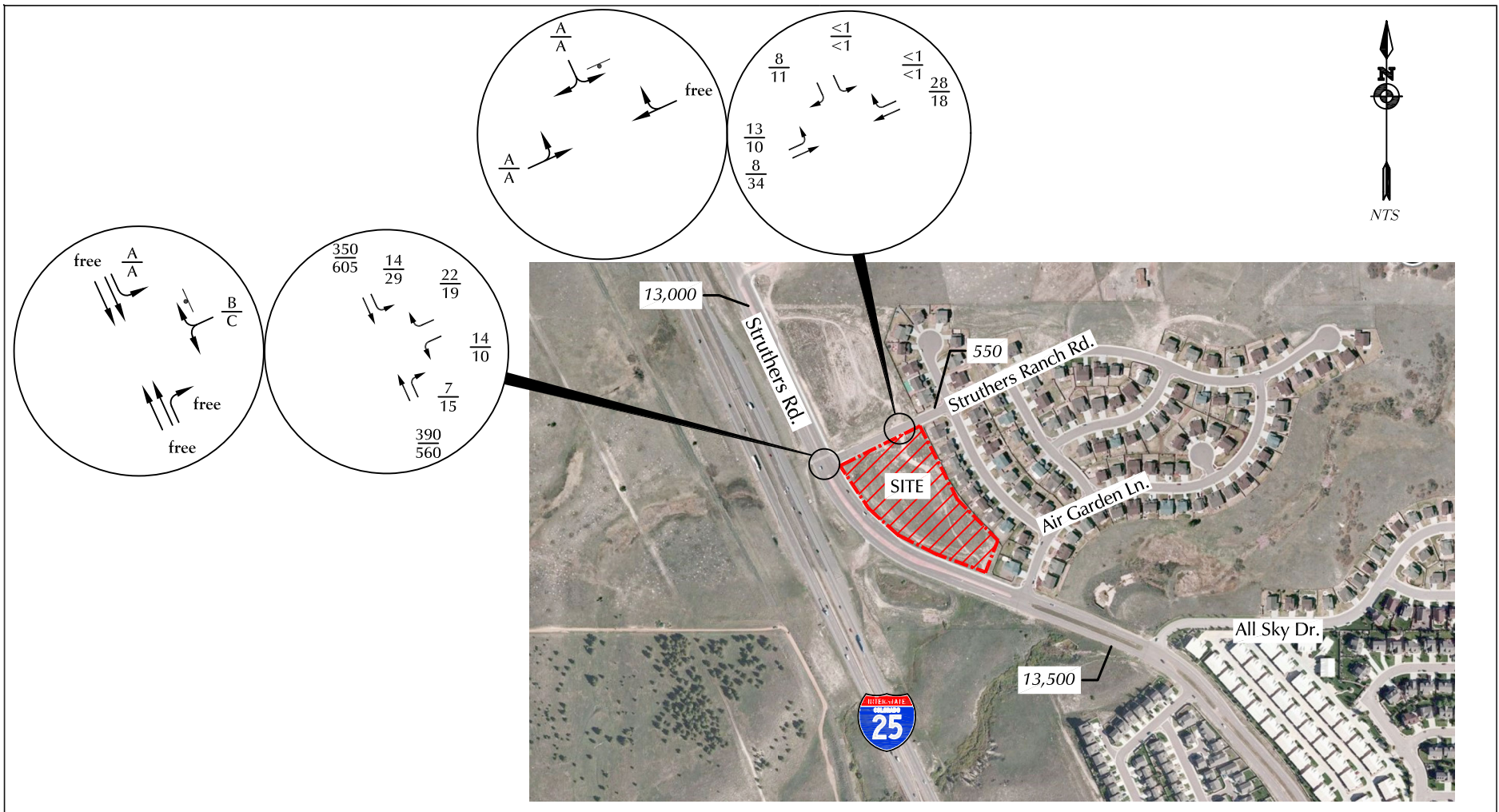
X,XXX = Average Weekday Traffic (vehicles per day)

Figure 4

# Short-Term Background Traffic Conditions

Struthers Ranch Tract B (LSC #204110)





LEGEND:

⊥ = Stop Sign

$\frac{XX}{XX}$  = AM Weekday Peak-Hour Traffic (vehicles per hour)  
 PM Weekday Peak-Hour Traffic (vehicles per hour)

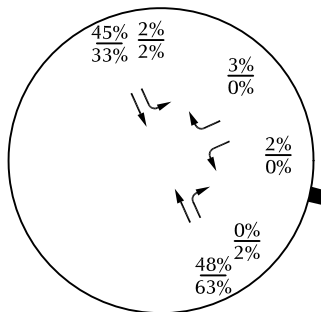
$\frac{A}{B}$  = AM Individual Movement Peak-Hour Level of Service  
 PM Individual Movement Peak-Hour Level of Service

X,XXX = Average Weekday Traffic (vehicles per day)

Figure 5

# Long-Term Background Traffic Conditions

Struthers Ranch Tract B (LSC #204110)



Passby Trip Distribution



Figure 6

## Directional Distribution of Site-Generated Traffic

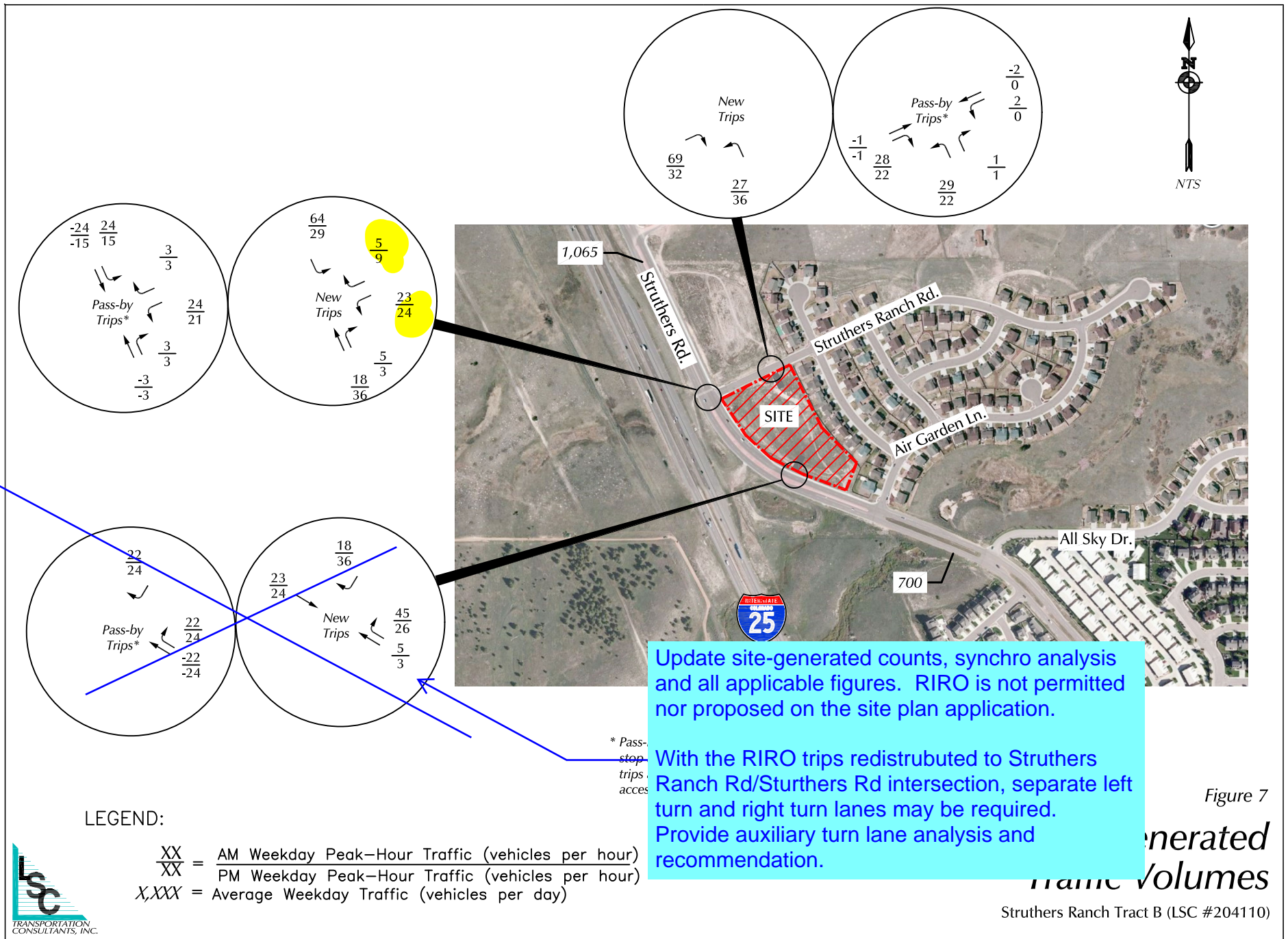
Struthers Ranch Tract B (LSC #204110)

LEGEND:

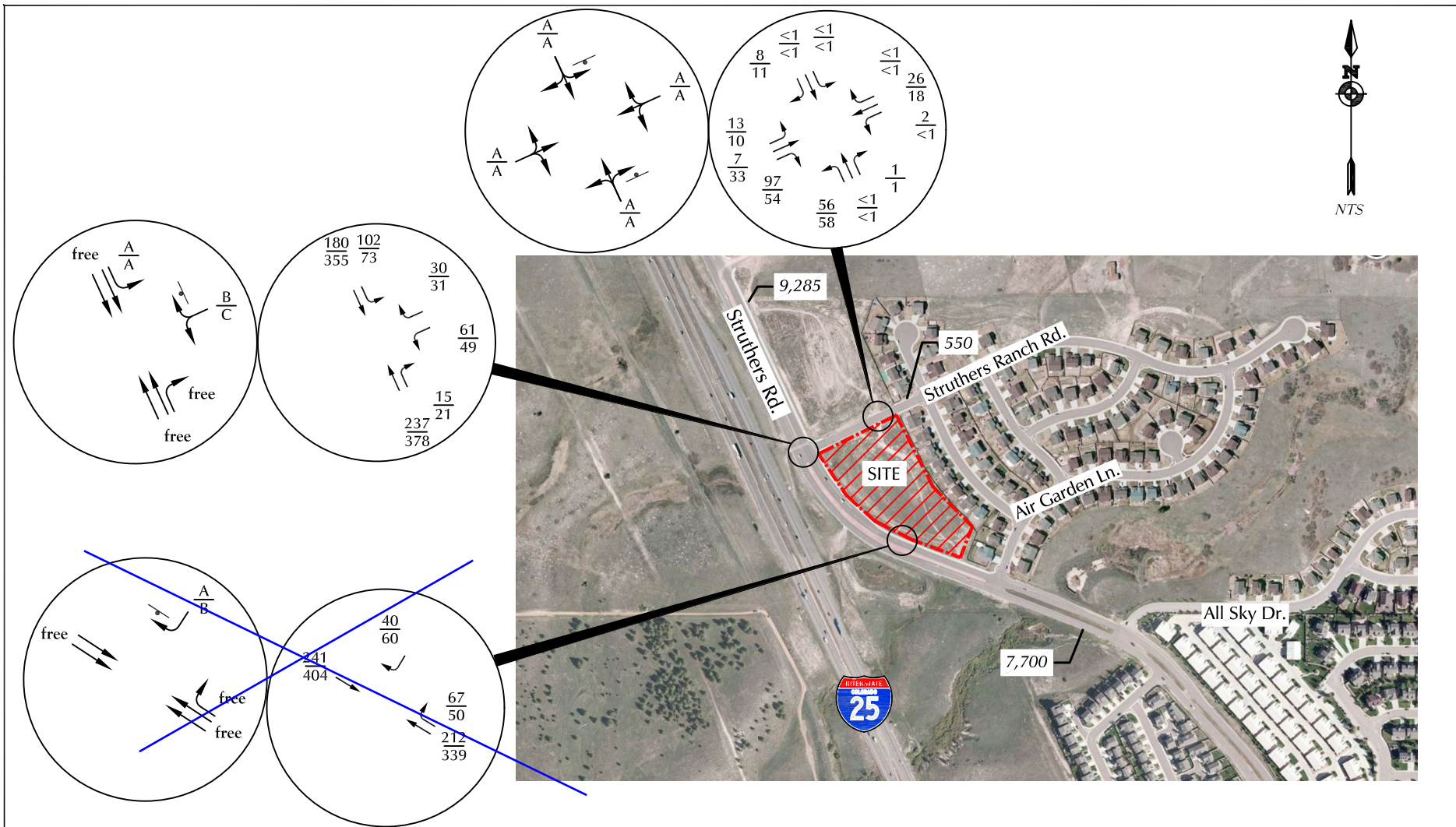
$\frac{XX}{XX}$  =  $\frac{\text{AM Percent Directional Distribution}}{\text{PM Percent Directional Distribution}}$











