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# Struthers Ranch Filing 4 Lot Nos. 1 & 2
# Traffic Impact Study
# PCD File No. PPR-2248
## (LSC #204111)
## April 4, 2023

**Traffic Engineer's Statement**

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


**Developer's Statement**

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

4-12-23
Date

# Struthers Ranch Filing No. 4 Lots 1 & 2 Traffic Impact Study

Prepared for:
Lisa Peterson
Hammers Construction
1411 Woolsey Heights
Colorado Springs, CO 80915

APRIL 4, 2023

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

LSC #204110
PCD File No. PPR-2248

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LSC TRANSPORTATION CONSULTANTS, INC.
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April 4, 2023

Lisa Peterson
Hammers Construction
1411 Woolsey Heights
Colorado Springs, CO 80915

RE: Struthers Ranch Filing 4 Lot Nos. 1 & 2
Traffic Impact Study
El Paso County, Colorado
EPC PCD File No. PPR-2248
LSC #204110

Dear Ms. Peterson:

LSC Transportation Consultants, Inc. has prepared this traffic impact study for the proposed Struthers Ranch Filing 4 Lot Nos. 1 and 2 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 a 12,000-square-foot off-road vehicle dealership on 1.75 acres. The balance of the parcel is not planned for development at this time. 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 description 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 estimates of buildout of adjacent potential future developments;
- Estimates of the daily and peak-hour trip generation for the proposed land use;

- Information regarding the trip generation caps established with the PUD and this project's conformance with those caps;
- The estimated directional distribution of site-generated vehicle trips on the adjacent roadway system;
- Projections of peak-hour site-generated turning-movement traffic volumes at the study-area intersections, which include:
- Site access-point intersection on Struthers Ranch Road
- 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 reports:

- Struthers Ranch Tract B Plat Updated Technical Memorandum, October 2006, LSC
- Monument Ridge Lots 7 & 8, December 2020, LSC
- Monument Ridge Apartments
- Cathedral Rock Church, February 2016, LSC

This report is consistent with the above reports and includes the proposed developments in the background traffic volumes.

**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, one access point is proposed: a full-movement access onto Struthers Ranch Road across from the proposed access to Cathedral Rock Church.

The planned land use for Struthers Ranch Filing 4 Lot Nos. 1 and 2 is for a 12,000-square-foot off-road vehicle dealership on 1.75 acres. The balance of the parcel is not planned for development at this time.

**INTERSECTION SIGHT DISTANCE**

**Struthers Road/Struthers Ranch Road**

The intersection sight distance for the intersection of Struthers Road/Struthers Ranch Road has been based Table 2-21 of the *Engineering Criteria Manual* (*ECM*). This table has a footnote that

special design considerations for situations other than intersecting two-lane roads are required. Please refer to **Appendix A** of this report for detailed calculations and application of criteria.

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

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

The field-measured **sight distance to the south**, in conjunction with the site plan/grading plan, would meet the calculated 590 feet of sight distance. This is shown in Exhibit 1.

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

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

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

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.

## 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 32.7 feet wide, which only allows for a shared westbound left/right lane on the minor street approach. Struthers Road has a 340-foot southbound left-turn deceleration lane and a 260-foot northbound right-turn deceleration lane at the intersection with Struthers Ranch Road.

### Traffic Volumes

Morning and evening peak-hour turning-movement traffic counts were conducted in the fall of 2022 at the intersection of Struthers Road/Struthers Ranch Road. These current morning and evening peak-hour volumes are shown in Figure 3. Traffic count reports are attached for reference.

### Crash History

Three years of crash data were collected at the intersection of Struthers Road/Struthers Ranch Road (through April 2020). There was only one crash during that study period. The only crash was a fixed-object type crash that resulted in property damage only. No correctable crash patterns were identified. LSC is in the process of obtaining the most recent data.

## BACKGROUND TRAFFIC

### Background Traffic Volumes

Figure 4 shows the projected 20-year, long-term 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 4 and 5 percent per year of through traffic on Struthers Road during the AM and PM peak hours, respectively. 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*.

Background traffic for the long term includes LSC estimates of potential future trips to be generated by future development on the balance of Filing No. 4 (Lots 3 and 4 – based on the estimates in Table 3) and Tract A on the north side of Struthers Ranch Road.

**TRIP GENERATION**

**Filing No. 4 Lots 1 and 2**

Estimates of the vehicle trips projected to be generated by the currently-proposed development for Lots 1 and 2 have been made using the nationally published trip-generation rates from land-use code "840 – Automobile Sales (New)" in *Trip Generation, 11th Edition, 2021* by the Institute of Transportation Engineers (ITE). This appeared to be the closest ITE land use to the proposed motorcycle/OHV dealership. 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 (attached).

Approximately 334 total vehicle trips are projected to be generated by this dealership on the average weekday during a 24-hour period. This total includes entering and exiting trips (entering and exiting are counted separately as two trips). During the morning peak hour, approximately 16 vehicles would enter and 6 vehicles would exit the site. During the evening peak hour, approximately 12 vehicles would enter and 17 vehicles would exit the site.

**Table 1: Estimated Site Vehicle-Trip Generation**

| Analysis Period | Total Trips | | |
|---|---|---|---|
| | In | Out | Total |
| A.M. Peak Hour | 16 | 6 | 22 |
| P.M. Peak Hour | 12 | 17 | 29 |
| Daily/24-Hour | 167 | 167 | 334 |

**Future Potential Development – Lots 3 and 4 ("Background" Trips)**

Table 3 also presents trip estimates of the potential future development on the remaining lots within Filing No. 4 – Lots 3 and 4. These trips are considered "background trips" as they are not part of this application but have been included in the future background traffic (and resulting total traffic). The trip generation for Tract A has also been included in the Table. The Tract A trips are also considered "background trips" as they are not part of this application but have been included in the future background (and resulting total) traffic volumes. The totals for Lots 1 through 4 are estimated and compared to the established trip generation "cap" for Filing 4, Lots 1-4. (Formerly Tract B) from the approved PUD plan.

As shown, based on the currently-proposed end-user for Lots 1 and 2 and the trip-generation estimate for the remaining two lots, the cap would not be exceeded.

## 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 5 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-estimated market area for the proposed dealership.

### 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 5) to the trip-generation estimates (from Table 1). Figure 6 shows the projected site-generated traffic volumes for the proposed development.

Note: Site-generated traffic includes **only** trips to be generated by Lots 1 & 2. The trips to be generated by lots 3 and 4 and Tract A have been included in the future background traffic (and resulting total traffic). They have not been shown as part of the site-generated traffic component, as they are not part of this application.

### Trip Generation "Cap"

A trip generation cap was established with the PUD for the non-residential land uses planned for Tracts A and B (Tract B is now Filing No. 4, lots 1-4), such that criteria for levels of service and vehicle queue length would not be exceeded. The trip generation was back-calculated from the intersection traffic volumes such that the criteria would be met. At that time, staff indicated that because of the difficulty of limiting vehicle trips generated by development, the land uses collectively allowed on the site should be restricted to those that are not projected to generate more vehicle trips than what is shown in the June 9, 2006 report as the trip generation cap. The cap established was 158 entering vehicles and 171 exiting vehicles during the afternoon peak hour for Tracts A and B.

The Tract B (now Filing No. 4, Lots 1-4) cap was documented in the LSC memo dated October 30, 2006. This memo showed the calculated Tract B portion of the overall cap at 71 entering vehicles and 77 exiting vehicles during the afternoon peak hour.

These caps are shown in the attached trip-generation table. The remaining Lots 1-4 "Cap" (originally Tract B) for Lots 3&4 (After Development of Lots 1 & 2) would be 59 entering vehicles and 60 exiting PM peak-hour vehicle trips.

This project is in conformance with the PUD guidelines (from the traffic impact standpoint) as the cap is not exceeded, and the land use proposed is comparable to some of the lower-intensity trip generators listed as part of the establishment of the cap.

## PROJECTED BACKGROUND AND TOTAL TRAFFIC VOLUMES

### Short-Term Total Traffic Volumes

Figure 7 shows the sum of **existing** traffic volumes (from Figure 3) and the site-generated peak-hour traffic volumes (shown in Figure 6). These volumes represent the projected short-term total traffic following construction and opening of the Polaris dealership.

### Long-Term Total Traffic Volumes

Figure 8 shows the projected 2040 total traffic volumes, which are the sum of 2040 background traffic volumes (from Figure 4) plus the site-generated traffic volumes (from Figure 6).

## 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**

| | Signalized Intersections | Unsignalized Intersections |
|---|---|---|
| Level of Service | Average Control Delay (seconds per vehicle) | Average Control Delay (seconds per vehicle)[(1)] |
| 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 vehicle.

The intersections of Struthers Road/Struthers Ranch Road, as well as the site-access points on Struthers Ranch Road, 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, while Figure 4 provides background levels of service for the short-term and long-term

scenarios. Figure 7 and Figure 8 provide the levels of service of the short-term and long-term total traffic scenarios, respectively.

**Struthers Road/Struthers Ranch Road**

Current and Short Term

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 B or better during both peak hours, with and without the proposed development.

Long Term

In the long-term future, the yielding turning movements are also forecast to operate at LOS C or better, with or without additional traffic from the proposed development.

**Site Access/Struthers Ranch Road**

During all scenarios (short and long term, background only, and total), minor-street 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 the addition of future church traffic. The turn lane already exists and is about 400 feet (lane plus taper). The *ECM* requirement is 435 feet.

A northbound right-turn acceleration lane is not required on Struthers Road.

The access on Struthers Ranch Road would **not** exceed the threshold for requiring an eastbound right-turn lane per the *ECM* because the turning volume is below the 50-vph threshold.

Although not anticipated to be required based on projected volumes or levels of service, minor widening of Struthers Ranch Road in the future to allow for separate right- and left-turn lanes in the westbound direction at the intersection with Struthers Road could fit within the existing 60-

foot right-of way. The six to seven feet of additional street width (current width is 32.7 feet, not including curb and gutter) plus sidewalks could be accommodated, if needed.

**VEHICLE QUEUING**

At the intersection of Struthers Road/Struthers Ranch Road, there are 250 feet available for vehicle queueing to the east, prior to the site access. The 95$^{th}$ percentile queue length for the westbound approach at the intersection is anticipated to be 30 feet, which will not impact the site access.

**TRAFFIC CONTROL**

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

**PEDESTRIAN AND BICYCLE ACCOMMODATION**

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

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

**COUNTY DEVIATION REQUESTS**

A deviation request for limited intersection sight distance to the north from Struthers Ranch Road has been included with this submittal, as this is being required by staff. However, note this is an existing condition regardless of this development. Please refer to the deviation request form (separate document).

**COUNTY ROAD IMPROVEMENT FEE PROGRAM**

**Transportation Impact Fees**

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

The applicant intends to opt out of the PID options and will pay the full-fee amount at the time of building permit. The current "full-fee" is $4,958 per 1,000 square feet of building floor area. The total fee amount for the 12,000 square feet of commercial buildings is $59,496.

