

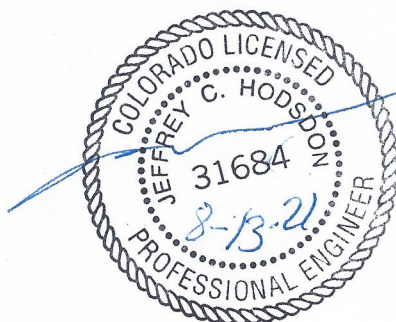


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## WMMI Variance of Use Transportation Memorandum (LSC #S214310) August 13, 2021

### 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.

  
\_\_\_\_\_

8/13/21  
Date

# WMMI Variance of Use Transportation Memorandum

Prepared for:  
Grant Dewey  
Executive Director  
Western Museum of Mining & Industry  
225 North Gate Blvd.  
Colorado Springs, CO 80921

AUGUST 11, 2021

---

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

LSC #S214310



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Excerpt from Springs at Gateway TIS

Excerpt from True North Commons





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August 13, 2021

Grant Dewey  
Executive Director  
Western Museum of Mining & Industry  
225 North Gate Blvd.  
Colorado Springs, CO 80921

RE: WMMI Variance of Use  
Transportation Memorandum  
El Paso County, Colorado  
LSC #S214310

Dear Mr. Dewey:

In response to your request, LSC Transportation Consultants, Inc. has prepared this Transportation Memorandum for the proposed variance of use for the existing Western Museum of Mining & Industry in El Paso County, Colorado. The site is located south of North Gate Boulevard between the I-25 northbound ramps and Struthers Road in El Paso County, Colorado (El Paso County parcel ID 6207200017).

#### **LAND USE AND ACCESS**

The existing Western Museum of Mining & Industry is located at 225 North Gate Boulevard. The museum has one full-movement access to North Gate Boulevard located 435 feet west of the North Gate Boulevard/Struthers Road intersection (centerline-to-centerline). The museum is currently open for visitors. The purpose of the variance is to also allow previous (or historic) operations as well as special events on the property. The report trip-generation and intersection/access analysis focuses on weekend special events.

Per information provided by the applicant, the museum intends to host medium-sized events on weekends and a few larger, all-day events on the weekends. The application also includes allowance for some small to medium events in the evenings on weekdays.

Because the weekend events may be larger, this analysis focuses on the daily and peak-hour trip impacts of these weekend events. Some planned weekend events include:

- Celtic Festival – Large event
- Oktober Fest – Large event
- RRH Harvest Festival – Medium event
- Miners' Pumpkin Patch – Medium event
- Pig Jig – Nephcare – Medium event
- Music Festivals – Small to Medium event
- Demo Days (Super Saturday) – Small event

The museum provided the expected number visitors for a medium- and large-sized event. To be conservative, the high end of the range of visitors was used for analysis. It was assumed that a small event may draw up to 250 visitors, medium-sized event may draw up to 1,250 visitors throughout the day on Saturday, while a large event may draw up to 1,750 visitors in a single day.

To classify event sizes, small events would range from 50 to 100 vehicles, medium events between 101 and 400 vehicles, and large events between 401 and 700 vehicles.

Events will generally occur between the hours of 4:00 p.m. and 10:00 p.m. on Fridays, 11:00 a.m. to 10:00 p.m. on Saturdays, and 11:00 a.m. to 5:00 p.m. on Sundays. The Saturday peak hour of event traffic would be early evening from about 6:00 to 7:00 p.m. For events beginning on Friday evening, the event peak hour would likely occur after the peak hour of the adjacent roadways, with higher entering than exiting trips.

## RECENT TRAFFIC REPORTS

The following traffic studies have been completed in the vicinity of the site within the last five years:

- True North Commons TIS (Matrix)
- Springs at North Gate TIS (LSC – City submittal)
- Academy Gateway TIS (LSC - not so recent)

## EXISTING ROAD AND TRAFFIC CONDITIONS

Figure 1 shows the streets adjacent to and in the vicinity of the site. In addition to **Interstate 25**, the adjacent streets serving the site are identified below followed by a brief description of each:

**North Gate Boulevard** is a four-lane urban principal arterial that runs east/west from the Air Force Academy to Highway 83. It is classified as a four-lane Urban Minor Arterial on the El Paso County *Major Transportation Corridors Plan* and the City of Colorado Springs *Intermodal Transportation Plan*. The posted speed limit is 40 miles per hour (mph) adjacent to the site.

**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 40 miles per hour (mph) at North Gate Boulevard.

### **Existing Traffic Volumes**

Figure 2 shows the results of Saturday-evening traffic-volume counts conducted in April 2021 from 5:00 p.m. to 6:00 p.m. at the intersection of North Gate Boulevard/Struthers Road and the site access on North Gate Boulevard. The figure also shows existing lane geometries and traffic controls. Count data is attached.

### **Crash History**

Three years of crash history was examined on North Gate Boulevard (2018-2020). No crashes were reported at the site access. There were sixteen reported crashes at the intersection of North Gate Boulevard/Struthers Road during the study period. Only one of these crashes resulted in injury, the remaining were property damage only. Of the 16 crashes, 7 were between an eastbound left-turning vehicle and a westbound through vehicle.

### **Pedestrian, Bicycle and Public Transit Access**

There are no sidewalks on North Gate Boulevard adjacent to the site. There are no Mountain Metropolitan transit routes in the vicinity of the site.

### **SIGHT DISTANCE**

The prescribed “sight distance along the roadway [along North Gate Boulevard]” is 325 feet, based on *Engineering Criteria Manual (ECM)* Table 2-33 and the 40-mph posted speed limit. This criterion is met for westbound traffic arriving from the North Gate Boulevard/Struthers Road intersection to the east. This criterion is also met for eastbound traffic arriving from the roundabout at the northbound the I-25 ramp terminal to the west. Although the distance from the northbound off-ramp right-turn “bypass” lane is about 250 feet, there is a clear line of sight to the access and traffic turning right onto North Gate Boulevard from this bypass lane is likely less than a 45-mph design speed. However, placement of a temporary event warning sign along this northbound bypass lane is recommended.

The *ECM* criteria require entering sight distance of 480 feet at the site-access point, based on *ECM* Table 2-35 and the 40-mph posted speed limit. Although the spacing between the access point and the I-25 ramp terminal to the west and the North Gate Boulevard/Struthers Road intersection to the east is shorter than 480 feet, there is adequate line of sight from the access to both intersections **and** to vehicles traveling eastbound/westbound through both intersections.

## TRIP GENERATION

Estimates of site-generated vehicle trips for proposed developments are typically made using the nationally published trip generation rates from *Trip Generation, 10th Edition, 2017* by the Institute of Transportation Engineers (ITE). However, this land use does not match a typical ITE Land Use category for use in estimating trip generation. Therefore, a project-specific, special-event trip-generation estimate, based on this operational information is included in this report.

It was assumed that, on average, there are 2.5 guests per vehicle. Hourly-traffic distributions for a Saturday event were provided, upon which LSC peak-hour trip calculations have been based. The peak hour was calculated based on the departure peak. Table 1 provides the resulting maximum daily and peak-hour trip-generation estimates for small-, medium-, and large-sized events.

**Table 1: Detailed Saturday-Trip Generation**

Land Use Description	Visitors per Day		Vehicles per Day <sup>(1)</sup>		Trip Generation Rates			Total Trips Generated			
					(Trips per Max # of Veh/day)	(Trips per Max # of visitors per day)					
	Range	Max	Range	Max	Saturday	Saturday Afternoon		Saturday Afternoon			
					Daily Trips <sup>(1)</sup>	Departure Peak Hour <sup>(2)</sup>		Daily Trips	Departure Peak Hour (2)		
						In	Out		In	Out	
Small Event	125-250	Visitors	250	50-100	100	2.00	0.07	0.18	200	7	18
Medium Event	251-1250	Visitors	1250	101-400	400	2.00	0.07	0.18	800	28	72
Large Event	1250-1750	Visitors	1750	401-700	700	2.00	0.07	0.18	1,400	50	125
Notes:											
(1) Assumes 2.5 guests/vehicle											
(2) Based on hourly tables provided and LSC Estimates - <b>One hour</b> period within the window of time between 3:00 pm and 5:00 pm Saturday afternoon											
Source: LSC Transportation Consultants, Inc. Rev. 7-20-2021											

As shown, a small event is anticipated to result in 100 cars or 200 vehicle **trips** per day (vpd) on a Saturday with 7 inbound trips and 18 outbound trips during the peak hour (Saturday evening). A medium event is anticipated to result in 400 cars or 800 vehicle trips per day (vpd) on a Saturday with 28 inbound trips and 72 outbound trips during the peak hour. A large event is anticipated to result in 700 cars or 1,400 vehicle trips per day (vpd) on a Saturday with 50 inbound trips and 125 outbound trips during the peak hour.

## 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 3 shows the directional distribution estimates for the proposed development. Estimates were based on the following factors: input from the museum, existing area development, the area roadway system, and the site's proposed land use.

### **Site-Generated Traffic**

Site-generated (event-generated) traffic volumes at the study intersections (including the WMMI access to North Gate Boulevard) have been calculated by applying the directional-distribution percentages estimated by LSC (from Figure 3) to the trip-generation estimates (from Table 1). The resulting site-generated traffic is shown in Figure 3. Site-generated traffic volumes for small, medium, and large events are provided.

### **Large Events**

It should be noted that large events may require turn-movement restrictions (i.e., no exiting and/or entering left turns). Therefore, the analysis assumes only right-in/right-out movements will be allowed at the site access. Should the left-in movement be restricted, vehicles entering from the east will be able to use the I-25 northbound ramp roundabout to make a U-turn to enter the site. Vehicles exiting the site will need to use alternate routes to access I-25, or potentially use the Struthers/Gleneagle roundabout to reverse direction and access I-25 at the North Gate interchange. By the end of summer 2021, the new I-25 interchange just south of the North Gate Boulevard is scheduled for completion. When this interchange is open, drivers will be able to turn right out of the site and use Voyager Parkway to access southbound I-25. Struthers Road to the Baptist Road interchange can be used by traffic wanting to access northbound I-25.

Law-enforcement-officer traffic control may also be needed for peak egress/ingress periods, or as otherwise identified as part of a traffic-control plan. However, the analysis with the access restricted to right-in/right-out turning movements represents the more conservative scenario assuming no law-enforcement traffic control.

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

Figure 4 shows the sum of the existing traffic volumes (from Figure 3) and site-generated Saturday peak-hour traffic volumes (shown in Figure 3). These volumes represent the projected short-term total traffic on Saturday evenings during which small, medium, or large events are held. Laneage and intersection traffic control at the study area intersections are also shown in this figure.

### **LEVEL OF SERVICE AND VEHICLE QUEUING ANALYSIS**

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

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

Level of Service	Signalized Intersections	Unsignalized Intersections
	Average Control Delay (seconds per vehicle)	Average Control Delay (seconds per vehicle) <sup>(1)</sup>
A	10.0 sec or less	10.0 sec or less
B	10.1-20.0 sec	10.1-15.0 sec
C	20.1-35.0 sec	15.1-25.0 sec
D	35.1-55.0 sec	25.1-35.0 sec
E	55.1-80.0 sec	35.1-50.0 sec
F	80.1 sec or more	50.1 sec or more
(1) For unsignalized intersections, if V/C ratio is greater than 1.0 the level of service is LOS F, regardless of the projected average control delay per vehicle.		

The study intersections have been analyzed to determine the projected intersection levels of service for medium and large events during the Saturday evening peak-hour period.

#### **North Gate Boulevard/Struthers Road**

As shown in Figure 2, the signalized intersection of North Gate Boulevard/Struthers Road currently operates at LOS B, with all movements operating at LOS C or better on Saturday evenings. These movements are anticipated to continue operating at LOS C or better when a small, medium, or large event occurs. The 95<sup>th</sup> percentile queue for the eastbound left is projected to be 85 feet, while the existing turn lanes are 190 feet in length.

#### **North Gate Boulevard/Site Access**

At the site access, the westbound left-turn into the site is projected to operate at LOS A during both small and medium events. The 95<sup>th</sup> percentile queue for this movement is projected to be 25 feet for both event sizes. The available storage for this movement is 70 feet. This left-in movement may need to be restricted during large events or any event for which the anticipated 95<sup>th</sup> percentile queue would exceed the lane storage length. This has been assumed for large events in this analysis.

The northbound approach is anticipated to operate at LOS D during both small and medium event scenarios in this report. During large events, the outbound left-turning movement may need to be restricted (depending on use of law-enforcement-officer traffic control), which results in LOS B for the northbound approach. Active law-enforcement-officer traffic control has the potential to reduce the need for turn-movement restrictions, or an officer in control of the intersection can override any turn-restriction signs. The projected on-site, northbound 95<sup>th</sup> percentile queue is 50 feet during a medium event, which is not anticipated to impact circulation within the site. A large event is anticipated to have a queue of 25 feet, due to the movement restrictions.

It should be noted that it was assumed that slightly more vehicles turned right out of the site access during medium events due to the increase in delay for left-turning vehicles. Most drivers exiting an event would want to turn left onto North Gate Boulevard to access I-25 at the North Gate interchange during small and medium events (this movement is restricted during large events). However, if at any time during the peak period of traffic exiting an event, drivers consider the delay to be excessive, they would have the option (once reaching position number one in the northbound lane) to turn right instead and use an alternate route. By the end of summer 2021, the new I-25 interchange just south of the North Gate Boulevard is scheduled for completion. When this interchange is open, drivers will be able to turn right out of the site and use Voyager Parkway to access southbound I-25 if they prefer to avoid the delay of turning left. For event traffic departing to I-25 north, a right turn onto North Gate Boulevard followed by use of Struthers Road to the Baptist Road interchange is an option. Level of service reports are attached.

## **TRAFFIC CONTROL**

As mentioned previously, during large events, the site access may need to be restricted to right-in/right-out turning movements. Also, any event for which the anticipated 95<sup>th</sup> percentile queue would exceed the lane storage length at the access on North Gate Boulevard should plan for closure of this turn bay. A traffic-control plan would be required for closure of this turn bay.

During small and medium events, it may be beneficial for event personnel to notify exiting motorists of alternate routes to I-25 – either verbally upon departure, or by providing a wayfinding map. For events (especially larger events), scheduling and hiring Colorado Springs Police Department or El Paso County Sheriff traffic control at the WMMI access intersection may also be an available option.

Larger events may require an access-management plan and, if so, would need to contract with a County-approved barricade company to run traffic-control operations.

## **PARKING MANAGEMENT**

Within the site, there are a total of 6 parking lots and 270 parking spots. These lots are divided between the lower campus with 4 lots and 168 spots and the upper campus with 2 lots and 102 spots.

A parking analysis has been completed for each of the event sizes. Please refer to the attached Parking Accumulation Analysis table. In past events it has been found that attendees tend to stay approximately 2 hours. Accounting for this turnover allows the maximum number of spots required for an event to be calculated. However, to be conservative, a stay of 3 hours has been evaluated as well. Events, especially larger events, will likely need supplemental/temporary event signage (including variable-message signs (or equivalent, such a set of pre-fabricated signs) as deemed necessary), traffic cones, and people to direct vehicles.

Note: This analysis is based on uniform arrivals and departures, based on information provided by the applicant. In case potential future events with more concentrated and/or different arrival and departure patterns are anticipated with potential for parking accumulation to exceed parking supply, an event-specific analysis may be needed as part of a traffic-control plan. The smaller events shown in the attached Parking Accumulation Table show parking capacity below 70 percent, which would allow for some more concentrated/variable arrivals.

### **Small Events**

During small events, the lower campus parking lots would be sufficient for all parking needs. Signs and traffic cones, along with a team of 1 to 2 people, would be used to direct parking.

### **Medium Events**

During medium events, the lower campus parking lots are anticipated to be sufficient for parking needs. However, the upper campus parking lots could function as overflow, if necessary. Signs and traffic cones, along with a team of 2 to 3 people, would be used to direct parking.

### **Large Events**

During large events, the upper and lower campus parking lots are not anticipated to be sufficient for parking needs assuming a 70% efficiency in parking. Therefore, off-site parking and shuttles will be used for large-events. Signs and traffic cones, along with a team of 3 to 5 people, would be used to direct parking.

Variable-message signs (VMS) could be used when an event has the potential for use of offsite overflow parking. These signs could be updated by event staff to direct motorists to off-site parking as necessary. Shuttle operation details including offsite overflow parking locations, number and capacity of operating shuttle vehicles, hours of operation, headways, frequency and specific routes to/from the overflow lots to the site need to be identified in the traffic-control plan, prior to any large event. LSC recommends the circulation plan include shuttle routing within the campus, which allows the shuttle to bypass any private-vehicle queues exiting the site (or entering parking areas). On-site staff could potentially be provided to stop private-vehicle traffic to allow shuttle vehicles to bypass queues.

The applicant has indicated use of the parking areas for Bass Pro Shops. Given the relatively short travel distance between the WMMI campus and this adjacent location, one to two continuously operating shuttle vehicles may be sufficient to achieve reasonable headways. However, peak arrival/departure time capacity needs should be verified for specific events. A pedestrian connection option between the Bass Pro overflow lot and the WMMI campus would be beneficial.



## **AUXILIARY TURN LANES**

- Please refer to Sketch Diagrams 1 and 2 (attached) for graphics of existing conditions. Also, please refer to the attached Auxiliary Lane table for *ECM* criteria and proposed mitigation for existing lanes which cannot meet criteria.

## **PEDESTRIAN AND BICYCLE ACCOMMODATION**

Although travel to festivals will primarily be via passenger vehicle rather than via bicycle or on foot, the following identifies the current bike/pedestrian facilities adjacent to and in the vicinity of the WMMI campus.

- There are paved shoulders along North Gate Boulevard between the access and the North Gate Boulevard/Struthers Road intersection which could be used (primarily for bicycles).
- There are bike lanes and a sidewalk on North Gate Boulevard east of Struthers Road.
- There are sidewalks/paved trails on Struthers Road north of North Gate Boulevard up through the roundabout.

A pedestrian-connection option between the Bass Pro overflow lot and the WMMI campus would be beneficial. However, the adjacent properties, including Bass Pro, are private, so such a connection would need to be negotiated.

## **CONCLUSIONS AND RECOMMENDATIONS**

### **Trip Generation**

- During the outbound Saturday peak hour of a small event, the site is projected to generate approximately 25 trips, with 7 inbound and 18 outbound.
- During the outbound Saturday peak hour of a medium event, the site is projected to generate approximately 100 trips, with 28 inbound and 72 outbound.
- During the outbound Saturday peak hour of a large event, the site is projected to generate approximately 175 trips, with 50 inbound and 125 outbound.

### **Level of Service**

- The intersection of North Gate Boulevard/Struthers Road is projected to operate at LOS B with all movements operating at LOS C or better during the Saturday evening peak hour, both with and without events.
- The outbound movement at the site access is projected to operate at LOS D during both small and medium events.

- The outbound movement at the site access is projected to operate at LOS B during large events, due to the northbound left-turning movement being restricted. See the level of service section for additional details.

### **Traffic Control and Potential Turn-Movement Restrictions**

- Alternatives to a left turn out of the site are available during small and medium events. It may be beneficial for event personnel to notify exiting motorists of these alternate routes – either verbally upon departure, or by providing a wayfinding map.
- The site access should be restricted to right-in/right-out movements during large events to improve traffic flow and limit delay.
- Large events or any event for which the anticipated 95<sup>th</sup> percentile queue would exceed the westbound left-turn lane storage length at the access on North Gate Boulevard should plan for closure of this turn bay as needed. A traffic-control plan would be required for closure of this turn bay. This plan should include, among other details, temporary sign(s) directing westbound entering event traffic to the downstream roundabout to reverse direction and return to the access from the west.
- Law-enforcement-officer traffic control during event peaks is also an option that should be considered, especially for large events.
- Please refer to the Traffic Control section of the report for additional detail.