LEGEND:

⊥ = Stop Sign

XX = AM Weekday Peak-Hour Traffic (vehicles per hour)  
 XX = PM Weekday Peak-Hour Traffic (vehicles per hour)

A/B = AM Individual Movement Peak-Hour Level of Service  
 B = PM Individual Movement Peak-Hour Level of Service

X,XXX = Average Weekday Traffic (vehicles per day)

Figure 8

# Short-Term Total Traffic Conditions

Struthers Ranch Tract B (LSC #204110)

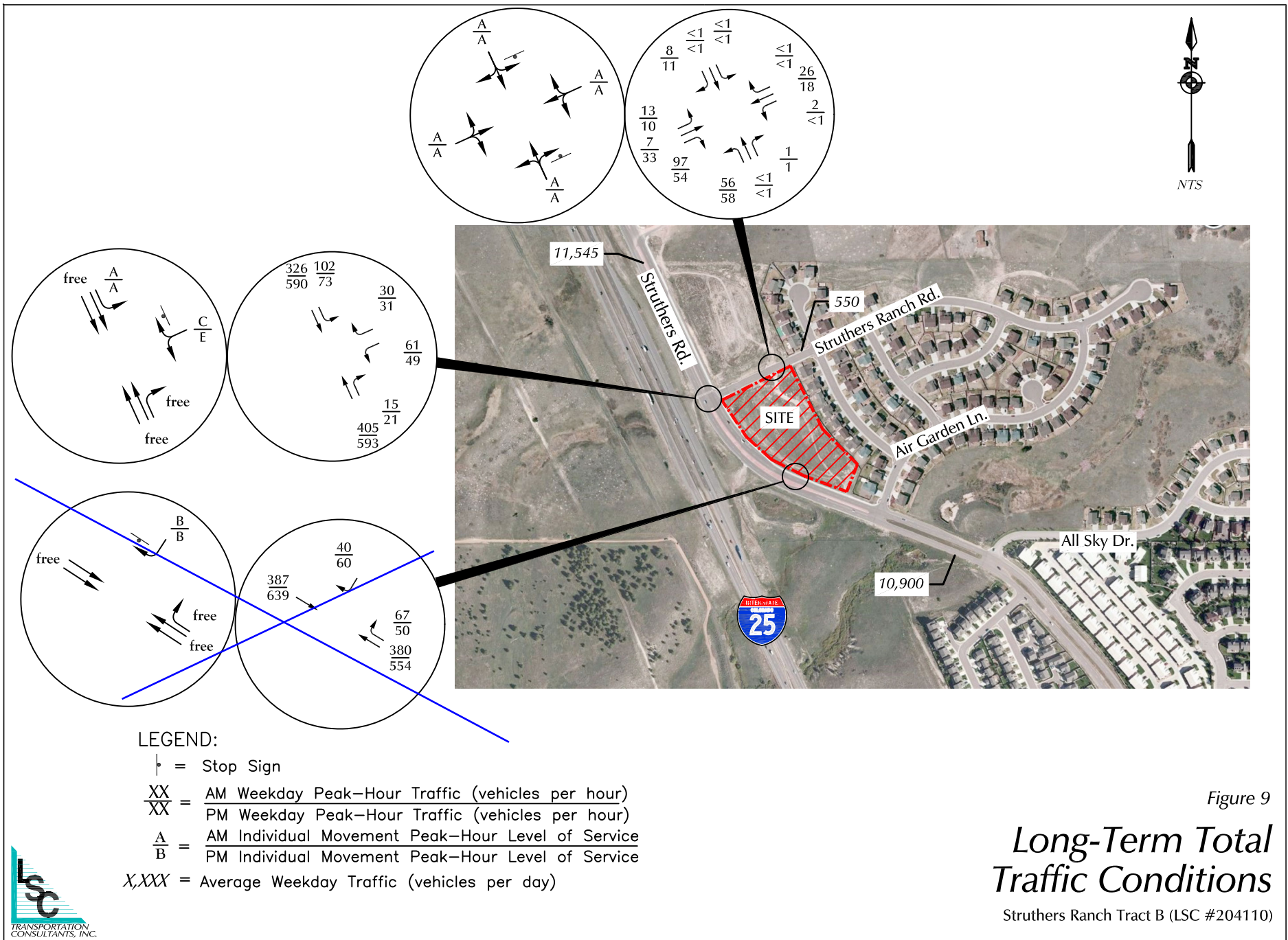


Figure 9

# Long-Term Total Traffic Conditions

Struthers Ranch Tract B (LSC #204110)



# Line of Sight Exhibits

---







Approximate Scale  
1" = 150'

- = 645' Required (passenger cars)
- = 975' Required (combination truck)
- - - = 450' Field-Measured Sight Distance (passenger cars)
- - - = 550' Field-Measured Sight Distance (combination truck)
- = Stopping Sight Distance

Deviation request for consideration  
is required

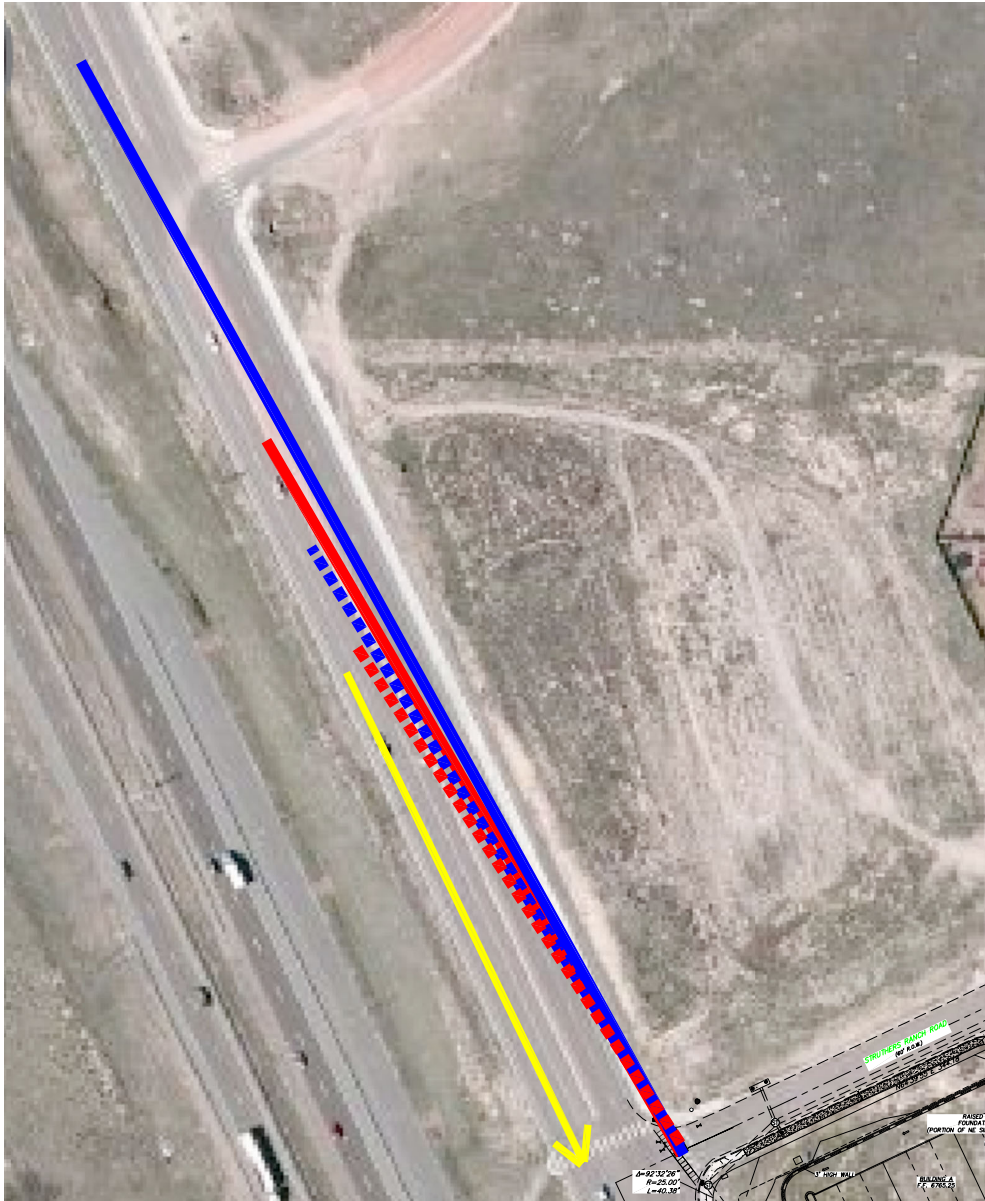
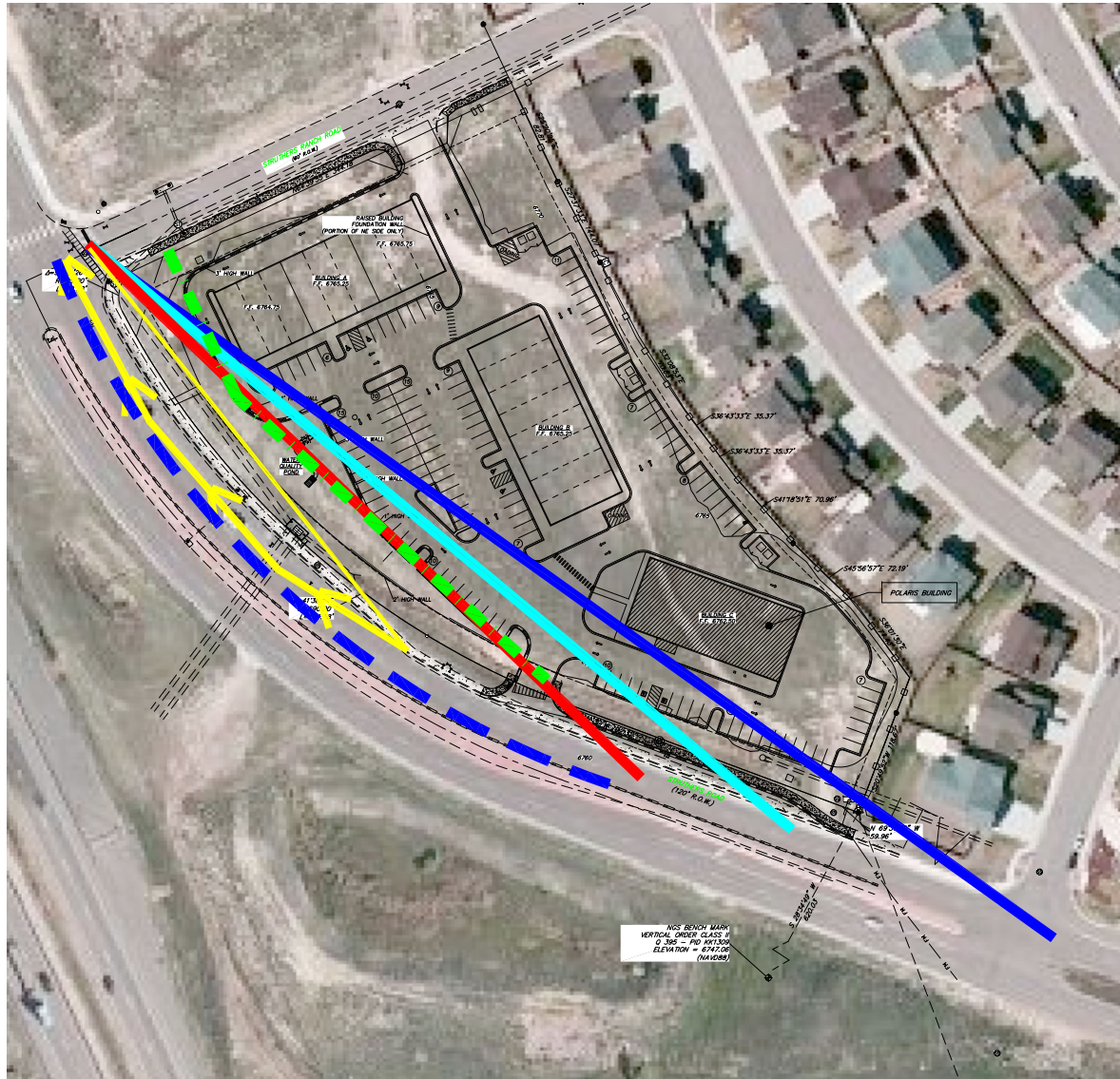


Exhibit 1  
*Line of Sight for  
Intersection Sight Distance  
(Struthers Ranch Rd to/from the north)*

Struthers Ranch Tract B (LSC #204110)



Revise the site layout to meet criteria or submit a deviation request for consideration.

