

# V1\_Traffic Impact Study\_comments.pdf Markup Summary

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# TRAFFIC IMPACT STUDY

## ELK VIEW ESTATES

El Paso County, CO

PREPARED FOR:  
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DATE:  
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REVISED: August 5, 2025

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in updated TIS

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- B. LOS Descriptions
- C. Traffic Counts
- D. Existing Synchro Outputs
- E. Future (with site development) Synchro Outputs

## **Executive Summary**

### **Site Location and Study Area**

The property that comprises the application area for the proposed development is approximately 17.1 acres in size and is identified as El Paso County Parcel Number 6223000044. It is located north of Old Ranch Road and east of Studebaker Street in Colorado Springs, CO. It is currently zoned Residential Rural – 5 acres and vacant. The proposed development seeks to rezone the parcel from Residential Rural – 5 acres (RR-5) to Residential Rural – 2.5 acres (RR-2.5).

### **Description of Proposed Development**

The Applicant, Elk Ridge Developments, LLC, seeks to rezone the property from RR-5 to RR-2.5 and subdivide the property to develop into six (6) residential lots for single family detached housing uses. Site access is proposed via one new full movement access on Old Ranch Road along the eastern boundary of the site.

## **Conclusions and Recommendations**

### **Conclusions**

Based on the results of this traffic impact study, the following may be concluded:

- Under existing traffic conditions, the unsignalized movements for the intersection of Old Ranch Road/Studebaker Street currently operate at levels of service (LOS) “A” in the weekday AM and PM peak hours and no queuing related concerns are currently present in the study area.
- The proposed site development would generate, upon completion and full occupancy, 6 new weekday AM and 6 new weekday PM peak hour vehicle trips as well as 57 new weekday daily trips.
- Under both short and long term total future traffic conditions, with the development of the subject site, the movements for the unsignalized intersections within the study area, including the proposed site access, are forecasted to operate at LOS “B” or better in the weekday AM and PM peak hours and no queuing related concerns were identified.

### **Recommendations**

- It is recommended that the Applicant provide access consistent with the site plan contained herein.

## I. Introduction

### Overview

This report presents the results of a Traffic Impact Study (TIS) conducted in support of a rezoning / map amendment application to develop residential uses in El Paso County, CO. Currently the site is vacant.

Per the requirements of the El Paso County, a Transportation Impact Study is required to support the proposed rezoning.

### Site Location and Study Area

The property that comprises the application area for the proposed development is approximately 17.1 acres in size and is identified as El Paso County Parcel Number 6223000044. It is located north of Old Ranch Road and east of Studebaker Street in Colorado Springs, CO, as shown on Figure 1-1. It is currently zoned RR-5 and vacant. The proposed development seeks to rezone the parcel from RR-5 to RR-2.5. Site access is proposed via one new full movement access on Old Ranch Road along the eastern boundary of the site. Old Ranch Road is owned and maintained by the City.

The Applicant, Elk Ridge Developments, LLC, seeks to rezone and subdivide the property to develop six (6) single family detached housing uses. A reduction of the Applicant's proposed conceptual site plan is provided on Figure 1-2. A full-size copy of the plan is provided in Appendix A.

Tasks undertaken in the course of this study included the following:

1. Reviewed the Applicant's proposed development plans and other background data.
2. Conducted a virtual field reconnaissance of existing roadway and intersection geometries, traffic controls, and speed limits.
3. Collected weekday AM and PM peak hour turning movement counts at the key intersection.
4. Analyzed existing levels of service at each of the key study intersections based on the methodologies set forth in the Highway Capacity Guidelines (HCM) 7<sup>th</sup> Edition as reported by Synchro version 12.
5. Estimated the number of AM and PM peak hour trips that would be generated by the proposed use based on the Institute of Transportation Engineers (ITE) Trip Generation 11<sup>th</sup> Edition rates/equations and methodologies.
6. Prepared AM and PM peak hour total future traffic forecasts based on existing volumes plus site traffic assignments for the build-out conditions.
7. Calculated total future levels of service for each of the key study intersections based on projected total future traffic forecasts, total future traffic controls and intersection geometries.
8. Identified roadway improvements required to accommodate future traffic volumes as necessary.

Sources of data for this analysis included the Institute of Transportation Engineers (ITE), Trip Generation, 11th edition, the Highway Capacity Guidelines (HCM) 7<sup>th</sup>, Synchro 12, Pikes Peak Area Council of Governments (PPACG), Elk Ridge Developments, LLC, El Paso County, Colorado and the files/library of Galloway.

## Site Description and Access

### **Site Conditions**

The terrain proximate to and surrounding the site is generally classified as “level”.

### **Hazardous Conditions**

Based on the field reconnaissance in the vicinity of the subject site, no hazardous features or constraints were identified.

### **Proposed Site Access**

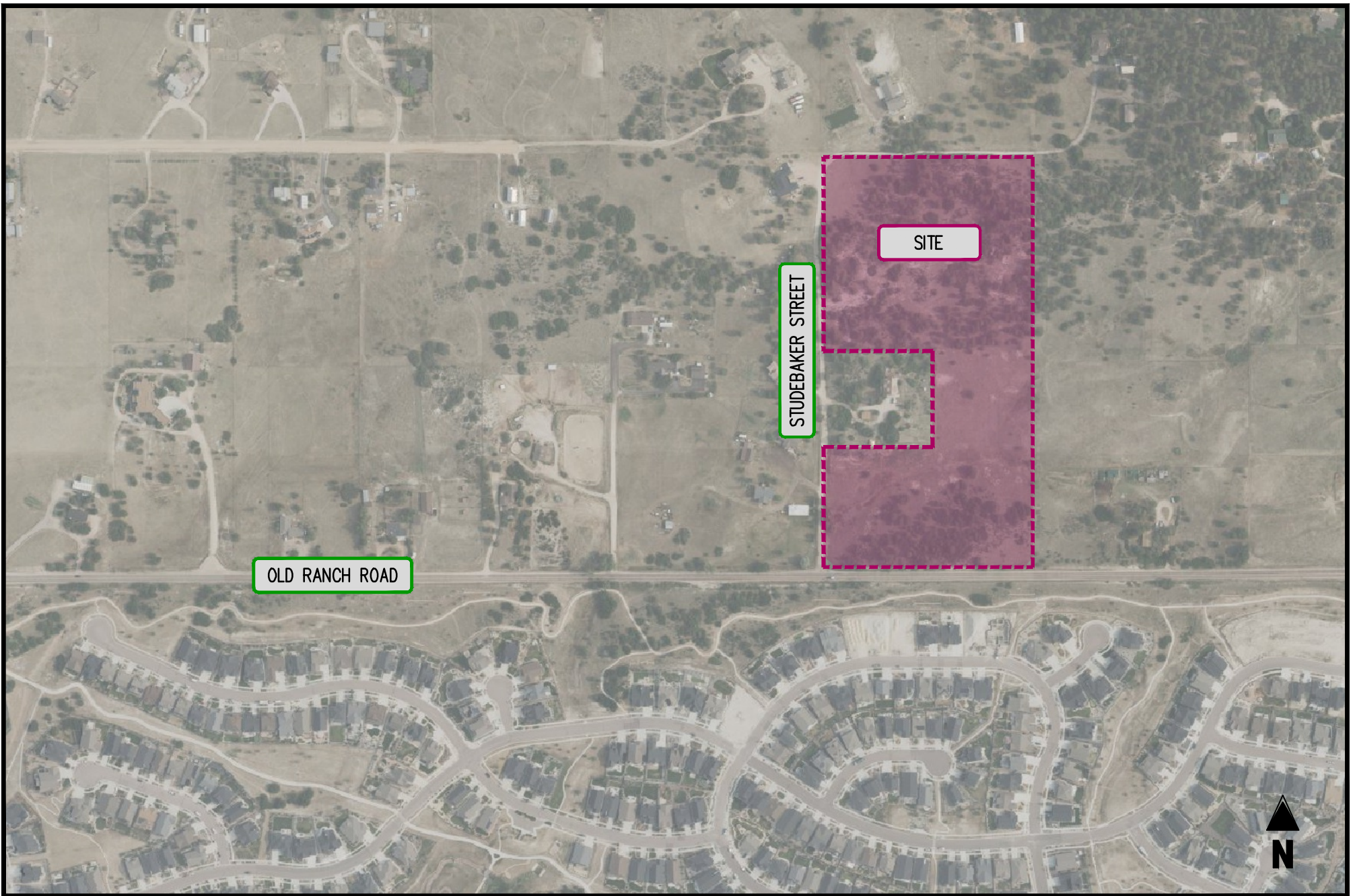
Access to the site is proposed via one new full movement access on Old Ranch Road along the eastern boundary of the site.