### **Parking Management**

- For small events, the lower campus parking lots will be sufficient. A team of 1 to 2 people will use signs and traffic cones to manage parking.
- For medium events, the lower campus parking lots with the upper lots for potential overflow will be sufficient. A team of 2 to 3 people will use signs and traffic cones to manage parking.
- For large events, off-site parking with shuttle would be used if the upper and lower campus parking lots are deemed insufficient for an event. A team of 3 to 5 people will use signs and traffic cones to manage parking.
- Please refer to the Parking Management section of the report for additional detail.

### **Auxiliary Lanes**

- Please refer to Auxiliary Turn Lane section, Sketch Diagrams 1 and 2 (attached) and the attached Auxiliary Lane table.

\* \* \* \* \*

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

Respectfully Submitted,

LSC TRANSPORTATION CONSULTANTS, INC.

By Jeffrey C. Hodsdon, P.E.  
Principal

CRG:jas

Enclosures: Tables  
Figures 1-4  
Traffic Count Reports  
Level of Service Reports  
Auxiliary Lane Sketch Diagrams 1 & 2  
2013 Tube Counts  
Academy Gateway Memo – 2017  
Excerpt from Academy Gateway TIS – 2015  
Excerpt from Springs at Gateway TIS  
Excerpt from True North Commons

### **References:**

*Trip Generation Handbook - An ITE Proposed Recommended Practice*, Third Edition September 2017, Institute of Transportation Engineers  
*El Paso County Major Transportation Corridors Plan*, 2016  
*City of Colorado Springs Traffic Criteria Manual*  
*City of Colorado Springs Intermodal Transportation Plan*, 2001

# Tables

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## WMMI Campus

### Parking Accumulation by Hour and Percent of On-Site Parking Capacity

[illegible]



## Auxiliary Turn-Lane Table

Auxiliary Turn Lanes	Existing		ECM-Standard Lengths				
	Lane Length (ft)	Taper Length (ft)	Deceleration Length (ft)	Storage Length (ft)	Taper Length (ft)	Can Standard be Met?	Required Modificaitons
<b>North Gate Blvd/Site Access</b>							
Westbound Left Turn	70	50	195	50	180	NO - the length is limited due to the I-25 NB off-ramp to the west.	Large events, or any event for which the anticipated 95th percentile queue would exceed the lane storage length, should include plans for closure of this turn bay as needed. A traffic control plan would be required for closure of this turn bay. This plan should include, among other details, temporary sign(s) directing westbound entering event traffic to the downstream roundabout to reverse direction and return to the access from the west.
<b>North Gate Blvd/Struthers Blvd</b>							
Eastbound Left Turn	215 (dual)	50	195	200 (per lane) <sup>1</sup>	180	Stacking plus decel. - NO; decel only - yes; stacking only- yes.	None - the length is limited due to the WMMI access, stacking or decel is accommodated.
Westbound Right Turn	160	155	195		180	No - Constrained;	No
Southbound Left Turn No. 1	Continuous	N/A					
Southbound Left Turn No. 2	215	100	195		180	Lane length is met; The 100' taper is adequate as the taper is within the continuous SB LT lane.	None
Southbound Right Turn	Continuous	N/A					
1: The calculated eastbound left-turn storage length at North Gate/Struthers was based on Saturday peak-hour volumes. It is likely that weekday peak-hour volumes are higher and therefore the stated storage length may not meet <i>ECM</i> requirements for weekday volumes.							

# Figures

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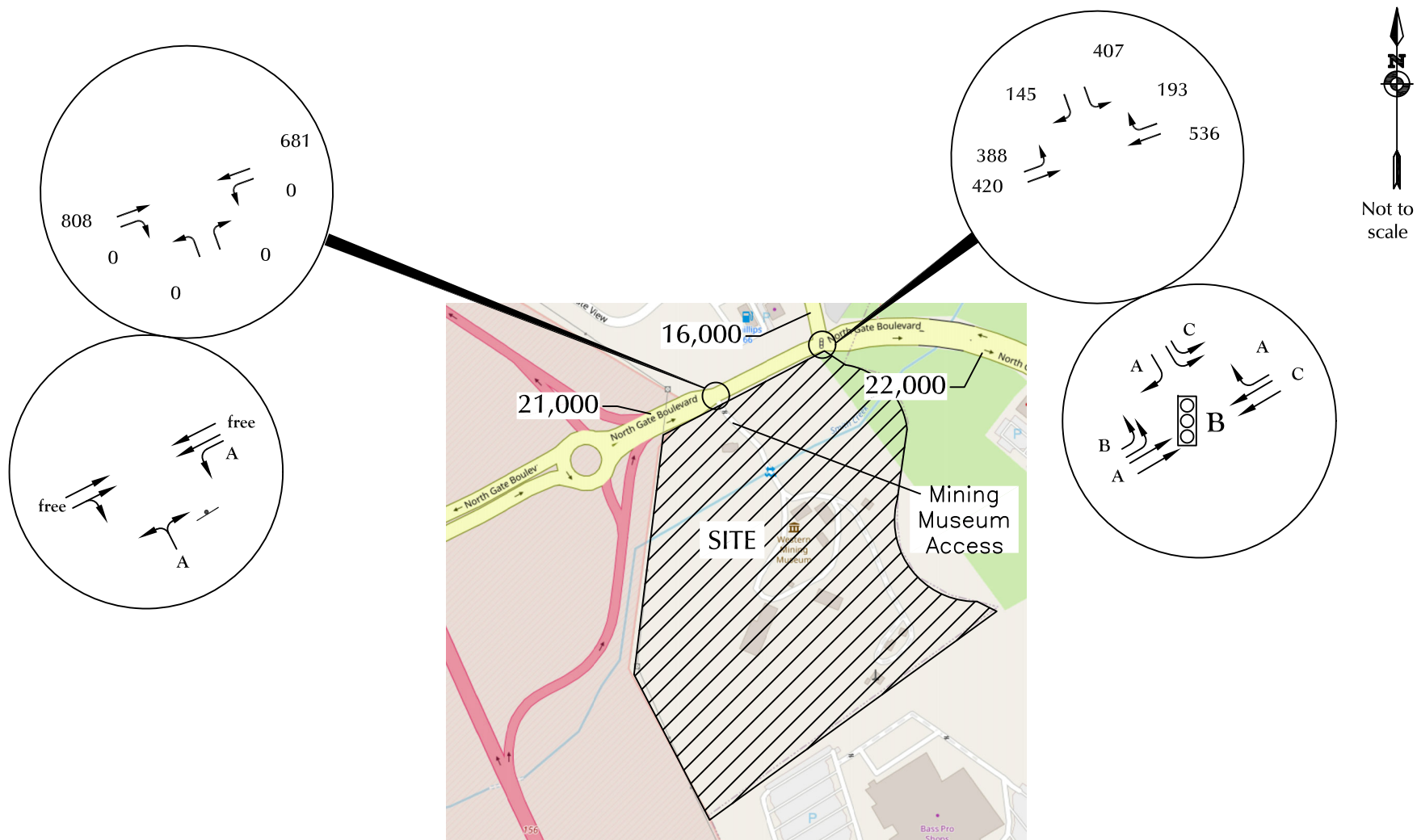




Figure 1

## Vicinity Map

WMMI (Western Mining Museum) (LSC# S214310)



# LEGEND:

XX = Saturday Evening Traffic (5–6pm) (veh/hr)

A = Saturday PM Individual Movement Peak–Hour Level of Service

C = Saturday PM Entire Intersection Peak–Hour Level of Service

XXX = Saturday Daily Traffic (LSC Estimate)

 = Traffic Signal

 = Stop Sign

\*During large events the access will be restricted to right-in/right-out only. It is assumed vehicles entering from the east could use the roundabout to make a u-turn, while vehicles exiting would use alternate routes to travel west.

#### LEGEND:

$$\frac{XX}{XX} = \frac{\text{Small Event Traffic (veh/hr)}}{\text{Medium Event Traffic (veh/hr)}}$$

$$\frac{XX}{XX} = \frac{\text{Medium Event Traffic (veh/hr)}}{\text{Large Event Traffic (veh/hr)}}$$

$$\frac{X\%}{X\%} = \frac{\text{Small Event (\% of entering or exiting traffic)}}{\text{Medium Event (\% of entering or exiting traffic)}}$$

$$\frac{X\%}{X\%} = \frac{\text{Medium Event (\% of entering or exiting traffic)}}{\text{Large Event (\% of entering or exiting traffic)}}$$

XXX = Saturday Daily Event Traffic (small/medium/large)

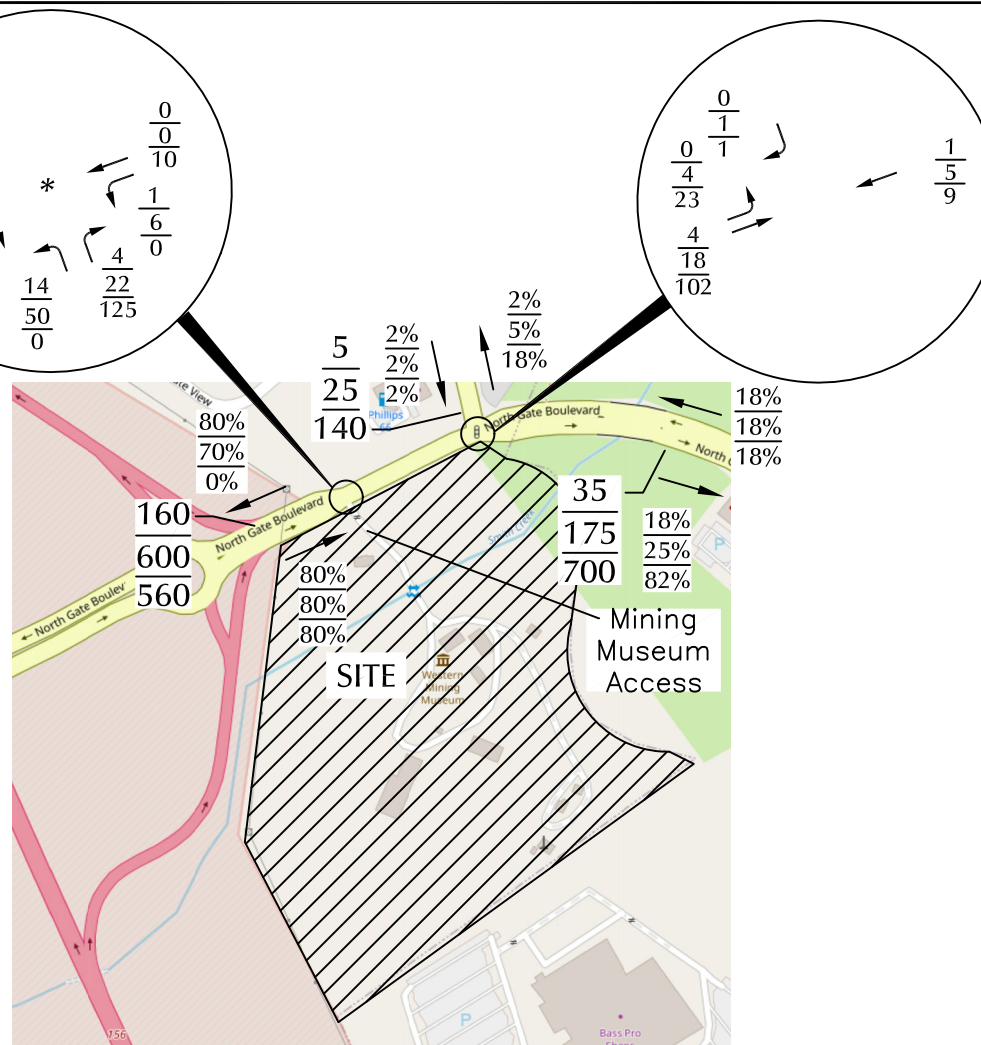
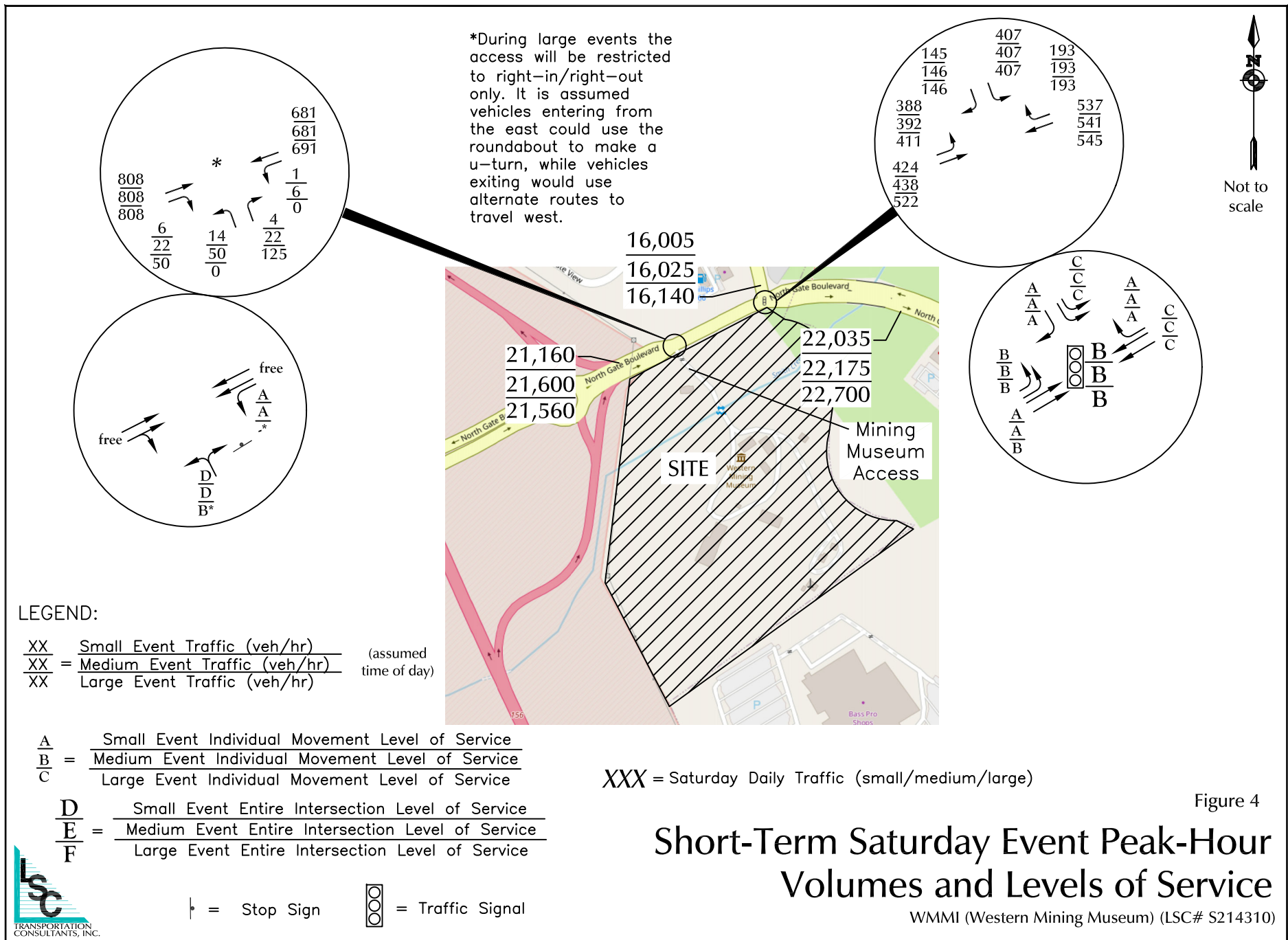


Figure 3  
**Trip Distribution  
 & Site-Generated Traffic**  
 WMMI (Western Mining Museum) (LSC# S214310)





# Traffic Counts

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# LSC Transportation Consultants, Inc.

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

File Name : Struthers Rd - Northgate Blvd Sat PM  
Site Code : 00000000  
Start Date : 4/3/2021  
Page No : 1

## Groups Printed- Unshifted

Start Time	Struthers Rd Southbound					Northgate Blvd Westbound										North Gate Blvd Eastbound					Int. Total
	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	L	T	R	U	App. Total	
03:45 PM	166	0	76	0	242	0	126	126	0	252	0	0	0	0	0	72	279	0	0	351	845
Total	166	0	76	0	242	0	126	126	0	252	0	0	0	0	0	72	279	0	0	351	845
04:00 PM	173	0	74	0	247	0	102	108	0	210	0	0	0	0	0	47	183	0	1	231	688
04:15 PM	123	0	50	0	173	0	90	116	0	206	0	0	0	0	0	63	136	0	0	199	578
04:30 PM	94	0	51	0	145	0	106	116	0	222	0	0	0	0	0	57	141	0	0	198	565
04:45 PM	101	0	37	2	140	0	87	116	0	203	0	0	0	0	0	45	149	0	1	195	538
Total	491	0	212	2	705	0	385	456	0	841	0	0	0	0	0	212	609	0	2	823	2369
05:00 PM	112	0	36	0	148	0	84	112	0	196	0	0	0	0	0	49	137	0	0	186	530
05:15 PM	119	0	37	0	156	0	105	106	0	211	0	0	0	0	0	52	131	0	0	183	550
05:30 PM	91	0	42	0	133	0	114	110	0	224	0	0	0	0	0	45	132	0	0	177	534
05:45 PM	85	0	30	0	115	0	85	92	0	177	0	0	0	0	0	47	136	0	0	183	475
Total	407	0	145	0	552	0	388	420	0	808	0	0	0	0	0	193	536	0	0	729	2089
Grand Total	1064	0	433	2	1499	0	899	1002	0	1901	0	0	0	0	0	477	1424	0	2	1903	5303
Apprch %	71	0	28.9	0.1		0	47.3	52.7	0		0	0	0	0		25.1	74.8	0	0.1		
Total %	20.1	0	8.2	0	28.3	0	17	18.9	0	35.8	0	0	0	0	0	9	26.9	0	0	35.9	