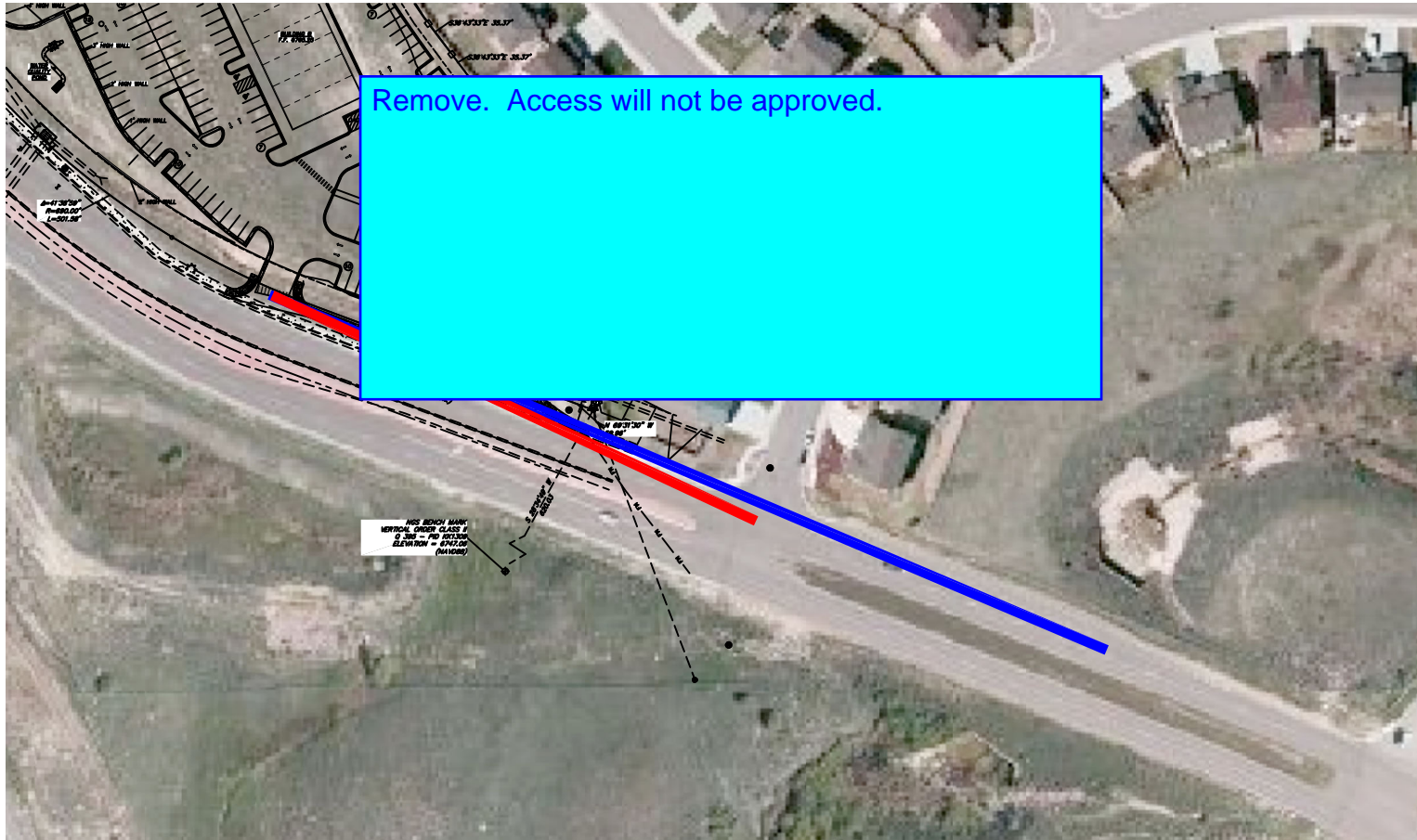
Include a plan & profile exhibit along the line of sight with the deviation request.

- = 590' Required (passenger cars)
- = 750' Required (single unit truck)
- = 900' Required (combination truck)
- - - = Line of Sight Easement
- = Stopping Sight Distance
- - - = 675' Available Sight Distance

Exhibit 2  
*Line of Sight for  
 Intersection Sight Distance  
 (Struthers Ranch Rd to/from the south)*

Struthers Ranch Tract B (LSC #204110)





Approximate Scale  
1" = 150'

Exhibit 3  
*Line of Sight for  
 Intersection Sight Distance  
 (South Access)*

Struthers Ranch Tract B (LSC #204110)

- = 450' Required (passenger cars)
- = 765' Required (combination truck)

# Traffic Counts

---



Provide new traffic counts. Per ECM Appendix B Section B.3.1 these shall be no more than one year old from the date of application submittal.

**Consultants, Inc.**

Ave, Suite 210  
 3, CO 80905  
 2868

File Name : Struthers Rd - Struthers Ranch Rd AM  
 Site Code : 00204110  
 Start Date : 3/3/2020  
 Page No : 1

**Groups Printed- Unshifted**

Start Time	Struthers Rd Southbound					Struthers Ranch Rd Westbound					Struthers Rd Northbound					Eastbound					Int. Total
	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	
06:30 AM	0	23	0	0	23	2	0	3	0	5	0	22	0	0	22	0	0	0	0	0	50
06:45 AM	0	22	0	0	22	2	0	3	0	5	0	27	0	0	27	0	0	0	0	0	54
Total	0	45	0	0	45	4	0	6	0	10	0	49	0	0	49	0	0	0	0	0	104
07:00 AM	1	36	0	0	37	4	0	4	0	8	0	32	1	0	33	0	0	0	0	0	78
07:15 AM	1	44	0	0	45	4	0	3	0	7	0	54	0	0	54	0	0	0	0	0	106
07:30 AM	0	51	0	0	51	1	0	7	0	8	0	47	0	0	47	0	0	0	0	0	106
07:45 AM	1	56	0	0	57	3	0	4	0	7	0	60	0	0	60	0	0	0	0	0	124
Total	3	187	0	0	190	12	0	18	0	30	0	193	1	0	194	0	0	0	0	0	414
08:00 AM	4	47	0	0	51	6	0	1	0	7	0	51	1	0	52	0	0	0	0	0	110
08:15 AM	1	41	0	0	42	1	0	5	0	6	0	58	1	0	59	0	0	0	0	0	107
Grand Total	8	320	0	0	328	23	0	30	0	53	0	351	3	0	354	0	0	0	0	0	735
Apprch %	2.4	97.6	0	0		43.4	0	56.6	0		0	99.2	0.8	0		0	0	0	0	0	
Total %	1.1	43.5	0	0	44.6	3.1	0	4.1	0	7.2	0	47.8	0.4	0	48.2	0	0	0	0	0	

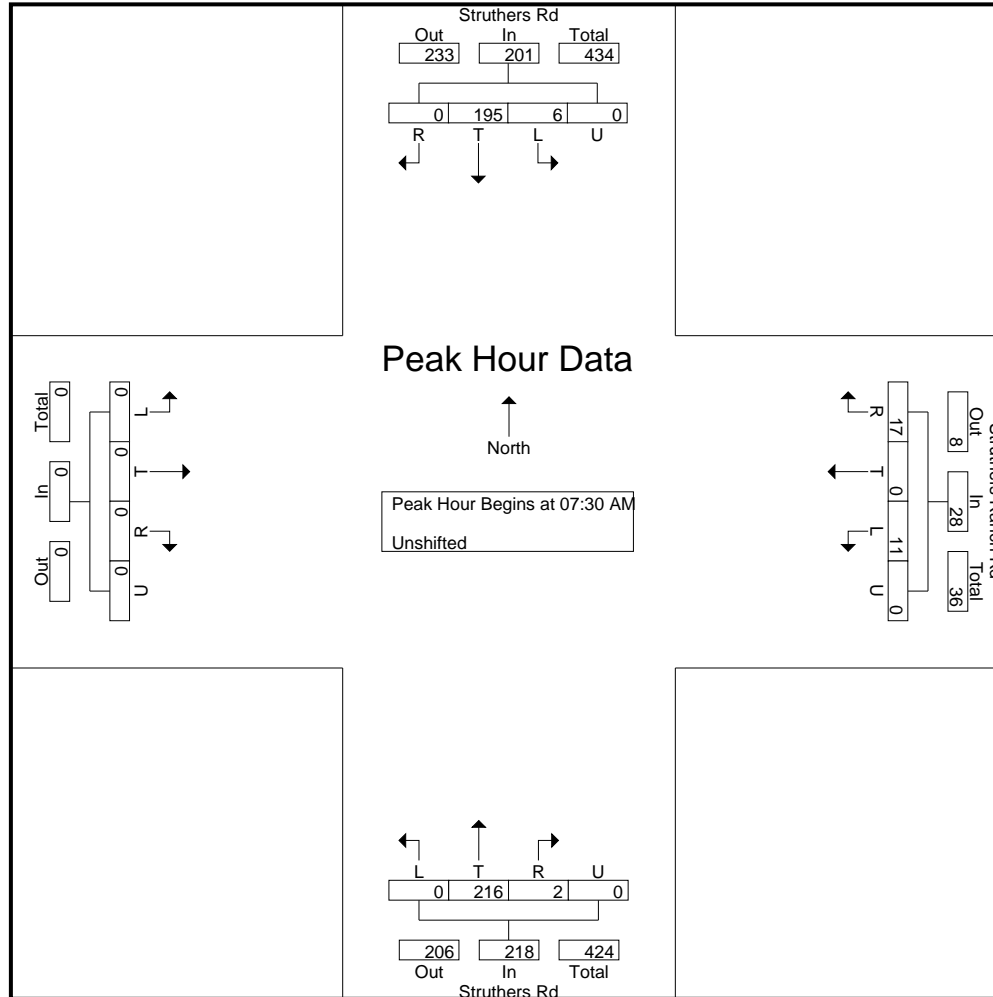




# LSC Transportation Consultants, Inc.

545 E Pikes Peak Ave, Suite 210  
 Colorado Springs, CO 80905  
 719-633-2868

File Name : Struthers Rd - Struthers Ranch Rd AM  
 Site Code : 00204110  
 Start Date : 3/3/2020  
 Page No : 3



# LSC Transportation Consultants, Inc.

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 Colorado Springs, CO 80905  
 719-633-2868