### **Existing Zoning**

The subject site is currently zoned RR-5 and vacant. The proposed development seeks to rezone the parcel from RR-5 to RR-2.5. Figure 1-3 depicts the existing zoning associated with the subject property, as well as neighboring properties as shown on the El Paso County zoning map.

### **Nearby Uses**

The properties surrounding the subject site are generally developed with residential uses.

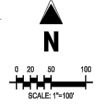
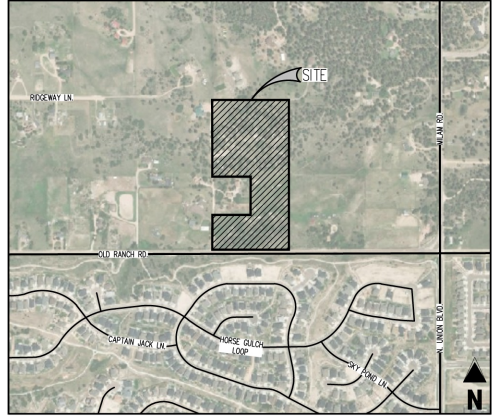
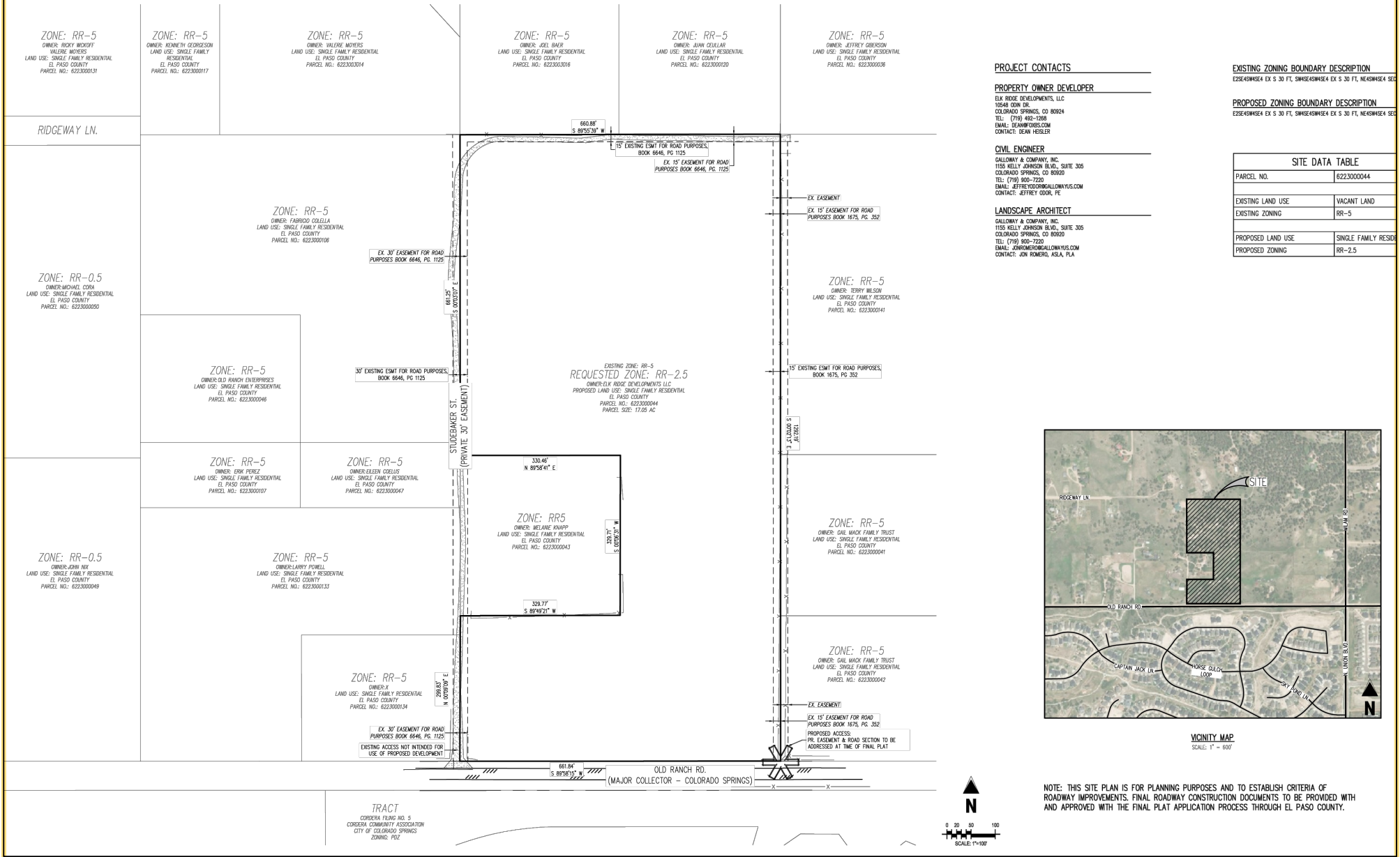


**FIGURE 1-1**  
**SITE LOCATION**



# MAP AMENDMENT (REZONE)

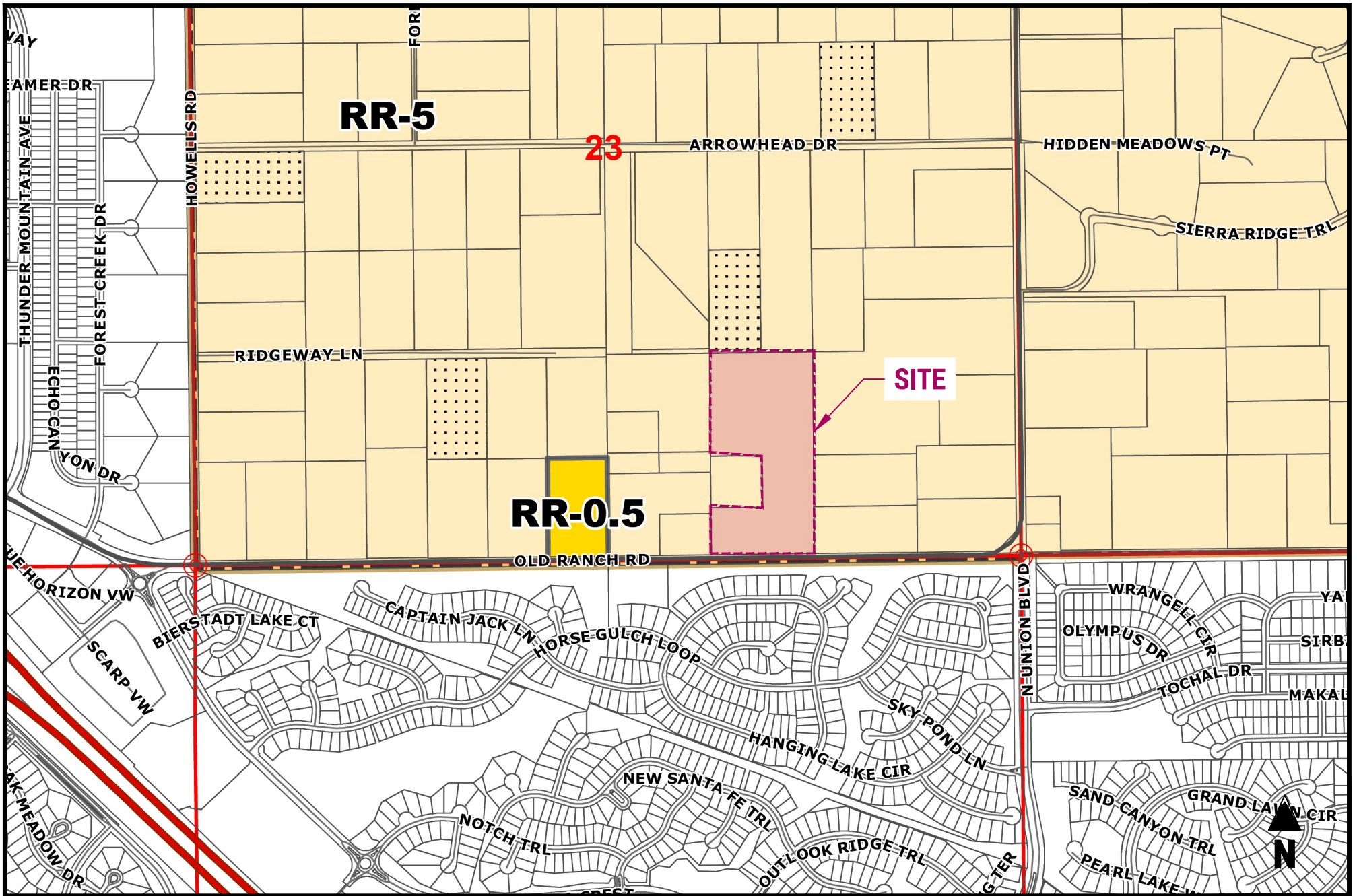
AUGUST 7, 2025



**FIGURE 1-2  
SITE PLAN**

ELK VIEW ESTATES  
EL PASO COUNTY, CO





**FIGURE 1-3**  
**EXISTING ZONING**



## II. Background Information

### Study Area

The study area was determined by a review of intersections that would experience a significant portion of turning movement volumes generated by the site. As such, the traffic study focuses primarily on the following intersections:

#### **Study Intersections**

- Proposed Site Access
- Old Ranch Road/Studebaker Street

### Study Methodology

Synchro software version 12 was used to evaluate levels of service at each of the study intersections during the weekday AM and PM peak hours. Synchro is a macroscopic model used for optimizing traffic signal timing and performing capacity analyses. The software can model existing traffic signal timings or optimize splits, offsets, and cycle lengths for individual intersections, an arterial, or a complete network. Synchro allows the user to evaluate the effects of changing intersection geometrics, traffic demands, traffic control, and/or traffic signal settings as well as optimize traffic signal timings.

