

MEMORANDUM

To: Bruce Abraham
Urban Redevelopment Authority of Forest Park

From: Rob Ross, P.E.
Kimley-Horn and Associates, Inc.

Date: December 14, 2022

Subject: **Transportation Services – Fort Gillem**

Project Overview

The Urban Redevelopment Authority of Forest Park has retained Kimley-Horn and Associates, Inc. to provide professional engineering services related to the former Fort Gillem site.

The roadway geometry and potential changes to the intersection of Anvil Block Road at 1st Street were analyzed. A guard house for Fort Gillem previously operated as a security checkpoint at the center of this intersection. Preliminary concept sketches and an opinion of probable construction costs for three (3) different alternatives for the intersection of Anvil Block Road at 1st Street is included in the memorandum. Exhibit A and B in the attachments illustrate the project location and the intersection study network.

The development site completed the Development of Regional Impact (DRI) review process in 2020 with the DRI Traffic Study (*Gillem Logistics Center DRI #3073*) completed by Kimley-Horn. Since the submission of *DRI #3073*, portions of the site plan have been partially built out while other portions have been updated with a new development program.

Because of these updates, this memorandum summarizes a comparison of current 2022 build-out and master planned conditions to the former DRI projections. Site circulation/traffic evaluation based on the updated development program is also documented for current 2022 and projected future conditions. The traffic evaluation consisted of volume development and a level-of-service analysis of three (3) study intersections along Anvil Block Road in the vicinity of Moreland Avenue (SR 42). The studied intersections are those most impacted by proposed development program changes since the DRI.

Task 1: Existing Conditions and DRI Projections

The *Gillem Logistics Center DRI #3073* entitled the development to approximately 10.78 million SF. As of May 2022, when the turning movement counts were collected, approximately 6.94 million SF of development were already complete, and an additional 1.11 million SF were under construction. The buildings under construction included Building 700, Building 1200, the proposed movie studios (newly proposed for the site), and the conversion of the former Forest Park Fire Station into restaurant/retail space. The movie studios replace Buildings A, B, and C, from the *Gillem Logistics Center DRI #3073* site plan, which were originally master planned to include commercial land uses. **Table 1** outlines the Development Program Updates from the 2020 *Gillem Logistics Center DRI #3073* to the current 2022 site plan.

It should be noted that the current 2022 development includes approximately 8 million SF, with approximately 2.73 million SF remaining that is entitled and not yet accounted for with programmed

development projects. For the analysis of future full build-out for the site under the updated 2022 development program, the remaining 2.73 million SF were assumed to be future warehousing. Exhibit H and I in the attachments include the *Gillem Logistics Center DRI #3073* site plan and the proposed movie studio site plan, respectively.

	2020*	2022
Existing	3.25 million SF	6.94 million SF
Under Construction	3.18 million SF	1.11 million SF
Future Proposed Buildings (Based on master plan)	4.35 million SF*	-
<i>Subtotal</i>	<i>10.78 million SF</i>	<i>8.04 million SF</i>
DRI Entitled Total	10,779,161 SF	
Remaining Entitled	-	2.73 million SF

*2020 DRI total considered under construction or previously entitled

The turning movement count collection dates and peak hours for each intersection are listed below in **Table 2**. The peak hour traffic counts were used to perform the analysis presented in this report.

Intersection	Date Collected	AM Peak Hour	PM Peak Hour
1. Anvil Block Road at 1 st Street (unsignalized)	5/18/2022	7:45 AM – 8:45 AM	4:00 PM – 5:00 PM
2. Anvil Block Road at Cub Drive (unsignalized)	5/18/2022	8:00 AM – 9:00 AM	4:00 PM – 5:00 PM
3. Anvil Block Road at Moreland Avenue (SR 42) (signalized)	5/18/2022	7:30 AM – 8:30 AM	4:30 PM – 5:30 PM

Task 2: Site Circulation/Traffic Evaluation

Traffic Volume Development

Future projected background (non-project) traffic is defined as the expected traffic on the roadway network in the future year(s) absent the continued build-out of the *Fort Gillem* development. The Existing 2022 peak hour traffic volumes were increased 1.3% per year for ten (10) years to account for the expected background growth in traffic through the projected build-out year of the project 2032.

Project traffic used in this analysis is defined as the vehicle trips expected to be generated by the proposed full build-out of the development that has not yet been completed, including the portions currently under construction and the 3.28 million SF of entitled, but not yet programmed development assumed to be future warehousing on the site. Gross trips associated with the proposed development were estimated using the *Institute of Transportation Engineers' (ITE) Trip Generation Manual, 11th Edition*. The trip generation estimates for the proposed movie studio were provided by the planned building user.

Based on trip generation and the anticipated trip distribution, new project trips were assigned to the study roadway network based on former DRI assignment of traffic with updates to account for updated land use and site access considerations in the current master plan. Exhibit C in the attachments contains a summary of the anticipated gross trip generation for the proposed development upon full build-out (2032).

Intersection Analysis

Level-of-service (LOS) is used to describe the operating characteristics of a road segment or intersection in relation to its capacity. LOS is defined as a qualitative measure that describes operational conditions and motorists' perceptions within a traffic stream. The Highway Capacity Manual defines six levels-of-service, LOS A through LOS F, with A being the best and F being the worst. LOS analyses were conducted at all intersections within the study network using *Synchro 11*.

LOS for signalized intersections is reported for the overall intersection. One or more movements at an intersection may experience a low LOS while the overall intersection may operate acceptably.