**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 334 external vehicle trips on the average weekday.
- During the morning peak hour, approximately 16 vehicles would enter and 6 vehicles would exit the site. During the evening peak hour, approximately 12 vehicles would enter and 17 vehicles would exit the site
- 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 access/Struthers Ranch Road intersection and at the proposed site access to Struthers Ranch Road are projected to operate at acceptable levels of service in all scenarios.
- The 95$^{th}$ percentile queues at all study intersections 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 (below) for a summary of recommended improvements.

**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 southbound, north of the Struthers Ranch Road intersection (per MUTCD guidance for placement) | LSC recommends posting an "intersection ahead" warning sign (MUTCD W2-2 ) on the southbound approach to this intersection due to the limited intersection sight distance. | With the Site Development Plan |
| 3 | Site Access - on the northbound approach (and the future southbound approach) at the Struthers Ranch Road/site access "intersection." | LSC recommends Stop-sign traffic control for the northbound approach (and the future southbound approach) at the Struthers Ranch Road/site access "intersection." | With the Site Development Plan |

*Source: LSC Transportation Consultants, Inc. (Rev. 04-4-2023)*

* * * * *

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

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.

By Jeffrey C. Hodsdon, P.E.
Principal

JCH/JAB:jas

Enclosures: Table 3
Figures 1-9
Sight Distance Exhibits 1 & 2
Traffic Count Reports
Level of Service Reports
Appendix A

References:

*Trip Generation Handbook - An ITE Proposed Recommended Practice*, Third Edition September 2017, Institute of Transportation Engineers
*Trip Generation, 11th Edition, 2021,* Institute of Transportation Engineers
*El Paso County Major Transportation Corridors Plan*, 2016

# Table 3

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## Table 3: Detailed Trip-Generation Estimatate – Filing No. 4

| ITE Land Uses | | Value | Units [1] | Trip Generation Rates [2] | | | | | Driveway Trips Generated | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Average | A.M. | | P.M. | | Average | A.M. | | P.M. | |
| Code | Description | | | Weekday | In | Out | In | Out | Weekday | In | Out | In | Out |
| **Proposed Land Use (Lots 1 + 2)** | | | | | | | | | | | | | |
| 840 | Automobile Sales (New) | 12.000 | KSF | 27.84 | 1.36 | 0.50 | 0.97 | 1.45 | 334 | 16 | 6 | 12 | 17 |
| **Additional Future Background Land Uses (Lots 3 + 4)** | | | | | | | | | | | | | |
| 822 | Strip Retail Plaza (< 40 KSF) | 10.750 | KSF | 54.45 | 1.42 | 0.94 | 3.30 | 3.30 | 585 | 15 | 10 | 35 | 35 |
| **Total for Lots 1 + 4** | | | | | | | | | | | | | |
| 840 | Automobile Sales (New) | 12.000 | KSF | 27.84 | 1.36 | 0.50 | 0.97 | 1.45 | 334 | 16 | 6 | 12 | 17 |
| 822 | Strip Retail Plaza (< 40 KSF) | 10.750 | KSF | 54.45 | 1.42 | 0.94 | 3.30 | 3.30 | 585 | 15 | 10 | 35 | 35 |
| | | | | | | | | **Total** | **919** | **32** | **16** | **47** | **53** |
| **Established "Cap" for Trip Generation (Lots 1-4 Combined - formerly Tract B)** | | | | | | | | | | | | | |
| 820 | Shopping Center | 39.500 | KSF | - | - | - | 1.80 | 1.96 | - | - | - | **71** | **77** |
| **Remaining Lots 1-4 "Cap" for Lots 3&4 (After Development of Lots 1 & 2)** | | | | | | | | | | | | **59** | **60** |
| **For Reference:** | | | | | | | | | | | | | |
| **Established "Cap" for Trip Generation (Tract A)** | | | | | | | | | | | | | |
| 820 | Shopping Center | | | | | | | | | | | 87 | 94 |
| **Established "Cap" for Trip Generation (Lots 1-4 & Tract A)** | | | | | | | | | | | | | |
| 820 | Shopping Center | | | | | | | | | | | 158 | 171 |

[1] KSF = 1,000 square feet

[2] Source: *Trip Generation, 11th Edition (2021)* by the Institute of Transportation Engineers (ITE)

# Figures 1-9

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*Figure 1*

# *Vicinity Map*

Struthers - Polaris RMC (LSC #204111)

LSC TRANSPORTATION CONSULTANTS, INC.

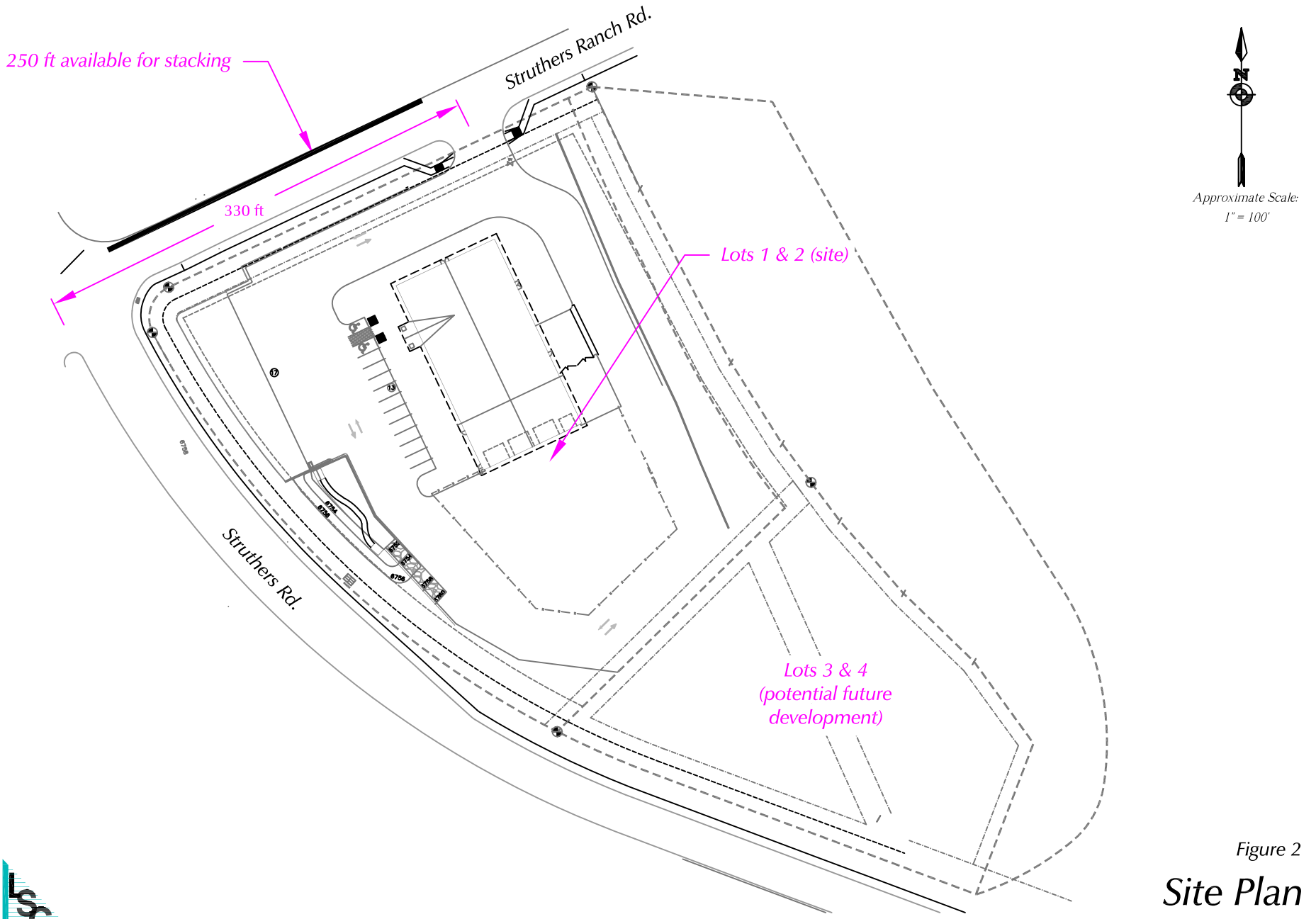
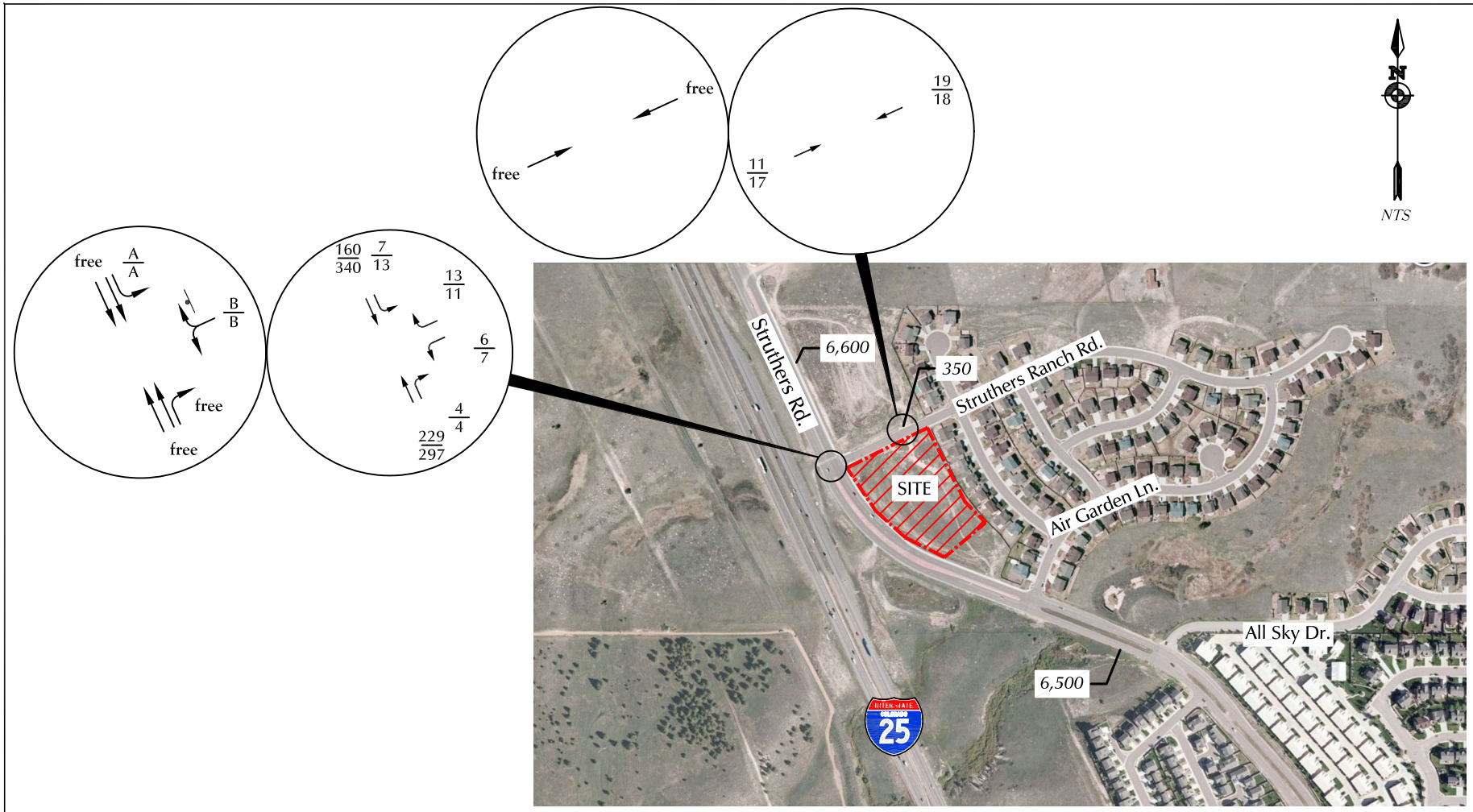



Figure 2

# Site Plan

Struthers - Polaris RMC (LSC #204111)

LSC TRANSPORTATION CONSULTANTS, INC.