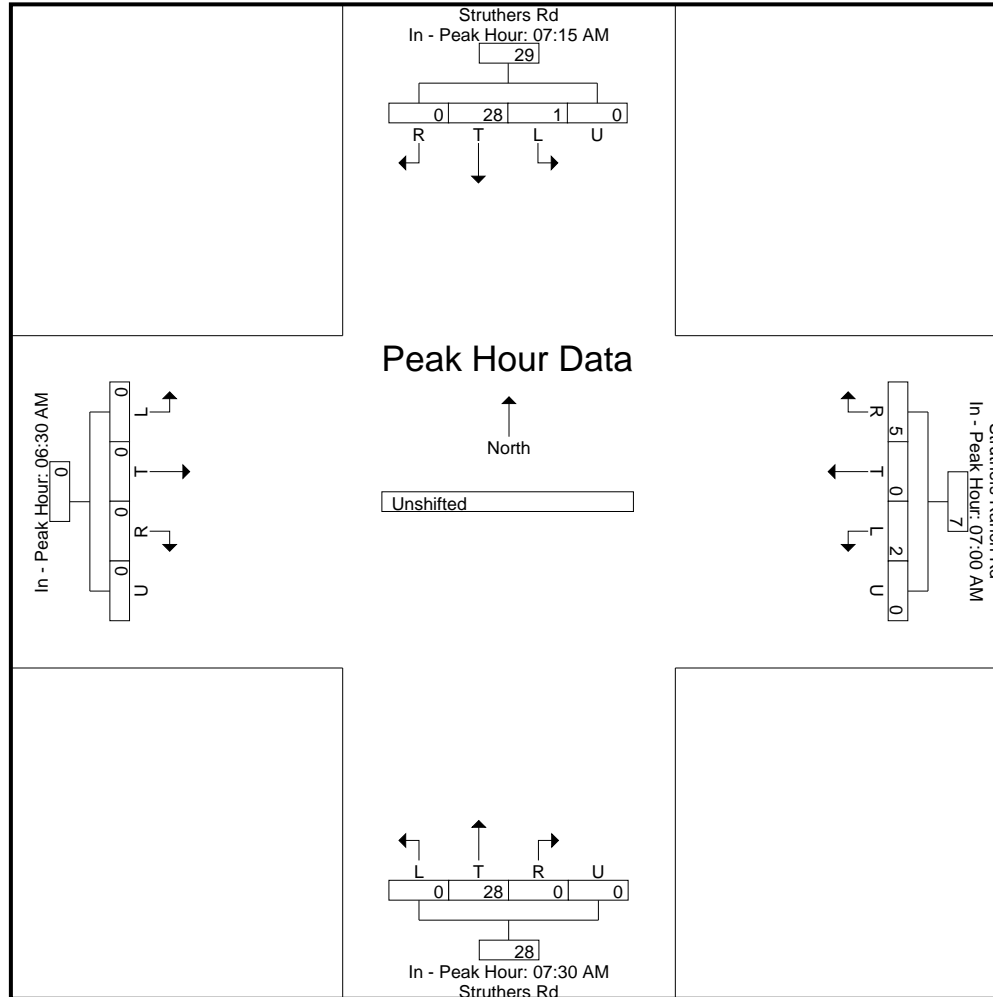
File Name : Struthers Rd - Struthers Ranch Rd AM  
 Site Code : 00204110  
 Start Date : 3/3/2020  
 Page No : 4

Start Time	Struthers Rd Southbound					Struthers Ranch Rd Westbound					Struthers Rd Northbound					Eastbound					Int. Total
	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	
<b>Peak Hour Analysis From 6:30:00 AM to 8:15:00 AM - Peak 1 of 1</b>																					
Peak Hour for Each Approach Begins at:																					
	7:15:00 AM					7:00:00 AM					7:30:00 AM					6:30:00 AM					
+0 mins.	1	44	0	0	45	4	0	4	0	8	0	47	0	0	47	0	0	0	0	0	
+5 mins.	0	51	0	0	51	4	0	3	0	7	0	60	0	0	60	0	0	0	0	0	
+10 mins.	1	56	0	0	57	1	0	7	0	8	0	51	1	0	52	0	0	0	0	0	
+15 mins.	4	47	0	0	51	3	0	4	0	7	0	58	1	0	59	0	0	0	0	0	
Total Volume	6	198	0	0	204	12	0	18	0	30	0	216	2	0	218	0	0	0	0	0	
% App. Total	2.9	97.1	0	0		40	0	60	0		0	99.1	0.9	0		0	0	0	0		
PHF	.375	.884	.000	.000	.895	.750	.000	.643	.000	.938	.000	.900	.500	.000	.908	.000	.000	.000	.000	.000	

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File Name : Struthers Rd - Struthers Ranch Rd AM  
 Site Code : 00204110  
 Start Date : 3/3/2020  
 Page No : 5



# LSC Transportation Consultants, Inc.

545 E Pikes Peak Ave, Suite 210  
 Colorado Springs, CO 80905  
 719-633-2868

File Name : Struthers Rd - Struthers Ranch Rd PM  
 Site Code : 00204110  
 Start Date : 3/3/2020  
 Page No : 1

### Groups Printed- Unshifted

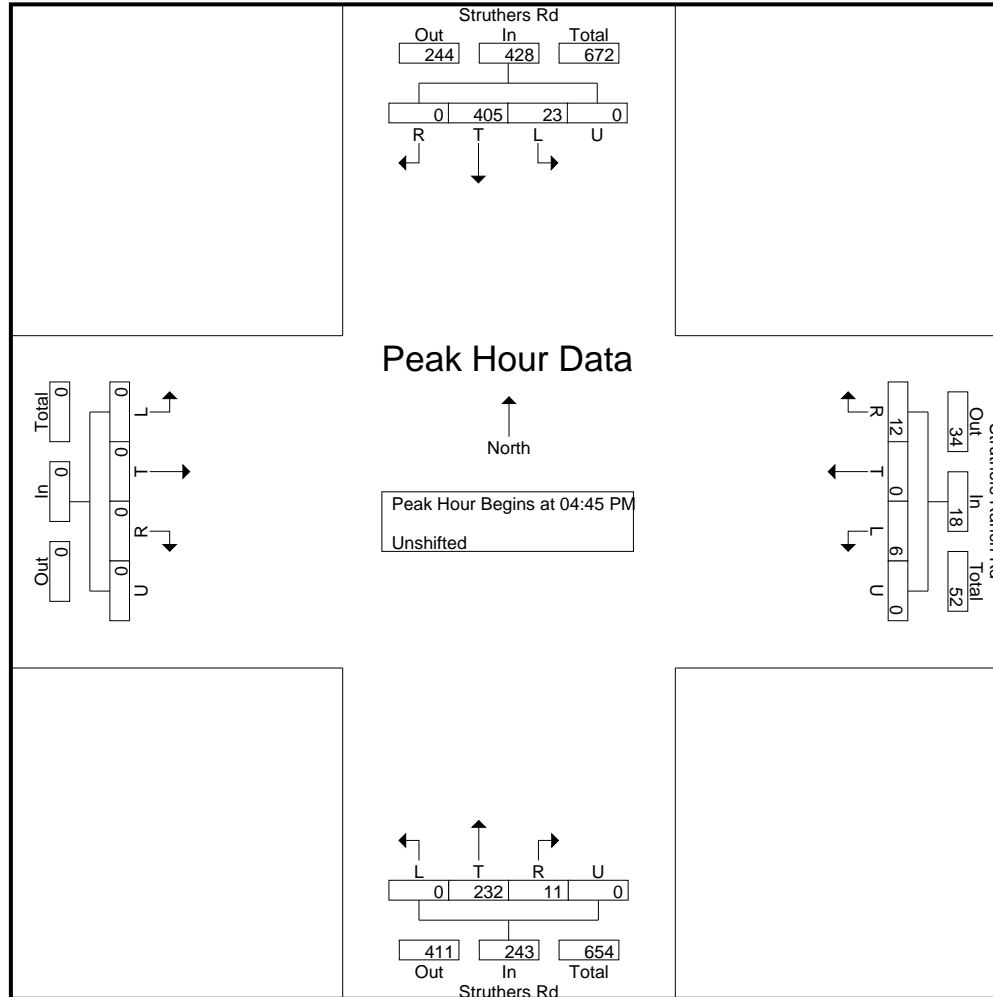
Start Time	Struthers Rd Southbound					Struthers Ranch Rd Westbound					Struthers Rd Northbound					Eastbound					Int. Total
	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	
04:00 PM	4	106	0	0	110	0	0	3	0	3	0	56	3	0	59	0	0	0	0	0	172
04:15 PM	4	98	0	0	102	1	0	3	0	4	0	52	3	0	55	0	0	0	0	0	161
04:30 PM	4	82	0	0	86	1	0	0	0	1	0	58	2	0	60	0	0	0	0	0	147
04:45 PM	6	75	0	0	81	0	0	3	0	3	0	61	2	0	63	0	0	0	0	0	147
Total	18	361	0	0	379	2	0	9	0	11	0	227	10	0	237	0	0	0	0	0	627
05:00 PM	6	120	0	0	126	1	0	1	0	2	0	61	2	0	63	0	0	0	0	0	191
05:15 PM	5	101	0	0	106	3	0	6	0	9	0	53	4	0	57	0	0	0	0	0	172
05:30 PM	6	109	0	0	115	2	0	2	0	4	0	57	3	0	60	0	0	0	0	0	179
05:45 PM	7	77	0	0	84	0	0	1	0	1	0	51	1	0	52	0	0	0	0	0	137
Total	24	407	0	0	431	6	0	10	0	16	0	222	10	0	232	0	0	0	0	0	679
Grand Total	42	768	0	0	810	8	0	19	0	27	0	449	20	0	469	0	0	0	0	0	1306
Apprch %	5.2	94.8	0	0		29.6	0	70.4	0		0	95.7	4.3	0		0	0	0	0		
Total %	3.2	58.8	0	0	62	0.6	0	1.5	0	2.1	0	34.4	1.5	0	35.9	0	0	0	0	0	



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File Name : Struthers Rd - Struthers Ranch Rd PM  
 Site Code : 00204110  
 Start Date : 3/3/2020  
 Page No : 3



# LSC Transportation Consultants, Inc.

545 E Pikes Peak Ave, Suite 210  
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 719-633-2868

File Name : Struthers Rd - Struthers Ranch Rd PM  
 Site Code : 00204110  
 Start Date : 3/3/2020  
 Page No : 4