LOS for unsignalized intersections with stop control on the minor street only is reported for the side street approaches and the major street left-turn movements. Low LOS for side street approaches is not uncommon, as vehicles may experience delays in turning onto a major roadway. **Table 3** outlines the LOS results for the study network.

Table 3: Level-of-Service Summary LOS (Delay in Seconds)					
Intersection	Approach/ Movement	2022 Existing Conditions		2032 Build Conditions	
		AM Peak	PM Peak	AM Peak	PM Peak
1. Anvil Block Road at 1 st Street (Unsignalized)	NB	A (9.8)	B (11.6)	B (10.9)	C (15.5)
	SB	A (12.1)	B (12.5)	D (27.9)	C (19.4)
	EBL	A (7.9)	A (7.9)	A (8.7)	A (8.5)
	WBL	A (7.7)	A (9.3)	A (8.0)	B (10.8)
2. Anvil Block Road at Cub Drive/ Future Site Driveway (Unsignalized)	NB			B (11.7)	C (21.4)
	SB	B (14.3)	C (16.0)	F (69.0)	E (44.8)
	EBL	A (8.8)	A (8.6)	B (10.4)	A (9.4)
	WBL			A (8.2)	B (10.4)
3. Anvil Block Road at Moreland Avenue (Signalized)	Overall	C (34.3)	D (39.7)	D (44.6)	D (54.8)

Intersection 1: The analyses indicate that under the Existing 2022 Conditions, the northbound and southbound approaches and the eastbound and westbound left-turning movements all operate at a LOS B or better during both the AM and PM peak hours. Under the 2032 Build Conditions, the

northbound and southbound approaches and the eastbound and westbound left-turning movements are all projected to operate at a LOS D or better during both the AM and PM peak hours.

Intersection 2: The analyses indicate that under the Existing 2022 Conditions, the southbound approach and the eastbound left-turning movements operate at a LOS C or better during both the AM and PM peak hours. Under the 2032 Build Conditions, the northbound approach and the eastbound and westbound left-turning movements are all projected to operate at a LOS C or better during both the AM and PM peak hours. The southbound approach is projected to operate at LOS F and LOS E during the AM and PM peak hours, respectively. It should be noted that a low levels-of-service for the side street approaches are not uncommon, as vehicles may experience a delay turning onto a major roadway.

Intersection 3: The analyses indicate that under the Existing 2022 Conditions, the intersection currently operates at an overall LOS C and LOS D during the AM and PM peak hours, respectively. Under the 2032 Build Conditions, the intersection is projected to operate at an overall LOS D E during the AM and PM peak hours.

In conclusion, the study intersections have sufficient capacity to handle the traffic under Existing 2022 Conditions and projected 2032 Build Conditions. The traffic does not require mitigation.

ANVIL BLOCK ROAD AT 1ST STREET (INTERSECTION 1) EVALUATION

Preliminary Signal Warrant Analysis

A traffic signal warrant analysis was performed based on the criteria contained in the *Manual on Uniform Traffic Control Devices (MUTCD), 2009 Edition* published by the Federal Highway Administration (FHWA).

According to the MUTCD, the investigation of the need for a traffic control signal shall include an analysis of the applicable factors contained in the following traffic signal warrants and other factors related to existing operation and safety at the study location:

- **Warrant 1, Eight-Hour Vehicular Volume**
- **Warrant 2, Four-Hour Vehicular Volume**
- **Warrant 3, Peak Hour**
- Warrant 4, Pedestrian Volume
- Warrant 5, School Crossing
- Warrant 6, Coordinated Signal System
- Warrant 7, Crash Experience
- Warrant 8, Roadway Network
- Warrant 9, Intersection Near a Grade Crossing

This traffic signal warrant analysis evaluated existing traffic conditions to determine if they satisfy the minimum vehicular volume warrants established by the MUTCD. Warrants 1, 2, and 3 are the vehicular volume warrants most applicable to this study and are based on mainline traffic volumes, side street traffic volumes, and number of travel lanes.

Warrant 1 (Eight Hour Vehicular Volume) Condition 1A is intended for application at locations where a large volume of intersecting traffic is the principal reason to consider installing a traffic signal. Warrant 1 Condition 1B is intended for application where Condition 1A is not satisfied and where the traffic

volume on a major street is so heavy that traffic on the intersecting minor street suffers excessive delay or conflict in entering or crossing the major street.

Warrant 2 (Four Hour Vehicular Volume) is intended at locations where the volume of intersecting traffic is the principal reason to consider installing a traffic signal.

Warrant 3 (Peak Hour) is intended at locations where traffic conditions are such that for a minimum of 1 hour of an average day, the minor street traffic suffers undue delay when entering or crossing the major street.

The results of the traffic signal warrant analysis (Warrants 1-3) for the intersection of Anvil Block Road at 1st Street are shown in **Table 4**.

For this traffic signal warrant analysis, the Projected Build traffic conditions assume the following roadway geometry:

- The westbound approach along Anvil Block Road has one (1) left-turn lane and two (2) through lanes.
- The eastbound approach along Anvil Block Road has one (1) shared right-turn/through lane, one (1) through lane, and one (1) left-turn lane.
- The northbound approach along 1st Street has one (1) left-turn lane and one (1) shared through/right-turn lane.
- The southbound approach along the warehouse driveway has one (1) shared left/through/right-turn lane.

Note: For all scenarios, traffic signal warrant analysis results were reported with minor street right-turn volume. The posted speed limit along Anvil Block Road is 40 MPH; thus, warrant threshold volume reductions associated with higher speeds were not applied for this traffic signal warrant analysis.