# LSC Transportation Consultants, Inc.

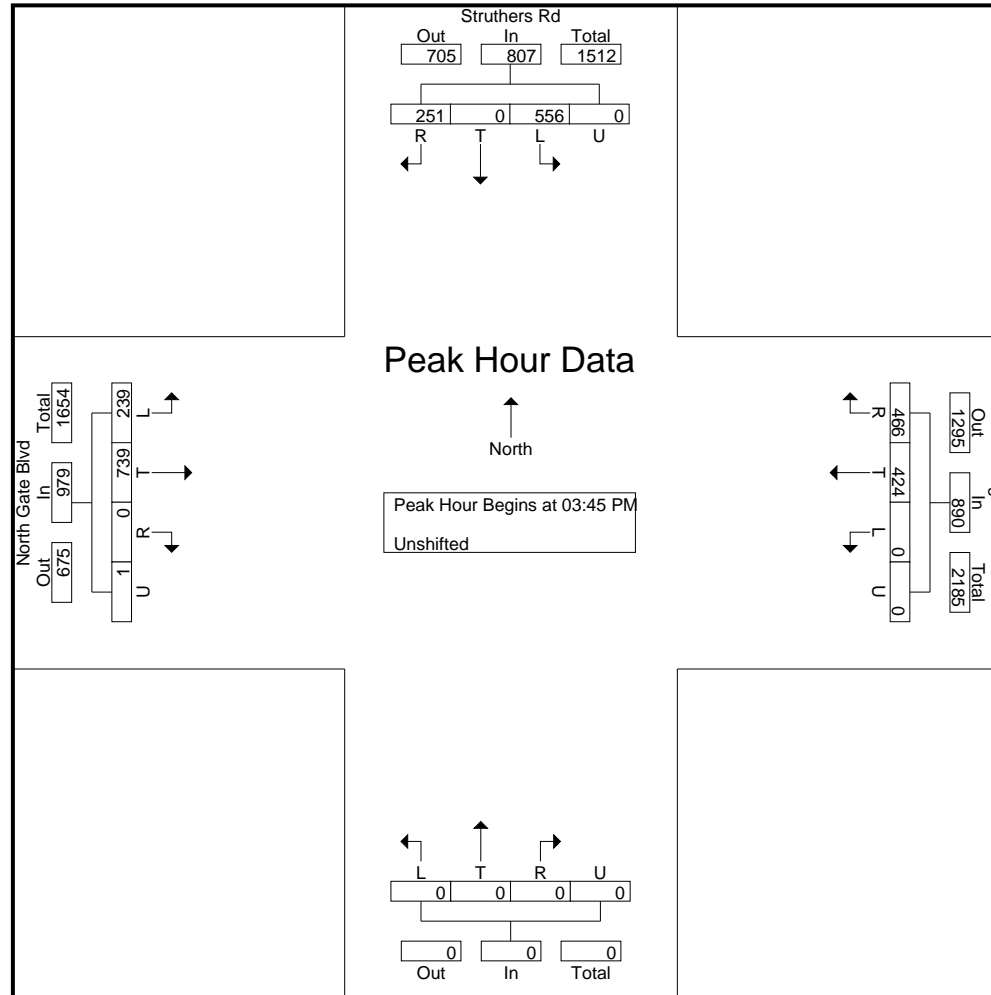
2504 E Pikes Peak Ave, Suite 304  
Colorado Springs, CO 80909  
719-633-2868

File Name : Struthers Rd - Northgate Blvd Sat PM

Site Code : 00000000

Start Date : 4/3/2021

Page No : 3



# Levels of Service

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Lanes, Volumes, Timings  
3: North Gate Blvd & Struthers Rd

Existing  
Saturday Evening



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰↰	↱↱	↰↰	↰	↰↰	↰
Traffic Volume (vph)	388	420	536	193	407	145
Future Volume (vph)	388	420	536	193	407	145
Satd. Flow (prot)	3433	3539	3539	1583	3433	1583
Flt Permitted	0.278				0.950	
Satd. Flow (perm)	1005	3539	3539	1583	3433	1583
Satd. Flow (RTOR)				210		165
Peak Hour Factor	0.90	0.90	0.92	0.92	0.88	0.88
Shared Lane Traffic (%)						
Lane Group Flow (vph)	431	467	583	210	463	165
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Total Split (s)	21.5	56.0	34.5	34.5	34.0	34.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Act Effect Green (s)	51.5	51.5	30.0	30.0	29.5	29.5
Actuated g/C Ratio	0.57	0.57	0.33	0.33	0.33	0.33
v/c Ratio	0.42	0.23	0.49	0.31	0.41	0.26
Control Delay	10.8	9.9	25.7	4.6	24.9	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.8	9.9	25.7	4.6	24.9	4.9
LOS	B	A	C	A	C	A
Approach Delay		10.3	20.1		19.6	
Approach LOS		B	C		B	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2: and 6:SBL, Start of Green

Control Type: Pretimed

Maximum v/c Ratio: 0.49

Intersection Signal Delay: 16.2

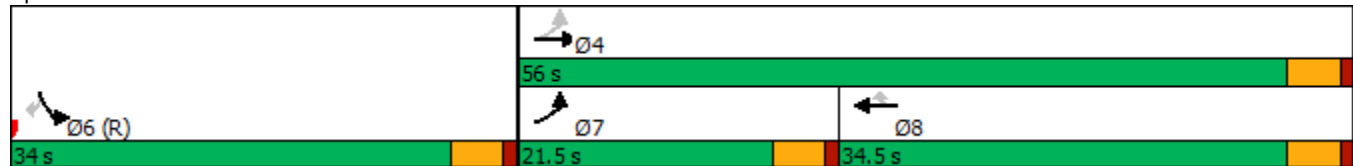
Intersection LOS: B

Intersection Capacity Utilization 48.7%

ICU Level of Service A













Analysis Period (min) 15

Splits and Phases: 3: North Gate Blvd & Struthers Rd



Lanes, Volumes, Timings  
3: North Gate Blvd & Struthers Rd

Short Term Total - Small Event  
Saturday Evening

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	388	424	537	193	407	145
Future Volume (vph)	388	424	537	193	407	145
Satd. Flow (prot)	3433	3539	3539	1583	3433	1583
Flt Permitted	0.277				0.950	
Satd. Flow (perm)	1001	3539	3539	1583	3433	1583
Satd. Flow (RTOR)				210		165
Peak Hour Factor	0.90	0.90	0.92	0.92	0.88	0.88
Shared Lane Traffic (%)						
Lane Group Flow (vph)	431	471	584	210	463	165
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Total Split (s)	21.5	56.0	34.5	34.5	34.0	34.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Act Effect Green (s)	51.5	51.5	30.0	30.0	29.5	29.5
Actuated g/C Ratio	0.57	0.57	0.33	0.33	0.33	0.33
v/c Ratio	0.42	0.23	0.50	0.31	0.41	0.26
Control Delay	10.8	9.9	25.7	4.6	24.9	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.8	9.9	25.7	4.6	24.9	4.9
LOS	B	A	C	A	C	A
Approach Delay		10.3	20.1		19.6	
Approach LOS		B	C		B	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2: and 6:SBL, Start of Green

Control Type: Pretimed

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 16.2

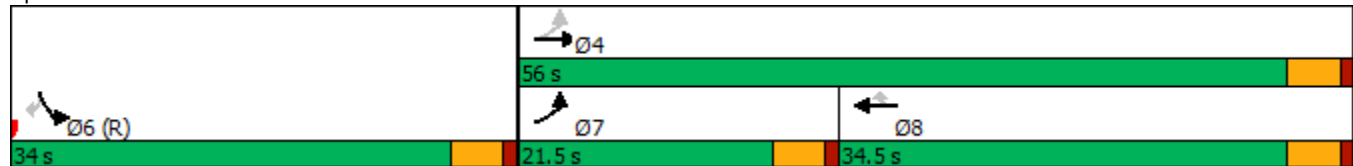
Intersection LOS: B

Intersection Capacity Utilization 48.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: North Gate Blvd & Struthers Rd



HCM 6th TWSC  
5: WMMI Access & North Gate Blvd













Short Term Total - Small Event  
Saturday Evening

Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑↑	
Traffic Vol, veh/h	808	6	1	681	14	4
Future Vol, veh/h	808	6	1	681	14	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	75	-	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	878	7	1	740	15	4
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	885	0	1254	443
Stage 1	-	-	-	-	882	-
Stage 2	-	-	-	-	372	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	760	-	164	562
Stage 1	-	-	-	-	365	-
Stage 2	-	-	-	-	667	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	760	-	164	562
Mov Cap-2 Maneuver	-	-	-	-	164	-
Stage 1	-	-	-	-	365	-
Stage 2	-	-	-	-	666	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		25.5	
HCM LOS					D	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	195	-	-	760	-	
HCM Lane V/C Ratio	0.1	-	-	0.001	-	
HCM Control Delay (s)	25.5	-	-	9.7	-	
HCM Lane LOS	D	-	-	A	-	
HCM 95th %tile Q(veh)	0.3	-	-	0	-	

Lanes, Volumes, Timings  
3: North Gate Blvd & Struthers Rd

Short Term Total - Medium Event

Saturday Evening

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	392	438	541	193	407	146
Future Volume (vph)	392	438	541	193	407	146
Satd. Flow (prot)	3433	3539	3539	1583	3433	1583
Flt Permitted	0.275				0.950	
Satd. Flow (perm)	994	3539	3539	1583	3433	1583
Satd. Flow (RTOR)				210		166
Peak Hour Factor	0.90	0.90	0.92	0.92	0.88	0.88
Shared Lane Traffic (%)						
Lane Group Flow (vph)	436	487	588	210	463	166
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Total Split (s)	21.5	56.0	34.5	34.5	34.0	34.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Act Effect Green (s)	51.5	51.5	30.0	30.0	29.5	29.5
Actuated g/C Ratio	0.57	0.57	0.33	0.33	0.33	0.33
v/c Ratio	0.42	0.24	0.50	0.31	0.41	0.26
Control Delay	10.8	9.9	25.8	4.6	24.9	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.8	9.9	25.8	4.6	24.9	4.8
LOS	B	A	C	A	C	A
Approach Delay		10.4	20.2		19.6	
Approach LOS		B	C		B	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2: and 6:SBL, Start of Green

Control Type: Pretimed

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 16.2

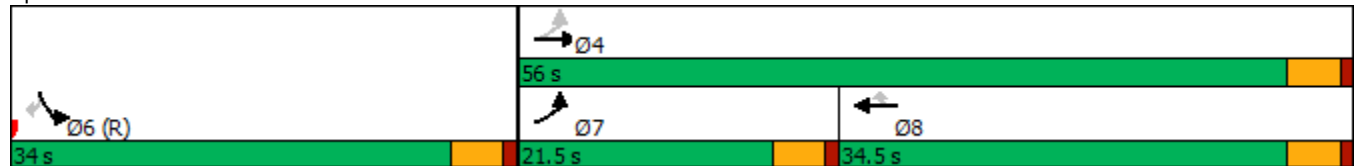
Intersection LOS: B

Intersection Capacity Utilization 49.0%

ICU Level of Service A

Analysis Period (min) 15













Splits and Phases: 3: North Gate Blvd & Struthers Rd



Intersection						
Int Delay, s/veh	1.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	
Traffic Vol, veh/h	808	22	6	681	50	22
Future Vol, veh/h	808	22	6	681	50	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	75	-	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	878	24	7	740	54	24
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	902	0	1274	451
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	384	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	749	-	159	556
Stage 1	-	-	-	-	361	-
Stage 2	-	-	-	-	658	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	749	-	158	556
Mov Cap-2 Maneuver	-	-	-	-	158	-
Stage 1	-	-	-	-	361	-
Stage 2	-	-	-	-	652	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.1		33.7	
HCM LOS	D					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	202	-	-	749	-	
HCM Lane V/C Ratio	0.387	-	-	0.009	-	
HCM Control Delay (s)	33.7	-	-	9.8	-	
HCM Lane LOS	D	-	-	A	-	
HCM 95th %tile Q(veh)	1.7	-	-	0	-	

Lanes, Volumes, Timings  
3: North Gate Blvd & Struthers Rd

Short Term Total - Large Event w/ Traffic Control  
Saturday Evening

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	411	522	545	193	407	146
Future Volume (vph)	411	522	545	193	407	146
Satd. Flow (prot)	3433	3539	3539	1583	3433	1583
Flt Permitted	0.272				0.950	
Satd. Flow (perm)	983	3539	3539	1583	3433	1583
Satd. Flow (RTOR)				210		166
Peak Hour Factor	0.90	0.90	0.92	0.92	0.88	0.88
Shared Lane Traffic (%)						
Lane Group Flow (vph)	457	580	592	210	463	166
Turn Type	pm+pt	NA	NA	Perm	Prot	Perm
Protected Phases	7	4	8		6	
Permitted Phases	4			8		6
Total Split (s)	21.5	56.0	34.5	34.5	34.0	34.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Act Effect Green (s)	51.5	51.5	30.0	30.0	29.5	29.5
Actuated g/C Ratio	0.57	0.57	0.33	0.33	0.33	0.33
v/c Ratio	0.45	0.29	0.50	0.31	0.41	0.26
Control Delay	11.0	10.3	25.8	4.6	24.9	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.0	10.3	25.8	4.6	24.9	4.8
LOS	B	B	C	A	C	A
Approach Delay		10.6	20.3		19.6	
Approach LOS		B	C		B	

Intersection Summary

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2: and 6:SBL, Start of Green

Control Type: Pretimed

Maximum v/c Ratio: 0.50

Intersection Signal Delay: 16.0

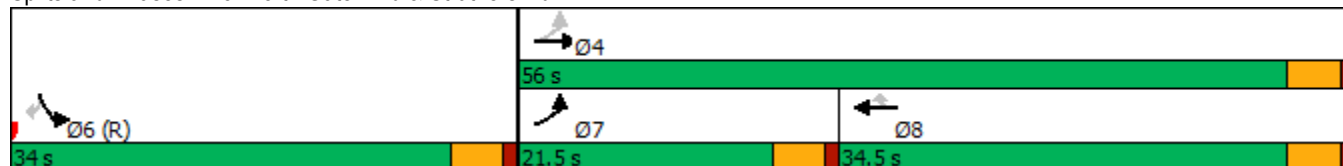
Intersection LOS: B

Intersection Capacity Utilization 49.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 3: North Gate Blvd & Struthers Rd



Intersection						
Int Delay, s/veh	1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	
Traffic Vol, veh/h	808	50	0	691	0	125
Future Vol, veh/h	808	50	0	691	0	125
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	75	-	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	878	54	0	751	0	136
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	932	0	1281	466
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	376	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	730	-	157	543
Stage 1	-	-	-	-	355	-
Stage 2	-	-	-	-	664	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	730	-	157	543
Mov Cap-2 Maneuver	-	-	-	-	157	-
Stage 1	-	-	-	-	355	-
Stage 2	-	-	-	-	664	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		13.8		
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	543	-	-	730	-	
HCM Lane V/C Ratio	0.25	-	-	-	-	
HCM Control Delay (s)	13.8	-	-	0	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	1	-	-	0	-	

## Auxiliary Lane Sketch Diagrams 1 & 2

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See Sketch  
Diagram 2

WMMI access

239

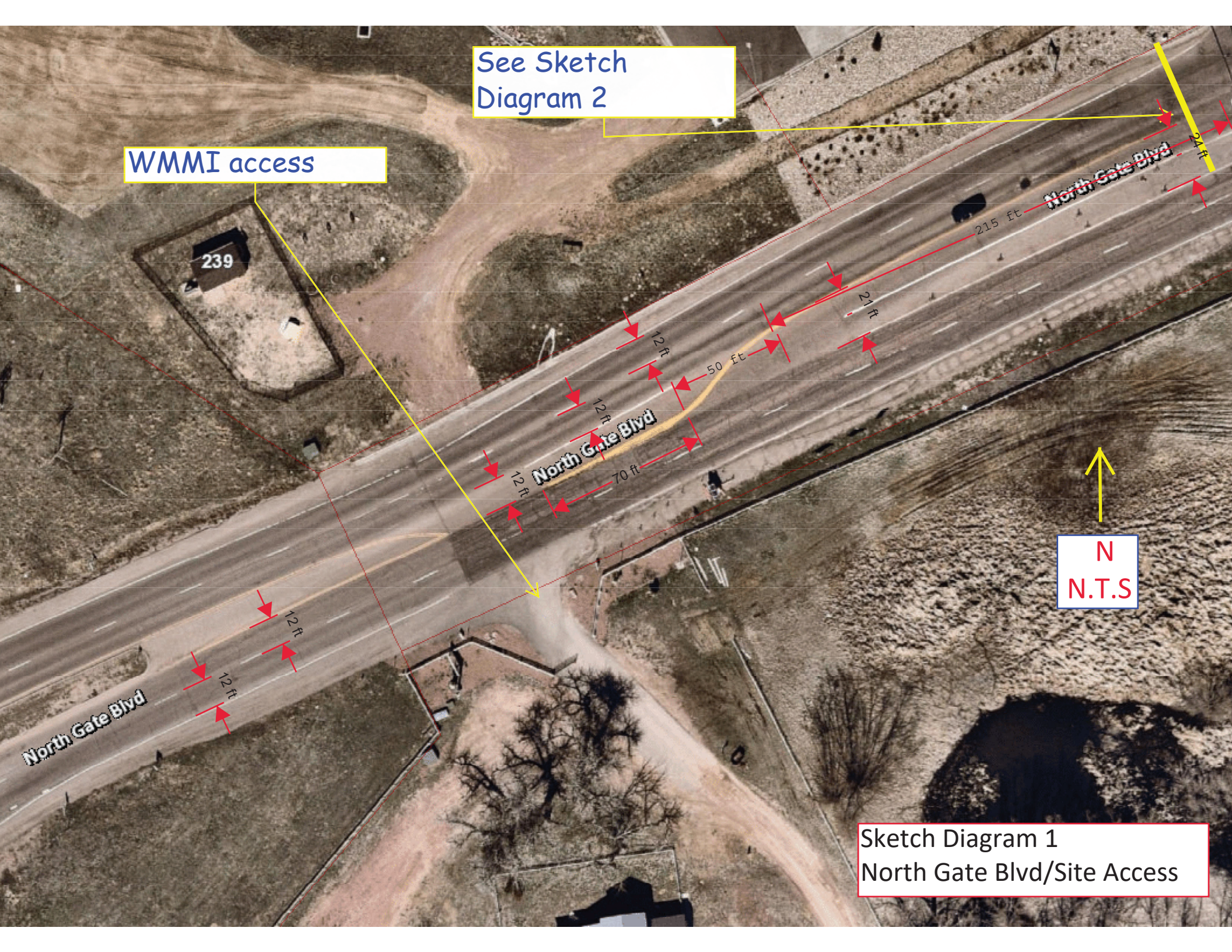
North Gate Blvd

North Gate Blvd

North Gate Blvd

N  
N.T.S

Sketch Diagram 1  
North Gate Blvd/Site Access





SB RT lane -  
continuous  
back to  
roundabout

No. 1 SB LT  
lane -  
continuous  
back to  
roundabout

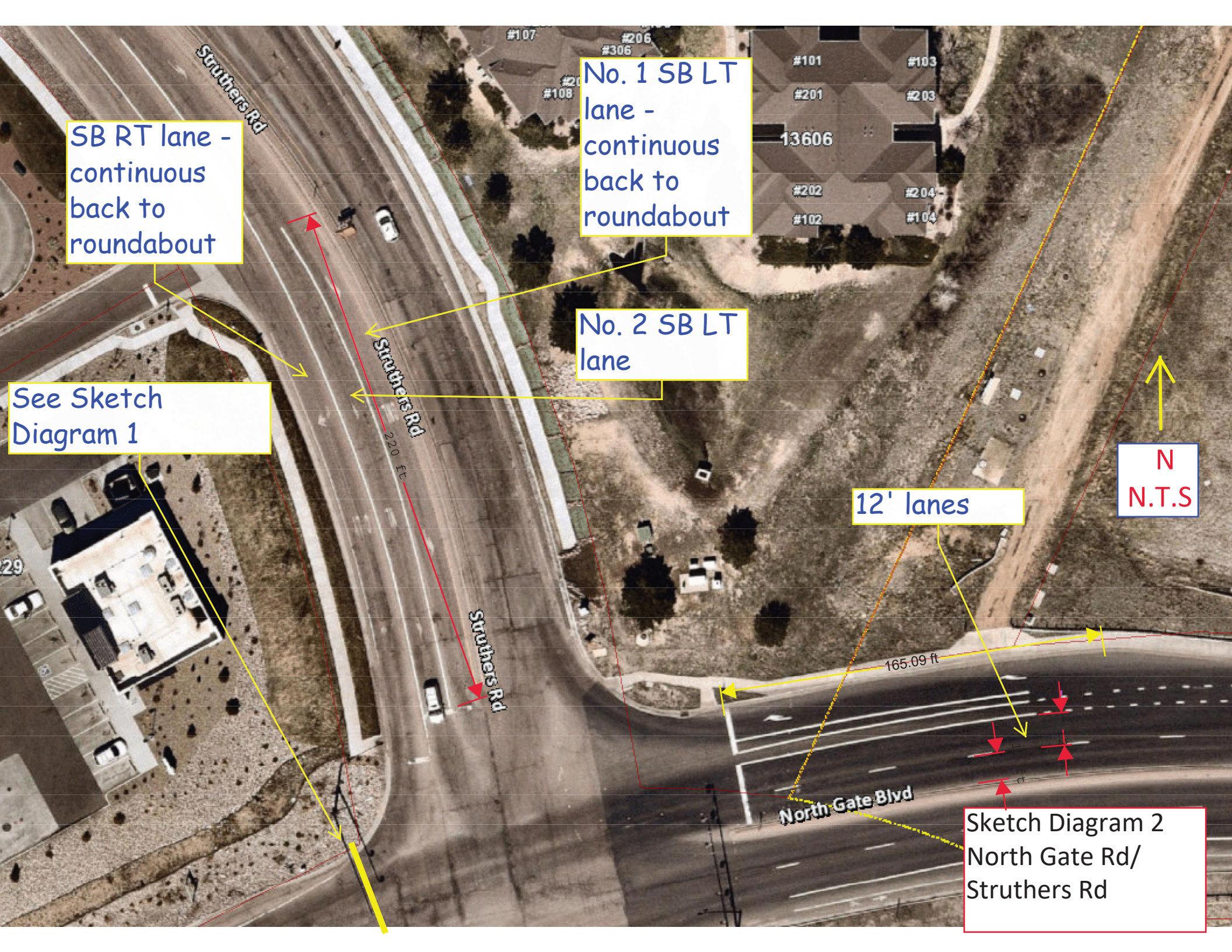
No. 2 SB LT  
lane

See Sketch  
Diagram 1

12' lanes

N  
N.T.S

Sketch Diagram 2  
North Gate Rd/  
Struthers Rd





## 2013 Tube Counts

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# COUNTER MEASURES INC.