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)

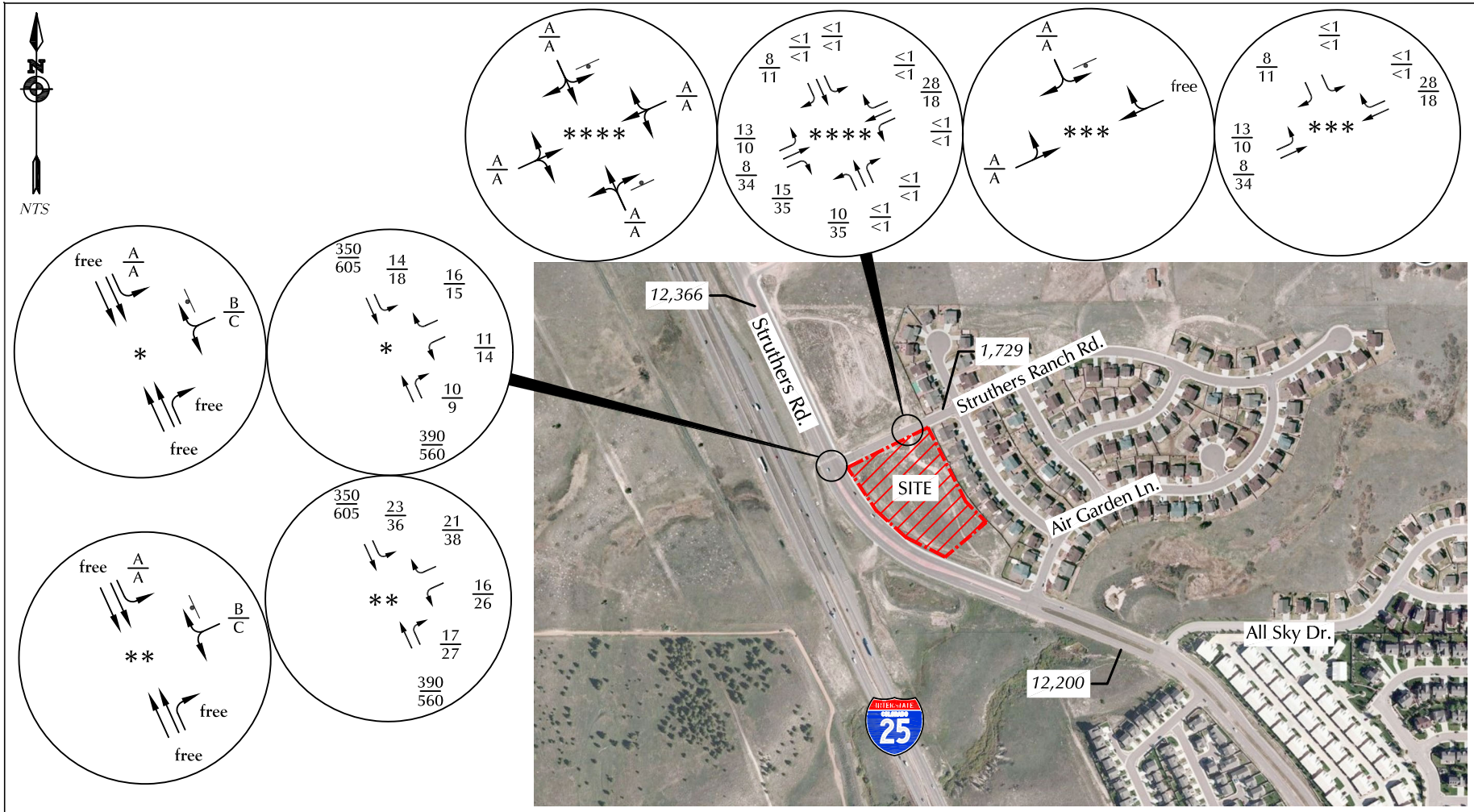
Based on counts by LSC Nov 2022

LSC TRANSPORTATION CONSULTANTS, INC.

*Figure 3*

# *Existing Traffic Conditions*

Struthers - Polaris RMC (LSC #204111)




* With through traffic, future Tract A trips and residential traffic (zero Filing 4 traffic)
** With through traffic, residential traffic, future Tract A trips, and future Lots 3 and 4 traffic.

*** With future Tract A trips and residential traffic only
**** With residential traffic, future Tract A trips, and future Lots 3 and 4 traffic.

LEGEND:

| | | |
|---|---|---|
| ⊢ | = | Stop Sign |
| XX/XX | = | AM Weekday Peak–Hour Traffic (vehicles per hour) / PM Weekday Peak–Hour Traffic (vehicles per hour) |
| 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) |

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*Figure 4*

# *Long-Term Background Traffic Conditions*

Struthers - Polaris RMC (LSC #204111)


NTS

*Figure 5*

# *Directional Distribution of Site-Generated Traffic*

Struthers - Polaris RMC (LSC #204111)

LEGEND:

XX% = Percent Directional Distribution (RMC Distribution)

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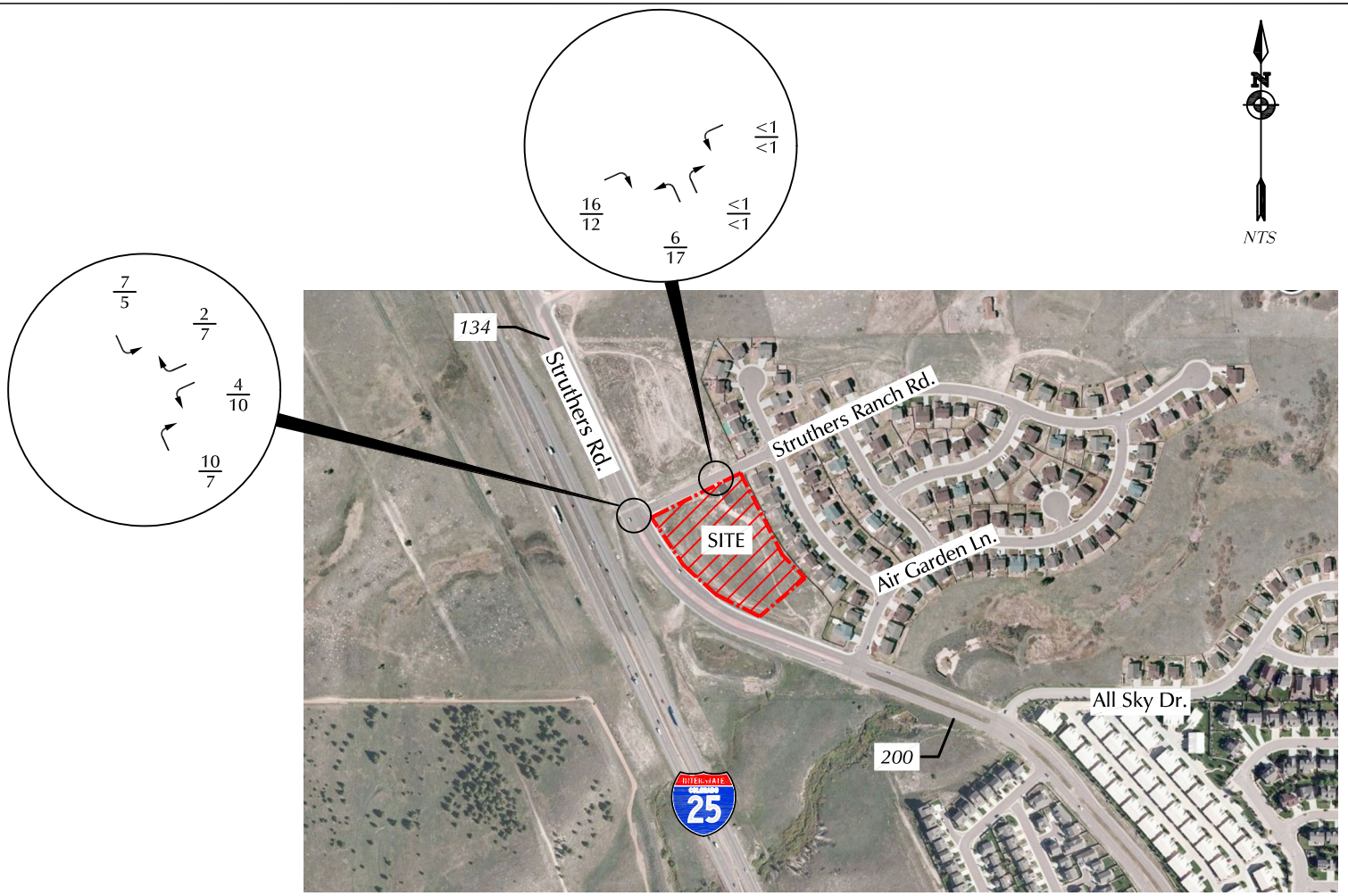



LEGEND:

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

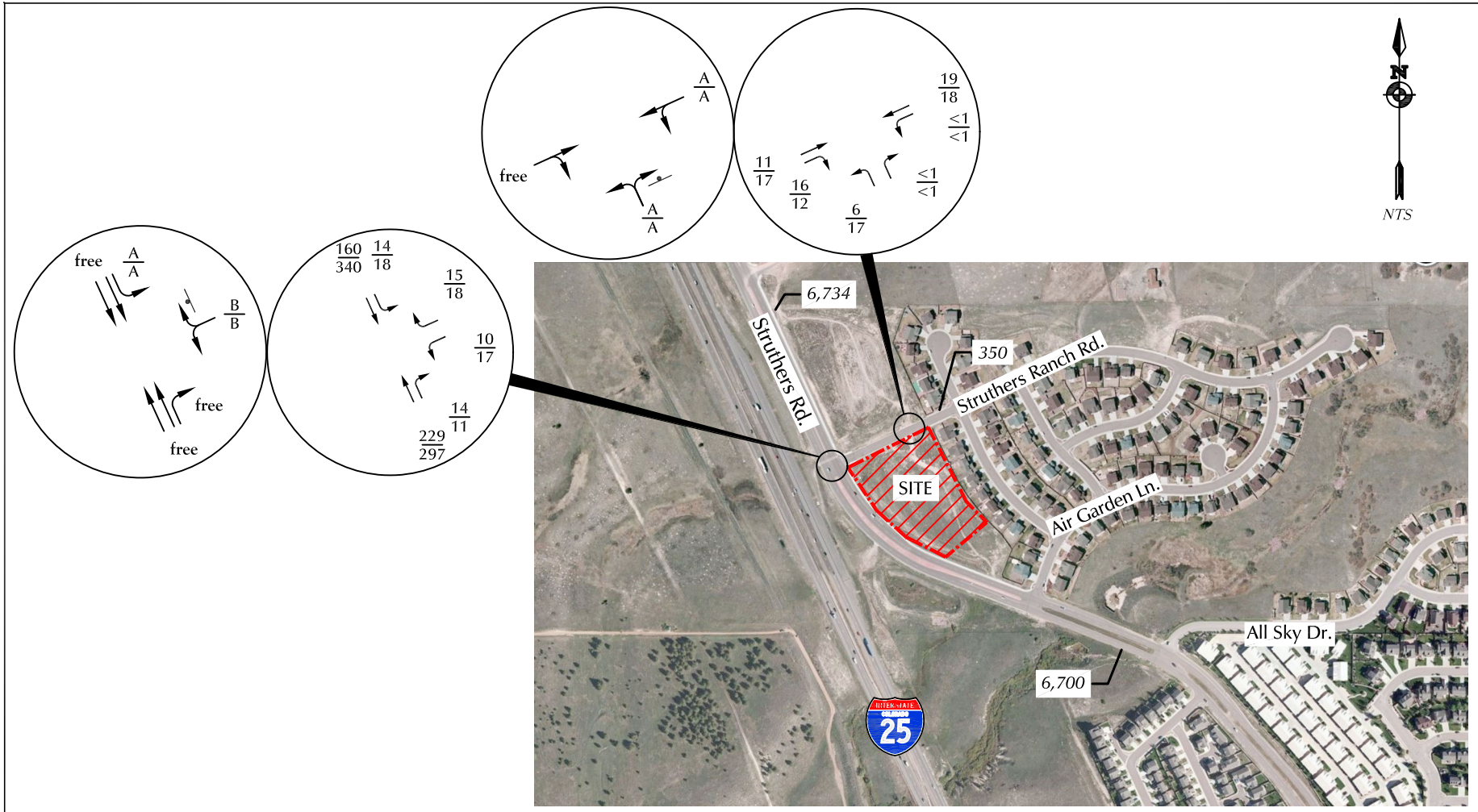
*X,XXX* = Average Weekday Traffic (vehicles per day)

TRANSPORTATION CONSULTANTS, INC.

*Figure 6*

# *Site-Generated Traffic Volumes*

Struthers - Polaris RMC (LSC #204111)




LEGEND:

| = Stop Sign

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

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

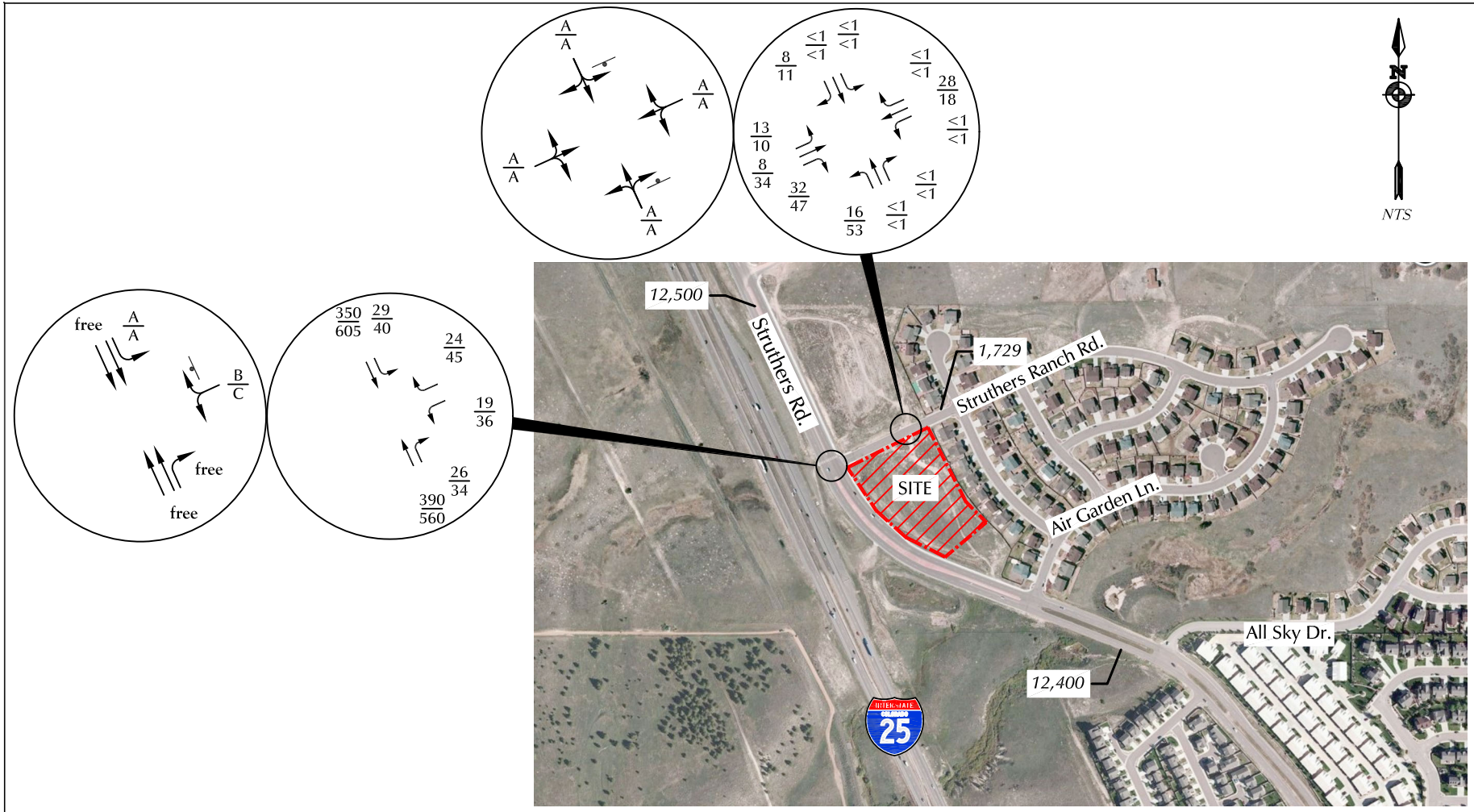
*X,XXX* = Average Weekday Traffic (vehicles per day)

TRANSPORTATION CONSULTANTS, INC.

*Figure 7*

# *Short-Term Total Traffic Conditions*

Struthers - Polaris RMC (LSC #204111)




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)

LSC TRANSPORTATION CONSULTANTS, INC.

*Figure 8*

# *Long-Term Total Traffic Conditions*

Struthers - Polaris RMC (LSC #204111)


NTS

*Appendix Figure 1*

# *Directional Distribution of Future Lost 3 and 4 Trips*

Struthers - Polaris RMC (LSC #204111)

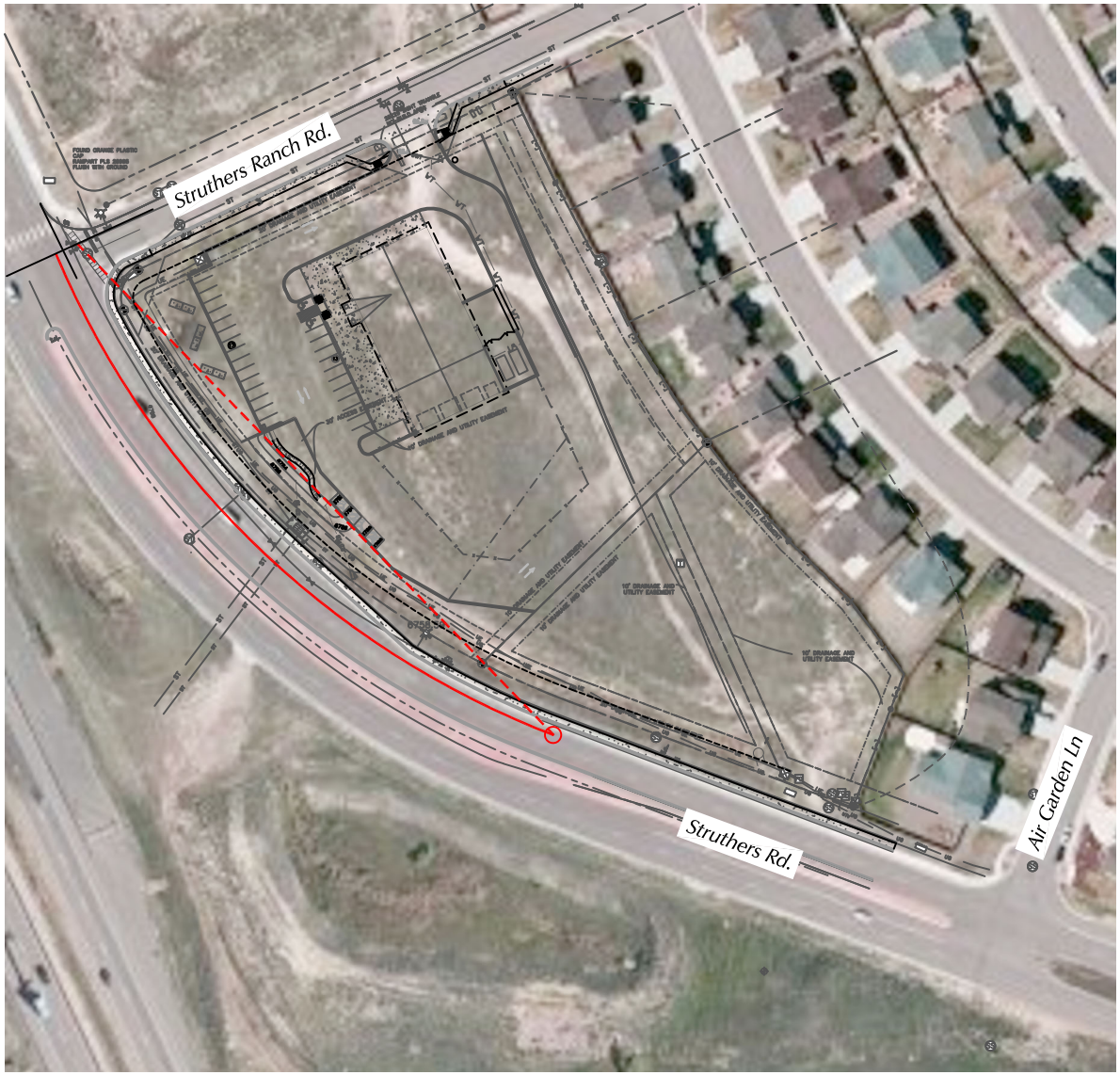
LEGEND:

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

LSC TRANSPORTATION CONSULTANTS, INC.