Table 4: Traffic Signal Volume Warrant Analysis Summary		
Warrant	Projected Build	
	Hours Met/Needed	Result
1A*	0 / 8	Not Warranted
1B*	0 / 8	Not Warranted
1C**	3 / 8	Not Warranted
2*	0 / 4	Not Warranted
3*	0 / 1	Not Warranted

*100% Thresholds

**80% Thresholds

The intersection of Anvil Block Road at 1st Street does not satisfy any warrants under projected Build 2032 conditions.

Additional Intersection Considerations

Sight Distance Measurements

Kimley-Horn conducted field observations at the intersection of 1st Street and Anvil Block Road on to document potential restrictions to sight distance at both study intersections. The GDOT *Regulations for*

Driveway and Encroachment Control, Revision 5.3 (November 2021) was referenced to determine the minimum sight distances recommended based on roadway speeds and vehicle maneuvers. **Table 5** outlines the required minimum and observed sight distances per study intersection, based on vehicle speeds of 40 mph.

Table 5: Sight Distance - Anvil Block Road at 1 st Street				
Location	Stopping Sight Distance for Left-Turn Maneuver (feet)		Stopping Sight Distance for Right-Turn Maneuver (feet)	
	Required	Observed	Required	Observed
Northbound Stop Bars along 1 st Street	475'	205'	530'	750'
Southbound Stop Bars along 1 st Street	475'	900'	530'	210'

As outlined in **Table 2**, the northbound right-turn from 1st Street onto Anvil Block Road has sufficient sight distance, but the northbound left-turn does not meet sight distance recommendations. The southbound left-turn from 1st Street onto Anvil Block Road has sufficient sight distance, but the southbound right-turn does not meet minimum sight distance recommendations. Traffic turning onto Anvil Block Road cannot see approaching traffic from the east. The former Forest Park Fire Station and the sharp horizontal curve of the eastern leg of the intersection along Anvil Block Road obstruct the view for the two maneuvers with insufficient sight distances.

Exhibit E contains a photo log from the site visit, illustrating the sight distances for each movement.

Crash Data, Driver Expectancy, and Safety Concerns

Crash report data were obtained for a five-year period from January 1, 2017 to December 31, 2021 from the Georgia Department of Transportation Georgia Numetric crash database. The crash history is summarized in **Table 6**.

Table 6: Summary of Crashes						
Year	Total Crashes	Injury Crashes	Fatality Crashes	Crash Type		
				Angle Crashes	Sideswipe Crashes	Not a Collision with a Motor Vehicle
2017	0	0	0	0	0	0
2018	1	0	0	0	0	1
2019	1	0	0	0	0	1
2020	1	0	0	1	0	0
2021	2	0	0	1	1	0
Total	5	0	0	2	1	2

As shown in **Table 6**, a total of five (5) crashes were reported at the intersection of 1st Street and Anvil Block Road, resulting in no injuries or no fatalities. The crash types included two (2) angle crashes, one (1) sideswipe crashes, and two (2) collisions not with a motor vehicle.

The MUTCD states that a traffic signal may be warranted if five (5) or more crashes have occurred in the vicinity of the intersection within a twelve-month period. The crashes must involve personal injury or property damage and be of a crash type that could be corrected by the installation of a traffic signal.

Although this intersection does not meet the MUTCD criterion for installing a traffic signal based on crash history, it should be noted that the irregular intersection geometry and stop control measures do not align with driver expectancy and likely cause confusion for drivers. Reduced driver expectancy can hinder a driver's readiness to respond in a predictable and successful manner. The two-stage crossing is not standard for a two-way stop control intersection. In addition, the westbound left-turning movement along Anvil Block Road has a stop bar and stop sign, but the through and right-turn movements along Anvil Block Road operate at free-flow. During field observations at the intersection, multiple vehicles traveling through Anvil Block Road in the westbound direction were observed stopping, even though they were not required to do so.

It is also notable that the intersection of Anvil Block Road at 1st Street likely experienced significant changes in development intensity and traffic starting in 2020 and 2021 with the opening of the warehouse and warehouse/distribution center, respectively, along the southwest frontage of 1st Street. Traffic at the intersection will likely continue to grow and change with the proposed movie studio development and warehouse programmed along the southeast frontage of 1st Street, along with the proposed conversion of the former Forest Park Fire Station into restaurant space.

Another safety and operational concern is the queuing that takes place within the median. Vehicles making a southbound left-turn at the median were observed overflowing the median storage length. This created queueing along Anvil Block Road, which blocked the northbound left-turning vehicles within the median.

Finally, the size of the median does not accommodate heavy vehicles. The median length is approximately 60 feet, which would not accommodate a semitrailer (WB-55 or larger), causing left-turn crossing maneuvers to block the cross-traffic along Anvil Block Road. In addition, the median is not wide enough to accommodate the turning radius of a semi-trailer if vehicle is traveling the opposite direction within the median. This was also observed during the field visit to the intersection. The proposed movie studio is anticipated to generate additional heavy vehicle traffic utilizing this intersection, which will increase the frequency of these hazards.

Design Considerations

The following design alternatives for the intersection of Anvil Block Road at 1st Street were reviewed for consideration:

Alternative 1: Traffic Signal, Minimal Roadway Impact

Installing a traffic signal at the intersection of Anvil Block Road at 1st Street, adjusting the median, and removing the guard house would have minimal impact to the roadway geometry. A signal would improve safety and operations due to the unconventional configuration of the intersection, but the intersection does not meet MUTCD signal warrants. As noted above, the horizontal curve of Anvil Block Road limits

sight distance for the northbound left-turn and southbound right-turn maneuvers. The installation of a traffic signal would limit conflicts between the northbound left-turn and southbound right-turn maneuvers. However, installing a signal at the intersection while maintaining the existing geometry with a wide median does not align with driver expectancy, which may reduce safety at the intersection.