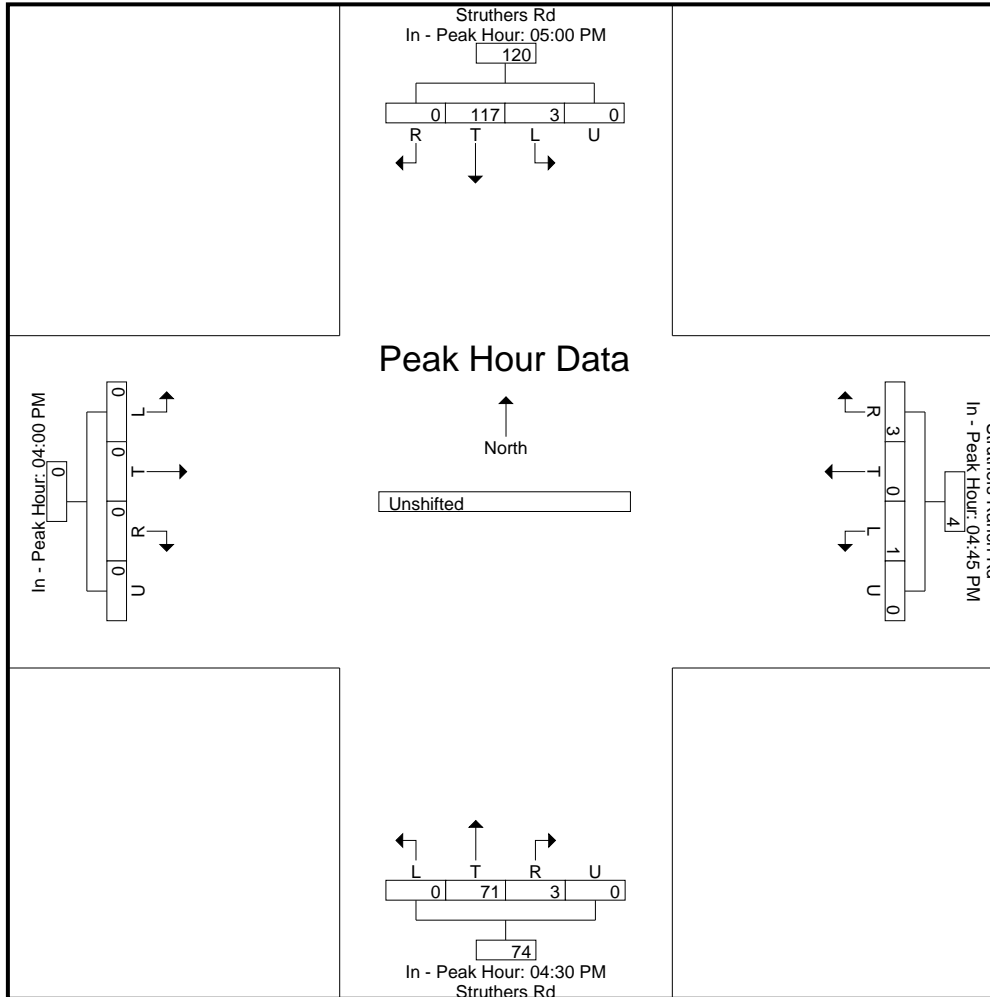
Start Time	Struthers Rd Southbound					Struthers Ranch Rd Westbound					Struthers Rd Northbound					Eastbound					Int. Total
	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	
<b>Peak Hour Analysis From 4:00:00 PM to 5:45:00 PM - Peak 1 of 1</b>																					
Peak Hour for Each Approach Begins at:																					
	5:00:00 PM					4:45:00 PM					4:30:00 PM					4:00:00 PM					
+0 mins.	6	120	0	0	126	0	0	3	0	3	0	58	2	0	60	0	0	0	0	0	
+5 mins.	5	101	0	0	106	1	0	1	0	2	0	61	2	0	63	0	0	0	0	0	
+10 mins.	6	109	0	0	115	3	0	6	0	9	0	61	2	0	63	0	0	0	0	0	
+15 mins.	7	77	0	0	84	2	0	2	0	4	0	53	4	0	57	0	0	0	0	0	
Total Volume	24	407	0	0	431	6	0	12	0	18	0	233	10	0	243	0	0	0	0	0	
% App. Total	5.6	94.4	0	0		33.3	0	66.7	0		0	95.9	4.1	0		0	0	0	0		
PHF	.857	.848	.000	.000	.855	.500	.000	.500	.000	.500	.000	.955	.625	.000	.964	.000	.000	.000	.000	.000	



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File Name : Struthers Rd - Struthers Ranch Rd PM  
 Site Code : 00204110  
 Start Date : 3/3/2020  
 Page No : 5



# LSC Transportation Consultants, Inc.

545 E Pikes Peak Ave, Suite 210  
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 719-633-2868

File Name : Struthers Rd - Struthers Ranch Rd PM 4-20  
 Site Code : S204110  
 Start Date : 4/28/2021  
 Page No : 1

### Groups Printed- Unshifted

Start Time	Struthers Rd Southbound					Struthers Ranch Rd Westbound					Struthers Rd Northbound					Eastbound					Int. Total
	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	
04:00 PM	6	89	0	0	95	1	0	4	0	5	0	73	3	0	76	0	0	0	0	0	176
04:15 PM	3	74	0	0	77	0	0	2	0	2	0	68	2	0	70	0	0	0	0	0	149
04:30 PM	5	68	0	0	73	1	0	4	0	5	0	86	1	0	87	0	0	0	0	0	165
04:45 PM	0	88	0	0	88	1	0	1	0	2	0	79	0	0	79	0	0	0	0	0	169
Total	14	319	0	0	333	3	0	11	0	14	0	306	6	0	312	0	0	0	0	0	659
05:00 PM	4	80	0	0	84	0	0	1	0	1	0	61	0	0	61	0	0	0	0	0	146
05:15 PM	3	99	0	0	102	0	0	3	0	3	0	85	1	0	86	0	0	0	0	0	191
05:30 PM	3	65	0	0	68	1	0	2	0	3	0	75	2	0	77	0	0	0	0	0	148
05:45 PM	5	67	0	0	72	1	0	4	0	5	0	64	4	0	68	0	0	0	0	0	145
Total	15	311	0	0	326	2	0	10	0	12	0	285	7	0	292	0	0	0	0	0	630
Grand Total	29	630	0	0	659	5	0	21	0	26	0	591	13	0	604	0	0	0	0	0	1289
Apprch %	4.4	95.6	0	0		19.2	0	80.8	0		0	97.8	2.2	0		0	0	0	0	0	
Total %	2.2	48.9	0	0	51.1	0.4	0	1.6	0	2	0	45.8	1	0	46.9	0	0	0	0	0	



# LSC Transportation Consultants, Inc.

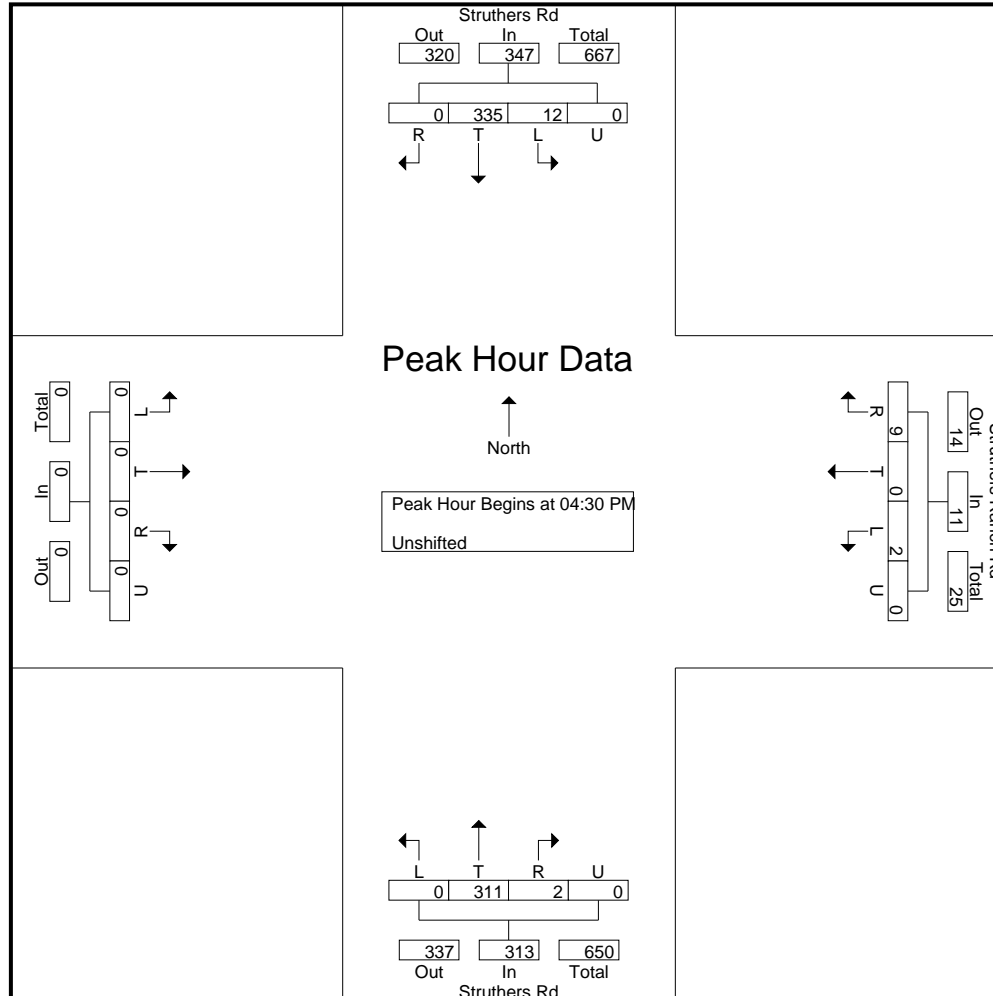
545 E Pikes Peak Ave, Suite 210  
 Colorado Springs, CO 80905  
 719-633-2868

File Name : Struthers Rd - Struthers Ranch Rd PM 4-20

Site Code : S204110

Start Date : 4/28/2021

Page No : 3



# LSC Transportation Consultants, Inc.

545 E Pikes Peak Ave, Suite 210  
 Colorado Springs, CO 80905  
 719-633-2868

File Name : Struthers Rd - Struthers Ranch Rd PM 4-20  
 Site Code : S204110  
 Start Date : 4/28/2021  
 Page No : 4

Start Time	Struthers Rd Southbound					Struthers Ranch Rd Westbound					Struthers Rd Northbound					Eastbound					Int. Total
	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	

**Peak Hour Analysis From 4:00:00 PM to 5:45:00 PM - Peak 1 of 1**

Peak Hour for Each Approach Begins at:

	4:30:00 PM					4:00:00 PM					4:30:00 PM					4:00:00 PM				
+0 mins.	<b>5</b>	68	0	0	73	<b>1</b>	0	<b>4</b>	0	<b>5</b>	<b>0</b>	<b>86</b>	<b>1</b>	0	<b>87</b>	0	0	0	0	0
+5 mins.	0	88	0	0	88	0	0	2	0	2	0	79	0	0	79	0	0	0	0	0
+10 mins.	4	80	0	0	84	1	0	4	0	5	0	61	0	0	61	0	0	0	0	0
+15 mins.	3	<b>99</b>	0	0	<b>102</b>	1	0	1	0	2	0	85	1	0	86	0	0	0	0	0
Total Volume	12	335	0	0	347	3	0	11	0	14	0	311	2	0	313	0	0	0	0	0
% App. Total	3.5	96.5	0	0		21.4	0	78.6	0		0	99.4	0.6	0		0	0	0	0	
PHF	.600	.846	.000	.000	.850	.750	.000	.688	.000	.700	.000	.904	.500	.000	.899	.000	.000	.000	.000	.000

# LSC Transportation Consultants, Inc.

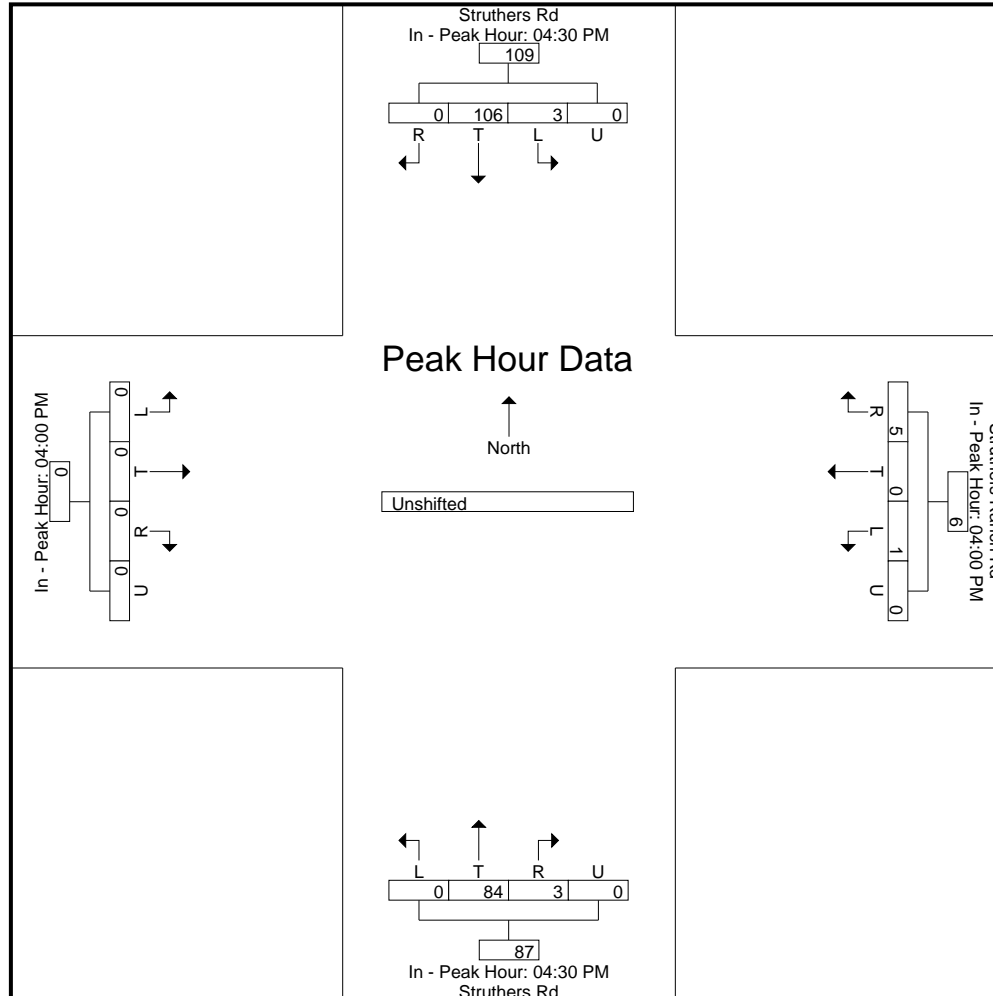
545 E Pikes Peak Ave, Suite 210  
 Colorado Springs, CO 80905  
 719-633-2868