# Sight Distance Exhibits 1 & 2

TRANSPORTATION
CONSULTANTS, INC.




N

*Approximate Scale*
*1" = 150'*

= 590' Required Sight Distance

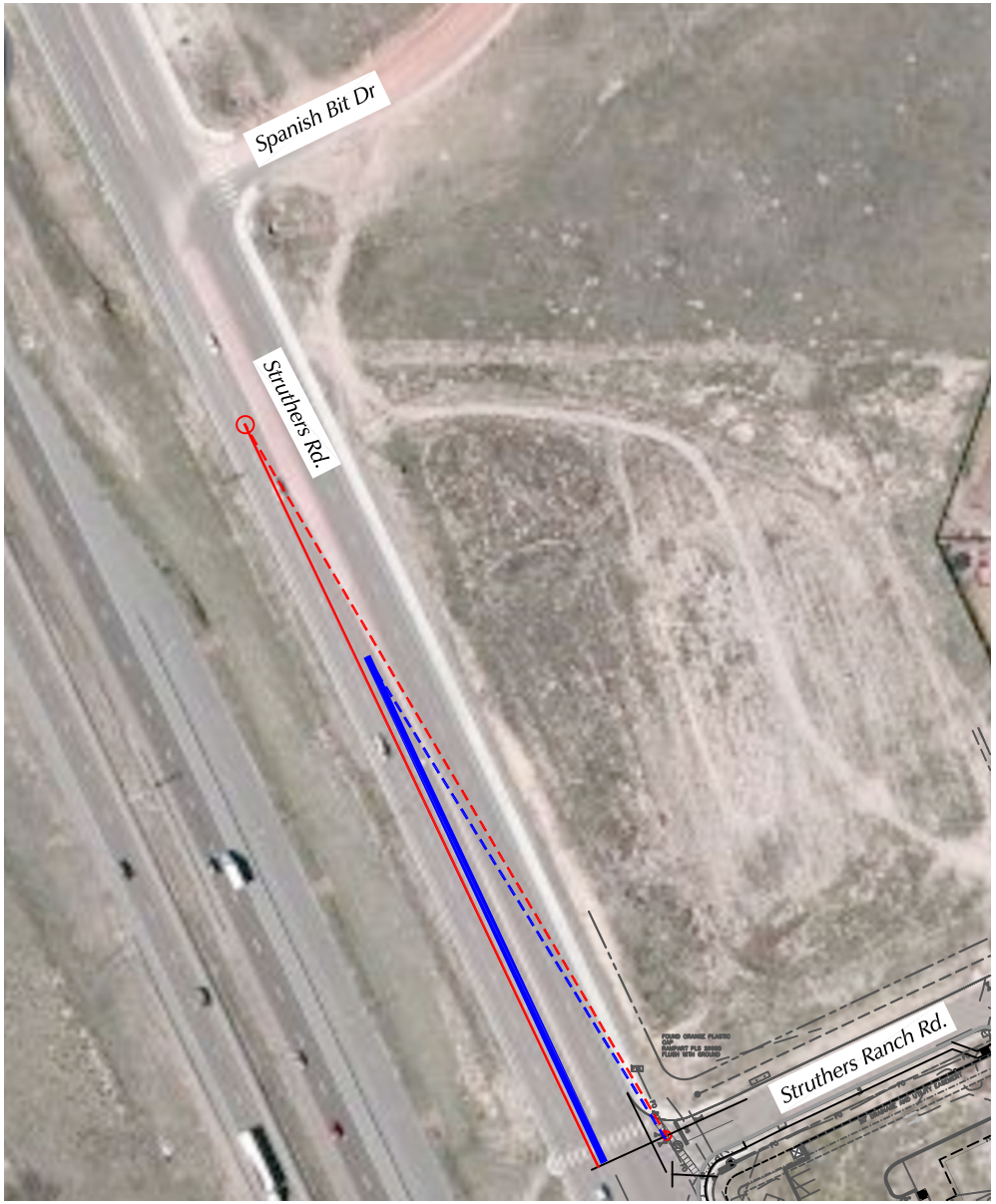
= Line of Sight for 590' of Intersection Sight Distance

*Exhibit 1*

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

Struthers - Polaris RMC (LSC #204111)

LSC TRANSPORTATION CONSULTANTS, INC.




*Approximate Scale*
*1" = 150'*

= 645' Required Intersection Sight Distance

= Line of Sight for 590' of Intersection Sight Distance

= 450' Field–Measured Sight Distance

= Line of sight for existing field measured sight distance

*Exhibit 2*

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

Struthers - Polaris RMC (LSC #204111)

LSC TRANSPORTATION CONSULTANTS, INC.

# Traffic Counts

TRANSPORTATION
CONSULTANTS, INC.

# LSC Transportation Consultants, Inc.

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

File Name : struthers rd - struthers ranch rd am pm 10-22
Site Code : S204111
Start Date : 11/1/2022
Page No : 1

**Groups Printed- Unshifted**

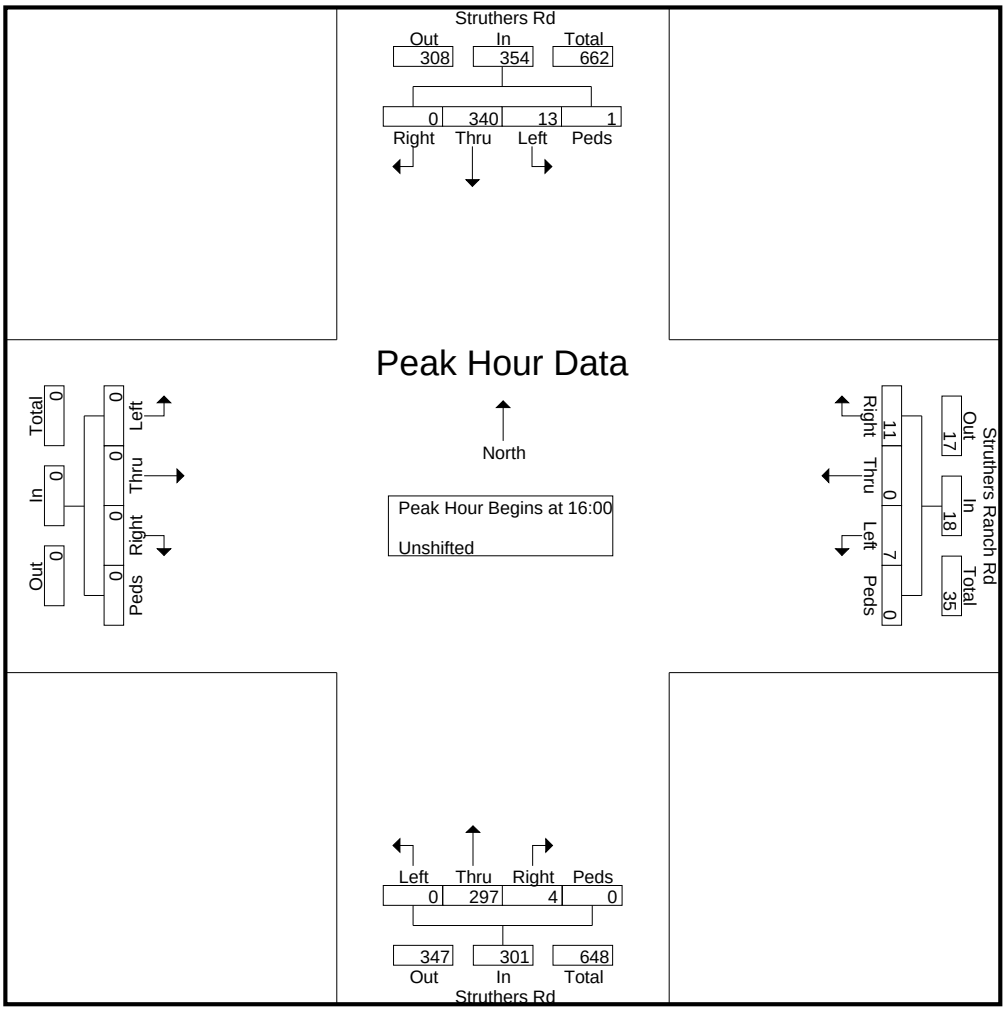
| | Struthers Rd Southbound | | | | | Struthers Ranch Rd Westbound | | | | | Struthers Rd Northbound | | | | | Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Int. Total |
| 06:30 | 0 | 10 | 0 | 0 | 10 | 3 | 0 | 1 | 0 | 4 | 0 | 24 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 38 |
| 06:45 | 0 | 14 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 35 |
| Total | 0 | 24 | 0 | 0 | 24 | 3 | 0 | 1 | 0 | 4 | 0 | 45 | 0 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 73 |
| 07:00 | 0 | 30 | 1 | 0 | 31 | 1 | 0 | 0 | 0 | 1 | 0 | 24 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0 | 56 |
| 07:15 | 0 | 32 | 0 | 0 | 32 | 2 | 0 | 4 | 0 | 6 | 1 | 45 | 0 | 0 | 46 | 0 | 0 | 0 | 0 | 0 | 84 |
| 07:30 | 0 | 36 | 3 | 0 | 39 | 4 | 0 | 0 | 0 | 4 | 1 | 49 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0 | 93 |
| 07:45 | 0 | 38 | 2 | 0 | 40 | 4 | 0 | 2 | 0 | 6 | 0 | 74 | 0 | 0 | 74 | 0 | 0 | 0 | 0 | 0 | 120 |
| Total | 0 | 136 | 6 | 0 | 142 | 11 | 0 | 6 | 0 | 17 | 2 | 192 | 0 | 0 | 194 | 0 | 0 | 0 | 0 | 0 | 353 |
| 08:00 | 0 | 45 | 0 | 0 | 45 | 1 | 0 | 0 | 0 | 1 | 1 | 44 | 0 | 0 | 45 | 0 | 0 | 0 | 0 | 0 | 91 |
| 08:15 | 0 | 41 | 2 | 0 | 43 | 4 | 0 | 0 | 0 | 4 | 2 | 62 | 0 | 0 | 64 | 0 | 0 | 0 | 0 | 0 | 111 |
| *** BREAK *** | | | | | | | | | | | | | | | | | | | | | |
| Total | 0 | 86 | 2 | 0 | 88 | 5 | 0 | 0 | 0 | 5 | 3 | 106 | 0 | 0 | 109 | 0 | 0 | 0 | 0 | 0 | 202 |
| *** BREAK *** | | | | | | | | | | | | | | | | | | | | | |
| 16:00 | 0 | 110 | 6 | 0 | 116 | 4 | 0 | 4 | 0 | 8 | 1 | 63 | 0 | 0 | 64 | 0 | 0 | 0 | 0 | 0 | 188 |
| 16:15 | 0 | 93 | 3 | 0 | 96 | 2 | 0 | 1 | 0 | 3 | 2 | 86 | 0 | 0 | 88 | 0 | 0 | 0 | 0 | 0 | 187 |
| 16:30 | 0 | 71 | 3 | 0 | 74 | 3 | 0 | 1 | 0 | 4 | 0 | 59 | 0 | 0 | 59 | 0 | 0 | 0 | 0 | 0 | 137 |
| 16:45 | 0 | 66 | 1 | 1 | 68 | 2 | 0 | 1 | 0 | 3 | 1 | 89 | 0 | 0 | 90 | 0 | 0 | 0 | 0 | 0 | 161 |
| Total | 0 | 340 | 13 | 1 | 354 | 11 | 0 | 7 | 0 | 18 | 4 | 297 | 0 | 0 | 301 | 0 | 0 | 0 | 0 | 0 | 673 |
| 17:00 | 0 | 82 | 4 | 0 | 86 | 0 | 0 | 1 | 0 | 1 | 3 | 74 | 0 | 0 | 77 | 0 | 0 | 0 | 0 | 0 | 164 |
| 17:15 | 0 | 72 | 1 | 0 | 73 | 0 | 0 | 0 | 0 | 0 | 0 | 75 | 0 | 0 | 75 | 0 | 0 | 0 | 0 | 0 | 148 |
| 17:30 | 0 | 98 | 4 | 0 | 102 | 2 | 0 | 2 | 0 | 4 | 5 | 60 | 0 | 0 | 65 | 0 | 0 | 0 | 0 | 0 | 171 |
| 17:45 | 0 | 89 | 7 | 0 | 96 | 1 | 0 | 0 | 0 | 1 | 1 | 55 | 0 | 0 | 56 | 0 | 0 | 0 | 0 | 0 | 153 |
| Total | 0 | 341 | 16 | 0 | 357 | 3 | 0 | 3 | 0 | 6 | 9 | 264 | 0 | 0 | 273 | 0 | 0 | 0 | 0 | 0 | 636 |
| Grand Total | 0 | 927 | 37 | 1 | 965 | 33 | 0 | 17 | 0 | 50 | 18 | 904 | 0 | 0 | 922 | 0 | 0 | 0 | 0 | 0 | 1937 |
| Apprch % | 0 | 96.1 | 3.8 | 0.1 | | 66 | 0 | 34 | 0 | | 2 | 98 | 0 | 0 | | 0 | 0 | 0 | 0 | | |
| Total % | 0 | 47.9 | 1.9 | 0.1 | 49.8 | 1.7 | 0 | 0.9 | 0 | 2.6 | 0.9 | 46.7 | 0 | 0 | 47.6 | 0 | 0 | 0 | 0 | 0 | |