Alternative 2: Traffic Signal Realignment, Larger Roadway Impact

Removing the guardhouse from the median of Anvil Block Road and reconstructing the roadway to reduce the width of the medians is an additional consideration for improving the operations and safety of the intersection of Anvil Block Road at 1st Street. This would remove the two-stage crossing, which vehicles experience today at the intersection. In addition, pulling the intersection to the south would improve sight-distance for the southbound right-turn and northbound left-turn maneuvers.

However, does not meet MUTCD signal warrants and reconstructing this section of Anvil Block Road would be expensive and may be cost prohibitive.

Alternative 3: Roundabout, Larger Roadway Impact

Constructing a roundabout at the intersection of Anvil Block Road at 1st Street is another option to improve the safety and operations of the intersection. Due to the high volume of heavy vehicles that are anticipated to travel through this intersection, a roundabout with a large radius would be needed to accommodate the heavy vehicles.

The roundabout size would likely require the southern driveway serving the Amazon facility along 1st Street to be moved or removed. This would likely alter the operations of the cross-docked warehouse, which may not be favorable.

Task 3: Preliminary Concept Sketches and Opinion of Probable Construction Costs

Table 7 provides cost estimates for each of the alternatives. Figure 1, Figure 2, and Figure 3, provide the preliminary concept sketches of Alternative 1, Alternative 2, and Alternative 3, respectively. Exhibit E provides full-size concepts, and Exhibit F provides cost estimate details.

Table 7: Cost Estimates	
Alternative	Estimated Total Cost
Alternative 1: Traffic Signal	\$2,160,000
Alternative 2: Traffic Signal with Realignment	\$2,540,000
Alternative 3: Roundabout	\$2,880,000



Figure 1: Alternative 1 - Traffic Signal



Figure 2: Alternative 2 - Traffic Signal with Realignment

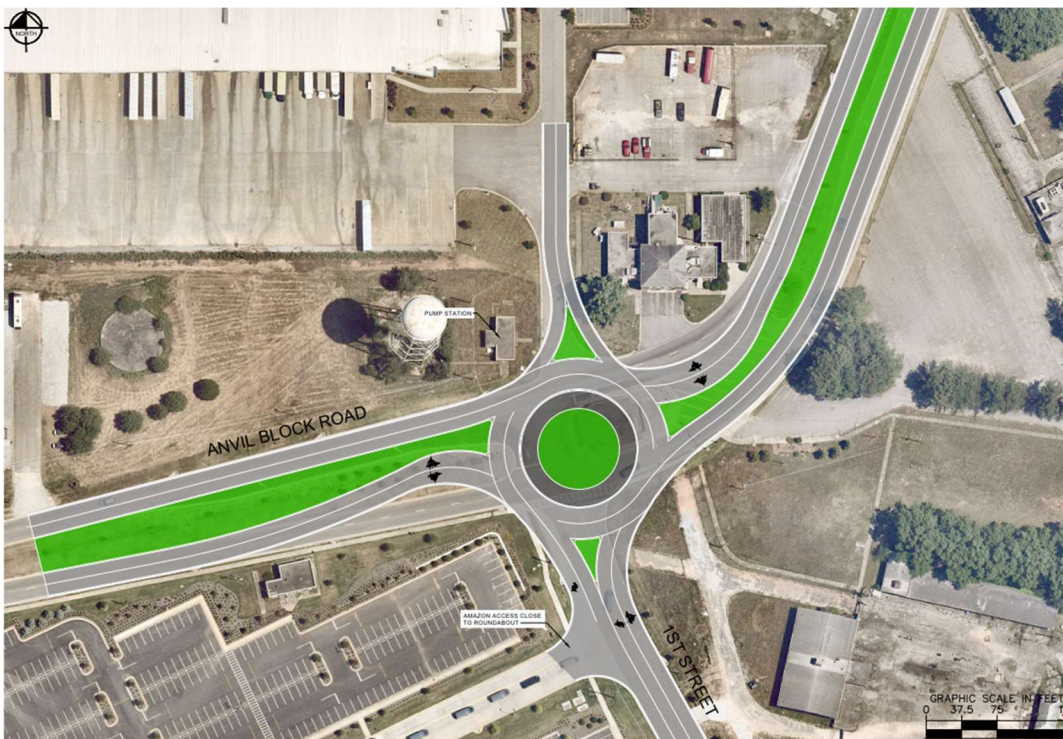


Figure 3: Alternative 3 - Roundabout

ADDITIONAL CONSIDERATION – RESTRICT ACCESS AT INTERSECTION

Because a traffic signal is not warranted based on MUTCD criteria *Alternative 1: Traffic Signal* is not recommended. *Alternative 2: Traffic Signal with Realignment* and *Alternative 3: Roundabout* require significant roadway construction and may be cost prohibitive.

Because these alternatives present some challenges, the following option should also be considered:

- Close the northern driveway that serves the Package Price Distribution Center/Kuhne & Nagel
- Restrict northbound left-turns from 1st Street onto Anvil Block Road
- Remove the guard house to create a reduced conflict u-turn (RCUT) intersection configuration

This alternative is less expensive and presents a functional way to serve traffic and improve safety.

Figure 4 illustrates how traffic would be rerouted with the closure of the northern leg and with the northbound left-turn restriction.