File Name : Struthers Rd - Struthers Ranch Rd PM 4-20

Site Code : S204110

Start Date : 4/28/2021

Page No : 5



# Levels of Service

---



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

Existing Traffic  
AM Peak Hour

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖↗		↕↕	↖↗	↖↗	↕↕
Traffic Vol, veh/h	11	17	216	2	6	195
Future Vol, veh/h	11	17	216	2	6	195
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	-	-	255	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	91	91	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	19	237	2	7	222

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	362	119	0	0	239
Stage 1	237	-	-	-	-
Stage 2	125	-	-	-	-
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	610	910	-	-	1325
Stage 1	780	-	-	-	-
Stage 2	887	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	607	910	-	-	1325
Mov Cap-2 Maneuver	607	-	-	-	-
Stage 1	780	-	-	-	-
Stage 2	883	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	761	1325
HCM Lane V/C Ratio	-	-	0.042	0.005
HCM Control Delay (s)	-	-	9.9	7.7
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0



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

Existing Traffic  
PM Peak Hour

Intersection						
Int Delay, s/veh	0.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y <sup>Y</sup>		↑↑	↑	↑	↑↑
Traffic Vol, veh/h	2	9	311	2	12	335
Future Vol, veh/h	2	9	311	2	12	335
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	-	-	255	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	50	92	92	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	18	338	2	14	394

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	563	169	0	0	340	0
Stage 1	338	-	-	-	-	-
Stage 2	225	-	-	-	-	-
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	456	845	-	-	1216	-
Stage 1	694	-	-	-	-	-
Stage 2	791	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	451	845	-	-	1216	-
Mov Cap-2 Maneuver	451	-	-	-	-	-
Stage 1	694	-	-	-	-	-
Stage 2	782	-	-	-	-	-

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)	-	-	729	1216
HCM Lane V/C Ratio	-	-	0.03	0.012
HCM Control Delay (s)	-	-	10.1	8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Intersection						
Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖↗		↕↕	↖↗	↖↗	↕↕
Traffic Vol, veh/h	14	22	222	7	14	204
Future Vol, veh/h	14	22	222	7	14	204
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	-	-	255	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	91	91	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	25	244	8	16	232

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	392	122	0	0	252	0
Stage 1	244	-	-	-	-	-
Stage 2	148	-	-	-	-	-
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	906	-	-	1310	-
Stage 1	774	-	-	-	-	-
Stage 2	864	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	578	906	-	-	1310	-
Mov Cap-2 Maneuver	578	-	-	-	-	-
Stage 1	774	-	-	-	-	-
Stage 2	854	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	0.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	742	1310
HCM Lane V/C Ratio	-	-	0.055	0.012
HCM Control Delay (s)	-	-	10.1	7.8
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	8	0	0	28	0	0	0	0	0	0	8
Future Vol, veh/h	13	8	0	0	28	0	0	0	0	0	0	8
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	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	10	0	0	36	0	0	0	0	0	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	36	0	0	10	0	0	85	80	10	80	80	36
Stage 1	-	-	-	-	-	-	44	44	-	36	36	-
Stage 2	-	-	-	-	-	-	41	36	-	44	44	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1575	-	-	1610	-	-	901	810	1071	908	810	1037
Stage 1	-	-	-	-	-	-	970	858	-	980	865	-
Stage 2	-	-	-	-	-	-	974	865	-	970	858	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1575	-	-	1610	-	-	885	801	1071	901	801	1037
Mov Cap-2 Maneuver	-	-	-	-	-	-	885	801	-	901	801	-
Stage 1	-	-	-	-	-	-	959	849	-	969	865	-
Stage 2	-	-	-	-	-	-	964	865	-	959	849	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.5	0	0	8.5
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1575	-	-	1610	-	-	1037
HCM Lane V/C Ratio	-	0.011	-	-	-	-	-	0.01
HCM Control Delay (s)	0	7.3	0	-	0	-	-	8.5
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0

Intersection						
Int Delay, s/veh	1.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↑	↑	↓	↑↑
Traffic Vol, veh/h	10	19	345	15	29	370
Future Vol, veh/h	10	19	345	15	29	370
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	-	-	255	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	50	92	92	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	38	375	16	34	435

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	661	188	0	0	391
Stage 1	375	-	-	-	-
Stage 2	286	-	-	-	-
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	395	822	-	-	1164
Stage 1	665	-	-	-	-
Stage 2	737	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	384	822	-	-	1164
Mov Cap-2 Maneuver	384	-	-	-	-
Stage 1	665	-	-	-	-
Stage 2	716	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.8	0	0.6
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	590	1164
HCM Lane V/C Ratio	-	-	0.098	0.029
HCM Control Delay (s)	-	-	11.8	8.2
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.3	0.1

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	34	0	0	18	0	0	0	0	0	0	11
Future Vol, veh/h	10	34	0	0	18	0	0	0	0	0	0	11
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	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	44	0	0	23	0	0	0	0	0	0	14

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	23	0	0	44	0	0	100	93	44	93	93	23
Stage 1	-	-	-	-	-	-	70	70	-	23	23	-
Stage 2	-	-	-	-	-	-	30	23	-	70	70	-
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	-	-	1564	-	-	881	797	1026	891	797	1054
Stage 1	-	-	-	-	-	-	940	837	-	995	876	-
Stage 2	-	-	-	-	-	-	987	876	-	940	837	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1592	-	-	1564	-	-	864	791	1026	886	791	1054
Mov Cap-2 Maneuver	-	-	-	-	-	-	864	791	-	886	791	-
Stage 1	-	-	-	-	-	-	932	830	-	987	876	-
Stage 2	-	-	-	-	-	-	974	876	-	932	830	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.7	0	0	8.5
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1592	-	-	1564	-	-	1054
HCM Lane V/C Ratio	-	0.008	-	-	-	-	-	0.013
HCM Control Delay (s)		0	7.3	0	-	0	-	8.5
HCM Lane LOS		A	A	A	-	A	-	A
HCM 95th %tile Q(veh)		-	0	-	-	0	-	0

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑↑	↗	↘	↑↑
Traffic Vol, veh/h	14	22	390	7	14	350
Future Vol, veh/h	14	22	390	7	14	350
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	-	-	255	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	91	91	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	25	429	8	16	398

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	660	215	0	0	437
Stage 1	429	-	-	-	-
Stage 2	231	-	-	-	-
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	396	790	-	-	1119
Stage 1	624	-	-	-	-
Stage 2	785	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	390	790	-	-	1119
Mov Cap-2 Maneuver	390	-	-	-	-
Stage 1	624	-	-	-	-
Stage 2	774	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.9	0	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	565	1119
HCM Lane V/C Ratio	-	-	0.072	0.014
HCM Control Delay (s)	-	-	11.9	8.3
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.2	0

Intersection												
Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	8	0	0	28	0	0	0	0	0	0	8
Future Vol, veh/h	13	8	0	0	28	0	0	0	0	0	0	8
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	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	10	0	0	36	0	0	0	0	0	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	36	0	0	10	0	0	85	80	10	80	80	36
Stage 1	-	-	-	-	-	-	44	44	-	36	36	-
Stage 2	-	-	-	-	-	-	41	36	-	44	44	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1575	-	-	1610	-	-	901	810	1071	908	810	1037
Stage 1	-	-	-	-	-	-	970	858	-	980	865	-
Stage 2	-	-	-	-	-	-	974	865	-	970	858	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1575	-	-	1610	-	-	885	801	1071	901	801	1037
Mov Cap-2 Maneuver	-	-	-	-	-	-	885	801	-	901	801	-
Stage 1	-	-	-	-	-	-	959	849	-	969	865	-
Stage 2	-	-	-	-	-	-	964	865	-	959	849	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	4.5	0	0	8.5
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1575	-	-	1610	-	-	1037
HCM Lane V/C Ratio	-	0.011	-	-	-	-	-	0.01
HCM Control Delay (s)	0	7.3	0	-	0	-	-	8.5
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑↑	↑	↘	↑↑
Traffic Vol, veh/h	10	19	560	15	29	605
Future Vol, veh/h	10	19	560	15	29	605
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	-	-	255	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	50	92	92	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	38	609	16	34	712

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1033	305	0	0	625	0
Stage 1	609	-	-	-	-	-
Stage 2	424	-	-	-	-	-
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	228	691	-	-	952	-
Stage 1	505	-	-	-	-	-
Stage 2	628	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	220	691	-	-	952	-
Mov Cap-2 Maneuver	220	-	-	-	-	-
Stage 1	505	-	-	-	-	-
Stage 2	605	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.6	0	0.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	398	952
HCM Lane V/C Ratio	-	-	0.146	0.036
HCM Control Delay (s)	-	-	15.6	8.9
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.5	0.1



Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	34	0	0	18	0	0	0	0	0	0	11
Future Vol, veh/h	10	34	0	0	18	0	0	0	0	0	0	11
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	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	44	0	0	23	0	0	0	0	0	0	14

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	23	0	0	44	0	0	100	93	44	93	93	23
Stage 1	-	-	-	-	-	-	70	70	-	23	23	-
Stage 2	-	-	-	-	-	-	30	23	-	70	70	-
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	-	-	1564	-	-	881	797	1026	891	797	1054
Stage 1	-	-	-	-	-	-	940	837	-	995	876	-
Stage 2	-	-	-	-	-	-	987	876	-	940	837	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1592	-	-	1564	-	-	864	791	1026	886	791	1054
Mov Cap-2 Maneuver	-	-	-	-	-	-	864	791	-	886	791	-
Stage 1	-	-	-	-	-	-	932	830	-	987	876	-
Stage 2	-	-	-	-	-	-	974	876	-	932	830	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.7	0	0	8.5
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	-	1592	-	-	1564	-	-	1054
HCM Lane V/C Ratio	-	0.008	-	-	-	-	-	0.013
HCM Control Delay (s)	0	7.3	0	-	0	-	-	8.5
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	-	0	-	-	0	-	-	0

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

Short-Term Total  
AM Peak Hour

Intersection						
Int Delay, s/veh	3.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↑	↑	↑	↑↑
Traffic Vol, veh/h	61	30	237	15	102	180
Future Vol, veh/h	61	30	237	15	102	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	-	-	255	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	91	91	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	69	34	260	16	116	205

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	595	130	0	0	276
Stage 1	260	-	-	-	-
Stage 2	335	-	-	-	-
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	436	896	-	-	1284
Stage 1	760	-	-	-	-
Stage 2	697	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	397	896	-	-	1284
Mov Cap-2 Maneuver	397	-	-	-	-
Stage 1	760	-	-	-	-
Stage 2	634	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.4	0	2.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	486	1284
HCM Lane V/C Ratio	-	-	0.213	0.09
HCM Control Delay (s)	-	-	14.4	8.1
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.8	0.3