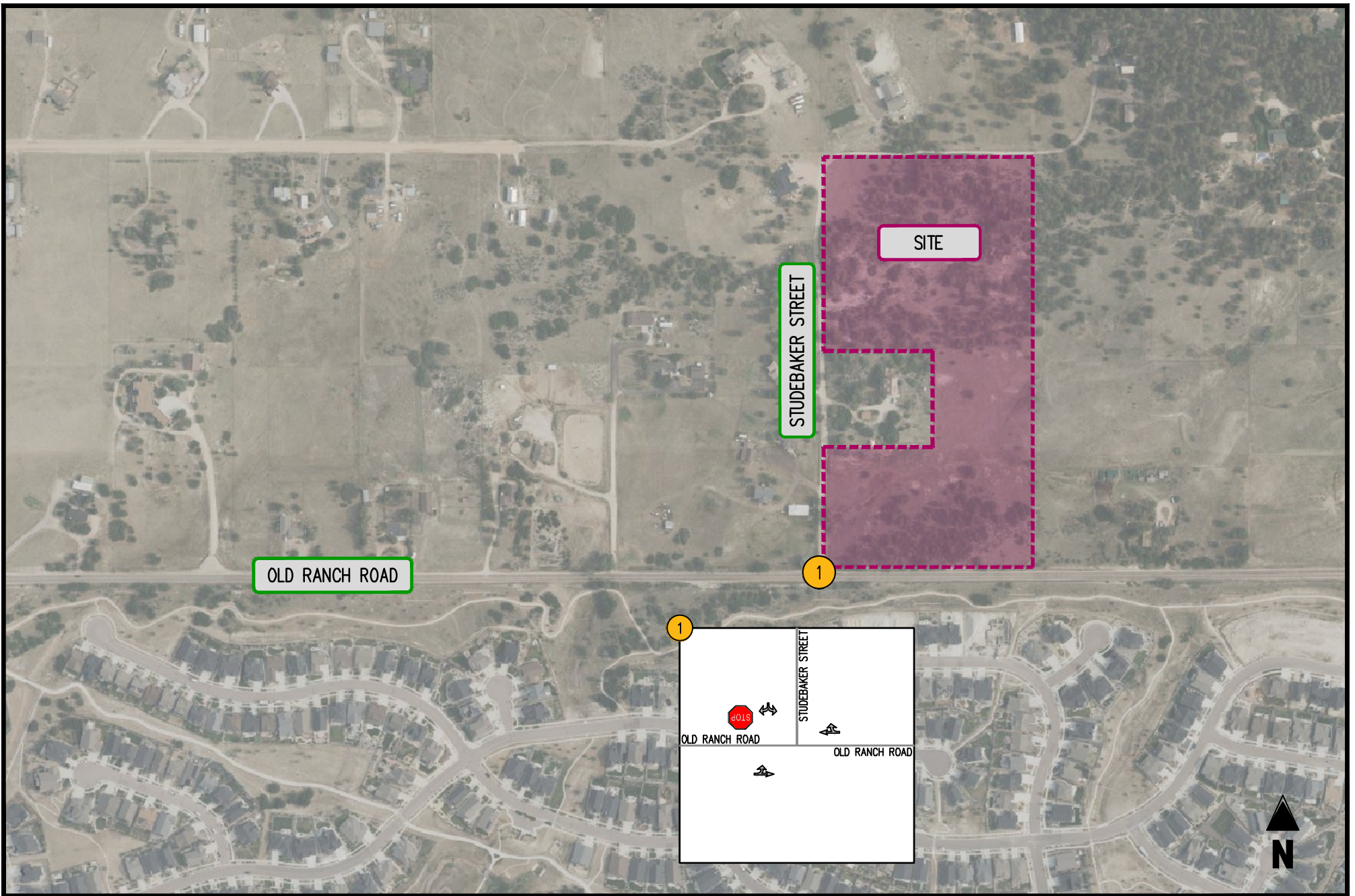
The levels of service reported for the signalized and unsignalized intersections analyzed were taken from the Highway Capacity Manual (HCM) 7<sup>th</sup> reports as generated by Synchro. Level of service descriptions are included in Appendix B. A default percent heavy vehicle (%HV) factor of 2% was used for all movements in the study area.

### Existing Roadway Network

Access to the subject site is provided by Old Ranch Road. Figure 2-1 depicts existing lane use and traffic controls in the vicinity of the subject site. The following provides a description of each of the roadways within the study network.

#### **Old Ranch Road**

Old Ranch Road is constructed as an east/west undivided two-lane section with a posted speed limit of 45 mph in the vicinity of the subject site. The City classifies the roadway as Industrial/Major Collector.



**FIGURE 2-1**  
**EXISTING LANE USE & TRAFFIC CONTROL**

- ← MOVEMENT
- 🚦 SIGNALIZED INTERSECTION
- 🛑 STOP SIGN
- 🚧 YIELD SIGN



### **III. Analysis of Existing Conditions**

#### **Traffic Volumes**

Weekday AM and PM peak hour traffic volumes counts were conducted on Wednesday April 16, 2025 from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM at the study intersections by IDAX Data Solutions.

The existing volumes are summarized on Figure 3-1. Copies of traffic counts are included in Appendix C. Existing peak hour factors (PHF) were also computed by approach from the traffic counts and applied to the analysis with a minimum of 0.85 and a maximum of 0.92.