Closing the northern leg of the intersection would simplify operations of the intersection. It would also improve the safety of the intersection by eliminating the sight distance hazard experienced by the southbound right-turn maneuver. To close the northern leg of the intersection, The Urban Redevelopment Authority of Forest Park would have to coordinate with the owners of the warehouse that is served by the driveway. The intersections labeled as A, B, and C on **Figure 4**, are projected to operate at an acceptable LOS during the AM and PM peak under Build 2032 conditions with the rerouted traffic.

Restricting northbound left-turns from 1st Street onto Anvil Block would also improve the safety of the intersection by eliminating the sight distance hazard experienced by the northbound left-turn maneuver. To restrict the northbound left-turn, The Urban Redevelopment Authority of Forest Park would have to coordinate with the owners of the warehouses that are served by 1st Street.

To accommodate the RCUT configuration, the guard house should be removed.

Figure 5 provides an example of an RCUT at a four-leg intersection. The proposed configuration at the intersection of Anvil Block Road at 1st Street is a three-leg RCUT.

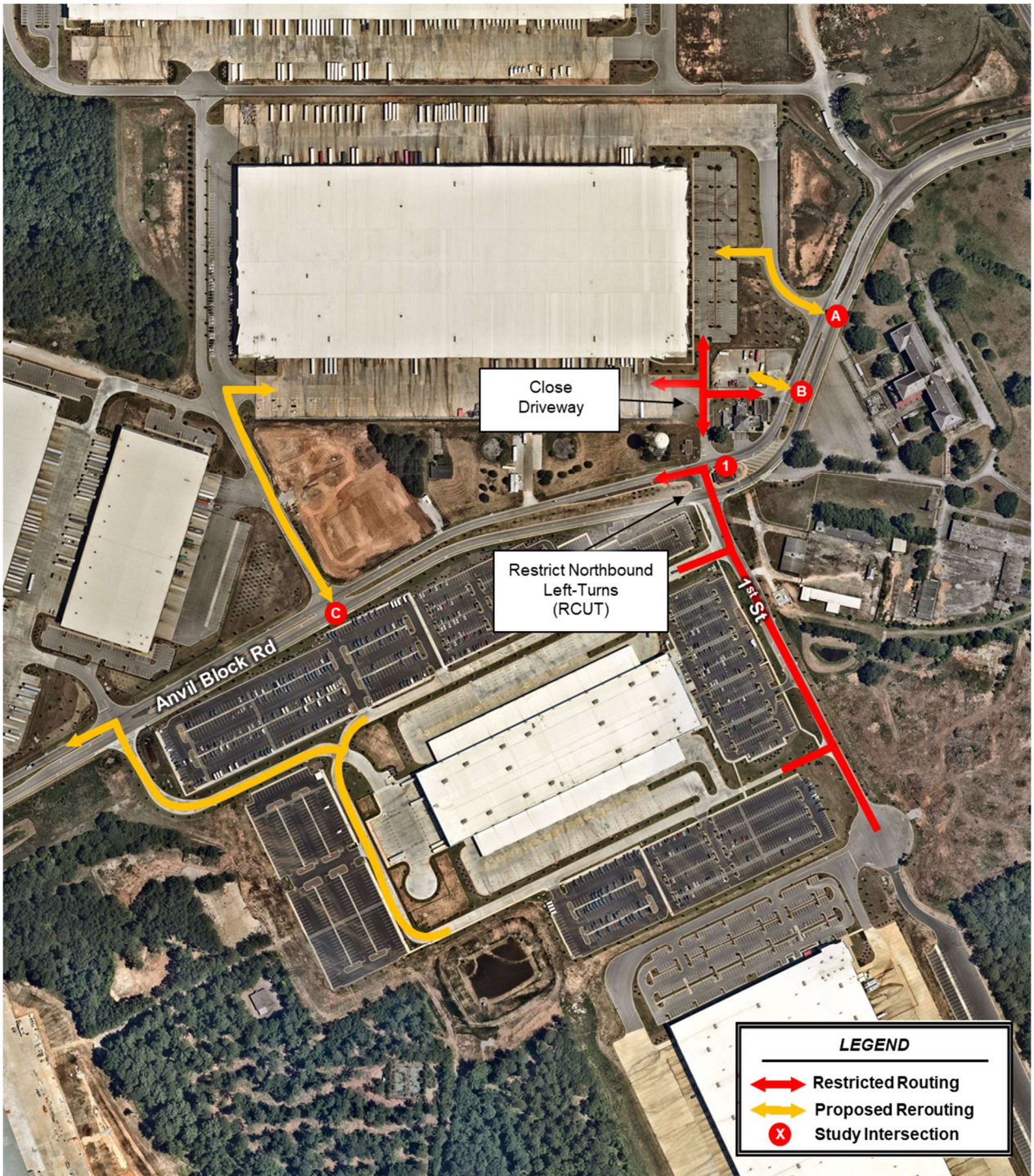


Figure 4: Traffic Rerouting

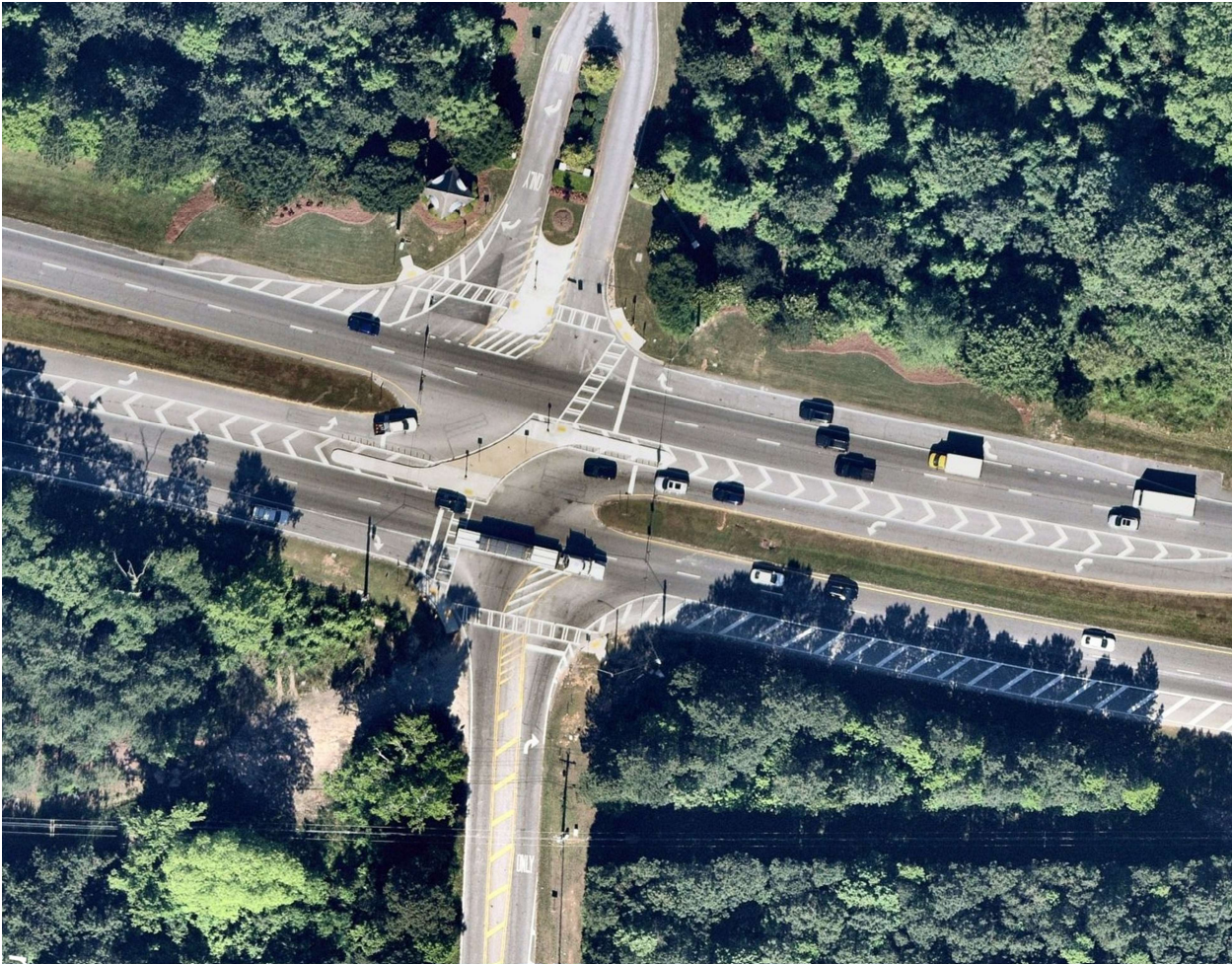


Figure 5: RCUT Intersection Configuration Example (Joel Cowan Pkwy at Sandy Creek Rd)

Summary

The former Fort Gillem site completed the DRI review process in 2020 (*Gillem Logistics Center DRI #3073*). Since the submission of *DRI #3073*, portions of the site plan have been partially built out while other portions have been updated with a new development program. This memorandum summarized a comparison