# LSC Transportation Consultants, Inc.

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


File Name : struthers rd - struthers ranch rd am pm 10-22
Site Code : S204111
Start Date : 11/1/2022
Page No : 2

| | Struthers Rd Southbound | | | | | Struthers Ranch Rd Westbound | | | | | Struthers Rd Northbound | | | | | Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Right | Thru | Left | Peds | App. Total | Int. Total |
| Peak Hour Analysis From 6:30:00 AM to 5:45:00 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 4:00:00 PM | | | | | | | | | | | | | | | | | | | | | |
| 4:00:00 PM | 0 | **110** | **6** | 0 | **116** | **4** | 0 | **4** | 0 | **8** | 1 | 63 | 0 | 0 | 64 | 0 | 0 | 0 | 0 | 0 | **188** |
| 4:15:00 PM | 0 | 93 | 3 | 0 | 96 | 2 | 0 | 1 | 0 | 3 | **2** | 86 | 0 | 0 | 88 | 0 | 0 | 0 | 0 | 0 | 187 |
| 4:30:00 PM | 0 | 71 | 3 | 0 | 74 | 3 | 0 | 1 | 0 | 4 | 0 | 59 | 0 | 0 | 59 | 0 | 0 | 0 | 0 | 0 | 137 |
| 4:45:00 PM | 0 | 66 | 1 | **1** | 68 | 2 | 0 | 1 | 0 | 3 | 1 | **89** | 0 | 0 | **90** | 0 | 0 | 0 | 0 | 0 | 161 |
| Total Volume | 0 | 340 | 13 | 1 | 354 | 11 | 0 | 7 | 0 | 18 | 4 | 297 | 0 | 0 | 301 | 0 | 0 | 0 | 0 | 0 | 673 |
| % App. Total | 0 | 96 | 3.7 | 0.3 | | 61.1 | 0 | 38.9 | 0 | | 1.3 | 98.7 | 0 | 0 | | 0 | 0 | 0 | 0 | | |
| PHF | .000 | .773 | .542 | .250 | .763 | .688 | .000 | .438 | .000 | .563 | .500 | .834 | .000 | .000 | .836 | .000 | .000 | .000 | .000 | .000 | .895 |



# Levels of Service

TRANSPORTATION
CONSULTANTS, INC.

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.6 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 6 | 13 | 229 | 4 | 7 | 160 |
| Future Vol, veh/h | 6 | 13 | 229 | 4 | 7 | 160 |
| 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 | - | - | 260 | 340 | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 78 | 78 | 87 | 87 | 87 | 87 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 8 | 17 | 263 | 5 | 8 | 184 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 371 | 132 | 0 | 0 | 268 | 0 |
| Stage 1 | 263 | - | - | - | - | - |
| Stage 2 | 108 | - | - | - | - | - |
| 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 | 603 | 893 | - | - | 1293 | - |
| Stage 1 | 757 | - | - | - | - | - |
| Stage 2 | 904 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 599 | 893 | - | - | 1293 | - |
| Mov Cap-2 Maneuver | 599 | - | - | - | - | - |
| Stage 1 | 757 | - | - | - | - | - |
| Stage 2 | 899 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 9.8 | 0 | 0.3 |
| HCM LOS | A | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 773 | 1293 | - |
| HCM Lane V/C Ratio | - | - | 0.032 | 0.006 | - |
| HCM Control Delay (s) | - | - | 9.8 | 7.8 | - |
| HCM Lane LOS | - | - | A | A | - |
| HCM 95th %tile Q(veh) | - | - | 0.1 | 0 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.5 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 7 | 11 | 297 | 4 | 13 | 340 |
| Future Vol, veh/h | 7 | 11 | 297 | 4 | 13 | 340 |
| 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 | - | - | 260 | 340 | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 78 | 78 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 9 | 14 | 323 | 4 | 14 | 370 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 536 | 162 | 0 | 0 | 327 | 0 |
| Stage 1 | 323 | - | - | - | - | - |
| Stage 2 | 213 | - | - | - | - | - |
| 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 | 475 | 854 | - | - | 1229 | - |
| Stage 1 | 706 | - | - | - | - | - |
| Stage 2 | 802 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 470 | 854 | - | - | 1229 | - |
| Mov Cap-2 Maneuver | 470 | - | - | - | - | - |
| Stage 1 | 706 | - | - | - | - | - |
| Stage 2 | 793 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 10.8 | 0 | 0.3 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 648 | 1229 | - |
| HCM Lane V/C Ratio | - | - | 0.036 | 0.011 | - |
| HCM Control Delay (s) | - | - | 10.8 | 8 | - |
| HCM Lane LOS | - | - | B | A | - |
| HCM 95th %tile Q(veh) | - | - | 0.1 | 0 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.3 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 11 | 16 | 1 | 19 | 6 | 1 |
| Future Vol, veh/h | 11 | 16 | 1 | 19 | 6 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 78 | 78 | 78 | 78 | 78 | 78 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 14 | 21 | 1 | 24 | 8 | 1 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 35 | 0 | 51 | 25 |
| Stage 1 | - | - | - | - | 25 | - |
| Stage 2 | - | - | - | - | 26 | - |
| Critical Hdwy | - | - | 4.12 | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | - | - | 2.218 | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | - | - | 1576 | - | 958 | 1051 |
| Stage 1 | - | - | - | - | 998 | - |
| Stage 2 | - | - | - | - | 997 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1576 | - | 957 | 1051 |
| Mov Cap-2 Maneuver | - | - | - | - | 957 | - |
| Stage 1 | - | - | - | - | 998 | - |
| Stage 2 | - | - | - | - | 996 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0.4 | 8.8 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 969 | - | - | 1576 | - |
| HCM Lane V/C Ratio | 0.009 | - | - | 0.001 | - |
| HCM Control Delay (s) | 8.8 | - | - | 7.3 | 0 |
| HCM Lane LOS | A | - | - | A | A |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.9 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 10 | 15 | 229 | 14 | 14 | 160 |
| Future Vol, veh/h | 10 | 15 | 229 | 14 | 14 | 160 |
| 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 | - | - | 260 | 340 | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 78 | 78 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 13 | 19 | 249 | 15 | 15 | 174 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 366 | 125 | 0 | 0 | 264 | 0 |
| Stage 1 | 249 | - | - | - | - | - |
| Stage 2 | 117 | - | - | - | - | - |
| 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 | 607 | 902 | - | - | 1297 | - |
| Stage 1 | 769 | - | - | - | - | - |
| Stage 2 | 895 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 600 | 902 | - | - | 1297 | - |
| Mov Cap-2 Maneuver | 600 | - | - | - | - | - |
| Stage 1 | 769 | - | - | - | - | - |
| Stage 2 | 884 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 10 | 0 | 0.6 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 751 | 1297 | - |
| HCM Lane V/C Ratio | - | - | 0.043 | 0.012 | - |
| HCM Control Delay (s) | - | - | 10 | 7.8 | - |
| HCM Lane LOS | - | - | B | A | - |
| HCM 95th %tile Q(veh) | - | - | 0.1 | 0 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.5 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 17 | 12 | 1 | 18 | 17 | 1 |
| Future Vol, veh/h | 17 | 12 | 1 | 18 | 17 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 78 | 78 | 78 | 78 | 78 | 78 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 22 | 15 | 1 | 23 | 22 | 1 |