HCM 6th TWSC  
5: Access & Struthers Ranch Rd

Short-Term Total  
AM Peak Hour

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	7	97	2	26	0	56	0	1	0	0	8
Future Vol, veh/h	13	7	97	2	26	0	56	0	1	0	0	8
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	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	9	124	3	33	0	72	0	1	0	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	33	0	0	133	0	0	149	144	71	145	206	33
Stage 1	-	-	-	-	-	-	105	105	-	39	39	-
Stage 2	-	-	-	-	-	-	44	39	-	106	167	-
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	1579	-	-	1452	-	-	819	747	991	824	691	1041
Stage 1	-	-	-	-	-	-	901	808	-	976	862	-
Stage 2	-	-	-	-	-	-	970	862	-	900	760	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1579	-	-	1452	-	-	803	737	991	814	681	1041
Mov Cap-2 Maneuver	-	-	-	-	-	-	803	737	-	814	681	-
Stage 1	-	-	-	-	-	-	890	798	-	964	860	-
Stage 2	-	-	-	-	-	-	959	860	-	888	751	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.8			0.5			9.9			8.5		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	806	1579	-	-	1452	-	-	1041
HCM Lane V/C Ratio	0.091	0.011	-	-	0.002	-	-	0.01
HCM Control Delay (s)	9.9	7.3	0	-	7.5	0	-	8.5
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Traffic Vol, veh/h	0	241	212	67	0	40
Future Vol, veh/h	0	241	212	67	0	40
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	87	87	87	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	277	244	86	0	51

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	-	0	-	0	- 165
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	0 850
Stage 1	0	-	-	-	0 -
Stage 2	0	-	-	-	0 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	- 850
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	9.5
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	850
HCM Lane V/C Ratio	-	-	-	0.06
HCM Control Delay (s)	-	-	-	9.5
HCM Lane LOS	-	-	-	A
HCM 95th %tile Q(veh)	-	-	-	0.2

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

Short-Term Total  
 PM Peak Hour

Intersection						
Int Delay, s/veh	3.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y <sup>Y</sup>		↑↑	↑	↑	↑↑
Traffic Vol, veh/h	49	31	378	21	73	355
Future Vol, veh/h	49	31	378	21	73	355
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	-	-	255	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	50	92	92	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	98	62	411	23	86	418

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	792	206	0	0	434
Stage 1	411	-	-	-	-
Stage 2	381	-	-	-	-
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	326	800	-	-	1122
Stage 1	638	-	-	-	-
Stage 2	660	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	301	800	-	-	1122
Mov Cap-2 Maneuver	301	-	-	-	-
Stage 1	638	-	-	-	-
Stage 2	609	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.1	0	1.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	397	1122
HCM Lane V/C Ratio	-	-	0.403	0.077
HCM Control Delay (s)	-	-	20.1	8.5
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	1.9	0.2

HCM 6th TWSC  
5: Access & Struthers Ranch Rd

Short-Term Total  
PM Peak Hour

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	33	54	0	18	0	58	0	1	0	0	11
Future Vol, veh/h	10	33	54	0	18	0	58	0	1	0	0	11
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	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	42	69	0	23	0	74	0	1	0	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	23	0	0	111	0	0	133	126	77	126	160	23
Stage 1	-	-	-	-	-	-	103	103	-	23	23	-
Stage 2	-	-	-	-	-	-	30	23	-	103	137	-
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	-	-	1479	-	-	839	764	984	848	732	1054
Stage 1	-	-	-	-	-	-	903	810	-	995	876	-
Stage 2	-	-	-	-	-	-	987	876	-	903	783	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1592	-	-	1479	-	-	822	757	984	841	725	1054
Mov Cap-2 Maneuver	-	-	-	-	-	-	822	757	-	841	725	-
Stage 1	-	-	-	-	-	-	895	803	-	986	876	-
Stage 2	-	-	-	-	-	-	974	876	-	894	776	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0	9.8	8.5
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	824	1592	-	-	1479	-	-	1054
HCM Lane V/C Ratio	0.092	0.008	-	-	-	-	-	0.013
HCM Control Delay (s)	9.8	7.3	0	-	0	-	-	8.5
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0

HCM 6th TWSC  
8: Struthers Rd & RIRO Access

Short-Term Total  
PM Peak Hour

Intersection						
Int Delay, s/veh	0.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Traffic Vol, veh/h	0	404	339	50	0	60
Future Vol, veh/h	0	404	339	50	0	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	464	390	64	0	77

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	-	0	-	0	- 227
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	-	-	- 6.94
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	- 3.32
Pot Cap-1 Maneuver	0	-	-	-	0 776
Stage 1	0	-	-	-	0 -
Stage 2	0	-	-	-	0 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	- 776
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

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

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	776
HCM Lane V/C Ratio	-	-	-	0.099
HCM Control Delay (s)	-	-	-	10.1
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.3



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

Long-Term Total  
AM Peak Hour

Intersection						
Int Delay, s/veh	3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑↑	↑	↑	↑↑
Traffic Vol, veh/h	61	30	405	15	102	326
Future Vol, veh/h	61	30	405	15	102	326
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	-	-	255	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	91	91	88	88
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	69	34	445	16	116	370

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	862	223	0	0	461	0
Stage 1	445	-	-	-	-	-
Stage 2	417	-	-	-	-	-
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	294	780	-	-	1096	-
Stage 1	613	-	-	-	-	-
Stage 2	633	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	263	780	-	-	1096	-
Mov Cap-2 Maneuver	263	-	-	-	-	-
Stage 1	613	-	-	-	-	-
Stage 2	566	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.3	0	2.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	337	1096
HCM Lane V/C Ratio	-	-	0.307	0.106
HCM Control Delay (s)	-	-	20.3	8.7
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	1.3	0.4

HCM 6th TWSC  
5: Access & Struthers Ranch Rd

Long-Term Total  
AM Peak Hour

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	7	97	2	26	0	56	0	1	0	0	8
Future Vol, veh/h	13	7	97	2	26	0	56	0	1	0	0	8
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	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	9	124	3	33	0	72	0	1	0	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	33	0	0	133	0	0	149	144	71	145	206	33
Stage 1	-	-	-	-	-	-	105	105	-	39	39	-
Stage 2	-	-	-	-	-	-	44	39	-	106	167	-
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	1579	-	-	1452	-	-	819	747	991	824	691	1041
Stage 1	-	-	-	-	-	-	901	808	-	976	862	-
Stage 2	-	-	-	-	-	-	970	862	-	900	760	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1579	-	-	1452	-	-	803	737	991	814	681	1041
Mov Cap-2 Maneuver	-	-	-	-	-	-	803	737	-	814	681	-
Stage 1	-	-	-	-	-	-	890	798	-	964	860	-
Stage 2	-	-	-	-	-	-	959	860	-	888	751	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.8			0.5			9.9			8.5		
HCM LOS							A			A		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	806	1579	-	-	1452	-	-	1041
HCM Lane V/C Ratio	0.091	0.011	-	-	0.002	-	-	0.01
HCM Control Delay (s)	9.9	7.3	0	-	7.5	0	-	8.5
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Traffic Vol, veh/h	0	387	380	67	0	40
Future Vol, veh/h	0	387	380	67	0	40
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	87	87	87	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	445	437	86	0	51

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	-	0	-	0	- 262
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	-	-	- 6.94
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	- 3.32
Pot Cap-1 Maneuver	0	-	-	-	0 737
Stage 1	0	-	-	-	0 -
Stage 2	0	-	-	-	0 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	- 737
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	737
HCM Lane V/C Ratio	-	-	-	0.07
HCM Control Delay (s)	-	-	-	10.3
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

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

Long-Term Total  
 PM Peak Hour

Intersection						
Int Delay, s/veh	5.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑↑	↗	↘	↑↑
Traffic Vol, veh/h	49	31	593	21	73	590
Future Vol, veh/h	49	31	593	21	73	590
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	-	-	255	340	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	50	50	92	92	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	98	62	645	23	86	694

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1164	323	0	0	668	0
Stage 1	645	-	-	-	-	-
Stage 2	519	-	-	-	-	-
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	188	673	-	-	918	-
Stage 1	484	-	-	-	-	-
Stage 2	562	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	170	673	-	-	918	-
Mov Cap-2 Maneuver	170	-	-	-	-	-
Stage 1	484	-	-	-	-	-
Stage 2	509	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	46	0	1
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	239	918
HCM Lane V/C Ratio	-	-	0.669	0.094
HCM Control Delay (s)	-	-	46	9.3
HCM Lane LOS	-	-	E	A
HCM 95th %tile Q(veh)	-	-	4.2	0.3

HCM 6th TWSC  
5: Access & Struthers Ranch Rd

Long-Term Total  
PM Peak Hour

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	10	33	54	0	18	0	58	0	1	0	0	11
Future Vol, veh/h	10	33	54	0	18	0	58	0	1	0	0	11
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	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	42	69	0	23	0	74	0	1	0	0	14

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	23	0	0	111	0	0	133	126	77	126	160	23
Stage 1	-	-	-	-	-	-	103	103	-	23	23	-
Stage 2	-	-	-	-	-	-	30	23	-	103	137	-
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	-	-	1479	-	-	839	764	984	848	732	1054
Stage 1	-	-	-	-	-	-	903	810	-	995	876	-
Stage 2	-	-	-	-	-	-	987	876	-	903	783	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1592	-	-	1479	-	-	822	757	984	841	725	1054
Mov Cap-2 Maneuver	-	-	-	-	-	-	822	757	-	841	725	-
Stage 1	-	-	-	-	-	-	895	803	-	986	876	-
Stage 2	-	-	-	-	-	-	974	876	-	894	776	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0	9.8	8.5
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	824	1592	-	-	1479	-	-	1054
HCM Lane V/C Ratio	0.092	0.008	-	-	-	-	-	0.013
HCM Control Delay (s)	9.8	7.3	0	-	0	-	-	8.5
HCM Lane LOS	A	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.3	0	-	-	0	-	-	0

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑			↑
Traffic Vol, veh/h	0	639	554	50	0	60
Future Vol, veh/h	0	639	554	50	0	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	87	87	87	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	734	637	64	0	77

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	-	0	-	0	351
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-
Critical Hdwy	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	3.32
Pot Cap-1 Maneuver	0	-	-	-	645
Stage 1	0	-	-	-	0
Stage 2	0	-	-	-	0
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	645
Mov Cap-2 Maneuver	-	-	-	-	-
Stage 1	-	-	-	-	-
Stage 2	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	645
HCM Lane V/C Ratio	-	-	-	0.119
HCM Control Delay (s)	-	-	-	11.3
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.4

# NCHRP Report 684 Internal Trip Capture Estimation Tool

---





<b>Project Name:</b>	Struther Ranch Filing 5
<b>Analysis Period:</b>	AM Street Peak Hour

Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	8	8	1.00	2	2
Retail	1.00	100	100	1.00	61	61
Restaurant	1.00	78	78	1.00	52	52
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	0	0	1.00	0	0
Hotel	1.00	0	0	1.00	0	0

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1	1	0	0	0
Retail	18		8	0	9	0
Restaurant	16	7		0	2	2
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		32	18	0	0	0
Retail	0		39	0	0	0
Restaurant	1	8		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	17	16	0		0
Hotel	0	4	5	0	0	

Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>
Office	1	7	8	7	0	0
Retail	7	93	100	93	0	0
Restaurant	9	69	78	69	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses <sup>3</sup>	0	0	0	0	0	0

Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>
Office	1	1	2	1	0	0
Retail	8	53	61	53	0	0
Restaurant	8	44	52	44	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses <sup>3</sup>	0	0	0	0	0	0

<sup>1</sup>Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A  
<sup>2</sup>Person-Trips  
<sup>3</sup>Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator  
\*Indicates computation that has been rounded to the nearest whole number.