Page 1

Location: NORTH GATE BLVD W/O VOYAGER PKY  
City: COLORADO SPRINGS  
County: EL PASO  
Direction: EASTBOUND-WESTBOUND

1889 YORK STREET  
DENVER, COLORADO 80206  
303-333-7409

Site Code: 082216

Start Time	23-Aug-13		24-Aug-13		25-Aug-13		26-Aug-13		27-Aug-13		28-Aug-13		29-Aug-13		Week Average	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	56	23	56	53	61	48	21	18	21	11	*	*	*	*	43	31
01:00	16	8	34	27	44	19	14	10	16	9	*	*	*	*	25	15
02:00	7	7	10	21	14	6	5	11	3	5	*	*	*	*	8	10
03:00	8	14	6	8	10	8	6	5	6	9	*	*	*	*	7	9
04:00	14	20	5	10	4	8	11	21	9	25	*	*	*	*	9	17
05:00	53	82	14	44	12	20	44	92	50	108	*	*	*	*	35	69
06:00	154	291	56	134	48	46	183	338	182	336	*	*	*	*	125	229
07:00	762	730	168	252	80	122	826	780	898	748	*	*	*	*	547	526
08:00	586	626	297	401	166	224	958	734	916	720	*	*	*	*	585	541
09:00	435	451	368	470	346	326	588	463	481	434	*	*	*	*	444	429
10:00	422	456	454	545	376	436	465	451	406	454	*	*	*	*	425	468
11:00	532	542	546	518	443	508	527	514	488	507	*	*	*	*	507	518
12:00 PM	588	647	616	711	430	558	510	540	536	507	*	*	*	*	536	593
01:00	540	602	608	786	456	596	492	488	462	496	*	*	*	*	512	594
02:00	626	596	516	924	456	512	512	496	522	532	*	*	*	*	526	612
03:00	801	918	446	1058	458	487	737	820	732	841	*	*	*	*	635	825
04:00	1076	1134	556	1037	428	504	798	871	844	884	*	*	*	*	740	886
05:00	1082	1244	582	872	458	504	871	920	894	963	*	*	*	*	777	901
06:00	664	818	470	478	382	350	680	682	625	728	*	*	*	*	564	611
07:00	448	448	409	382	300	296	381	388	391	414	*	*	*	*	386	386
08:00	352	322	294	220	291	216	271	288	440	335	*	*	*	*	330	276
09:00	248	197	240	211	334	174	234	206	366	196	*	*	*	*	284	197
10:00	170	182	274	256	326	70	129	73	141	96	*	*	*	*	208	135
11:00	95	100	133	90	181	44	48	46	58	34	*	*	*	*	103	63
Total Day	9735	10458	7158	9508	6104	6082	9311	9255	9487	9392	0	0	0	0	8361	8941
AM Peak	07:00	07:00	11:00	10:00	11:00	11:00	08:00	07:00	08:00	07:00	-	-	-	-	08:00	08:00
Vol.	762	730	546	545	443	508	958	780	916	748	-	-	-	-	585	541
PM Peak	17:00	17:00	12:00	15:00	15:00	13:00	17:00	17:00	17:00	17:00	-	-	-	-	17:00	17:00
Vol.	1082	1244	616	1058	458	596	871	920	894	963	-	-	-	-	777	901

Comb. Total	20193	16666	12186	18566	18879	0	0	17302
ADT	ADT 17,298	AADT 17,298						

# COUNTER MEASURES INC.

Page 1

Location: NORTH GATE BLVD E/O VOYAGER PKY  
City: COLORADO SPRINGS  
County: EL PASO  
Direction: EASTBOUND-WESTBOUND

1889 YORK STREET  
DENVER, COLORADO 80206  
303-333-7409

Site Code: 082214

Start Time	23-Aug-13		24-Aug-13		25-Aug-13		26-Aug-13		27-Aug-13		28-Aug-13		29-Aug-13		Week Average	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	47	14	31	23	26	28	9	9	12	3	*	*	*	*	25	15
01:00	12	3	14	12	18	8	7	3	7	3	*	*	*	*	12	6
02:00	5	5	8	6	5	4	3	2	1	2	*	*	*	*	4	4
03:00	13	12	1	3	5	4	3	6	4	4	*	*	*	*	5	6
04:00	16	19	1	3	6	6	8	21	5	16	*	*	*	*	7	13
05:00	60	93	11	37	16	12	51	96	55	102	*	*	*	*	39	68
06:00	145	288	56	115	20	39	150	295	145	334	*	*	*	*	103	214
07:00	566	708	132	195	54	77	670	756	618	732	*	*	*	*	408	494
08:00	342	480	194	287	116	138	376	554	363	544	*	*	*	*	278	401
09:00	234	312	237	287	198	205	262	297	265	320	*	*	*	*	239	284
10:00	270	288	309	298	264	204	248	270	258	316	*	*	*	*	270	275
11:00	373	326	388	310	274	318	348	322	320	318	*	*	*	*	341	319
12:00 PM	366	383	340	358	328	315	279	331	331	310	*	*	*	*	329	339
01:00	363	295	358	290	314	298	320	282	320	288	*	*	*	*	335	291
02:00	452	432	323	344	300	274	366	371	401	390	*	*	*	*	368	362
03:00	592	606	316	368	301	261	546	625	532	584	*	*	*	*	457	489
04:00	626	484	377	318	260	245	594	462	698	468	*	*	*	*	511	395
05:00	600	516	326	311	242	258	625	442	706	419	*	*	*	*	500	389
06:00	370	284	320	259	196	186	386	364	350	432	*	*	*	*	324	305
07:00	255	205	248	208	160	132	248	192	217	350	*	*	*	*	226	217
08:00	215	174	174	137	162	113	143	121	228	134	*	*	*	*	184	136
09:00	123	94	196	136	104	59	98	62	109	73	*	*	*	*	126	85
10:00	89	85	170	234	117	39	46	45	57	42	*	*	*	*	96	89
11:00	58	83	62	38	38	18	24	14	32	17	*	*	*	*	43	34
Total	6192	6189	4592	4577	3524	3241	5810	5942	6034	6201	0	0	0	0	5230	5230
Day	12381		9169		6765		11752		12235		0		0		10460	
AM Peak	07:00	07:00	11:00	11:00	11:00	11:00	07:00	07:00	07:00	07:00	-	-	-	-	07:00	07:00
Vol.	566	708	388	310	274	318	670	756	618	732	-	-	-	-	408	494
PM Peak	16:00	15:00	16:00	15:00	12:00	12:00	17:00	15:00	17:00	15:00	-	-	-	-	16:00	15:00
Vol.	626	606	377	368	328	315	625	625	706	584	-	-	-	-	511	489

Comb. Total	12381	9169	6765	11752	12235	0	0	10460
ADT	ADT 10,460	AADT 10,460						

# COUNTER MEASURES INC.

Page 1

Location: VOYAGER PKY S/O NORTH GATE BLVD  
City: COLORADO SPRINGS  
County: EL PASO  
Direction: NORTHBOUND-SOUTHBOUND

1889 YORK STREET  
DENVER, COLORADO 80206  
303-333-7409

Site Code: 082215

Start Time	23-Aug-13		24-Aug-13		25-Aug-13		26-Aug-13		27-Aug-13		28-Aug-13		29-Aug-13		Week Average	
	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	19	0	39	0	31	0	18	0	12	0	*	*	*	*	24	0
01:00	11	1	26	0	18	0	10	0	7	0	*	*	*	*	14	0
02:00	6	2	16	0	3	0	5	0	4	0	*	*	*	*	7	0
03:00	4	0	5	0	4	0	3	0	7	0	*	*	*	*	5	0
04:00	12	2	10	0	4	0	9	0	18	0	*	*	*	*	11	0
05:00	49	37	26	0	24	0	48	0	46	0	*	*	*	*	39	7
06:00	166	204	68	0	27	0	160	0	150	0	*	*	*	*	114	41
07:00	600	891	162	0	75	0	592	0	577	0	*	*	*	*	401	178
08:00	412	538	274	0	144	0	405	0	419	0	*	*	*	*	331	108
09:00	333	322	327	0	212	0	312	0	265	0	*	*	*	*	290	64
10:00	326	278	378	0	364	0	324	0	298	0	*	*	*	*	338	56
11:00	477	490	448	0	332	0	460	0	404	0	*	*	*	*	424	98
12:00 PM	421	516	588	0	446	0	418	0	439	0	*	*	*	*	462	103
01:00	422	384	740	0	439	0	416	0	398	0	*	*	*	*	483	77
02:00	419	440	828	0	398	0	408	0	454	0	*	*	*	*	501	88
03:00	766	647	906	0	362	0	758	0	784	0	*	*	*	*	715	129
04:00	721	502	948	0	380	0	720	0	784	0	*	*	*	*	711	100
05:00	851	920	718	0	320	0	832	0	878	0	*	*	*	*	720	184
06:00	539	246	385	0	266	0	534	0	488	0	*	*	*	*	442	49
07:00	355	60	320	0	212	0	354	0	314	0	*	*	*	*	311	12
08:00	229	41	172	0	179	0	228	0	268	0	*	*	*	*	215	8
09:00	172	39	194	0	126	0	164	0	164	0	*	*	*	*	164	8
10:00	54	44	197	0	50	0	50	0	60	0	*	*	*	*	82	9
11:00	33	33	61	0	23	0	30	0	24	0	*	*	*	*	34	7
Total	7397	6637	7836	0	4439	0	7258	0	7262	0	0	0	0	0	6838	1326
Day	14034		7836		4439		7258		7262		0	0	0	0	8164	
AM Peak	07:00	07:00	11:00	-	10:00	-	07:00	-	07:00	-	-	-	-	-	11:00	07:00
Vol.	600	891	448	-	364	-	592	-	577	-	-	-	-	-	424	178
PM Peak	17:00	17:00	16:00	-	12:00	-	17:00	-	17:00	-	-	-	-	-	17:00	17:00
Vol.	851	920	948	-	446	-	832	-	878	-	-	-	-	-	720	184

Comb. Total	14034	7836	4439	7258	7262	0	0	8164
ADT	ADT 8,166	AADT 8,166						

# Academy Gateway Memo – 2017

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LSC TRANSPORTATION CONSULTANTS, INC.

545 East Pikes Peak Avenue, Suite 210  
Colorado Springs, CO 80903  
(719) 633-2868  
FAX (719) 633-5430  
E-mail: [lsc@lscs.com](mailto:lsc@lscs.com)

## MEMORANDUM

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DATE: May 10, 2017  
(previous version March 15, 2017)

TO: Jennifer Irvine, P.E.  
County Engineer  
El Paso County Department of Public Works

FROM: Jeffrey C. Hodsdon, P.E., PTOE - LSC Transportation Consultants, Inc.

SUBJECT: Academy Gateway  
LSC #134640

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We have prepared this memorandum to provide you with the most currently anticipated land use and trip generation information for the Academy Gateway development. The memo also addresses Planning and Community Development (PCD) Engineering staff review comments.

### Site Land Use Changes and Trip Generation

Attached is an updated trip generation estimate for the entire Academy Gateway site. The trip generation estimate has been updated to reflect the following:

Lot 1: The previously proposed Kum & Go gas station/convenience store has been replaced with another potential gas station/convenience store. The most recent site plan shows fewer vehicle fueling positions than the previously proposed Kum & Go.

Lot 2: The currently anticipated potential user for this lot is a coffee shop with a drive-through window. Note: At the time the traffic impact study (TIS) was prepared, there was no information on potential users.

Lot 10: The currently anticipated potential user for this lot is a limited service hotel. Note: At the time the TIS was prepared, there was no information on a potential user for this site.

The table shows an estimated increase in the morning peak-hour "driveway" trip generation but a decrease in afternoon peak-hour trip generation. The increase in the morning peak hour is primarily



due to the proposed Lot 2 coffee shop. A high percentage of these morning peak-hour trips will likely be pass-by and diverted trips with most exiting to the south on Struthers Road. This would translate to more right turns out of the site at the access points than left turns (right turns being an easier turning movement). This would apply to the gas station/convenience store trips as well.

### **Gleneagle/Struthers Intersection Traffic Control**

It is our understanding that the County is proceeding with the roundabout intersection control option for Gleneagle/Struthers. The report from Wilson & Company dated February 2, 2017 indicates that *Year 2035 peak hour traffic volumes documented in the Academy Gateway Traffic Impact Analysis, January 2014 were used to conduct the traffic analyses for the intersection improvement re-evaluation.*

### **Other Technical Notes**

- The intersection peak-hour traffic volumes shown in Figure 3 of the TIS incorporate adjustments by LSC for the intersection of Gleneagle/Struthers (and Shepherd Heights/ Struthers). LSC adjusted the raw counts from May 21, 2014 at these intersections due to Interstate 25 construction. Motorists were avoiding construction on the interstate by using a combination of Voyager and Struthers as an alternate route. Therefore, the counts were abnormal. We completed a follow-up count at North Gate/Struthers. Based on this newer count, LSC adjusted the volumes at the two intersections to the north of it.
- The TIS indicates the following in the last paragraph on page 7:

*Once a connection is made through the Phase II parcel to the north, internal way-finding signs should be placed on site to direct traffic from the Kum & Go and other parcels on the south to the intersection of Struthers/Gleneagle as an alternative to making a left turn at Shepard Heights.*

The volume estimates reflect the internal connection and resulting option available to exiting traffic during peak times to utilize this internal connection to turn north onto Struthers or northeast on Gleneagle Drive via the Struther/Gleneagle intersection. The proposed internal signs will assist in directing drivers who may be unfamiliar with the site (and remind those familiar with the site) to the north access via the internal connection. This connection would provide an alternative to the eastbound left turn at the two-way stop-sign controlled middle access intersection during peak periods.

- Per staff comments, average daily traffic (ADT) values have been added to the attached Figures 3 and 8 from the TIS. These ADT values correspond to the peak-hour counts and site-generated traffic volumes and contained in the TIS.
- Estimated fair and equitable contribution to the intersection improvements at Struthers and Gleneagle:

- \$268,125.84 based on **twenty percent** of the estimated total cost of \$1,340,629.20 as shown on the attached cost estimate for the roundabout intersection.
- Twenty percent represents the site buildout traffic percentage of the projected total existing-plus-site morning plus afternoon peak hour intersection approach volumes (all approaches) from Figures 3 and 7 of the TIS. The sum of the existing intersection turning movements (AM plus PM) shown in Figure 3 is 2,624 trips and the sum of the projected buildout site generated turning movements in Figure 7 is 642 trips. Six hundred forty-two divided by 3,266 (the sum of 2,624 and 642) is 0.2 or 20 percent.

\* \* \* \* \*

As the recent Wilson & Company report was based on traffic volumes from our traffic report for this project, this memo will serve as the final update to our traffic report. The Wilson report showed an option for restricting the site access across from Shepard Heights to a three-quarter movement access. We assume the County will disregard this option shown in the Wilson report and allow the Academy Gateway project approvals to proceed with this access as a full-movement intersection.