| Major/Minor | Major1 | | Major2 | | Minor1 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 0 | 0 | 37 | 0 | 55 | 30 |
| Stage 1 | - | - | - | - | 30 | - |
| Stage 2 | - | - | - | - | 25 | - |
| Critical Hdwy | - | - | 4.12 | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | - | - | 2.218 | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | - | - | 1574 | - | 953 | 1044 |
| Stage 1 | - | - | - | - | 993 | - |
| Stage 2 | - | - | - | - | 998 | - |
| Platoon blocked, % | - | - | | - | | |
| Mov Cap-1 Maneuver | - | - | 1574 | - | 952 | 1044 |
| Mov Cap-2 Maneuver | - | - | - | - | 952 | - |
| Stage 1 | - | - | - | - | 993 | - |
| Stage 2 | - | - | - | - | 997 | - |

| Approach | EB | WB | NB |
|---|---|---|---|
| HCM Control Delay, s | 0 | 0.4 | 8.9 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL | WBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | 957 | - | - | 1574 | - |
| HCM Lane V/C Ratio | 0.024 | - | - | 0.001 | - |
| HCM Control Delay (s) | 8.9 | - | - | 7.3 | 0 |
| HCM Lane LOS | A | - | - | A | A |
| HCM 95th %tile Q(veh) | 0.1 | - | - | 0 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.9 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 17 | 18 | 297 | 11 | 18 | 340 |
| Future Vol, veh/h | 17 | 18 | 297 | 11 | 18 | 340 |
| 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 | - | - | 260 | 340 | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 78 | 78 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 22 | 23 | 323 | 12 | 20 | 370 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 548 | 162 | 0 | 0 | 335 | 0 |
| Stage 1 | 323 | - | - | - | - | - |
| 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 | 466 | 854 | - | - | 1221 | - |
| Stage 1 | 706 | - | - | - | - | - |
| Stage 2 | 791 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 459 | 854 | - | - | 1221 | - |
| Mov Cap-2 Maneuver | 459 | - | - | - | - | - |
| Stage 1 | 706 | - | - | - | - | - |
| Stage 2 | 778 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 11.5 | 0 | 0.4 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 602 | 1221 | - |
| HCM Lane V/C Ratio | - | - | 0.075 | 0.016 | - |
| HCM Control Delay (s) | - | - | 11.5 | 8 | - |
| HCM Lane LOS | - | - | B | A | - |
| HCM 95th %tile Q(veh) | - | - | 0.2 | 0 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.9 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 13 | 8 | 28 | 1 | 1 | 8 |
| Future Vol, veh/h | 13 | 8 | 28 | 1 | 1 | 8 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 78 | 78 | 78 | 78 | 78 | 78 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 17 | 10 | 36 | 1 | 1 | 10 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 37 | 0 | - | 0 | 81 | 37 |
| Stage 1 | - | - | - | - | 37 | - |
| Stage 2 | - | - | - | - | 44 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1574 | - | - | - | 921 | 1035 |
| Stage 1 | - | - | - | - | 985 | - |
| Stage 2 | - | - | - | - | 978 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1574 | - | - | - | 911 | 1035 |
| Mov Cap-2 Maneuver | - | - | - | - | 911 | - |
| Stage 1 | - | - | - | - | 974 | - |
| Stage 2 | - | - | - | - | 978 | - |

| Approach | EB | WB | SB |
|---|---|---|---|
| HCM Control Delay, s | 4.5 | 0 | 8.6 |
| HCM LOS | | | A |

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1574 | - | - | - | 1020 |
| HCM Lane V/C Ratio | 0.011 | - | - | - | 0.011 |
| HCM Control Delay (s) | 7.3 | 0 | - | - | 8.6 |
| HCM Lane LOS | A | A | - | - | A |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.6 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 11 | 18 | 390 | 11 | 14 | 350 |
| Future Vol, veh/h | 11 | 18 | 390 | 11 | 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 | - | - | 260 | 340 | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 78 | 78 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 14 | 23 | 424 | 12 | 15 | 380 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 644 | 212 | 0 | 0 | 436 | 0 |
| Stage 1 | 424 | - | - | - | - | - |
| Stage 2 | 220 | - | - | - | - | - |
| 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 | 405 | 793 | - | - | 1120 | - |
| Stage 1 | 628 | - | - | - | - | - |
| Stage 2 | 795 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 400 | 793 | - | - | 1120 | - |
| Mov Cap-2 Maneuver | 400 | - | - | - | - | - |
| Stage 1 | 628 | - | - | - | - | - |
| Stage 2 | 785 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 11.7 | 0 | 0.3 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 578 | 1120 | - |
| HCM Lane V/C Ratio | - | - | 0.064 | 0.014 | - |
| HCM Control Delay (s) | - | - | 11.7 | 8.3 | - |
| HCM Lane LOS | - | - | B | A | - |
| HCM 95th %tile Q(veh) | - | - | 0.2 | 0 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 2.4 |

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 10 | 34 | 18 | 1 | 1 | 11 |
| Future Vol, veh/h | 10 | 34 | 18 | 1 | 1 | 11 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Free | Free | Free | Free | Stop | Stop |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | - | - | - | - | 0 | - |
| Veh in Median Storage, # | - | 0 | 0 | - | 0 | - |
| Grade, % | - | 0 | 0 | - | 0 | - |
| Peak Hour Factor | 78 | 78 | 78 | 78 | 78 | 78 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 13 | 44 | 23 | 1 | 1 | 14 |

| Major/Minor | Major1 | | Major2 | | Minor2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 24 | 0 | - | 0 | 94 | 24 |
| Stage 1 | - | - | - | - | 24 | - |
| Stage 2 | - | - | - | - | 70 | - |
| Critical Hdwy | 4.12 | - | - | - | 6.42 | 6.22 |
| Critical Hdwy Stg 1 | - | - | - | - | 5.42 | - |
| Critical Hdwy Stg 2 | - | - | - | - | 5.42 | - |
| Follow-up Hdwy | 2.218 | - | - | - | 3.518 | 3.318 |
| Pot Cap-1 Maneuver | 1591 | - | - | - | 906 | 1052 |
| Stage 1 | - | - | - | - | 999 | - |
| Stage 2 | - | - | - | - | 953 | - |
| Platoon blocked, % | | - | - | - | | |
| Mov Cap-1 Maneuver | 1591 | - | - | - | 899 | 1052 |
| Mov Cap-2 Maneuver | - | - | - | - | 899 | - |
| Stage 1 | - | - | - | - | 991 | - |
| Stage 2 | - | - | - | - | 953 | - |