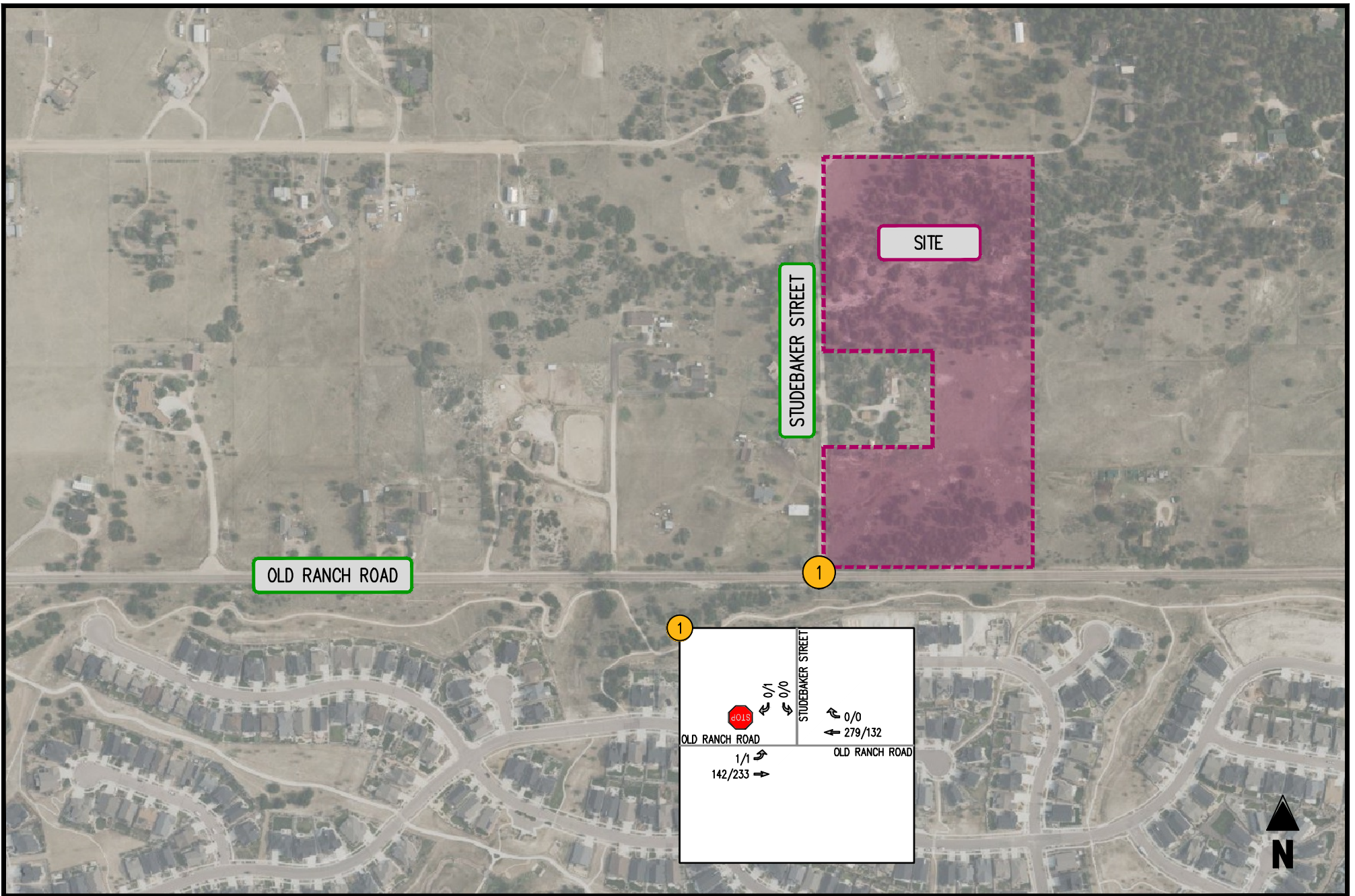
#### **Operational Analysis**

Capacity/level of service (LOS) analyses were conducted at the study intersections based on the existing lane use and traffic controls shown on Figure 2-1 and existing baseline vehicular traffic volumes shown on Figure 3-1. The capacity analysis results are presented in Appendix D and summarized in Table 3-1 and on Figure 3-2.

As shown in Table 3-1, the unsignalized movements for the intersection of Old Ranch Road/Studebaker Street currently operate at overall level of service (LOS) "A" during the weekday AM and PM peak hours.

#### **Existing Intersection Queues**

An analysis of intersection 95<sup>th</sup>-percentile queues was performed at key locations. The results of the queuing analysis, as reported by Synchro, are summarized in Table 3-2. As shown in the table, no queuing related concerns are currently present in the study area.



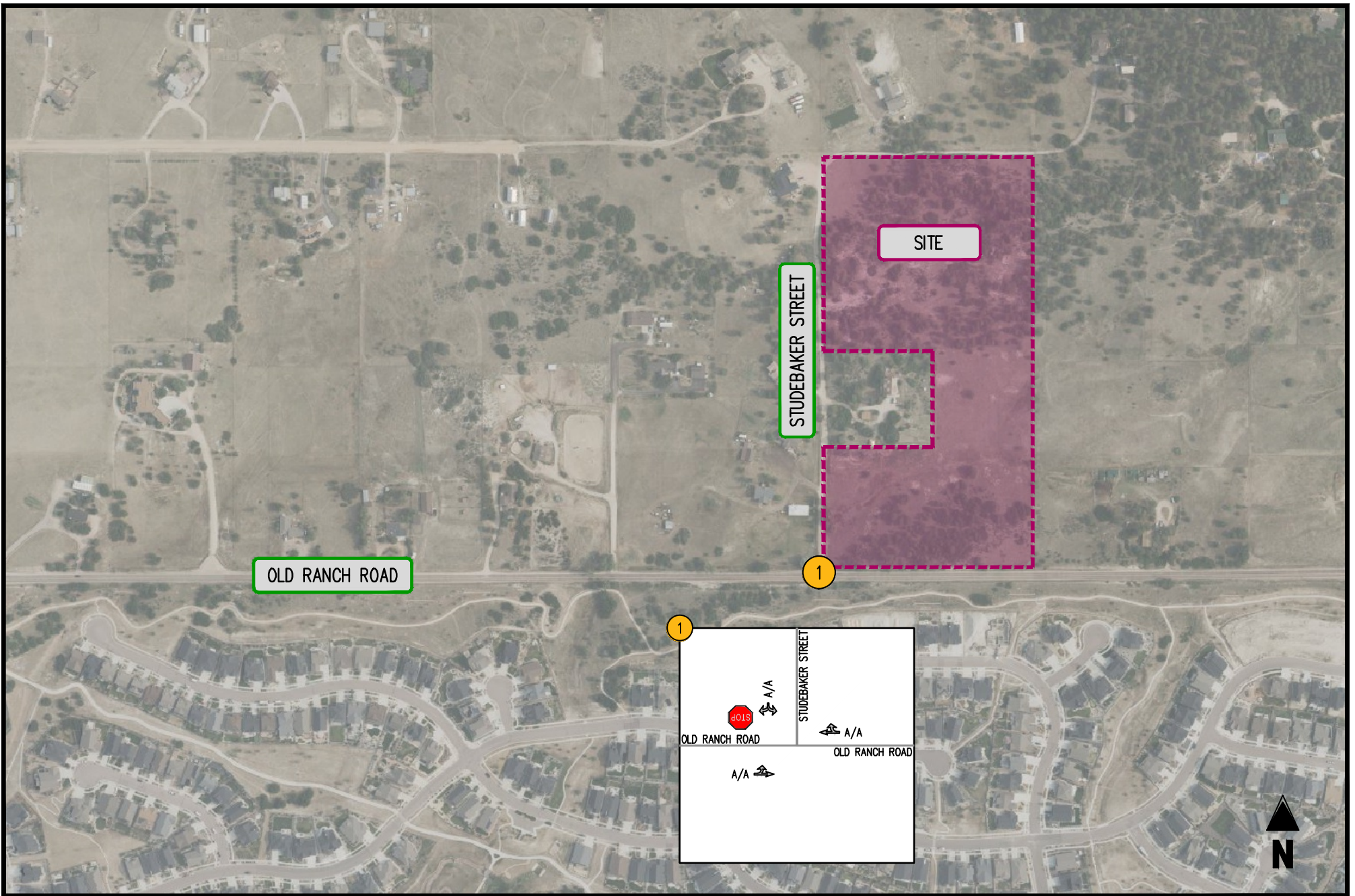
**FIGURE 3-1**  
**EXISTING VOLUMES**

ELK VIEW ESTATES  
EL PASO COUNTY, CO

0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

- ← MOVEMENT
- 🚦 SIGNALIZED INTERSECTION
- 🛑 STOP SIGN
- 🚧 YIELD SIGN





**FIGURE 3-2**  
**EXISTING LEVELS OF SERVICE**

ELK VIEW ESTATES  
 EL PASO COUNTY, CO

0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

- ← MOVEMENT
- 🚦 SIGNALIZED INTERSECTION
- 🛑 STOP SIGN
- 🚧 YIELD SIGN



Table 3-1  
 Elk View Estates - El Paso County, CO  
 Existing Intersection Level of Service Summary (1)

Intersection	Operating Condition	Street Name	Approach/Movement	Existing	
				AM Peak Hour	PM Peak Hour
1 Old Ranch Road/Studebaker Street	STOP	Old Ranch Road	EBLT	A [7.9]	A [7.5]
		Old Ranch Road	WBTR	A [0.0]	A [0.0]
		Studebaker Street	SBLR	A [0.0]	A [9.0]

Notes (1) Numbers in brackets [] represent delay at unsignalized intersections in seconds per vehicle.

Table 3-2  
 Elk View Estates - El Paso County, CO  
 Existing Intersection Queueing Summary (1)

Intersection	Operating Condition	Street Name	Approach/Movement	Available Storage	Existing	
					AM Peak Hour	PM Peak Hour
1 Old Ranch Road/Studebaker Street	STOP	Old Ranch Road	EBLT	-	0	0
		Old Ranch Road	WBTR	-	0	0
		Studebaker Street	SBLR	-	0	0

Notes : (1) Queue length, in feet, is based on the 95th percentile queue as reported by Synchro, Version 12.

## IV. Site Analysis

### Overview

The Applicant is proposing develop the approximately 17.1 acre site with residential uses. The following use and development program was analyzed:

6 DU Single Family Detached Housing

### Proposed Site Access

As shown on the Applicant's conceptual plan (Figure 1-2), access to the development is being proposed via one new full movement access on Old Ranch Road along the eastern boundary of the site. Proposed future lane use and traffic control is shown on Figure 4-1. Section 2.3.G, Table 2-21 of the El Paso County Engineering Criteria Manual was referenced to determine site distance triangles for the new proposed access location and further detailed in an exhibit provided in Appendix A.

Did not see site distance triangles in Appendix A. Please provide

Site distance triangles provided in updated site plan of the updated TIS

### Trip Generation

#### **Overview**

Trip generation estimates for the weekday AM and PM peak hours, as well as the weekday average daily traffic (ADT), were derived from the standard Institute of Transportation Engineers (ITE) Trip Generation Manual rates/equations, as published in the 11<sup>th</sup> edition. The trip generation analysis is presented in Table 4-1.