Enclosures: Table 1 - Trip Generation

Figures 3 and 8 from Updated TIA 7-28-15 with ADT values added

Figure 7 from Updated TIA 7-28-15

Roundabout Intersection Cost Estimate Exhibit

**Table 1**  
**Trip Generation Estimate**  
**Academy Gateway**

Land Use Code	Land Use Description	Trip Generation Units	Trip Generation Rates <sup>(1)</sup>					Total Trips Generated					Internal Trips	Total External Trips Generated					Pass-By Trips <sup>(2)</sup>	New External Trips Generated						
			Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour		Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour			Average Weekday Traffic	Morning Peak Hour		Afternoon Peak Hour			Average New Weekday Traffic						
				In	Out	In	Out		In	Out	In	Out			In	Out	In	Out								
Trip Generation Estimate Based on Currently Proposed Site Plan																										
945	Gasoline/Service Station with Convenience Market	12 VFP <sup>(3)</sup>	162.78	5.08	5.08	6.76	6.76	1,953	61	61	81	81	15%	1,660	52	52	69	69	66%	564						
937	Coffee/Donut Shop w/ Drive Thru	2.2 KSF <sup>(4)</sup>	818.28	51.30	49.28	21.40	21.40	1,800	113	108	47	47	15%	1,530	96	92	40	40	89%	168						
932	High-Turnover (Sit-Down) Restaurant	10 KSF	127.15	5.95	4.86	5.91	3.94	1,272	59	49	59	39	10%	1,144	54	44	53	35	43%	652						
934	Fast-Food Restaurant with Drive-Through Window	3 KSF	496.12	23.16	22.26	16.98	15.67	1,488	69	67	51	47	12%	1,310	61	59	45	41	50%	655						
912	Drive-in Bank	3 DIL <sup>(5)</sup>	139.25	5.57	3.72	16.29	16.95	418	17	11	49	51	9%	380	15	10	44	46	47%	201						
310	Hotel	64 Rooms	8.17	0.31	0.22	0.31	0.29	523	20	14	20	19	15%	444	17	12	17	16	0%	444						
820	Shopping Center	47 KSF	70.74	1.01	0.62	2.99	3.37	3,325	48	29	140	158	10%	2,992	43	26	126	143	34%	1,975						
								10,779	387	339	447	443									9,460	338	295	394	390	4,660
Trip Generation Estimate Based on Previous Site Plan																										
945	Gasoline/Service Station with Convenience Market	20 VFP	162.78	5.08	5.08	6.76	6.76	3,256	102	102	135	135	9%	2,963	92	92	123	123	56%	1,304						
932	High-Turnover (Sit-Down) Restaurant	10 KSF	127.15	5.95	4.86	5.91	3.94	1,272	59	49	59	39	9%	1,157	54	44	54	36	43%	659						
934	Fast-Food Restaurant with Drive-Through Window	3 KSF	496.12	23.16	22.26	16.98	15.67	1,488	69	67	51	47	9%	1,354	63	61	46	43	50%	677						
912	Drive-in Bank	3 DIL	139.25	5.57	3.72	16.29	16.95	418	17	11	49	51	9%	380	15	10	44	46	47%	201						
820	Shopping Center	73 KSF	70.74	1.01	0.62	2.99	3.37	5,164	74	45	218	246	9%	4,699	67	41	199	224	34%	3,101						
								11,597	321	273	512	519									10,553	291	248	466	472	5,943
Change in trip generation estimate								-818	66	66	-65	-76									-1,093	47	47	-72	-82	-1,283

**Notes:**

(1) Source: "Trip Generation, 9th Edition, 2012" by the Institute of Transportation Engineers (ITE)

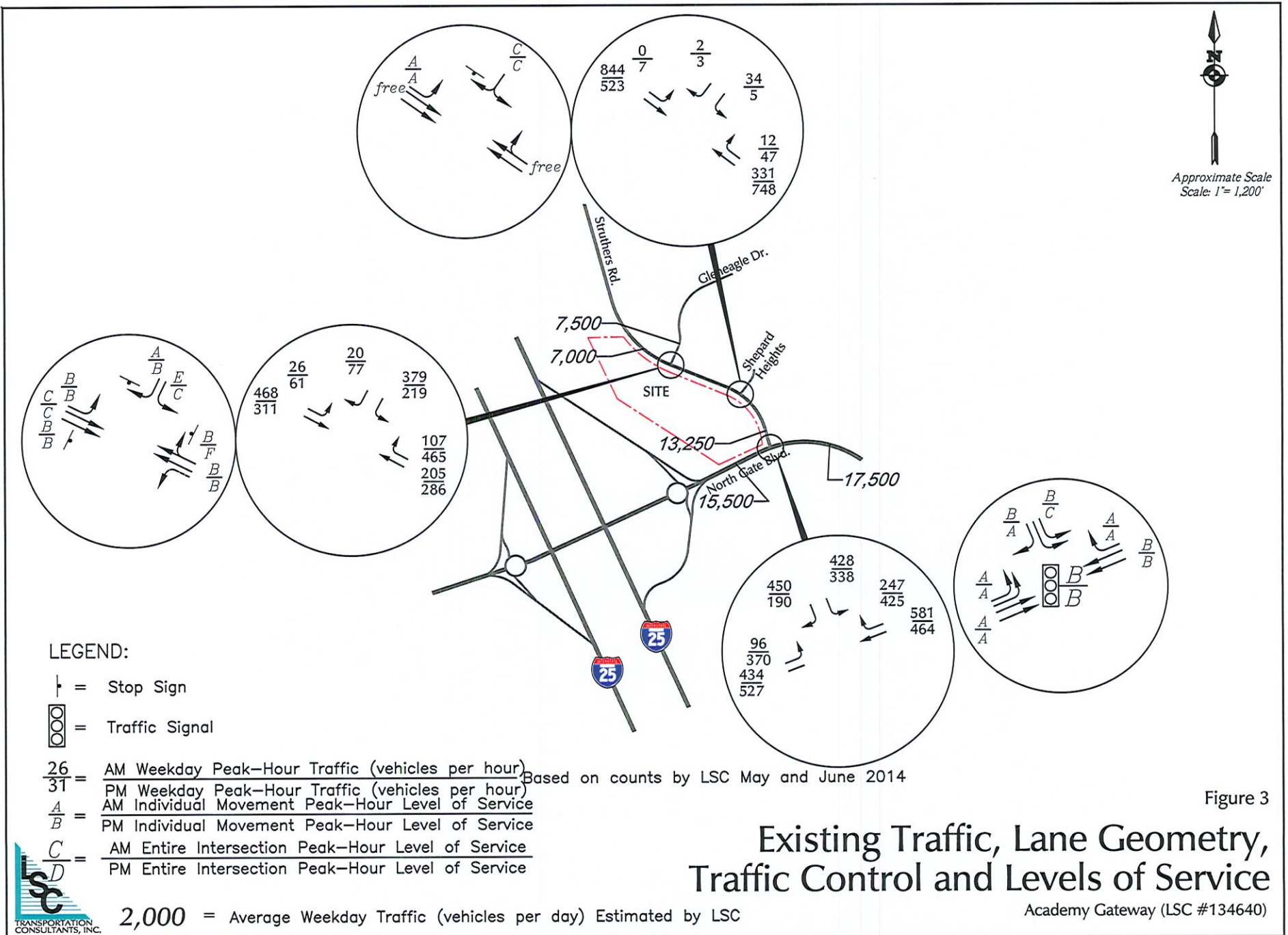
(2) Source: "Trip Generation Handbook - An ITE Proposed Recommended Practice 2nd Edition, 2004" by ITE

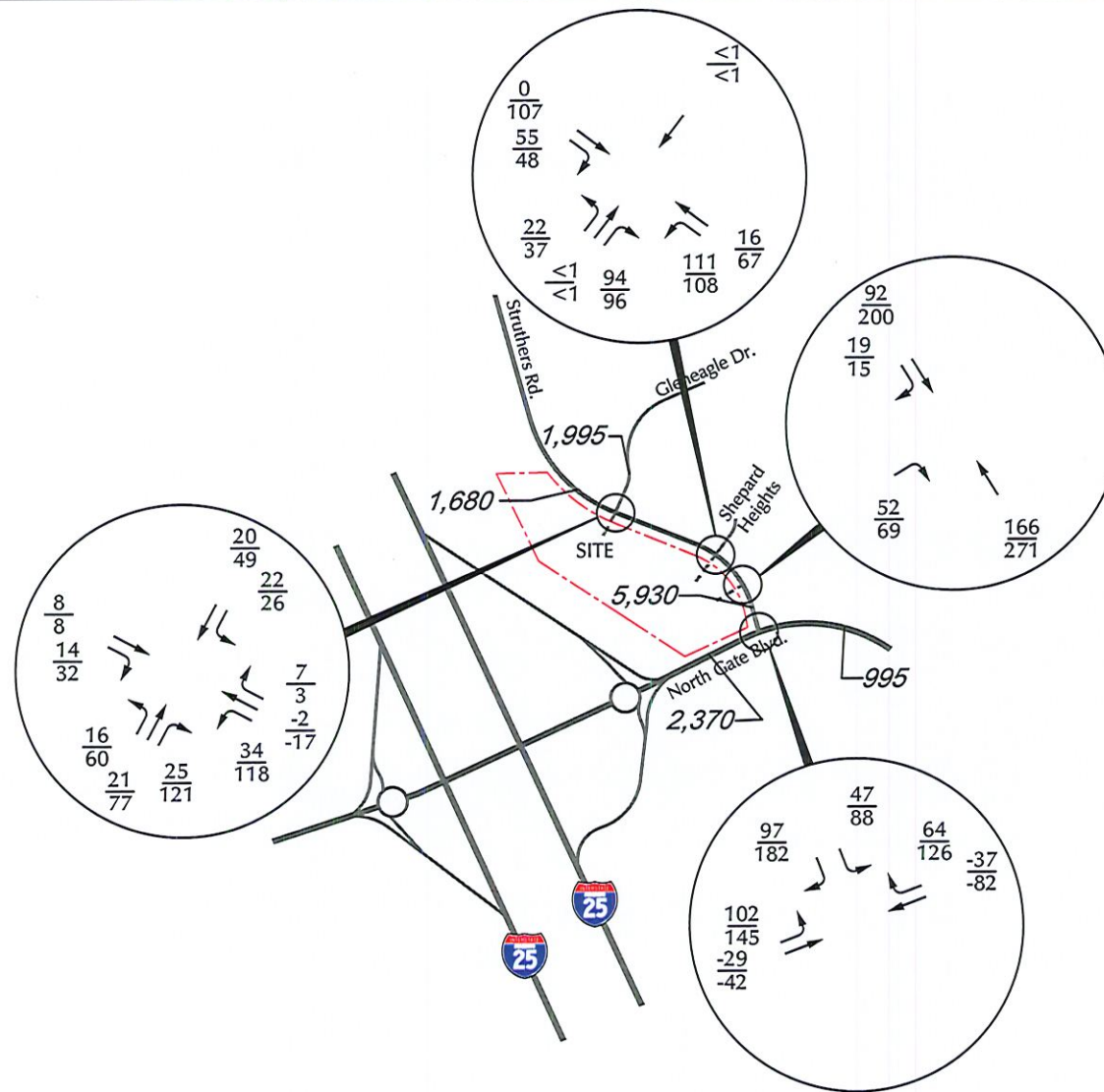
(3) VFP = vehicle fueling position

(4) KSF = 1,000 square feet of floor area

(5) DIL = drive-in lane

Source: LSC Transportation Consultants, Inc.





Approximate Scale  
Scale: 1" = 1,200'

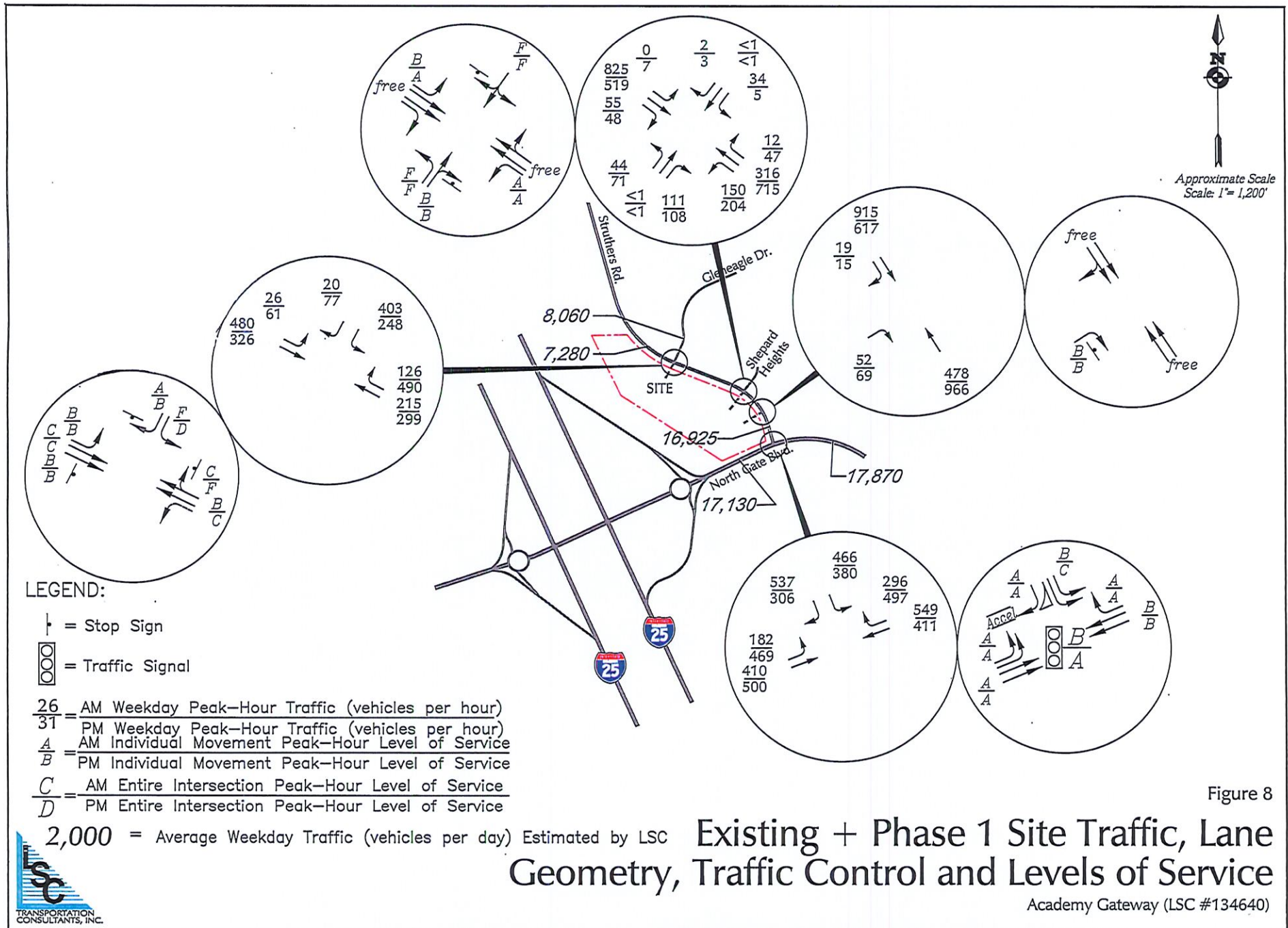
#### LEGEND:

$\frac{26}{31}$  = AM Weekday Peak-Hour Traffic (vehicles per hour)  
PM Weekday Peak-Hour Traffic (vehicles per hour)

2,000 = Average Weekday Traffic (vehicles per day) Estimated by LSC

Figure 7  
**Assignment of  
Buildout Site-Generated Traffic**  
Academy Gateway (LSC #134640)





## Roundabout Intersection Estimate for Struthers Road at Gleneagle Drive

Item Number	Item	Units	Estimated Quantity	Unit Price	Extended Cost
202-00000	Clearing and Grubbing	LS	1	\$ 10,000.00	\$ 10,000.00
202-00010	Removal of Tree	EA	7	\$ 380.00	\$ 2,660.00
202-00195	Removal of Median Cover	SY	320	\$ 12.00	\$ 3,840.00
202-00203	Removal of Curb and Gutter	LF	1253	\$ 8.00	\$ 10,024.00
202-00210	Removal of Concrete Pavement	SY	290	\$ 12.00	\$ 3,480.00
202-00220	Removal of Asphalt Mat	SY	10706	\$ 7.00	\$ 74,942.00
202-00810	Removal of Ground Sign	EA	16	\$ 60.00	\$ 960.00
202-00825	Removal of Flashing Beacon	EA	4	\$ 100.00	\$ 400.00
202-05010	Sawing Concrete (10 inch)	LF	13	\$ 12.00	\$ 156.00
202-05030	Sawing Asphalt Material (10 inch)	LF	1081	\$ 6.00	\$ 6,486.00
	Relocate Telephone Vault	EA	1	\$ 5,000.00	\$ 5,000.00
	Relocate Telephone Riser	EA	1	\$ 5,000.00	\$ 5,000.00
203-00000	Unclassified Excavation / Embankment	CY	5000	\$ 18.00	\$ 90,000.00
208-00020	Silt Fence	LF	500	\$ 2.30	\$ 1,150.00
208-00045	Concrete Washout Structure	EA	2	\$ 1,500.00	\$ 3,000.00
208-00070	Vehicle Tracking Pad	EA	1	\$ 2,100.00	\$ 2,100.00
210-04020	Modify Inlet	EA	1	\$ 3,000.00	\$ 3,000.00
210-00827	Reset Pull box	EA	1	\$ 500.00	\$ 500.00
212-00006	Seeding (Native)	ACRE	1	\$ 775.00	\$ 775.00
212-00032	Soil Conditioning	ACRE	1	\$ 2,600.00	\$ 2,600.00
213-00100	Soil Binder	ACRE	1	\$ 500.00	\$ 500.00
213-00004	Mulching (Weed Free Straw)	ACRE	1	\$ 1,100.00	\$ 1,100.00
304-06007	Aggregate Base Course (Class6)	CY	2220	\$ 40.00	\$ 88,800.00
403-00721	Hot Mix Asphalt (Patching) (Asphalt)	SY	80	\$ 190.00	\$ 15,200.00
412-00600	Concrete Pavement (6inch)	SY	2644	\$ 42.00	\$ 111,048.00
412-00801	Concrete Pavement (8inch) (Special)	SY	633	\$ 110.00	\$ 69,630.00
506-00212	Riprap (12inch)	CY	50	\$ 140.00	\$ 7,000.00
603-01185	18 Inch Reinforced Concrete Pipe (CIP)	LF	150	\$ 75.00	\$ 11,250.00
603-01240	24 Inch Reinforced Concrete Pipe (CIP)	LF	800	\$ 125.00	\$ 100,000.00
604-30005	Manhole	EA	3	\$ 4,000.00	\$ 12,000.00
604-00505	Inlet Ty C (5ft)	EA	1	\$ 5,100.00	\$ 5,100.00
604-19210	Inlet Ty R L 10 (10ft)	EA	5	\$ 7,500.00	\$ 37,500.00
608-00000	Concrete Sidewalk	SY	600	\$ 50.00	\$ 30,000.00
608-00010	Concrete Curb Ramp	SY	203	\$ 135.00	\$ 27,405.00
609-21010	Curb and Gutter Type 2 (Section I-B)	LF	2771	\$ 22.00	\$ 60,962.00
609-21020	Curb and Gutter Type 2 (Section II-B)	LF	3579	\$ 21.00	\$ 75,159.00
610-00020	Median Cover Material (Patterned Concrete)	SF	20644	\$ 11.00	\$ 227,084.00
625-00000	Construction Surveying	LS	1	\$ 10,000.00	\$ 10,000.00
627-00005	Epoxy Pavement Marking	GAL	23	\$ 60.00	\$ 1,380.00
630-10005	Traffic Control	LS	1	\$ 60,000.00	\$ 60,000.00
SUBTOTALS					\$ 1,117,191.00
Contingencies @ 20%					\$ 223,438.20
					\$ 1,340,629.20





July 28, 2015

Mr. James R. Barash  
c/o N.E.S., Inc.  
508 South Tejon Street  
Colorado Springs, CO 80903

RE: Academy Gateway  
Updated Traffic Impact Analysis  
LSC #134640

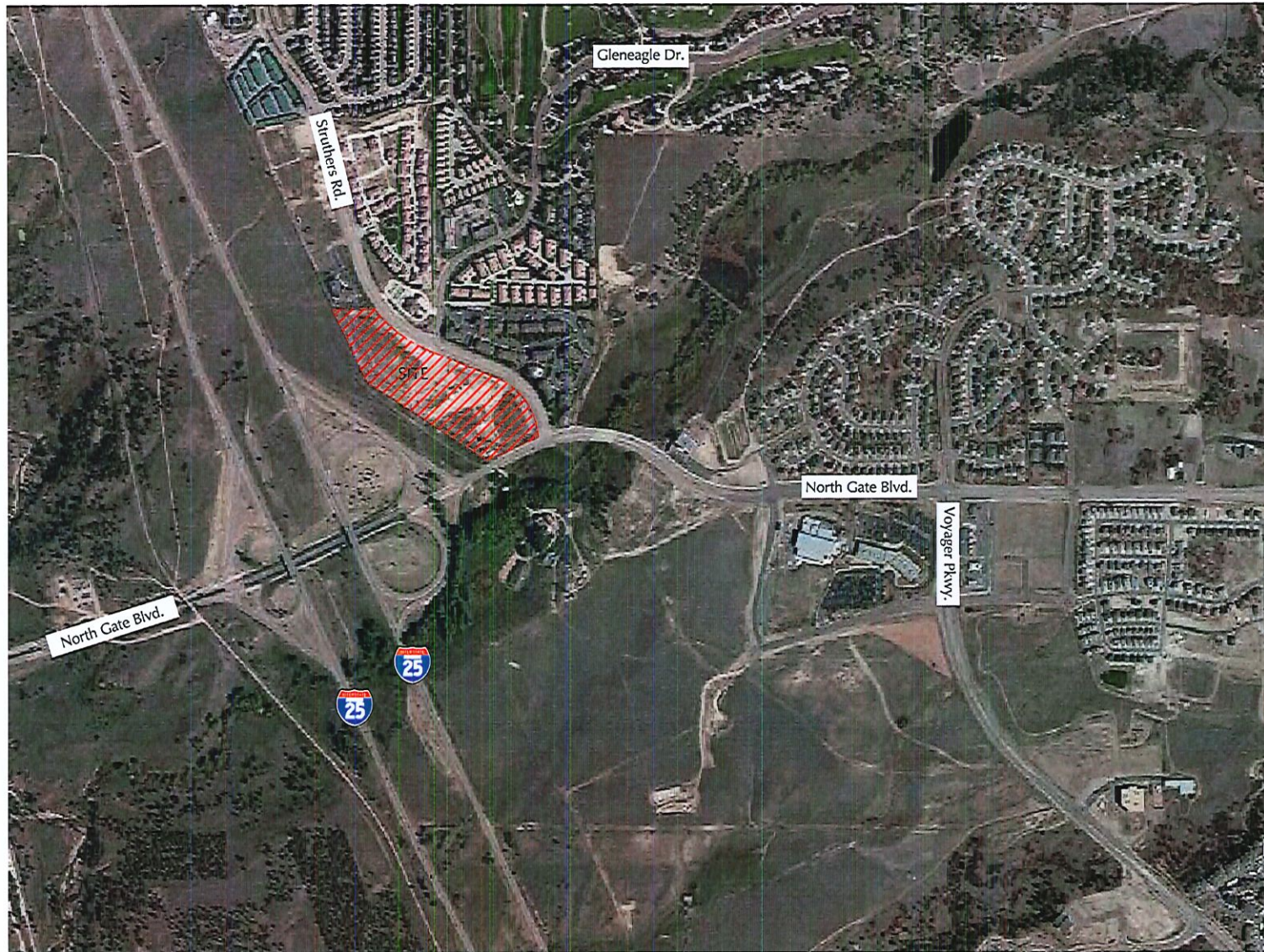
Dear Mr. Barash:

In response to our meeting with the County Engineer, LSC Transportation Consultants, Inc. has prepared this updated traffic impact analysis for the proposed Academy Gateway commercial/retail development. As shown on Figure 1, the site is located northwest of the intersection of North Gate Boulevard and Struthers Road in El Paso County, Colorado.