of current 2022 build-out and master planned conditions to the former DRI projections. The traffic evaluation consisted of volume development and a level-of-service analysis of three (3) study intersections along Anvil Block Road in the vicinity of Moreland Avenue (SR 42). The studied intersections are those associated with the areas most impacted by proposed development program changes since the DRI. Each intersection is projected to operate at an acceptable LOS under 2032 Build Conditions.

The roadway geometry and potential changes to the intersection of Anvil Block Road at 1st Street were analyzed. A guard house for Fort Gillem previously operated as a security checkpoint at the center of this intersection. Preliminary concept sketches and an opinion of probable construction costs for three (3) different alternatives for the intersection of Anvil Block Road at 1st Street is included in the memorandum. The following alternatives were analyzed: *Alternative 1: Traffic Signal*, *Alternative 2: Realignment*, and *Alternative 3: Roundabout*. A traffic signal is not warranted based on MUTCD criteria. The realignment and roundabout are reasonable options, they would require more significant and expensive roadway changes.

An additional option that should be considered is closing the northern driveway that serves the Package Price Distribution Center/Kuhne & Nagel, removing the guard house, and constructing an RCUT to restrict the northbound left-turn from 1st Street to Anvil Block Road. This option would simplify operations and improve safety at the intersection.

If you have any questions or comments on the preliminary evaluation of event traffic, please do not hesitate to contact me at 404-201-6146, or rob.ross@kimley-horn.com.