#### **Site Trips**

The vehicle trips that would be generated by the proposed development plan are summarized in Table 5-1. As shown in Table 4-1, the site would generate upon completion and full occupancy 6 new weekday AM and 6 new weekday PM peak hour vehicle trips, as well as 57 new weekday daily trips.

#### **Site Trip Distributions**

The distribution of the anticipated trips generated by the completion of the proposed development was based on an examination of existing traffic counts and local knowledge. Existing travel patterns indicate the following distribution is appropriate in the forecasting of future site traffic:

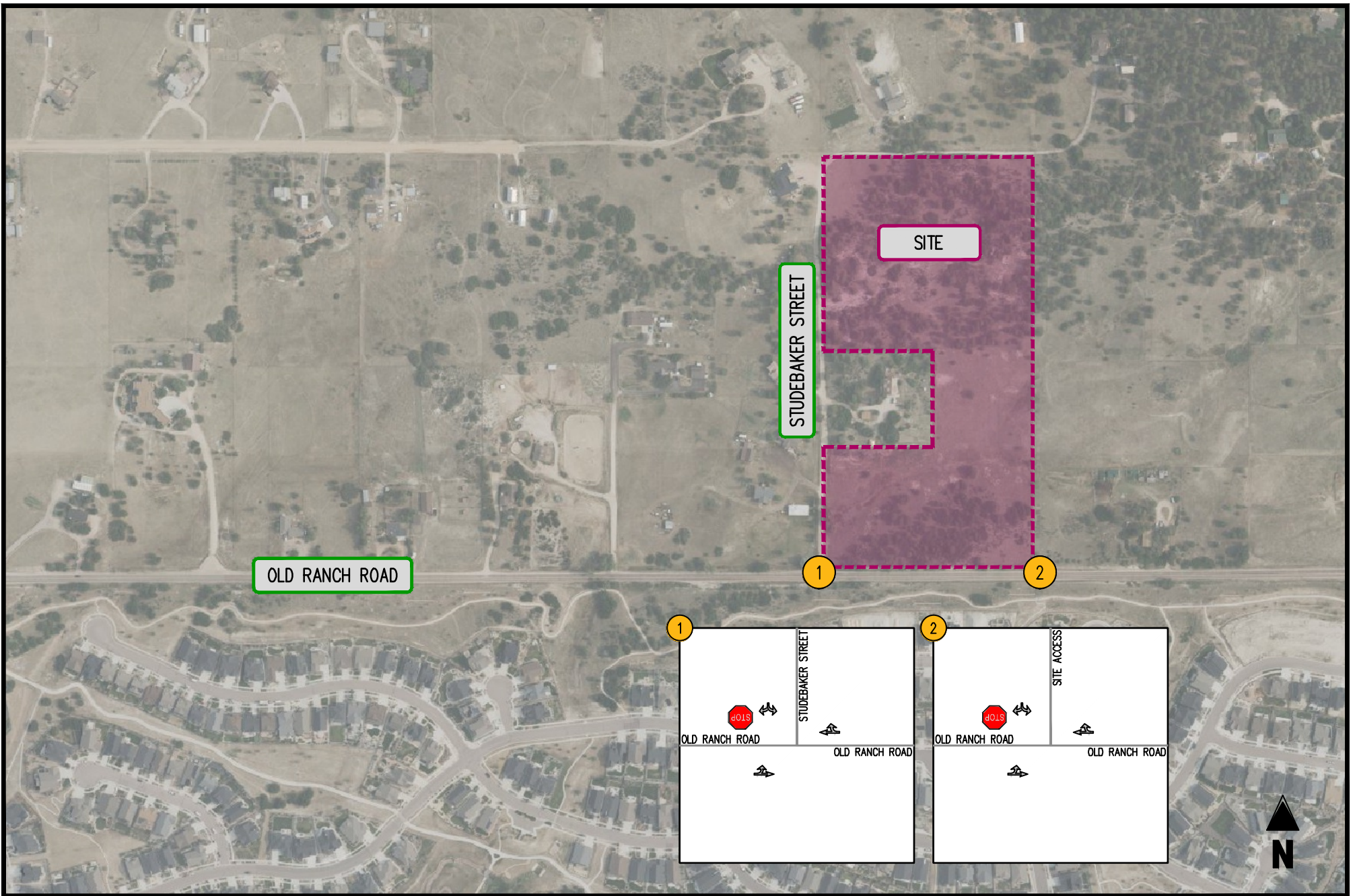
- To/from the west on Old Ranch Road: 50%
- To/from the east on Old Ranch Road: 50%

The assignment of the new vehicle trips generated upon the future build-out of the development project was based on the above distribution, which are shown on Figure 4-2.

It is anticipated that with the current design, the proposed access location would meet spacing criteria as provided in ECM 2.4.1.B. Verification will be provided in future land use applications along with analysis of future internal roadways.

Please provide verification as this is the final land use application.

Verification provided in updated TIS

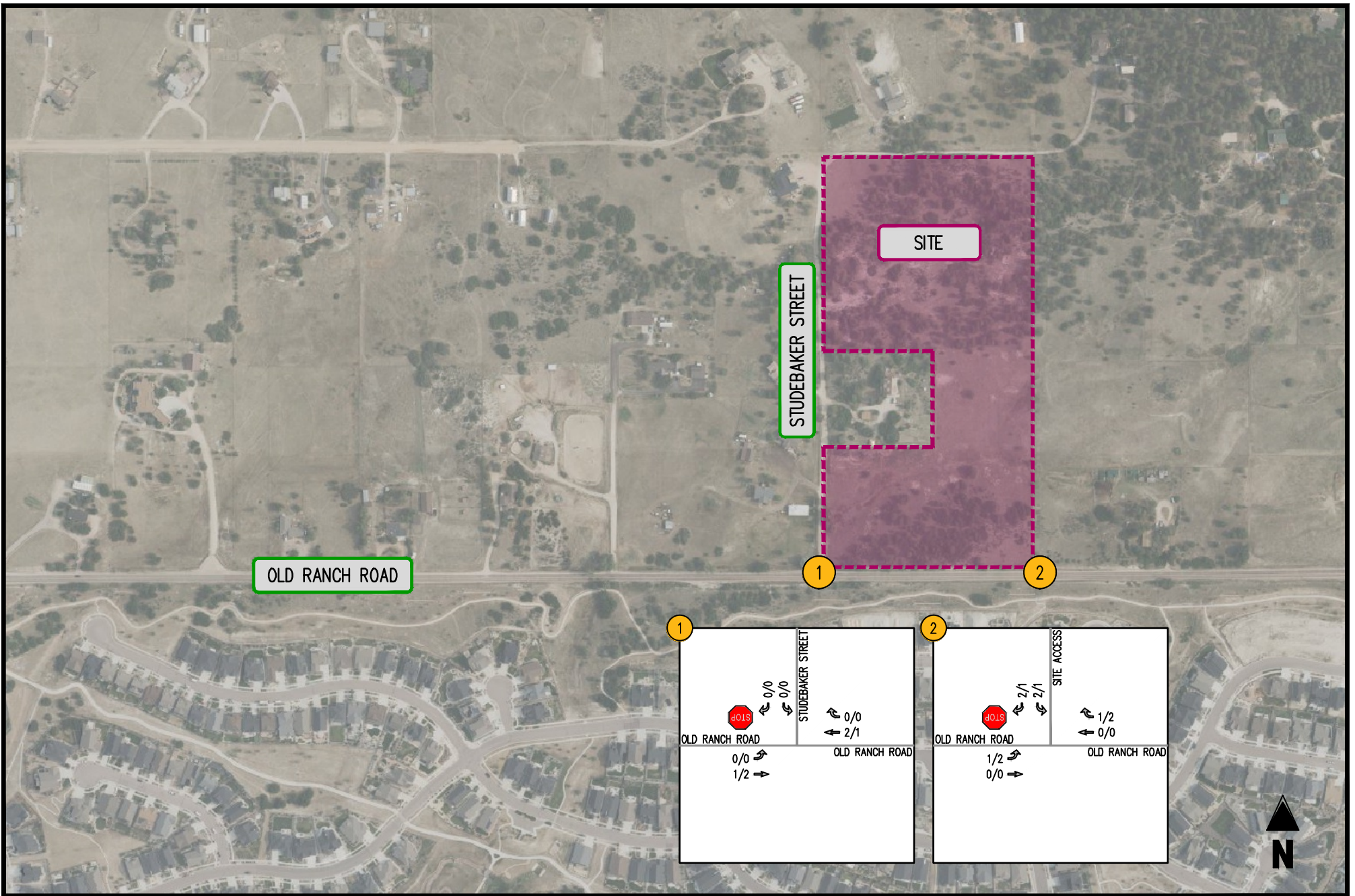


**FIGURE 4-1  
FUTURE LANE USE & TRAFFIC CONTROL**

ELK VIEW ESTATES  
EL PASO COUNTY, CO

- ← MOVEMENT
- 🚦 SIGNALIZED INTERSECTION
- 🛑 STOP SIGN
- 🚧 YIELD SIGN





**FIGURE 4-2**  
**SITE TRIPS**

ELK VIEW ESTATES  
EL PASO COUNTY, CO

0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

- ← MOVEMENT
- SIGNALIZED INTERSECTION
- STOP SIGN
- YIELD SIGN



Table 4-1

Elk View Estates  
Site Trip Generation

Land Use	Land Use Code	Amount	Units	AM Peak Hour			PM Peak Hour			Average Daily Trips
				In	Out	Total	In	Out	Total	
<i>Proposed<sup>(1)</sup></i>										
Single-Family Detached Housing	210	6	DU	2	4	6	4	2	6	57