## **REPORT CONTENTS**

The report contains the following:

- The existing street and traffic conditions adjacent to the site including the intersection lane geometries, traffic controls, posted speed limits, street classifications, etc.
- Existing traffic volumes at the intersections adjacent to the site and estimates of future background traffic volumes.
- The projected average weekday and peak-hour vehicle-trips to be generated by the Phase 1 convenience store and the remainder of the commercial development site.
- The assignment of the projected traffic volumes to the adjacent streets and intersections.
- The resulting total traffic volumes.
- The resulting traffic impacts. The traffic impacts have been quantified by determining the future levels of service and projected vehicle queues at the intersections of North Gate Boulevard/Struthers Road, Gleneagle Drive/Struthers Road, and at the site access to Struthers Road.
- Evaluation of the traffic control options for the Gleneagle/Struthers intersection.
- Based on the traffic analysis, the report concludes with recommendations for traffic control and street improvements.

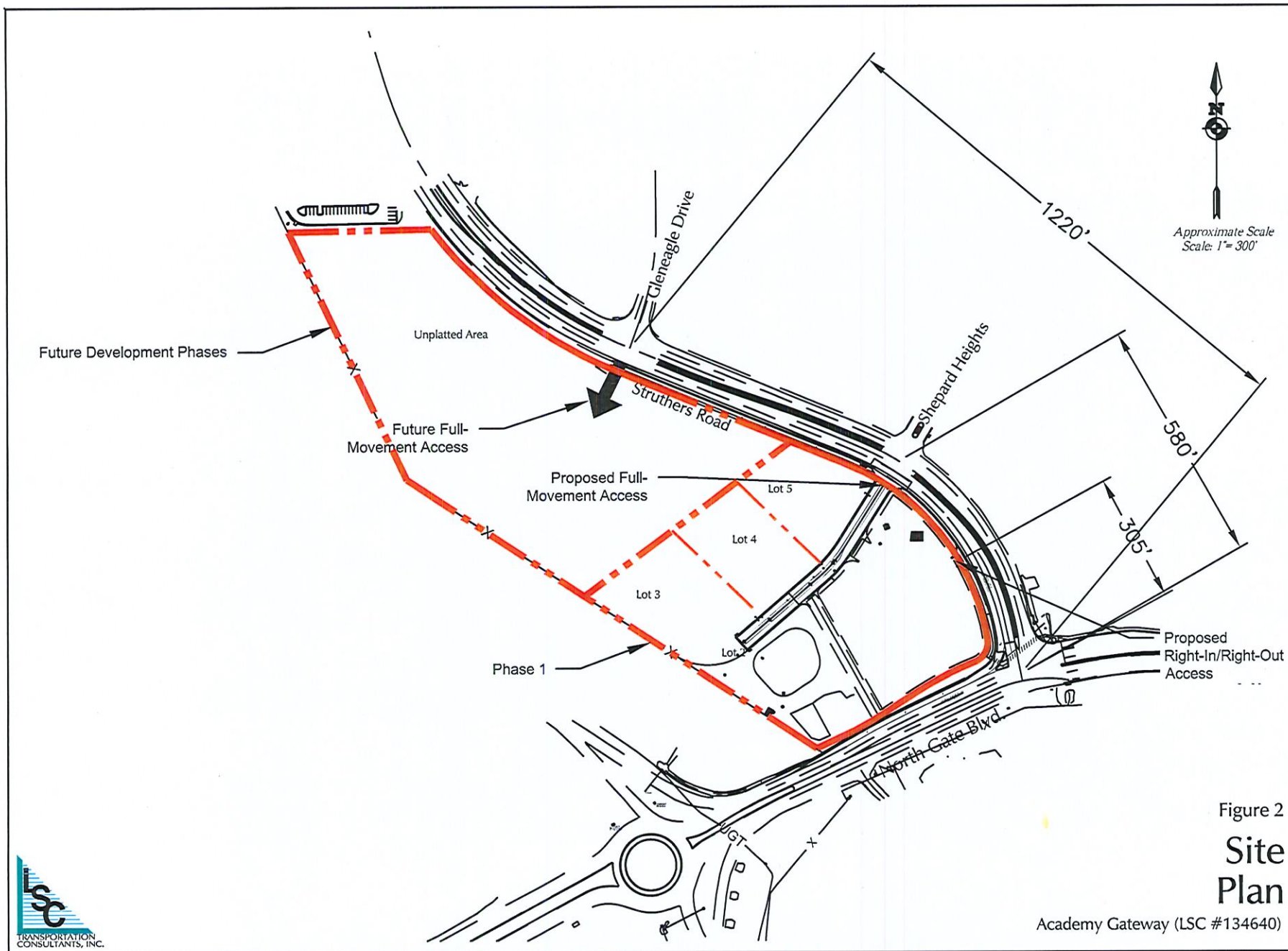


Approximate Scale  
Scale: 1" = 1,200'

Figure 1  
**Vicinity  
Map**

Academy Gateway (LSC #134640)





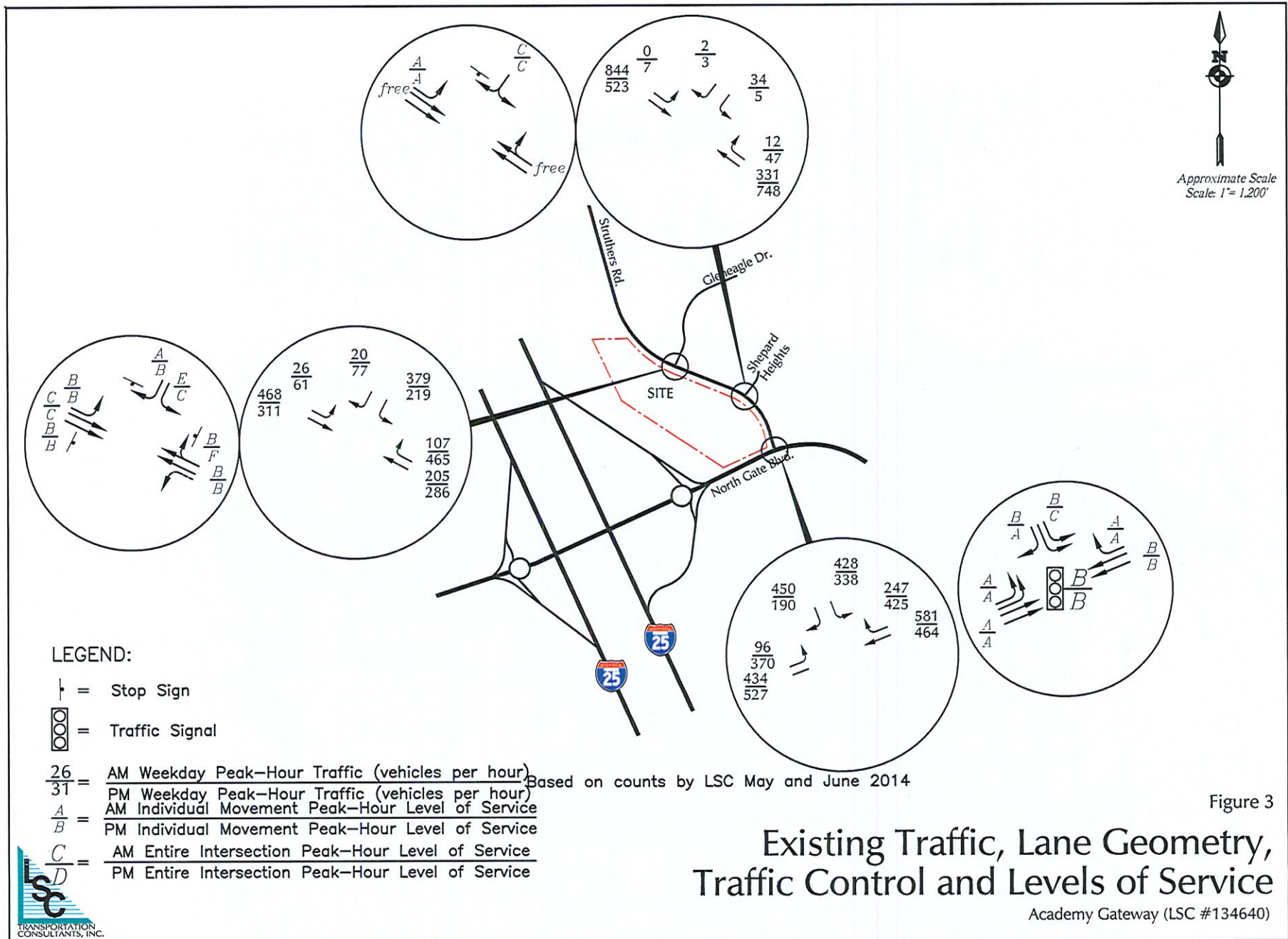
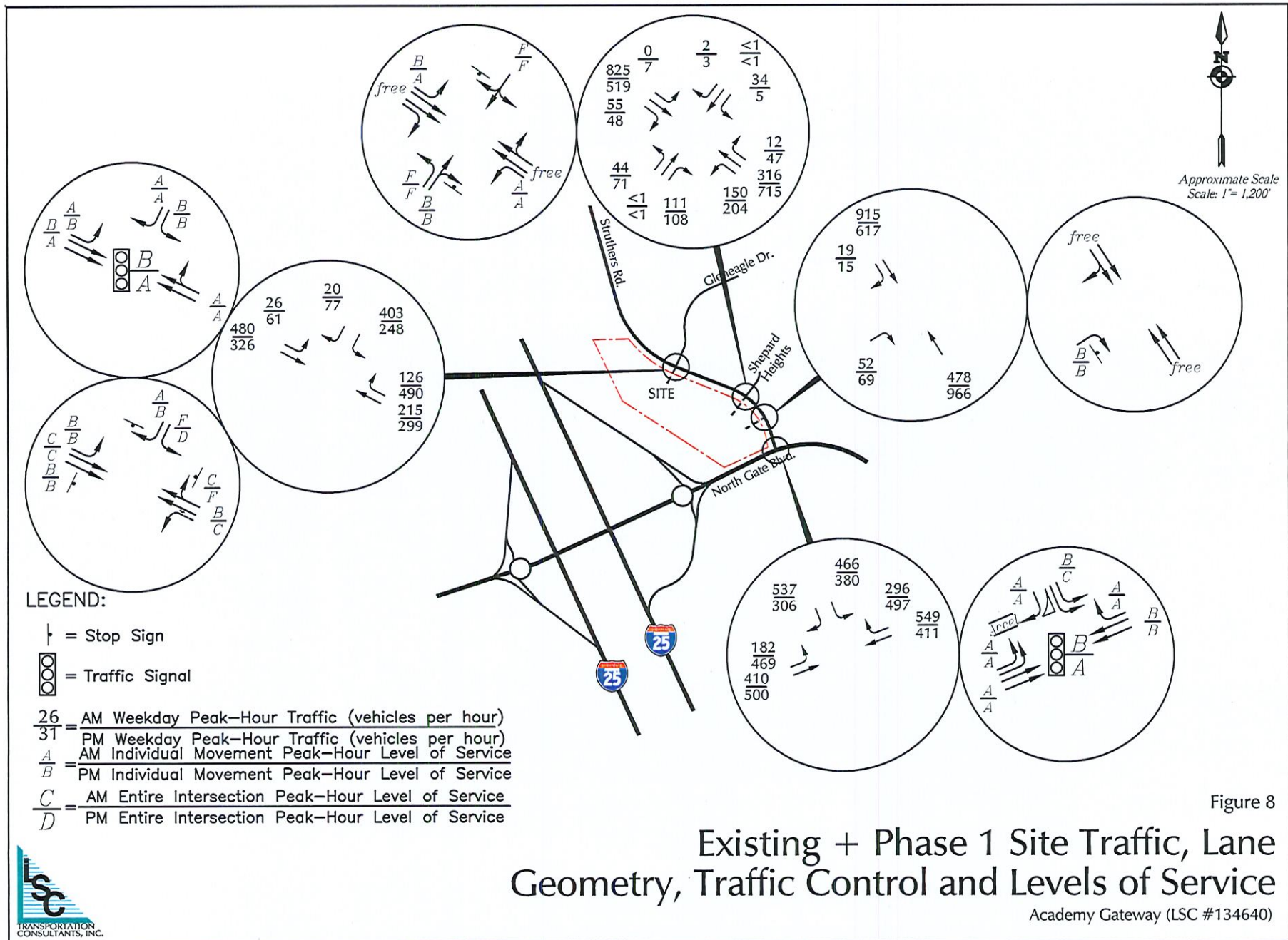


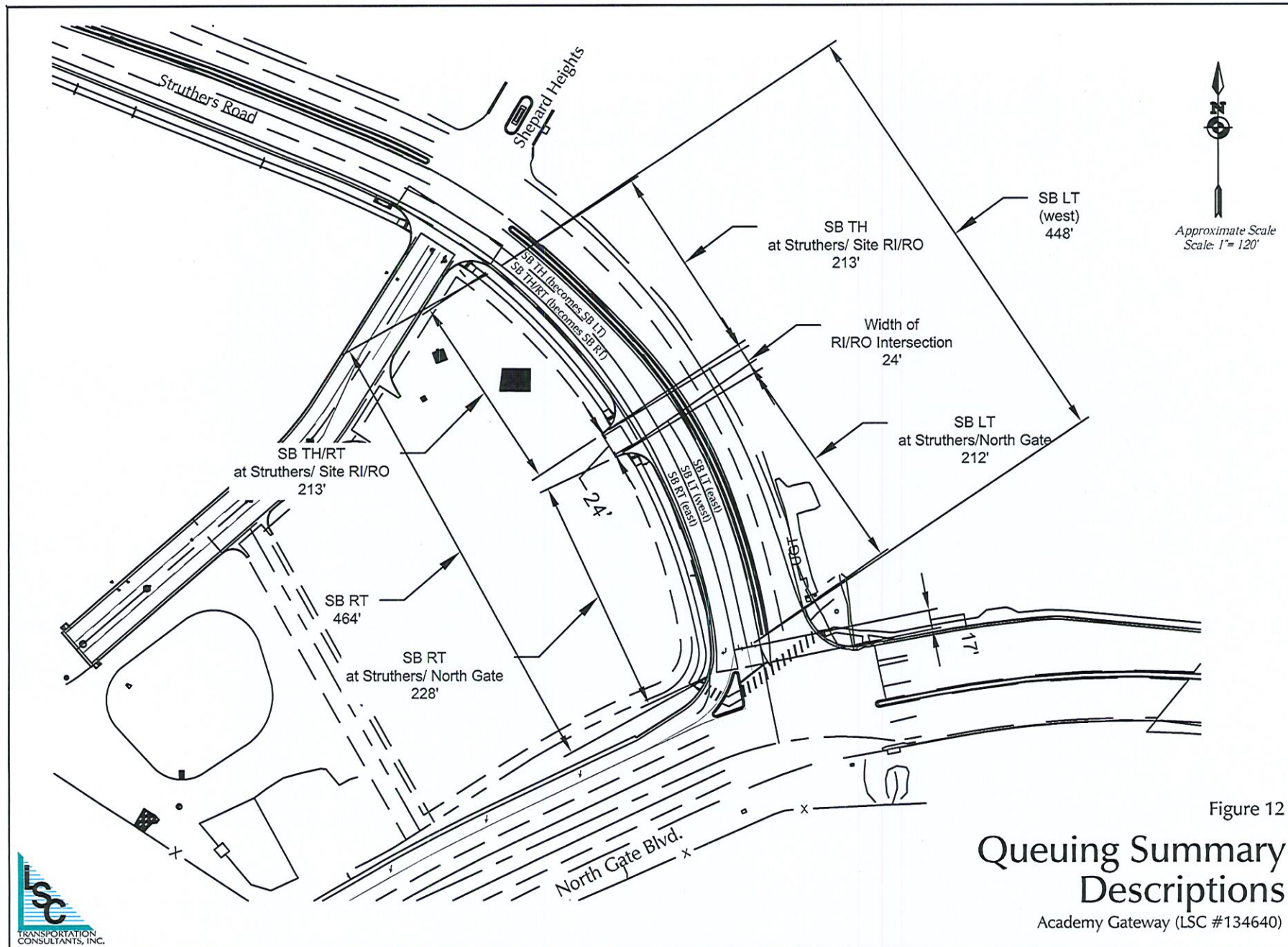
Figure 3

## Existing Traffic, Lane Geometry, Traffic Control and Levels of Service

Academy Gateway (LSC #134640)







LSC Transportation Consultants, Inc.

516 N. Tejon St.

LSC Transportation Consultants, Inc.