<b>Project Name:</b>	Struther Ranch Filing 5
<b>Analysis Period:</b>	PM Street Peak Hour

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends						
Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	4	4	1.00	9	9
Retail	1.00	79	79	1.00	85	85
Restaurant	1.00	74	74	1.00	74	74
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	0	0	1.00	0	0
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		2	0	0	0	0
Retail	2		25	3	22	4
Restaurant	2	30		6	13	5
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		6	1	0	0	0
Retail	1		21	0	0	0
Restaurant	1	40		0	0	0
Cinema/Entertainment	0	3	2		0	0
Residential	2	8	10	0		0
Hotel	0	2	4	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)						
Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>
Office	2	2	4	2	0	0
Retail	32	47	79	47	0	0
Restaurant	21	53	74	53	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses <sup>3</sup>	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)						
Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles <sup>1</sup>	Transit <sup>2</sup>	Non-Motorized <sup>2</sup>
Office	2	7	9	7	0	0
Retail	22	63	85	63	0	0
Restaurant	31	43	74	43	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	0	0	0	0	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses <sup>3</sup>	0	0	0	0	0	0


<sup>1</sup>Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P  
<sup>2</sup>Person-Trips  
<sup>3</sup>Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator  
\*Indicates computation that has been rounded to the nearest whole number.

# Traffic Impact Study\_V1.pdf Markup Summary

9/14/2022 11:53:51 AM (1)

3121010 Consultants  
c/ Colleen Quillora, P.E., PTDE, RSP  
y/ Jeffrey C. Hodsdon, P.E.


18.2201  [Revise to PPR-2248](#)

**Subject:** Callout  
**Page Label:** 1  
**Author:** lpackman  
**Date:** 9/14/2022 11:53:51 AM  
**Status:**  
**Color:**   
**Layer:**  
**Space:**

Revise to PPR-2248

9/14/2022 11:56:14 AM (1)



**Subject:** Text Box  
**Page Label:** 3  
**Author:** lpackman  
**Date:** 9/14/2022 11:56:14 AM  
**Status:**  
**Color:**   
**Layer:**  
**Space:**

Provide a page before report contents begin and include signature block: "The attached traffic report and supporting information were prepared under my responsible charge and they comport with the standard of care. So far as is consistent with the standard of care, said report was prepared in general conformance with the criteria established by the County for traffic reports.

\_\_\_\_\_  
[Name, P.E. # \_\_\_\_\_ ] Date

Developer's Statement

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


\_\_\_\_\_  
[Name, Title] Date

[Business Name]

[Address] "

9/15/2022 10:22:29 AM (1)



**Subject:** Callout  
**Page Label:** 5  
**Author:** dsdlaforce  
**Date:** 9/15/2022 10:22:29 AM  
**Status:**  
**Color:**   
**Layer:**  
**Space:**

Elaborate on the specific manual used and update the reference list. "A Policy on Geometric Design of Highways and Streets"

Identify the section and Intersection Case used  
- Add the reference tables, charts, etc used.  
- Provide the SSD computation in the appendix.  
- State the vertex (decision point) in the minor road in measuring the line of sight from edge of travel lane.



9/15/2022 10:34:44 AM (1)

ducted March 2020  
hat the southbound  
evening count was  
shown in Figure 3.

Provide updated  
traffic counts.

ad/Struthers Ranch

**Subject:** Callout  
**Page Label:** 7  
**Author:** lpackman  
**Date:** 9/15/2022 10:34:44 AM  
**Status:**  
**Color:** ■  
**Layer:**  
**Space:**

Provide updated traffic counts.

9/15/2022 10:36:31 AM (1)



**Subject:** Image  
**Page Label:** 13  
**Author:** dsdlaforce  
**Date:** 9/15/2022 10:36:31 AM  
**Status:**  
**Color:** ■  
**Layer:**  
**Space:**

9/15/2022 10:36:50 AM (1)

are used and the roadway is not planned to have side lanes.  
7. Struthers Ranch Site Plan, include deviations to  
the application. Please refer to the deviation request form  
to provide a detailed description of the applicant's  
proposed deviations.  
No variance application Transportation Impact Areas are and what  
the applicant is proposing.  
If the PMU applicant will pay the full fee amount at the time  
of the PMU application, the applicant must provide a check for  
\$100,000.00 or a \$100,000.00 cash bond for the full amount.  
\$100,000.00 of commercial buildings is \$100,000.

**Subject:** Callout  
**Page Label:** 12  
**Author:** dsdlaforce  
**Date:** 9/15/2022 10:36:50 AM  
**Status:**  
**Color:** ■  
**Layer:**  
**Space:**

List deviations the applicant plans to submit with  
the site plan application.

9/15/2022 10:37:32 AM (1)



**Subject:** Line  
**Page Label:** 13  
**Author:** dsdlaforce  
**Date:** 9/15/2022 10:37:32 AM  
**Status:**  
**Color:** ■  
**Layer:**  
**Space:**

9/15/2022 10:37:59 AM (1)

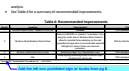
recommendations based on the sight distance  
improvements. Delete.

Item	Priority	Comments
1. Improve sight distance at the intersection of the site and the main road.	High	See the Site Development Plan for the proposed sight triangle improvements.
2. Improve sight distance at the intersection of the site and the main road.	High	See the Site Development Plan for the proposed sight triangle improvements.

**Subject:** Callout  
**Page Label:** 13  
**Author:** dsdlaforce  
**Date:** 9/15/2022 10:37:59 AM  
**Status:**  
**Color:** ■  
**Layer:**  
**Space:**

Delete.

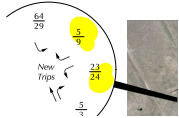
9/15/2022 10:38:51 AM (1)



**Subject:** Callout  
**Page Label:** 13  
**Author:** dsdlaforce  
**Date:** 9/15/2022 10:38:51 AM  
**Status:**  
**Color:** ■  
**Layer:**  
**Space:**

Add the left turn prohibited sign w/ trucks from pg  
6.

9/15/2022 10:42:01 AM (1)



**Subject:** Highlight  
**Page Label:** 24  
**Author:** dsdlaforce  
**Date:** 9/15/2022 10:42:01 AM  
**Status:**  
**Color:**    
**Layer:**  
**Space:**

9/15/2022 10:44:35 AM (1)

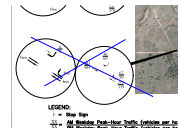


**Subject:** Callout  
**Page Label:** 24  
**Author:** dsdlaforce  
**Date:** 9/15/2022 10:44:35 AM  
**Status:**  
**Color:**    
**Layer:**  
**Space:**

Update site-generated counts, synchro analysis and all applicable figures. RIRO is not permitted nor proposed on the site plan application.

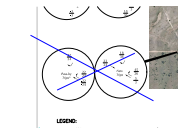
With the RIRO trips redistributed to Struthers Ranch Rd/Sturthers Rd intersection, separate left turn and right turn lanes may be required. Provide auxiliary turn lane analysis and recommendation.

9/15/2022 10:44:46 AM (1)



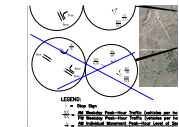
**Subject:** Line  
**Page Label:** 25  
**Author:** dsdlaforce  
**Date:** 9/15/2022 10:44:46 AM  
**Status:**  
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9/15/2022 10:44:54 AM (1)



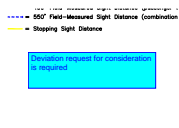
**Subject:** Line  
**Page Label:** 24  
**Author:** dsdlaforce  
**Date:** 9/15/2022 10:44:54 AM  
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9/15/2022 10:45:00 AM (1)



**Subject:** Line  
**Page Label:** 26  
**Author:** dsdlaforce  
**Date:** 9/15/2022 10:45:00 AM  
**Status:**  
**Color:**    
**Layer:**  
**Space:**

9/15/2022 10:46:00 AM (1)



**Subject:** Text Box  
**Page Label:** 28  
**Author:** dsdlaforce  
**Date:** 9/15/2022 10:46:00 AM  
**Status:**  
**Color:**    
**Layer:**  
**Space:**

Deviation request for consideration is required

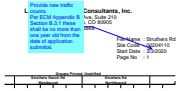
9/15/2022 10:49:09 AM (1)



**Subject:** Text Box  
**Page Label:** 30  
**Author:** dsdlaforce  
**Date:** 9/15/2022 10:49:09 AM  
**Status:**  
**Color:** ■  
**Layer:**  
**Space:**

Remove. Access will not be approved.

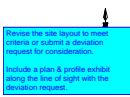
9/15/2022 10:51:43 AM (1)



**Subject:** Callout  
**Page Label:** 32  
**Author:** dsdlaforce  
**Date:** 9/15/2022 10:51:43 AM  
**Status:**  
**Color:** ■  
**Layer:**  
**Space:**

Provide new traffic counts.  
Per ECM Appendix B Section B.3.1 these shall be no more than one year old from the date of application submittal.

9/15/2022 12:54:04 PM (1)

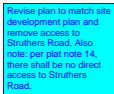


**Subject:** Text Box  
**Page Label:** 29  
**Author:** dsdlaforce  
**Date:** 9/15/2022 12:54:04 PM  
**Status:**  
**Color:** ■  
**Layer:**  
**Space:**

Revise the site layout to meet criteria or submit a deviation request for consideration.

Include a plan & profile exhibit along the line of sight with the deviation request.

9/15/2022 7:58:40 AM (1)



**Subject:** Text Box  
**Page Label:** 19  
**Author:** lpackman  
**Date:** 9/15/2022 7:58:40 AM  
**Status:**  
**Color:** ■  
**Layer:**  
**Space:**

Revise plan to match site development plan and remove access to Struthers Road. Also note: per plat note 14, there shall be no direct access to Struthers Road.

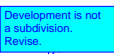
9/15/2022 8:24:32 AM (1)



**Subject:** Callout  
**Page Label:** 5  
**Author:** lpackman  
**Date:** 9/15/2022 8:24:32 AM  
**Status:**  
**Color:** ■  
**Layer:**  
**Space:**

Per site development plan it appears only one access point is being proposed. Revise to remove access to Struthers Road. Access to Struthers is not allowed per plat.

9/15/2022 8:25:44 AM (1)



**Subject:** Callout  
**Page Label:** 4  
**Author:** lpackman  
**Date:** 9/15/2022 8:25:44 AM  
**Status:**  
**Color:** ■  
**Layer:**  
**Space:**

Development is not a subdivision. Revise.



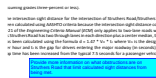
9/15/2022 8:27:20 AM (1)



**Subject:** Callout  
**Page Label:** 5  
**Author:** lpackman  
**Date:** 9/15/2022 8:27:20 AM  
**Status:**  
**Color:** █  
**Layer:**  
**Space:**

Revise to include trip generation from Struthers Ranch Filing 4. Per plat traffic amounts are limited to what said report provided.

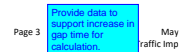
9/15/2022 9:40:02 AM (1)



**Subject:** Text Box  
**Page Label:** 5  
**Author:** lpackman  
**Date:** 9/15/2022 9:40:02 AM  
**Status:**  
**Color:** █  
**Layer:**  
**Space:**

Provide more information on what obstructions are on Struthers Road that limit calculated sight distances from being met.

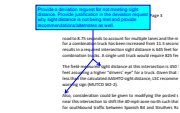
9/15/2022 9:47:21 AM (1)



**Subject:** Callout  
**Page Label:** 6  
**Author:** lpackman  
**Date:** 9/15/2022 9:47:21 AM  
**Status:**  
**Color:** █  
**Layer:**  
**Space:**

Provide data to support increase in gap time for calculation.

9/15/2022 9:54:55 AM (1)



**Subject:** Callout  
**Page Label:** 6  
**Author:** lpackman  
**Date:** 9/15/2022 9:54:55 AM  
**Status:**  
**Color:** █  
**Layer:**  
**Space:**

Provide a deviation request for not meeting sight distance. Provide justification in the deviation request why sight distance is not being met and provide recommendations/alternates as well.