Note(s):

(1) Trip generation based on the Institute of Transportation Engineers' Trip Generation Manual, 11th Edition

## **V. Analysis of Future Conditions with Site Development**

### **Short Term (2026) Future Traffic Forecasts**

The future traffic forecasts associated with the proposed development were developed by combining the existing volumes shown on Figure 3-1 and the site trips shown on Figure 4-2. The resulting future traffic forecasts are provided on Figure 5-1.

### **Short Term (2026) Future Levels of Service with Proposed Development**

Future levels of service with the proposed development plan were estimated at study intersections based on the future traffic volumes shown on Figures 5-1, the total future lane use on Figure 4-1, and the HCM 7<sup>th</sup> methodologies for unsignalized intersections. The results of these analyses are provided in Appendix E and presented in Table 5-1. The future levels of service are also presented graphically on Figure 5-2.

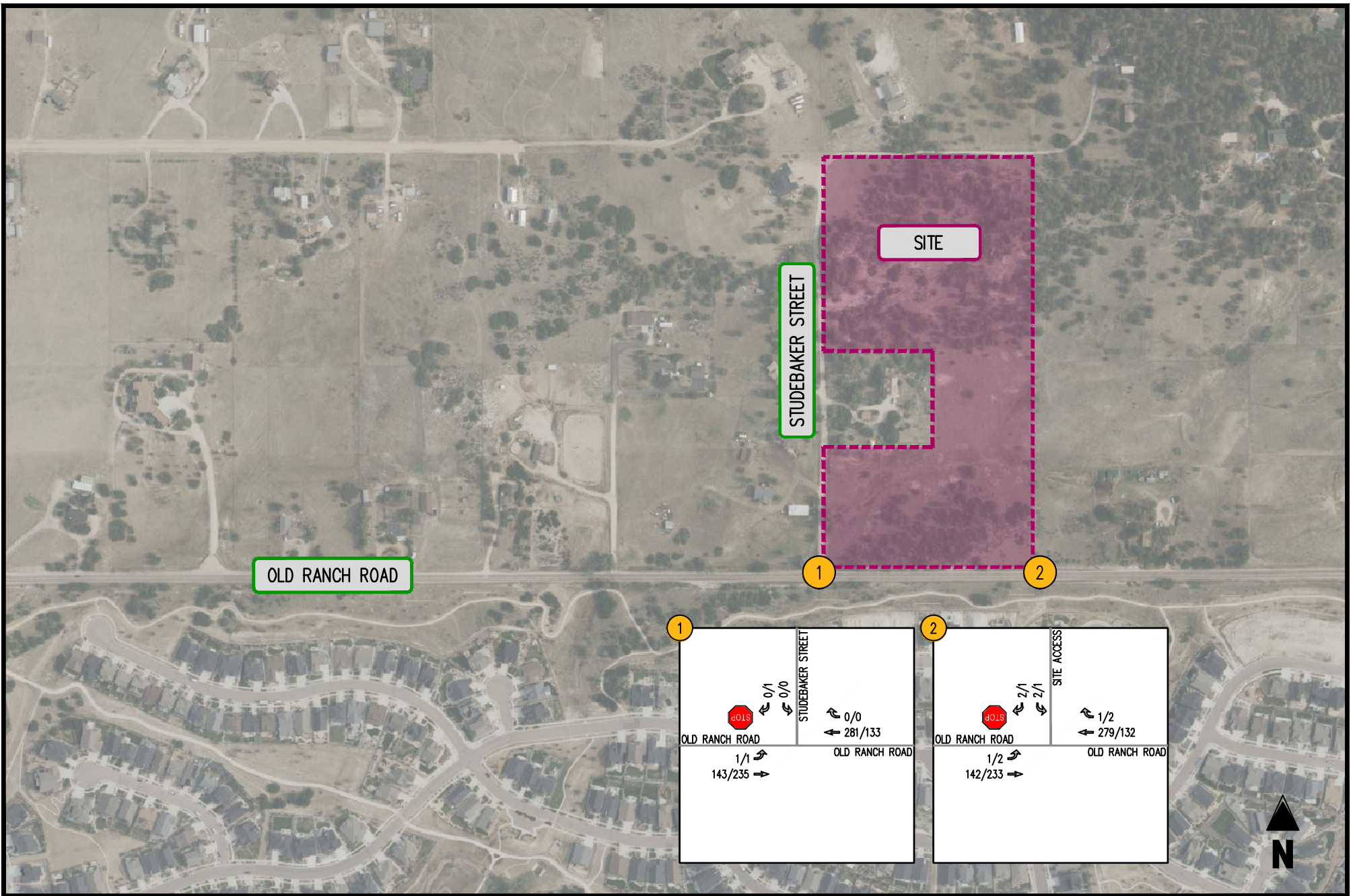
As shown in Table 5-1, under future traffic conditions, with the development of the subject site, the movements for the unsignalized intersections within the study area, including the proposed site access, are forecasted to operate at LOS "B" or better in the weekday AM and PM peak hours.

### **Short Term (2026) Future Queuing**

Total future queues were forecasted using Synchro software. The results of the queuing analysis are summarized in Table 5-2. As shown in Table 5-2, no queuing related concerns in the study area were identified.

### **Long Term (2046) Analysis**




No adjacent developments were identified in the vicinity of the subject site. The traffic data provided via the Pikes Peak Area Council of Governments (PPACG), suggest a decrease in growth along Old Ranch Road in the vicinity of the subject site. Considering these factors, along with the proposed trip generation for the site, no significant change is expected between short term and long term analysis.