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

| Minor Lane/Major Mvmt | EBL | EBT | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1591 | - | - | - | 1037 |
| HCM Lane V/C Ratio | 0.008 | - | - | - | 0.015 |
| HCM Control Delay (s) | 7.3 | 0 | - | - | 8.5 |
| HCM Lane LOS | A | A | - | - | A |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.6 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 14 | 15 | 560 | 9 | 18 | 605 |
| Future Vol, veh/h | 14 | 15 | 560 | 9 | 18 | 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 | - | - | 260 | 340 | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 78 | 78 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 18 | 19 | 602 | 10 | 19 | 651 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 966 | 301 | 0 | 0 | 612 | 0 |
| Stage 1 | 602 | - | - | - | - | - |
| Stage 2 | 364 | - | - | - | - | - |
| 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 | 252 | 695 | - | - | 963 | - |
| Stage 1 | 510 | - | - | - | - | - |
| Stage 2 | 673 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 247 | 695 | - | - | 963 | - |
| Mov Cap-2 Maneuver | 247 | - | - | - | - | - |
| Stage 1 | 510 | - | - | - | - | - |
| Stage 2 | 660 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 15.8 | 0 | 0.3 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 371 | 963 | - |
| HCM Lane V/C Ratio | - | - | 0.1 | 0.02 | - |
| HCM Control Delay (s) | - | - | 15.8 | 8.8 | - |
| HCM Lane LOS | - | - | C | A | - |
| HCM 95th %tile Q(veh) | - | - | 0.3 | 0.1 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.4 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 13 | 8 | 15 | 1 | 28 | 1 | 10 | 1 | 8 | 1 | 1 | 1 |
| Future Vol, veh/h | 13 | 8 | 15 | 1 | 28 | 1 | 10 | 1 | 8 | 1 | 1 | 1 |
| 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 | 19 | 1 | 36 | 1 | 13 | 1 | 10 | 1 | 1 | 1 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 37 | 0 | 0 | 29 | 0 | 0 | 94 | 93 | 20 | 98 | 102 | 37 |
| Stage 1 | - | - | - | - | - | - | 54 | 54 | - | 39 | 39 | - |
| Stage 2 | - | - | - | - | - | - | 40 | 39 | - | 59 | 63 | - |
| 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 | 1574 | - | - | 1584 | - | - | 889 | 797 | 1058 | 884 | 788 | 1035 |
| Stage 1 | - | - | - | - | - | - | 958 | 850 | - | 976 | 862 | - |
| Stage 2 | - | - | - | - | - | - | 975 | 862 | - | 953 | 842 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1574 | - | - | 1584 | - | - | 878 | 787 | 1058 | 866 | 779 | 1035 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 878 | 787 | - | 866 | 779 | - |
| Stage 1 | - | - | - | - | - | - | 947 | 841 | - | 965 | 861 | - |
| Stage 2 | - | - | - | - | - | - | 971 | 861 | - | 932 | 833 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 2.6 | 0.2 | 8.9 | 9.1 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 940 | 1574 | - | - | 1584 | - | - | 881 |
| HCM Lane V/C Ratio | 0.026 | 0.011 | - | - | 0.001 | - | - | 0.004 |
| HCM Control Delay (s) | 8.9 | 7.3 | 0 | - | 7.3 | 0 | - | 9.1 |
| HCM Lane LOS | A | A | A | - | A | A | - | A |
| HCM 95th %tile Q(veh) | 0.1 | 0 | - | - | 0 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.9 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 16 | 21 | 390 | 17 | 23 | 350 |
| Future Vol, veh/h | 16 | 21 | 390 | 17 | 23 | 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 | - | - | 260 | 340 | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 78 | 78 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 21 | 27 | 424 | 18 | 25 | 380 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 664 | 212 | 0 | 0 | 442 | 0 |
| Stage 1 | 424 | - | - | - | - | - |
| Stage 2 | 240 | - | - | - | - | - |
| 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 | 394 | 793 | - | - | 1114 | - |
| Stage 1 | 628 | - | - | - | - | - |
| Stage 2 | 777 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 385 | 793 | - | - | 1114 | - |
| Mov Cap-2 Maneuver | 385 | - | - | - | - | - |
| Stage 1 | 628 | - | - | - | - | - |
| Stage 2 | 760 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 12.2 | 0 | 0.5 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 544 | 1114 | - |
| HCM Lane V/C Ratio | - | - | 0.087 | 0.022 | - |
| HCM Control Delay (s) | - | - | 12.2 | 8.3 | - |
| HCM Lane LOS | - | - | B | A | - |
| HCM 95th %tile Q(veh) | - | - | 0.3 | 0.1 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.7 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ⇕ | | | ⇕ | | | ⇕ | | | ⇕ | |
| Traffic Vol, veh/h | 10 | 34 | 35 | 1 | 18 | 1 | 35 | 1 | 1 | 1 | 1 | 11 |
| Future Vol, veh/h | 10 | 34 | 35 | 1 | 18 | 1 | 35 | 1 | 1 | 1 | 1 | 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 | 83 | 83 | 83 | 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 | 12 | 41 | 42 | 1 | 23 | 1 | 45 | 1 | 1 | 1 | 1 | 14 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 24 | 0 | 0 | 83 | 0 | 0 | 119 | 112 | 62 | 113 | 133 | 24 |
| Stage 1 | - | - | - | - | - | - | 86 | 86 | - | 26 | 26 | - |
| Stage 2 | - | - | - | - | - | - | 33 | 26 | - | 87 | 107 | - |
| 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 | 1591 | - | - | 1514 | - | - | 857 | 778 | 1003 | 864 | 758 | 1052 |
| Stage 1 | - | - | - | - | - | - | 922 | 824 | - | 992 | 874 | - |
| Stage 2 | - | - | - | - | - | - | 983 | 874 | - | 921 | 807 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1591 | - | - | 1514 | - | - | 839 | 771 | 1003 | 856 | 751 | 1052 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 839 | 771 | - | 856 | 751 | - |
| Stage 1 | - | - | - | - | - | - | 915 | 817 | - | 984 | 873 | - |
| Stage 2 | - | - | - | - | - | - | 967 | 873 | - | 911 | 801 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.9 | 0.4 | 9.5 | 8.7 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 841 | 1591 | - | - | 1514 | - | - | 1003 |
| HCM Lane V/C Ratio | 0.056 | 0.008 | - | - | 0.001 | - | - | 0.017 |
| HCM Control Delay (s) | 9.5 | 7.3 | 0 | - | 7.4 | 0 | - | 8.7 |
| HCM Lane LOS | A | A | A | - | A | A | - | A |
| HCM 95th %tile Q(veh) | 0.2 | 0 | - | - | 0 | - | - | 0.1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.2 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 26 | 38 | 560 | 27 | 36 | 605 |
| Future Vol, veh/h | 26 | 38 | 560 | 27 | 36 | 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 | - | - | 260 | 340 | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 78 | 78 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 33 | 49 | 602 | 29 | 39 | 651 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1006 | 301 | 0 | 0 | 631 | 0 |
| Stage 1 | 602 | - | - | - | - | - |
| Stage 2 | 404 | - | - | - | - | - |
| 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 | 238 | 695 | - | - | 947 | - |
| Stage 1 | 510 | - | - | - | - | - |
| Stage 2 | 643 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 228 | 695 | - | - | 947 | - |
| Mov Cap-2 Maneuver | 228 | - | - | - | - | - |
| Stage 1 | 510 | - | - | - | - | - |
| Stage 2 | 617 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 17.1 | 0 | 0.5 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 379 | 947 | - |
| HCM Lane V/C Ratio | - | - | 0.216 | 0.041 | - |
| HCM Control Delay (s) | - | - | 17.1 | 9 | - |
| HCM Lane LOS | - | - | C | A | - |
| HCM 95th %tile Q(veh) | - | - | 0.8 | 0.1 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 3.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ⇕ | | | ⇕ | | | ⇕ | | | ⇕ | |
| Traffic Vol, veh/h | 13 | 8 | 32 | 1 | 28 | 1 | 16 | 1 | 1 | 1 | 1 | 8 |
| Future Vol, veh/h | 13 | 8 | 32 | 1 | 28 | 1 | 16 | 1 | 1 | 1 | 1 | 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 | 83 | 83 | 83 | 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 | 16 | 10 | 39 | 1 | 36 | 1 | 21 | 1 | 1 | 1 | 1 | 10 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 37 | 0 | 0 | 49 | 0 | 0 | 106 | 101 | 30 | 102 | 120 | 37 |
| Stage 1 | - | - | - | - | - | - | 62 | 62 | - | 39 | 39 | - |
| Stage 2 | - | - | - | - | - | - | 44 | 39 | - | 63 | 81 | - |
| 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 | 1574 | - | - | 1558 | - | - | 873 | 789 | 1044 | 879 | 770 | 1035 |
| Stage 1 | - | - | - | - | - | - | 949 | 843 | - | 976 | 862 | - |
| Stage 2 | - | - | - | - | - | - | 970 | 862 | - | 948 | 828 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1574 | - | - | 1558 | - | - | 856 | 780 | 1044 | 869 | 762 | 1035 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 856 | 780 | - | 869 | 762 | - |
| Stage 1 | - | - | - | - | - | - | 940 | 835 | - | 966 | 861 | - |
| Stage 2 | - | - | - | - | - | - | 958 | 861 | - | 936 | 820 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 1.8 | 0.2 | 9.3 | 8.7 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 860 | 1574 | - | - | 1558 | - | - | 981 |
| HCM Lane V/C Ratio | 0.027 | 0.01 | - | - | 0.001 | - | - | 0.013 |
| HCM Control Delay (s) | 9.3 | 7.3 | 0 | - | 7.3 | 0 | - | 8.7 |
| HCM Lane LOS | A | A | A | - | A | A | - | A |
| HCM 95th %tile Q(veh) | 0.1 | 0 | - | - | 0 | - | - | 0 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 19 | 24 | 390 | 26 | 29 | 350 |
| Future Vol, veh/h | 19 | 24 | 390 | 26 | 29 | 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 | - | - | 260 | 340 | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 78 | 78 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 24 | 31 | 419 | 28 | 31 | 376 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 669 | 210 | 0 | 0 | 447 | 0 |
| Stage 1 | 419 | - | - | - | - | - |
| Stage 2 | 250 | - | - | - | - | - |
| 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 | 391 | 796 | - | - | 1110 | - |
| Stage 1 | 632 | - | - | - | - | - |
| Stage 2 | 768 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 380 | 796 | - | - | 1110 | - |
| Mov Cap-2 Maneuver | 380 | - | - | - | - | - |
| Stage 1 | 632 | - | - | - | - | - |
| Stage 2 | 746 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 12.5 | 0 | 0.6 |
| HCM LOS | B | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 536 | 1110 | - |
| HCM Lane V/C Ratio | - | - | 0.103 | 0.028 | - |
| HCM Control Delay (s) | - | - | 12.5 | 8.3 | - |
| HCM Lane LOS | - | - | B | A | - |
| HCM 95th %tile Q(veh) | - | - | 0.3 | 0.1 | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 4.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ⇕ | | | ⇕ | | | ⇕ | | | ⇕ | |
| Traffic Vol, veh/h | 10 | 34 | 47 | 1 | 18 | 1 | 53 | 1 | 1 | 1 | 1 | 11 |
| Future Vol, veh/h | 10 | 34 | 47 | 1 | 18 | 1 | 53 | 1 | 1 | 1 | 1 | 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 | 83 | 83 | 83 | 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 | 12 | 41 | 57 | 1 | 23 | 1 | 68 | 1 | 1 | 1 | 1 | 14 |

| Major/Minor | Major1 | | | Major2 | | | Minor1 | | | Minor2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 24 | 0 | 0 | 98 | 0 | 0 | 127 | 120 | 70 | 121 | 148 | 24 |
| Stage 1 | - | - | - | - | - | - | 94 | 94 | - | 26 | 26 | - |
| Stage 2 | - | - | - | - | - | - | 33 | 26 | - | 95 | 122 | - |
| 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 | 1591 | - | - | 1495 | - | - | 846 | 770 | 993 | 854 | 743 | 1052 |
| Stage 1 | - | - | - | - | - | - | 913 | 817 | - | 992 | 874 | - |
| Stage 2 | - | - | - | - | - | - | 983 | 874 | - | 912 | 795 | - |
| Platoon blocked, % | | - | - | | - | - | | | | | | |
| Mov Cap-1 Maneuver | 1591 | - | - | 1495 | - | - | 828 | 763 | 993 | 846 | 736 | 1052 |
| Mov Cap-2 Maneuver | - | - | - | - | - | - | 828 | 763 | - | 846 | 736 | - |
| Stage 1 | - | - | - | - | - | - | 906 | 810 | - | 984 | 873 | - |
| Stage 2 | - | - | - | - | - | - | 967 | 873 | - | 902 | 789 | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0.8 | 0.4 | 9.7 | 8.7 |
| HCM LOS | | | A | A |

| Minor Lane/Major Mvmt | NBLn1 | EBL | EBT | EBR | WBL | WBT | WBR | SBLn1 |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 829 | 1591 | - | - | 1495 | - | - | 1000 |
| HCM Lane V/C Ratio | 0.085 | 0.008 | - | - | 0.001 | - | - | 0.017 |
| HCM Control Delay (s) | 9.7 | 7.3 | 0 | - | 7.4 | 0 | - | 8.7 |
| HCM Lane LOS | A | A | A | - | A | A | - | A |
| HCM 95th %tile Q(veh) | 0.3 | 0 | - | - | 0 | - | - | 0.1 |

| Intersection | |
|---|---|
| Int Delay, s/veh | 1.7 |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 36 | 45 | 560 | 34 | 40 | 605 |
| Future Vol, veh/h | 36 | 45 | 560 | 34 | 40 | 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 | - | - | 260 | 340 | - |
| Veh in Median Storage, # | 0 | - | 0 | - | - | 0 |
| Grade, % | 0 | - | 0 | - | - | 0 |
| Peak Hour Factor | 78 | 78 | 93 | 93 | 93 | 93 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 46 | 58 | 602 | 37 | 43 | 651 |

| Major/Minor | Minor1 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1014 | 301 | 0 | 0 | 639 | 0 |
| Stage 1 | 602 | - | - | - | - | - |
| Stage 2 | 412 | - | - | - | - | - |
| 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 | 235 | 695 | - | - | 941 | - |
| Stage 1 | 510 | - | - | - | - | - |
| Stage 2 | 637 | - | - | - | - | - |
| Platoon blocked, % | | | - | - | | - |
| Mov Cap-1 Maneuver | 224 | 695 | - | - | 941 | - |
| Mov Cap-2 Maneuver | 224 | - | - | - | - | - |
| Stage 1 | 510 | - | - | - | - | - |
| Stage 2 | 608 | - | - | - | - | - |

| Approach | WB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 19.1 | 0 | 0.6 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBT | NBR | WBLn1 | SBL | SBT |
|---|---|---|---|---|---|
| Capacity (veh/h) | - | - | 359 | 941 | - |
| HCM Lane V/C Ratio | - | - | 0.289 | 0.046 | - |
| HCM Control Delay (s) | - | - | 19.1 | 9 | - |
| HCM Lane LOS | - | - | C | A | - |
| HCM 95th %tile Q(veh) | - | - | 1.2 | 0.1 | - |

# Appendix A

TRANSPORTATION
CONSULTANTS, INC.

# Appendix A - Intersection Sight Distance Calculations

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

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

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

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

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

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

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

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

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

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

Also, on page 9-44,

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

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

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

**Sight Distance to the south**

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

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

**Sight Distance to the north**

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

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

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

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

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