Sincerely,

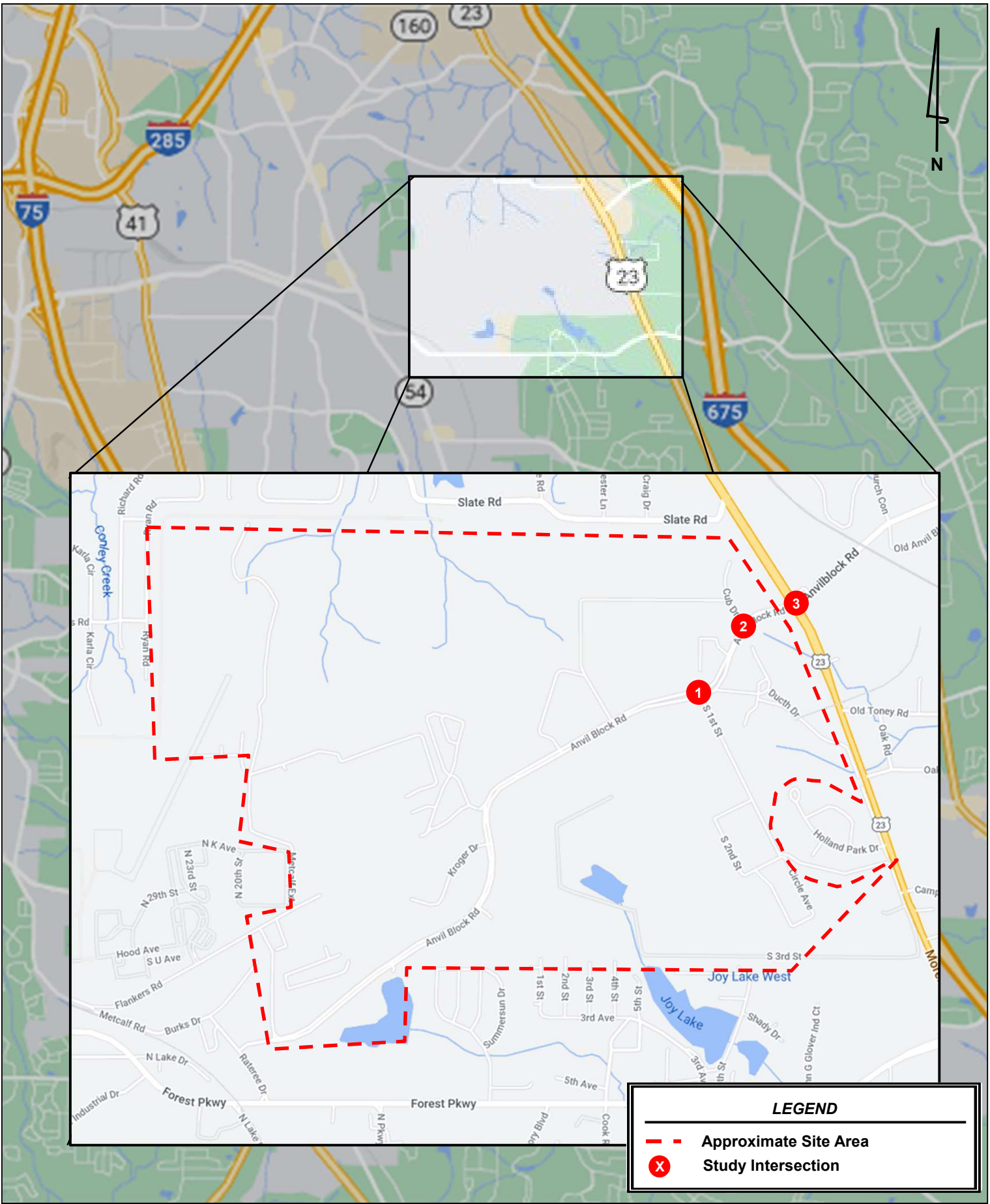
KIMLEY-HORN AND ASSOCIATES, INC.