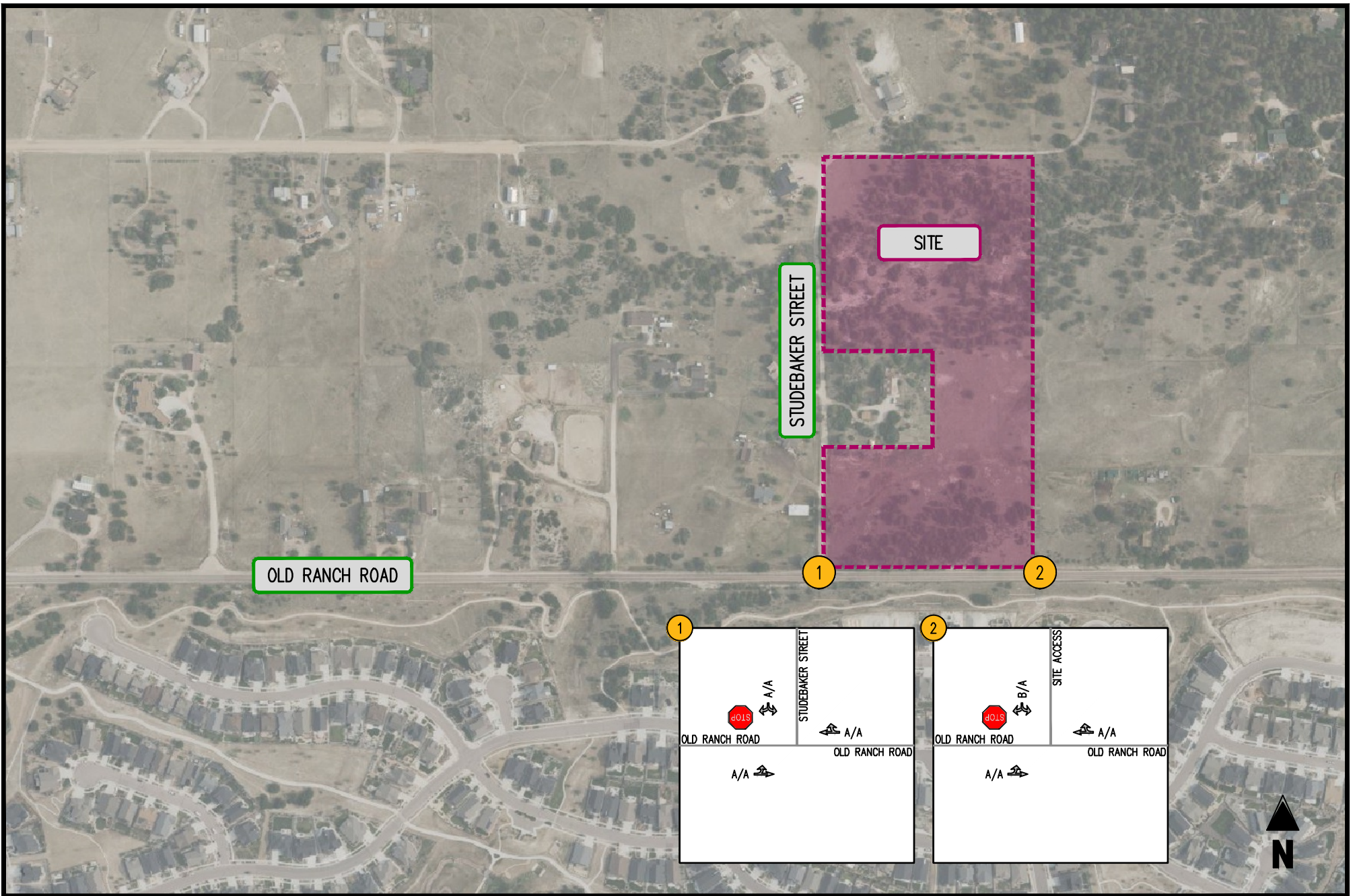
**FIGURE 5-1**  
**FUTURE FORECASTS**

ELK VIEW ESTATES  
EL PASO COUNTY, CO

0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

- ← MOVEMENT
-  SIGNALIZED INTERSECTION
-  STOP SIGN
-  YIELD SIGN





**FIGURE 5-2**  
**FUTURE LEVELS OF SERVICE**

ELK VIEW ESTATES  
EL PASO COUNTY, CO

0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

- ← MOVEMENT
- ◫ SIGNALIZED INTERSECTION
- STOP STOP SIGN
- ▽ YIELD SIGN



Table 5-1  
 Elk View Estates - El Paso County, CO  
 Future Intersection Level of Service Summary (1)

Intersection	Operating Condition	Street Name	Approach/ Movement	Existing		Future	
				AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
1 Old Ranch Road/Studebaker Street	STOP	Old Ranch Road Old Ranch Road Studebaker Street	EBLT WBTR SBLR	A [7.9] A [0.0] A [0.0]	A [7.5] A [0.0] A [9.0]	A [7.9] A [0.0] A [0.0]	A [7.5] A [0.0] A [9.0]
2 Old Ranch Road/Site Access	STOP	Old Ranch Road Old Ranch Road Site Access	EBLT WBTR SBLR	N/A N/A N/A	N/A N/A N/A	A [7.9] A [0.0] B [10.7]	A [7.5] A [0.0] A [10.0]

Notes (1) Numbers in brackets [] represent delay at unsignalized intersections in seconds per vehicle.

Table 5-2  
 Elk View Estates - El Paso County, CO  
 Future Intersection Queueing Summary (1)

Intersection	Operating Condition	Street Name	Approach/ Movement	Available Storage	Existing		Future	
					AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
1 Old Ranch Road/Studebaker Street	STOP	Old Ranch Road	EBLT	-	0	0	0	0
		Old Ranch Road	WBTR	-	0	0	0	0
		Studebaker Street	SBLR	-	0	0	0	0
2 Old Ranch Road/Site Access	STOP	Old Ranch Road	EBLT	-	N/A	N/A	0	0
		Old Ranch Road	WBTR	-	N/A	N/A	0	0
		Site Access	SBLR	-	N/A	N/A	0	0

Notes : (1) Queue length, in feet, is based on the 95th percentile queue as reported by Synchro, Version 12.

## VI. Conclusions and Recommendations

### Conclusions

Based on the results of this traffic impact study, the following may be concluded:

- Under existing traffic conditions, the unsignalized movements for the intersection of Old Ranch Road/Studebaker Street currently operate at levels of service (LOS) “A” in the weekday AM and PM peak hours and no queuing related concerns are currently present in the study area.
- The proposed site development would generate, upon completion and full occupancy, 6 new weekday AM and 6 new weekday PM peak hour vehicle trips as well as 57 new weekday daily trips.
- Under both short and long term total future traffic conditions, with the development of the subject site, the movements for the unsignalized intersections within the study area, including the proposed site access, are forecasted to operate at LOS “B” or better in the weekday AM and PM peak hours and no queuing related concerns were identified.

### Recommendations

- It is recommended that the Applicant provide access consistent with the site plan contained herein.

Indicate that turning lanes were looked at and whether or not any were warranted.

Comment addressed in recommendations section of the updated TIS

# APPENDIX A – Full Sized Conceptual Plan



## **APPENDIX B – LOS Descriptions**

## Level of Service for Signalized Intersections

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average stopped delay per vehicle for a 15-min analysis period. The criteria are given in Exhibit 16-2. Delay may be measured in the field or estimated using procedures presented later in this chapter. Delay is a complex measure and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the  $v/c$  ratio for the lane group in question.

**LOS A** describes operations with very low delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

**LOS B** describes operations with delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.

Exhibit 16-2. Level-of-Service Criteria for Signalized Intersections

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC)
A	$\leq 10.0$
B	$> 10.0$ and $\leq 20.0$
C	$> 20.0$ and $\leq 35.0$
D	$> 35.0$ and $\leq 55.0$
E	$> 55.0$ and $\leq 80.0$
F	$> 80.0$

**LOS C** describes operations with delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

**LOS D** describes operations with delay greater than 35 and up to 55 sec per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high  $v/c$  ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

**LOS E** describes operations with delay greater than 55 and up to 80 sec per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high  $v/c$  ratios. Individual cycle failures are frequent occurrences.

**LOS F** describes operations with delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high  $v/c$  ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Source: [Highway Capacity Manual, 2000](#). Transportation Research Board, National Research Council

## Level of Service Criteria for Stop Sign Controlled Intersections

The level of service criteria are given in Table 17-2. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in queue.

The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. . . .

Table 17-2. Level of Service Criteria for TWSC Intersections

LEVEL OF SERVICE	AVERAGE CONTROL DELAY (sec/veh)
A	$\leq 10$
B	$> 10$ and $\leq 15$
C	$> 15$ and $\leq 25$
D	$> 25$ and $\leq 35$
E	$> 35$ and $\leq 50$
F	$> 50$

Average total delay less than 10 sec/veh is defined as Level of Service (LOS) A. Follow-up times of less than 5 sec have been measured when there is no conflicting traffic for a minor street movement, so control delays of less than 10 sec/veh are appropriate for low flow conditions. To remain consistent with the AWSC intersection analysis procedure described later in this chapter, a total delay of 50 sec/veh is assumed as the break point between LOS E and F.

The proposed level of service criteria for TWSC intersections are somewhat different from the criteria used in Chapter 16 for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, several driver behavior considerations combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, where drivers on the minor approaches to unsignalized intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized than signalized intersections. For these reasons, it is considered that the total delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection. . . .

LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queueing on the minor approaches. The method, however, is based on a constant critical gap size - that is, the critical gap remains constant, no matter how long the side street motorist waits. LOS F may also appear in the form of side street vehicles' selecting smaller-than-usual gaps. In such cases, safety may be a problem and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior. The latter is more difficult to observe on the field than queueing, which is more obvious.