Colorado Springs, CO

(719) 633-2868

File Name : Struthers - North Gate Blvd AM

Site Code : 00134640

Start Date : 05/21/2014

Page No : 1

Groups Printed- Unshifted

Start Time	Struthers Rd From North				North Gate Blvd From East				From South				North Gate Blvd From West				Int. Total
	Righ t	Thru	Left	Ped s	Righ t	Thru	Left	Ped s	Righ t	Thru	Left	Ped s	Righ t	Thru	Left	Ped s	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	58	0	49	0	12	75	0	0	0	0	0	0	0	44	7	0	245
06:45 AM	79	0	59	0	14	98	0	0	0	0	0	0	0	69	9	0	328
Total	137	0	108	0	26	173	0	0	0	0	0	0	0	113	16	0	573
07:00 AM	120	0	64	0	24	120	0	0	0	0	0	0	0	98	19	0	445
07:15 AM	109	0	114	0	28	157	0	0	0	0	0	0	0	116	12	0	536
07:30 AM	139	0	115	0	38	159	0	0	0	0	0	0	0	113	17	0	581
07:45 AM	100	0	121	0	95	139	0	0	0	0	0	0	0	109	32	0	596
Total	468	0	414	0	185	575	0	0	0	0	0	0	0	436	80	0	2158
08:00 AM	102	0	78	0	86	126	0	0	0	0	0	0	0	96	35	0	523
08:15 AM	83	0	76	0	72	124	0	0	0	0	0	0	0	88	30	0	473
Grand Total	790	0	676	0	369	998	0	0	0	0	0	0	0	733	161	0	3727
Apprch %	53.9	0.0	46.1	0.0	27.0	73.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	82.0	18.0	0.0	
Total %	21.2	0.0	18.1	0.0	9.9	26.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	19.7	4.3	0.0	

LSC Transportation Consultants, Inc.

516 N. Tejon St.

Colorado Springs, CO

(719) 633-2868

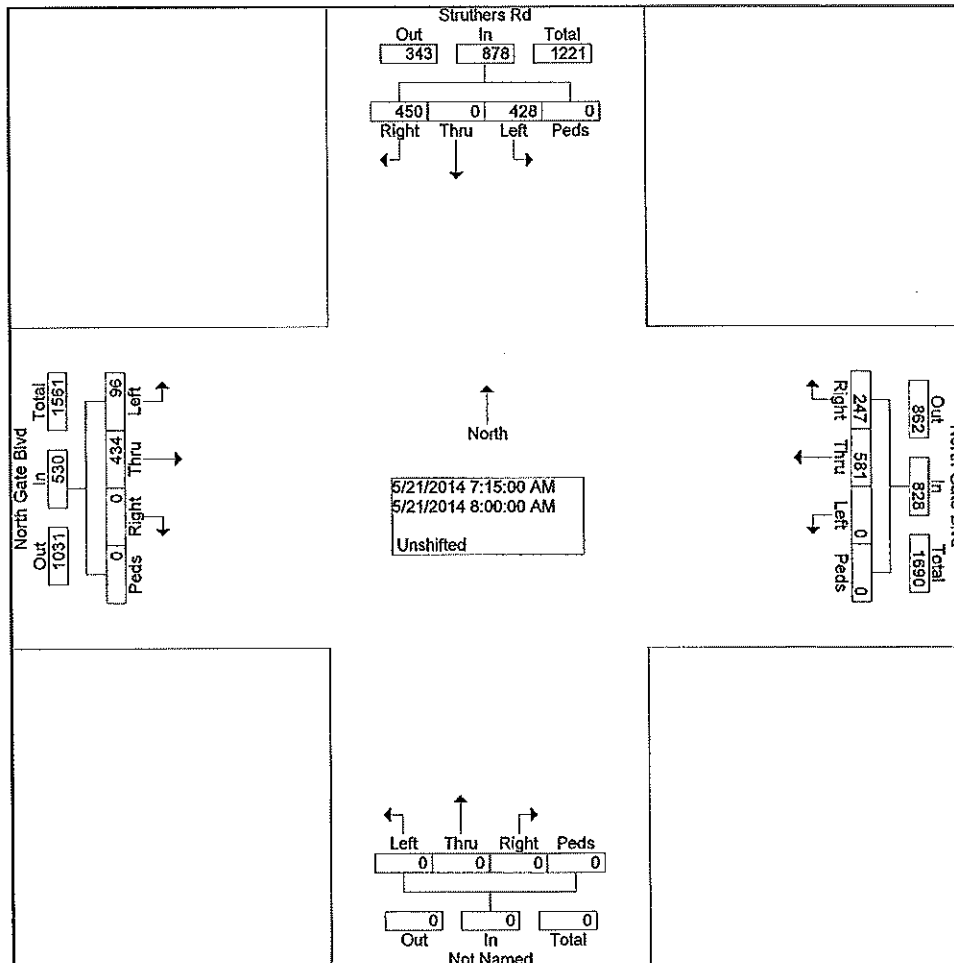
File Name : Struthers - North Gate Blvd AM

Site Code : 00134640

Start Date : 05/21/2014

Page No : 2

Start Time	Struthers Rd From North					North Gate Blvd From East					From South					North Gate Blvd From West					Int. Total
	Rig ht	Thru	Left	Peds	App. Total	Rig ht	Thru	Left	Peds	App. Total	Rig ht	Thru	Left	Peds	App. Total	Rig ht	Thru	Left	Peds	App. Total	
Peak Hour	From 06:30 AM to 08:15 AM - Peak 1 of 1																				
Intersection	07:15 AM																				
Volume	45	0	42	0	87	24	58	0	0	82	0	0	0	0	0	0	43	96	0	53	2236
Percent	51.	0.0	48.	0.0		29.	70.	0.0	0.0		0.0	0.0	0.0	0.0		0.0	81.	18.	0.0		
	3		7			8	2										9	1			
07:45	10	0	12	0	22	95	13	0	0	234	0	0	0	0	0	0	10	32	0	14	596
Volume	0		1				9										9				0.938
Peak Factor																					
High Int.																					
Volume	13	0	11	0	25	95	13	0	0	234	0	0	0	0	0	0	10	32	0	14	
Peak Factor	9		5		0.86		9			0.88							9				0.94
																					0





## COUNTER MEASURES INC.

1889 YORK STREET

DENVER, COLORADO 80206

303-333-7409

N/S STREET: STRUTHERS RD  
 E/W STREET: NORTH GATE BLVD  
 CITY: COLORADO SPRINGS  
 COUNTY: EL PASO

File Name : STRUNORT

Site Code : 00000005

Start Date : 6/4/2014

Page No : 1

## Groups Printed- VEHICLES

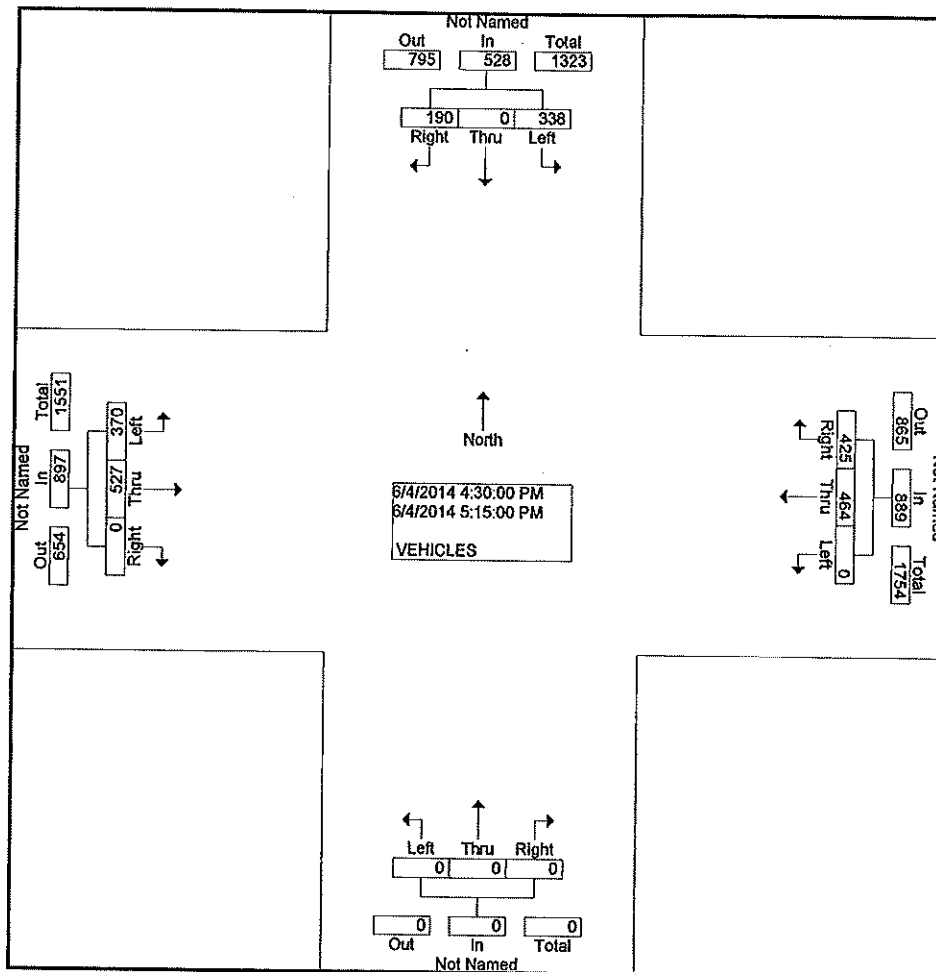
	Southbound			Westbound			Northbound			Eastbound			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
04:00 PM	82	0	40	0	91	97	0	0	0	79	83	0	472
04:15 PM	83	0	45	0	103	105	0	0	0	83	125	0	544
04:30 PM	86	0	51	0	126	98	0	0	0	95	145	0	601
04:45 PM	84	0	39	0	106	108	0	0	0	86	129	0	552
Total	335	0	175	0	426	408	0	0	0	343	482	0	2169
05:00 PM	84	0	48	0	115	116	0	0	0	88	127	0	578
05:15 PM	84	0	52	0	117	103	0	0	0	101	126	0	583
05:30 PM	79	0	30	0	90	100	0	0	0	98	112	0	509
05:45 PM	73	0	48	0	77	93	0	0	0	85	92	0	468
Total	320	0	178	0	399	412	0	0	0	372	457	0	2138
Grand Total	655	0	353	0	825	820	0	0	0	715	939	0	4307
Apprch %	65.0	0.0	35.0	0.0	50.2	49.8	0.0	0.0	0.0	43.2	56.8	0.0	
Total %	15.2	0.0	8.2	0.0	19.2	19.0	0.0	0.0	0.0	16.6	21.8	0.0	

COUNTER MEASURES INC.  
1889 YORK STREET  
DENVER, COLORADO 80206  
303-333-7409

N/S STREET: STRUTHERS RD  
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CITY: COLORADO SPRINGS  
COUNTY: EL PASO

File Name : STRUNORT  
Site Code : 00000005  
Start Date : 6/4/2014  
Page No : 2

	Southbound				Westbound				Northbound				Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Intersection	04:30 PM																
Volume	338	0	190	528	0	464	425	889	0	0	0	0	370	527	0	897	2314
Percent	64.0	0.0	36.0		0.0	52.2	47.8		0.0	0.0	0.0		41.2	58.8	0.0		
04:30	86	0	51	137	0	126	98	224	0	0	0	0	95	145	0	240	601
Volume																	0.963
Peak Factor	0.964				0.962								0.934				
High Int.	04:30 PM				05:00 PM				3:45:00 PM				04:30 PM				
Volume	86	0	51	137	0	115	116	231	0	0	0	0	95	145	0	240	
Peak Factor																	



## COUNTER MEASURES INC.

1889 YORK STREET

DENVER, COLORADO 80206

303-333-7409

N/S STREET: GLENEAGLE DR  
 E/W STREET: STRUTHERS RD  
 CITY: COLORADO SPRINGS  
 COUNTY: EL PASO

File Name : GLENSTRU

Site Code : 00000005

Start Date : 5/21/2014

Page No : 1

## Groups Printed- VEHICLES

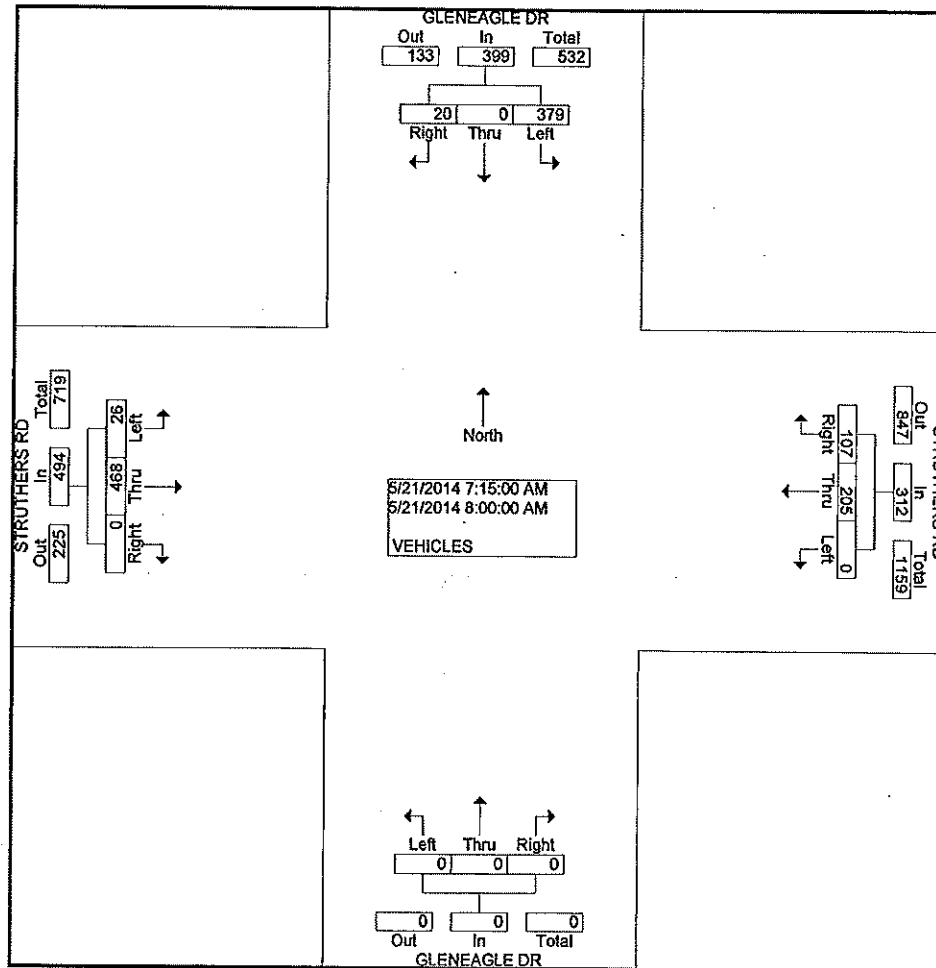
Start Time	GLENEAGLE DR Southbound			STRUTHERS RD Westbound			GLENEAGLE DR Northbound			STRUTHERS RD Eastbound			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Factor	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
06:30 AM	56	0	4	0	12	9	0	0	0	3	45	0	129
06:45 AM	72	0	4	0	11	6	0	0	0	1	58	0	152
Total	128	0	8	0	23	15	0	0	0	4	103	0	281
07:00 AM	88	0	8	0	31	14	0	0	0	6	80	0	227
07:15 AM	96	0	6	0	20	20	0	0	0	5	122	0	269
07:30 AM	108	0	7	0	35	13	0	0	0	10	136	0	309
07:45 AM	92	0	1	0	67	38	0	0	0	5	115	0	318
Total	384	0	22	0	153	85	0	0	0	26	453	0	1123
08:00 AM	83	0	6	0	83	36	0	0	0	6	95	0	309
08:15 AM	68	0	6	0	60	48	0	0	0	7	79	0	268
Total	151	0	12	0	143	84	0	0	0	13	174	0	577
04:15 PM	58	0	15	0	141	104	0	0	0	15	138	0	471
04:30 PM	51	0	26	0	121	82	0	0	0	12	163	0	455
04:45 PM	52	0	22	0	117	66	0	0	0	9	168	0	434
Total	161	0	63	0	379	252	0	0	0	36	469	0	1360
05:00 PM	53	0	25	0	127	94	0	0	0	19	181	0	499
05:15 PM	49	0	23	0	107	83	0	0	0	16	202	0	480
05:30 PM	63	0	16	0	108	80	0	0	0	17	174	0	458
05:45 PM	60	0	21	0	100	90	0	0	0	11	117	0	399
Total	225	0	85	0	442	347	0	0	0	63	674	0	1836
06:00 PM	42	0	14	0	82	54	0	0	0	17	60	0	269
Grand Total	1091	0	204	0	1222	837	0	0	0	159	1933	0	5446
Apprch %	84.2	0.0	15.8	0.0	59.3	40.7	0.0	0.0	0.0	7.6	92.4	0.0	
Total %	20.0	0.0	3.7	0.0	22.4	15.4	0.0	0.0	0.0	2.9	35.5	0.0	

**COUNTER MEASURES INC.**  
 1889 YORK STREET  
 DENVER, COLORADO 80206  
 303-333-7409

N/S STREET: GLENEAGLE DR  
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 CITY: COLORADO SPRINGS  
 COUNTY: EL PASO

File Name : GLENSTRU  
 Site Code : 00000005  
 Start Date : 5/21/2014  
 Page No : 2

	GLENEAGLE DR Southbound				STRUTHERS RD Westbound				GLENEAGLE DR Northbound				STRUTHERS RD Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 06:30 AM to 08:30 AM - Peak 1 of 1																	
Intersection	07:15 AM																
Volume	379	0	20	399	0	205	107	312	0	0	0	0	26	468	0	494	1205
Percent	95.0	0.0	5.0		0.0	65.7	34.3		0.0	0.0	0.0		5.3	94.7	0.0		
07:45																	
Volume	92	0	1	93	0	67	38	105	0	0	0	0	5	115	0	120	318
Peak Factor																	0.947
High Int.	07:30 AM				08:00 AM				6:15:00 AM				07:30 AM				
Volume	108	0	7	115	0	83	36	119	0	0	0	0	10	136	0	146	
Peak Factor	0.867								0.655				0.846				

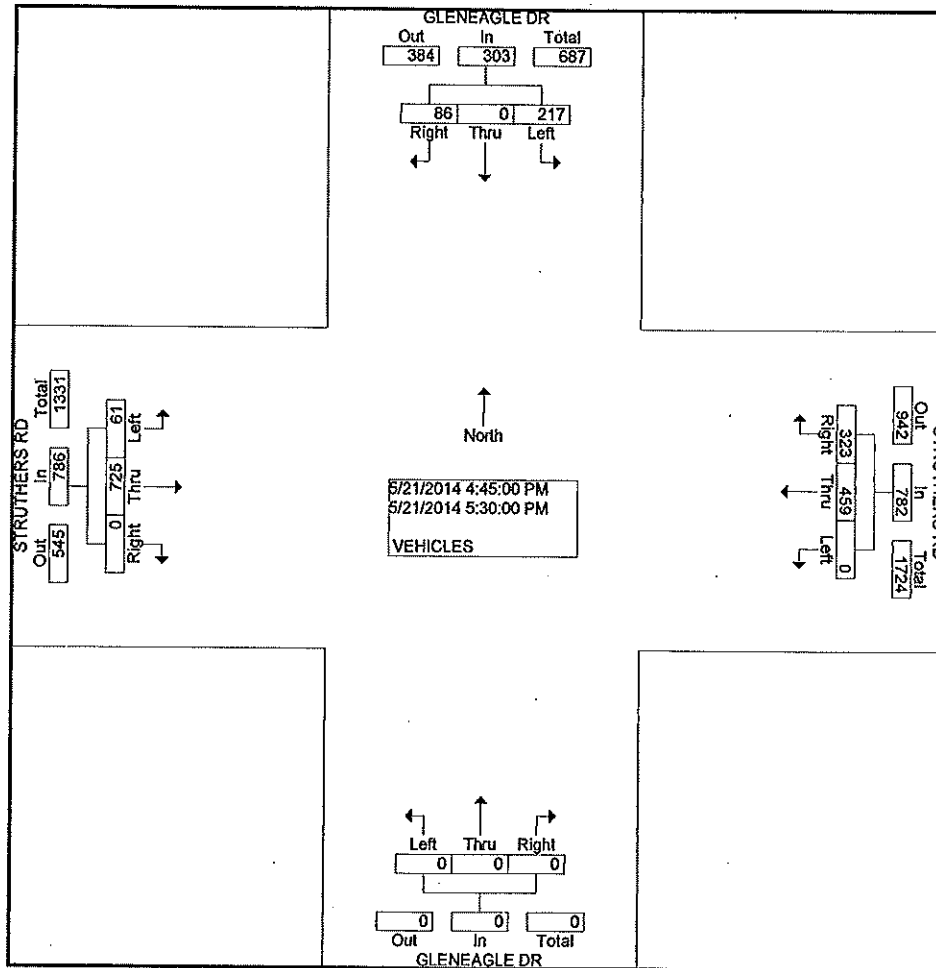


COUNTER MEASURES INC.  
1889 YORK STREET  
DENVER, COLORADO 80206  
303-333-7409

N/S STREET: GLENEAGLE DR  
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CITY: COLORADO SPRINGS  
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File Name : GLENSTRU  
Site Code : 00000005  
Start Date : 5/21/2014  
Page No : 2

	GLENEAGLE DR Southbound				STRUTHERS RD Westbound				GLENEAGLE DR Northbound				STRUTHERS RD Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour From 04:15 PM to 06:00 PM - Peak 1 of 1																	
Intersection	04:45 PM																
Volume	217	0	86	303	0	459	323	782	0	0	0	0	61	725	0	786	1871
Percent	71.6	0.0	28.4		0.0	58.7	41.3		0.0	0.0	0.0		7.8	92.2	0.0		
05:00	53	0	25	78	0	127	94	221	0	0	0	0	19	181	0	200	499
Volume																	
Peak Factor																	0.937
High Int.	05:30 PM				05:00 PM								05:15 PM				
Volume	63	0	16	79	0	127	94	221	0	0	0	0	16	202	0	218	
Peak Factor				0.959				0.885								0.901	



## Excerpt from Springs at Gateway TIS

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# **Springs at Northgate Traffic Impact Study**

Prepared for:

Erin Conway  
Development Associate  
Continental Properties  
W134N8675 Executive Parkway  
Menomonee Falls, WI 53051

MAY 14, 2021

---

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

LSC #S214140



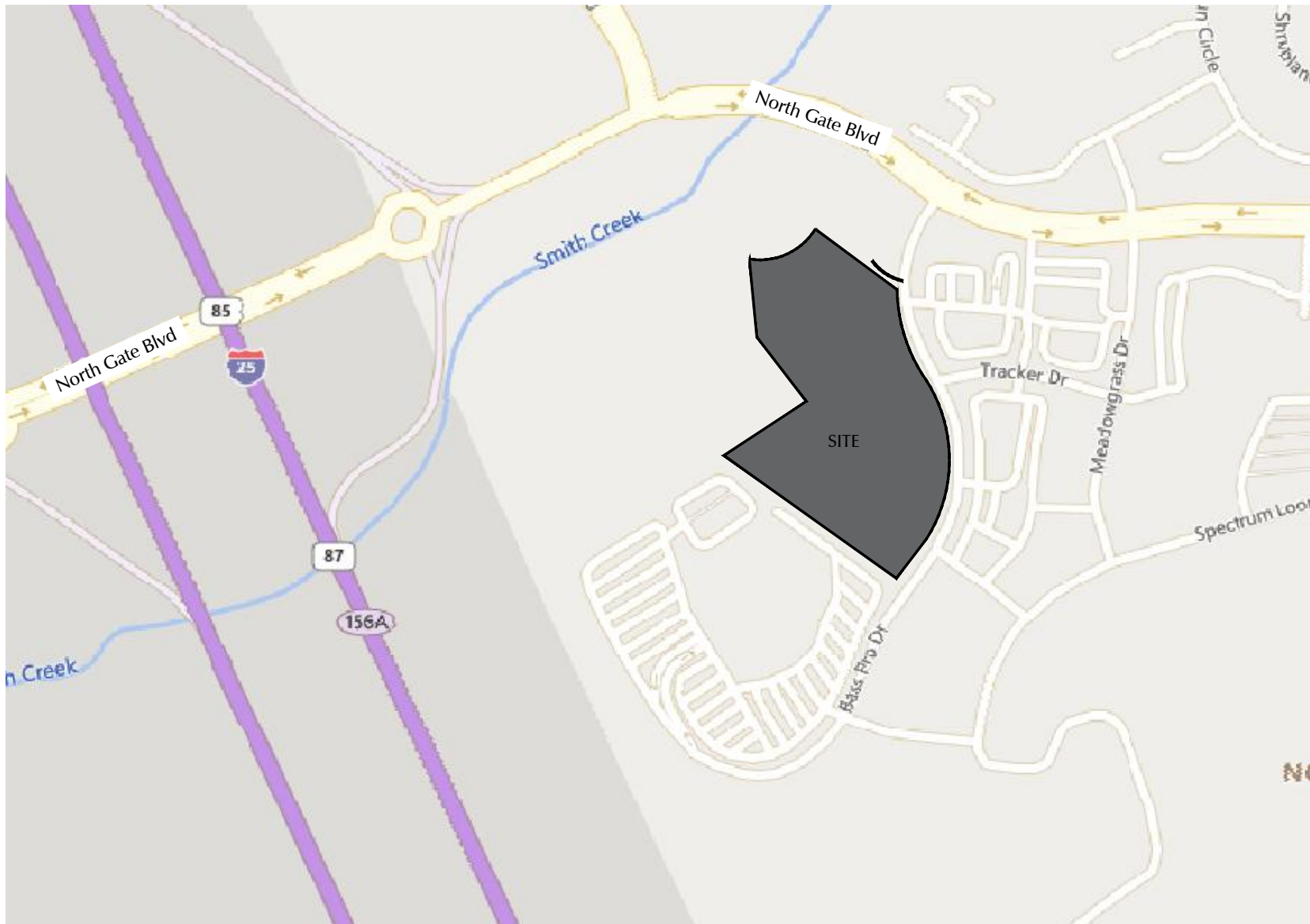
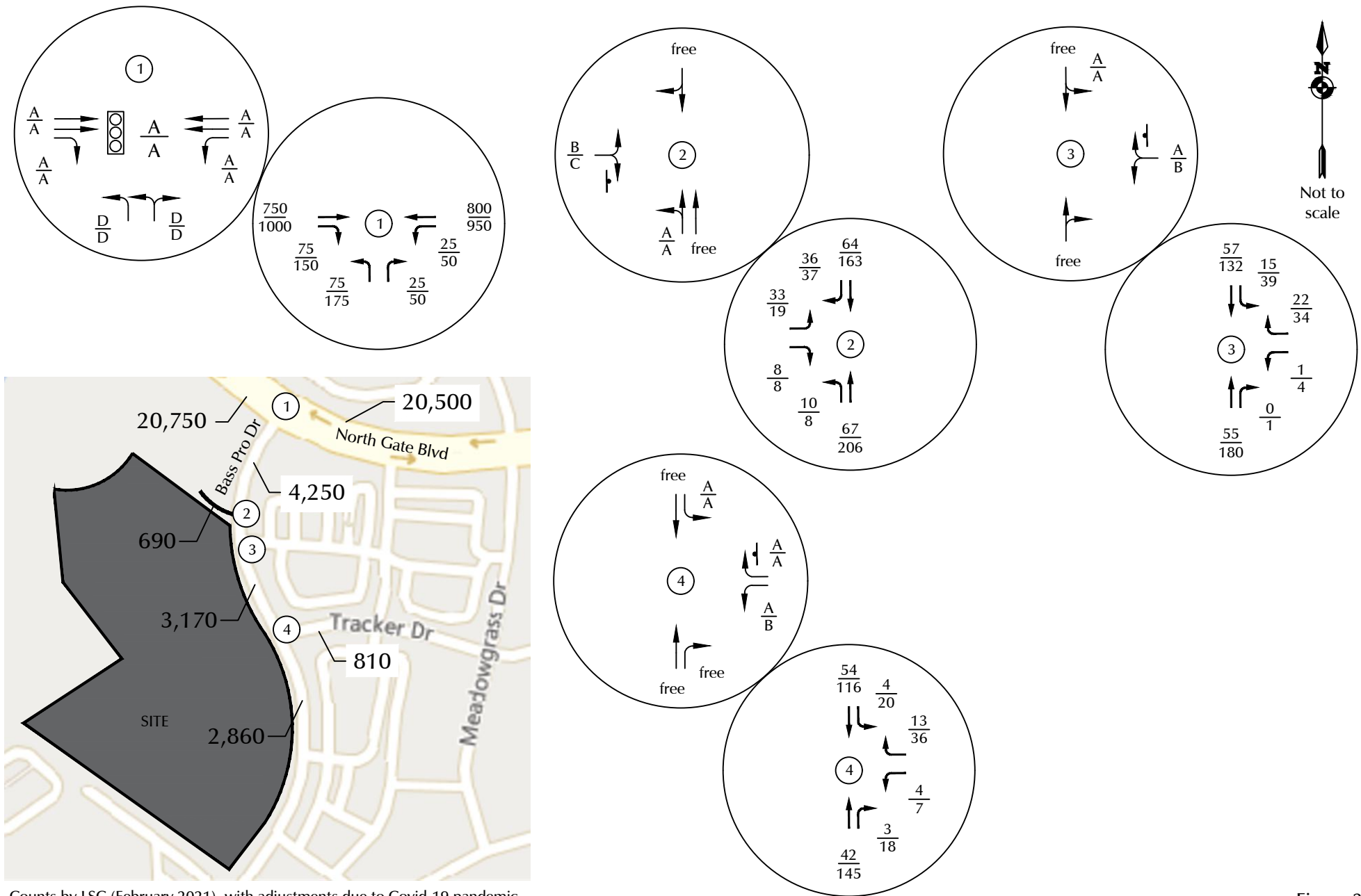


Figure 1

## Vicinity Map

S214140 - Springs at Northgate





Counts by LSC (February 2021), with adjustments due to Covid-19 pandemic



$\frac{X}{X}$  = AM Individual Movement Peak-Hour LOS  
 $\frac{XX}{XX}$  = PM Individual Movement Peak-Hour LOS  
 $\frac{XX}{XX}$  = AM Weekday Peak-Hour Traffic (Veh/Hour)  
 $\frac{XX}{XX}$  = PM Weekday Peak-Hour Traffic (Veh/Hour)  
 X,XXX = Average Daily Traffic (Vehicles/Day)

$\downarrow$  = Stop Sign  
 $\square$  = Traffic Signal

## Existing Traffic, Lane Geometry, Traffic Control, and LOS

S214140 - Springs at Northgate

Figure 3



## Excerpt from True North Commons

---



# TRUE NORTH COMMONS

---

## TRAFFIC IMPACT STUDY

***Prepared for:***

City of Colorado Springs, CO

***Prepared by:***



2435 Research Parkway, Suite 300  
Colorado Springs, CO 80920

Contact: Scott Barnhart, PE, PTOE

***On Behalf of:***

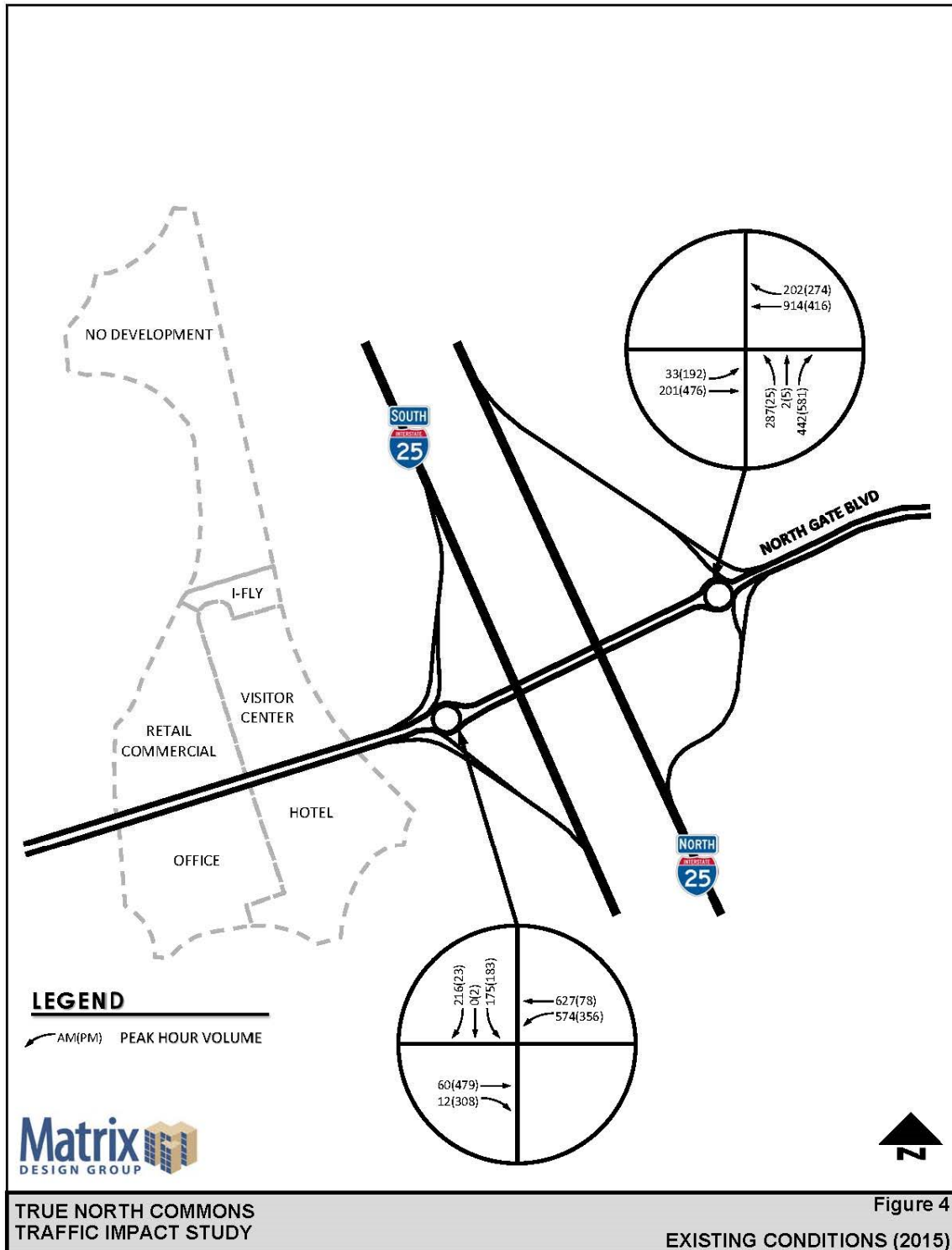
Blue and Silver Development, LLC  
2435 Research Parkway, Suite 300  
Colorado Springs, CO 8920

**September 21, 2018**

## TRUE NORTH COMMONS TRAFFIC IMPACT STUDY

I-25 ramp intersections was taken directly from the *I-25/Powers Boulevard IAR*. The AM and PM peak hour volumes at these two intersections is shown in Figure 4.

**Figure 4 – Existing Conditions Traffic Volumes**



# TRUE NORTH COMMONS TRAFFIC IMPACT STUDY

Figure 6 – Opening Year (2020) Traffic Volumes

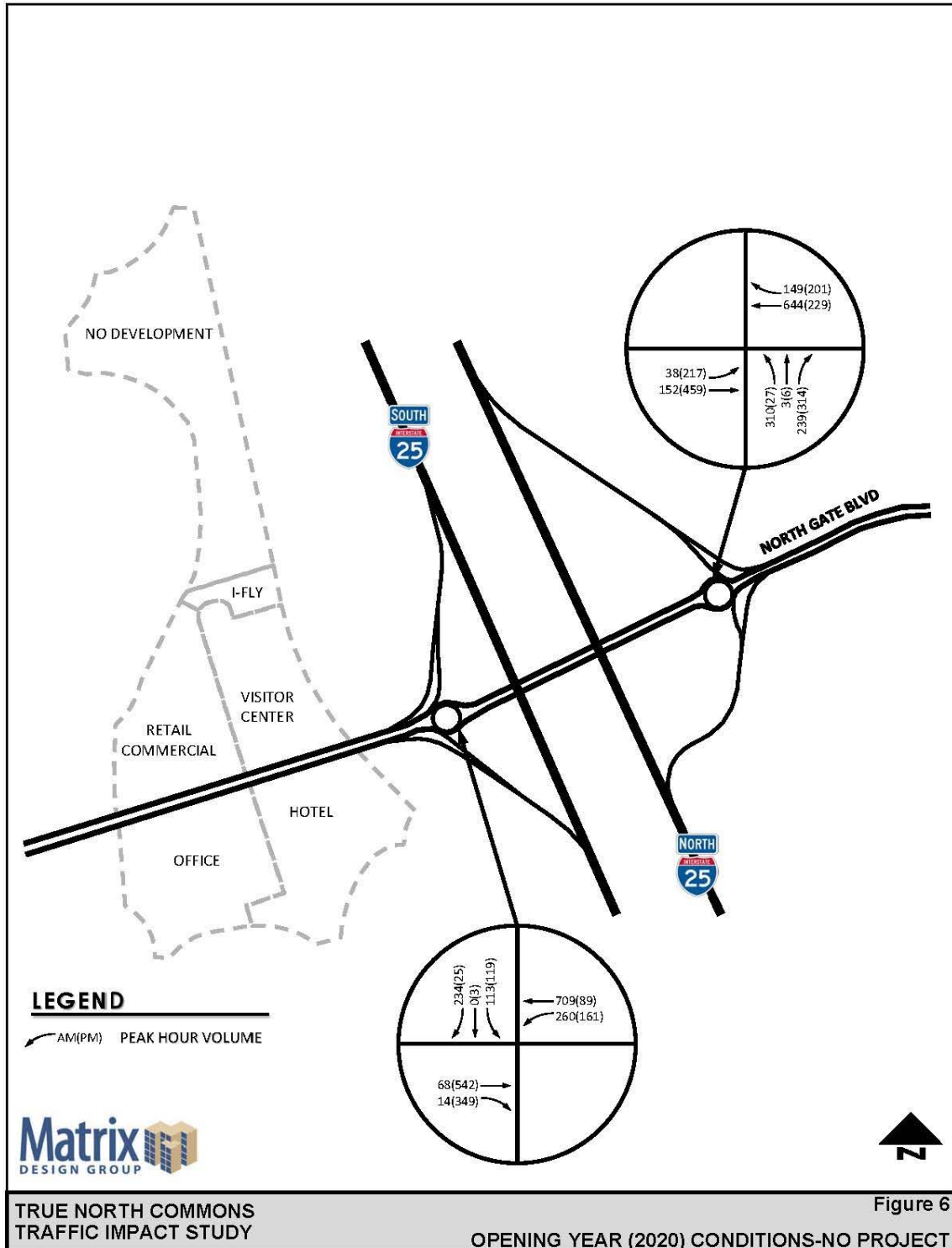


Table 3 shows the LOS of the two I-25 ramp intersections with Northgate Boulevard. As can be seen from Table 3, both intersections will operate well during 2020 without the project.

**Figure 3-1 Existing Traffic Volumes (2015)**

#,###(#,###) = AM (PM)  
peak-hour volumes