Source: Highway Capacity Manual, 2000. Transportation Research Board, National Research Council

## **APPENDIX C – Traffic Counts**



Count Summaries - All Vehicles																		
Interval Start	Old Ranch Rd				Old Ranch Rd				n/a				Studebaker St				15-min Total	Rolling Hour Total
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	8	0	0	0	70	0	0	0	0	0	0	0	0	0	78	0
7:15 AM	0	0	26	0	0	0	89	0	0	0	0	0	0	0	1	116	0	
7:30 AM	0	0	23	0	0	0	54	0	0	0	0	0	0	1	0	78	0	
7:45 AM	0	0	30	0	0	0	65	0	0	0	0	0	0	0	0	95	367	
8:00 AM	0	0	22	0	0	0	70	0	0	0	0	0	0	0	0	92	381	
8:15 AM	0	0	56	0	0	0	88	0	0	0	0	0	0	0	0	144	409	
8:30 AM	0	1	34	0	0	0	56	0	0	0	0	0	0	0	0	91	422	
8:45 AM	0	0	25	0	0	0	37	0	0	0	0	0	0	0	0	62	389	
Count Total	0	1	224	0	0	0	529	0	0	0	0	0	0	1	1	756		
Pk Hr	All	0	1	142	0	0	0	279	0	0	0	0	0	0	0	422		
	HV	0	0	3	0	0	0	4	0	0	0	0	0	0	0	7		
	HV%	-	0%	2%	-	-	-	1%	-	-	-	-	-	-	-	2%		

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	E	W	N	S	Total
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0
7:30 AM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0
7:45 AM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0
8:00 AM	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
8:45 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Count Total	6	8	0	0	14	0	0	0	0	0	0	0	0	0	0
Peak Hour	3	4	0	0	7	0	0	0	0	0	0	0	0	0	0

<b>Count Summaries - Heavy Vehicles</b>																		
Interval Start	Old Ranch Rd				Old Ranch Rd				n/a				Studebaker St				15-min Total	Rolling Hour Total
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4	0
7:30 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
7:45 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	8	8
8:00 AM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	3	11	11
8:15 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	8	8
8:30 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	7	7
8:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	6	6
Count Total	0	0	6	0	0	0	8	0	0	0	0	0	0	0	0	14		
Pk Hr Heavy	0	0	3	0	0	0	4	0	0	0	0	0	0	0	0	7		

<b>Count Summaries - Bikes</b>																		
Interval Start	Old Ranch Rd				Old Ranch Rd				n/a				Studebaker St				15-min Total	Rolling Hour Total
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Pk Hr Bike	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		



Count Summaries - All Vehicles																		
Interval Start	Old Ranch Rd				Old Ranch Rd				n/a				Studebaker St				15-min Total	Rolling Hour Total
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	1	59	0	0	0	40	0	0	0	0	0	0	0	0	0	100	0
4:15 PM	0	0	52	0	0	0	33	0	0	0	0	0	0	0	0	1	86	0
4:30 PM	0	0	73	0	0	0	37	0	0	0	0	0	0	0	0	0	110	0
4:45 PM	0	0	49	0	0	0	22	0	0	0	0	0	0	0	0	0	71	367
5:00 PM	0	2	47	0	0	0	37	0	0	0	0	0	0	0	0	0	86	353
5:15 PM	0	0	58	0	0	0	34	1	0	0	0	0	0	0	0	0	93	360
5:30 PM	0	0	61	0	0	0	31	0	0	0	0	0	0	0	0	0	92	342
5:45 PM	0	0	49	0	0	0	34	0	0	0	0	0	0	0	0	0	83	354
Count Total	0	3	448	0	0	0	268	1	0	0	0	0	0	0	0	1	721	
Pk Hr	All	0	1	233	0	0	0	132	0	0	0	0	0	0	0	1	367	
	HV	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	3	
	HV%	-	0%	0%	-	-	-	2%	-	-	-	-	-	-	-	0%	1%	

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	E	W	N	S	Total
4:00 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
5:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
5:45 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Count Total	4	2	0	0	6	0	0	0	0	0	0	0	0	0	0
Peak Hour	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0

<b>Count Summaries - Heavy Vehicles</b>																		
Interval Start	Old Ranch Rd				Old Ranch Rd				n/a				Studebaker St				15-min Total	Rolling Hour Total
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
4:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
4:30 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
5:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
5:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3
Count Total	0	0	4	0	0	0	2	0	0	0	0	0	0	0	0	0	6	
Pk Hr Heavy	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	3	

<b>Count Summaries - Bikes</b>																		
Interval Start	Old Ranch Rd				Old Ranch Rd				n/a				Studebaker St				15-min Total	Rolling Hour Total
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pk Hr Bike	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

## **APPENDIX D – Existing Synchro Outputs**

HCM 7th TWSC  
 1: Old Ranch Road & Studebaker Street

04/30/2025

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	1	142	279	0	0	0
Future Vol, veh/h	1	142	279	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	154	303	0	0	0

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	303	0	-	0	460 303
Stage 1	-	-	-	-	303 -
Stage 2	-	-	-	-	157 -
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	1258	-	-	-	560 736
Stage 1	-	-	-	-	749 -
Stage 2	-	-	-	-	872 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1258	-	-	-	559 736
Mov Cap-2 Maneuver	-	-	-	-	559 -
Stage 1	-	-	-	-	748 -
Stage 2	-	-	-	-	872 -

Approach	EB	WB	SB
HCM Control Delay, s/v	0.06	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	13	-	-	-	-
HCM Lane V/C Ratio	0.001	-	-	-	-
HCM Control Delay (s/veh)	7.9	0	-	-	0
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

HCM 7th TWSC  
1: Old Ranch Road & Studebaker Street

04/30/2025

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	1	233	132	0	0	1
Future Vol, veh/h	1	233	132	0	0	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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	253	143	0	0	1

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	143	0	-	0	399 143
Stage 1	-	-	-	-	143 -
Stage 2	-	-	-	-	255 -
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	1439	-	-	-	607 904
Stage 1	-	-	-	-	884 -
Stage 2	-	-	-	-	787 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1439	-	-	-	606 904
Mov Cap-2 Maneuver	-	-	-	-	606 -
Stage 1	-	-	-	-	883 -
Stage 2	-	-	-	-	787 -

Approach	EB	WB	SB
HCM Control Delay, s/v	0.03	0	8.99
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	8	-	-	-	904
HCM Lane V/C Ratio	0.001	-	-	-	0.001
HCM Control Delay (s/veh)	7.5	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

## **APPENDIX E – Future (with site development) Synchro Outputs**

HCM 7th TWSC  
 1: Old Ranch Road & Studebaker Street

04/30/2025

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	1	143	281	0	0	0
Future Vol, veh/h	1	143	281	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	155	305	0	0	0

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	305	0	-	0	463 305
Stage 1	-	-	-	-	305 -
Stage 2	-	-	-	-	158 -
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	1255	-	-	-	557 734
Stage 1	-	-	-	-	747 -
Stage 2	-	-	-	-	871 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1255	-	-	-	557 734
Mov Cap-2 Maneuver	-	-	-	-	557 -
Stage 1	-	-	-	-	747 -
Stage 2	-	-	-	-	871 -

Approach	EB	WB	SB
HCM Control Delay, s/v	0.05	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	12	-	-	-	-
HCM Lane V/C Ratio	0.001	-	-	-	-
HCM Control Delay (s/veh)	7.9	0	-	-	0
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

HCM 7th TWSC  
2: Old Ranch Road

04/30/2025

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	1	142	279	1	2	2
Future Vol, veh/h	1	142	279	1	2	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	154	303	1	2	2

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	304	0	-	0	460 304
Stage 1	-	-	-	-	304 -
Stage 2	-	-	-	-	157 -
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	1256	-	-	-	559 736
Stage 1	-	-	-	-	749 -
Stage 2	-	-	-	-	872 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1256	-	-	-	559 736
Mov Cap-2 Maneuver	-	-	-	-	559 -
Stage 1	-	-	-	-	748 -
Stage 2	-	-	-	-	872 -

Approach	EB	WB	SB
HCM Control Delay, s/v	0.06	0	10.71
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	13	-	-	-	635
HCM Lane V/C Ratio	0.001	-	-	-	0.007
HCM Control Delay (s/veh)	7.9	0	-	-	10.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

HCM 7th TWSC  
 1: Old Ranch Road & Studebaker Street

04/30/2025

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	1	235	133	0	0	1
Future Vol, veh/h	1	235	133	0	0	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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	255	145	0	0	1

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	145	0	-	0	402 145
Stage 1	-	-	-	-	145 -
Stage 2	-	-	-	-	258 -
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	1438	-	-	-	604 903
Stage 1	-	-	-	-	883 -
Stage 2	-	-	-	-	785 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1438	-	-	-	604 903
Mov Cap-2 Maneuver	-	-	-	-	604 -
Stage 1	-	-	-	-	882 -
Stage 2	-	-	-	-	785 -

Approach	EB	WB	SB
HCM Control Delay, s/v	0.03	0	8.99
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	8	-	-	-	903
HCM Lane V/C Ratio	0.001	-	-	-	0.001
HCM Control Delay (s/veh)	7.5	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	
Traffic Vol, veh/h	2	233	132	2	1	1
Future Vol, veh/h	2	233	132	2	1	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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	253	143	2	1	1

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	146	0	-	0	402 145
Stage 1	-	-	-	-	145 -
Stage 2	-	-	-	-	258 -
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	1436	-	-	-	604 903
Stage 1	-	-	-	-	883 -
Stage 2	-	-	-	-	785 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1436	-	-	-	603 903
Mov Cap-2 Maneuver	-	-	-	-	603 -
Stage 1	-	-	-	-	881 -
Stage 2	-	-	-	-	785 -

Approach	EB	WB	SB
HCM Control Delay, s/v	0.06	0	9.99
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	15	-	-	-	723
HCM Lane V/C Ratio	0.002	-	-	-	0.003
HCM Control Delay (s/veh)	7.5	0	-	-	10
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0