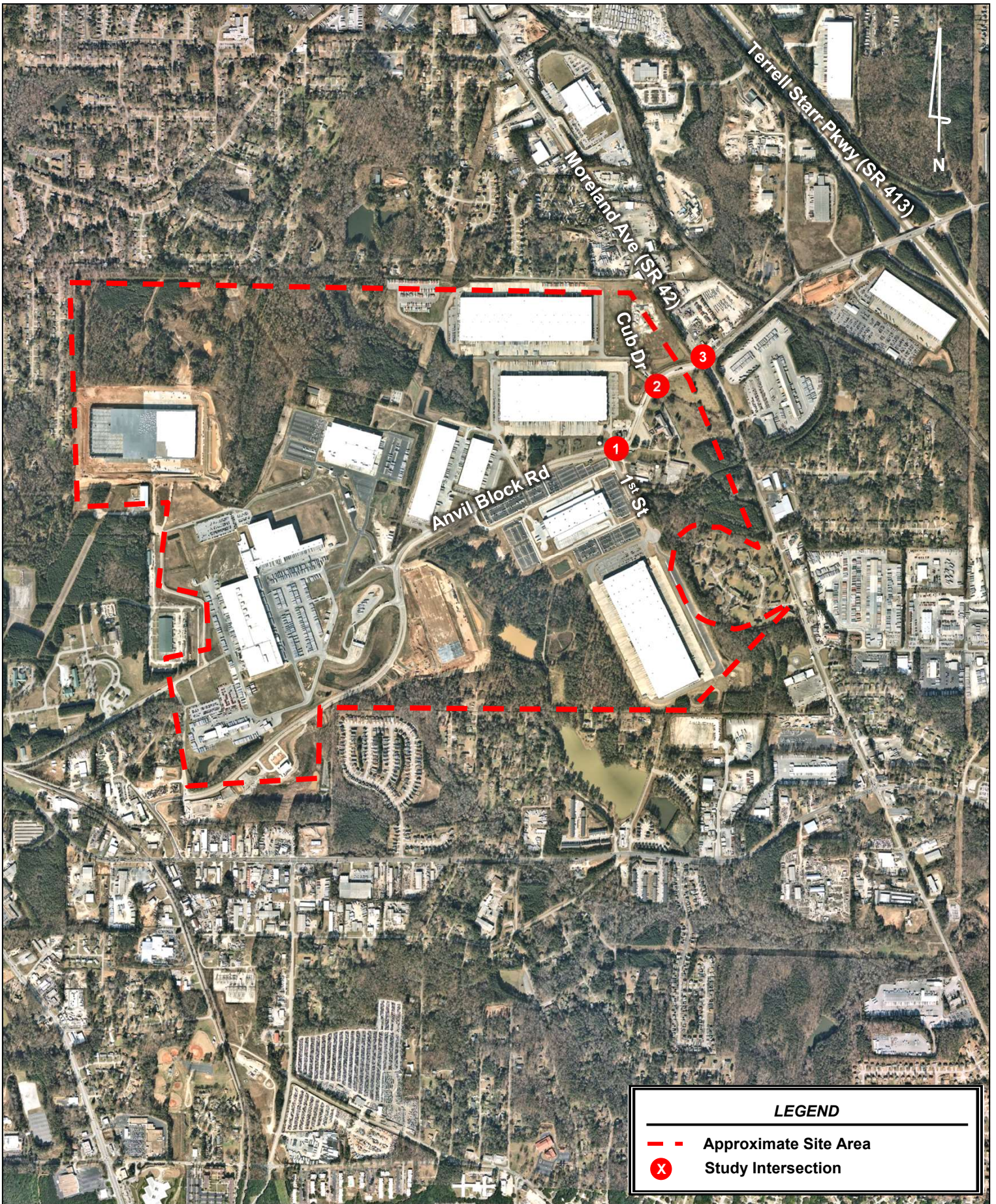


Rob Ross, P.E.
Project Engineer

Attachments:

- Exhibit A: Project Location Map
- Exhibit B: Site Aerial
- Exhibit C: Trip Generation
- Exhibit D: Synchro Reports
- Exhibit E: Preliminary Concept Sketches
- Exhibit F: Cost Estimates
- Exhibit G: Site Visit Photo Log
- Exhibit H: *Gillem Logistics Center DRI #3073* Site Plan
- Exhibit I: Movie Studio Site Plan





LEGEND

- - Approximate Site Area
- ⊗ Study Intersection

BUILD Trip Generation Analysis (11th Edition ITE)
Fort Gillem
City of Forest Park, GA

Land Use	Intensity	Daily Trips	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
<u>Proposed Site Traffic</u>								
150 Warehousing	3,280,000 s.f.	5,221	417	321	96	420	117	303
932 High-Turnover (Sit-Down) Restaurant	10,000 s.f.	1,072	96	53	43	91	55	36
N/A Movie Studio		1,200	300	270	30	150	15	135
New Trips		5,592	693	551	143	456	121	336

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔			↔	
Traffic Vol, veh/h	4	107	22	51	261	0	8	0	15	1	0	2
Future Vol, veh/h	4	107	22	51	261	0	8	0	15	1	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	35	23	6	17	2	2	2	33	100	2	100
Mvmt Flow	4	120	25	57	293	0	9	0	17	1	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	293	0	0	145	0	0	402	548	73	475	560	147
Stage 1	-	-	-	-	-	-	141	141	-	407	407	-
Stage 2	-	-	-	-	-	-	261	407	-	68	153	-
Critical Hdwy	4.14	-	-	4.22	-	-	7.54	6.54	7.56	9.5	6.54	8.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	8.5	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	8.5	5.54	-
Follow-up Hdwy	2.22	-	-	2.26	-	-	3.52	4.02	3.63	4.5	4.02	4.3
Pot Cap-1 Maneuver	1265	-	-	1406	-	-	533	442	882	303	436	635
Stage 1	-	-	-	-	-	-	847	779	-	390	596	-
Stage 2	-	-	-	-	-	-	721	596	-	711	770	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1265	-	-	1406	-	-	511	419	882	286	414	635
Mov Cap-2 Maneuver	-	-	-	-	-	-	622	520	-	363	516	-
Stage 1	-	-	-	-	-	-	844	777	-	389	567	-
Stage 2	-	-	-	-	-	-	684	567	-	695	768	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			1.3			9.8			12.1		
HCM LOS							A			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	770	1265	-	-	1406	-	-	508
HCM Lane V/C Ratio	0.034	0.004	-	-	0.041	-	-	0.007
HCM Control Delay (s)	9.8	7.9	0	-	7.7	0.1	-	12.1
HCM Lane LOS	A	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.1	0	-	-	0.1	-	-	0

Intersection						
Int Delay, s/veh	1.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑		↘	↘
Traffic Vol, veh/h	13	126	285	52	37	8
Future Vol, veh/h	13	126	285	52	37	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	89	89	89	89
Heavy Vehicles, %	38	35	15	17	65	75
Mvmt Flow	15	142	320	58	42	9

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	378	0	-	0	450 189
Stage 1	-	-	-	-	349 -
Stage 2	-	-	-	-	101 -
Critical Hdwy	4.86	-	-	-	8.1 8.4
Critical Hdwy Stg 1	-	-	-	-	7.1 -
Critical Hdwy Stg 2	-	-	-	-	7.1 -
Follow-up Hdwy	2.58	-	-	-	4.15 4.05
Pot Cap-1 Maneuver	956	-	-	-	404 635
Stage 1	-	-	-	-	529 -
Stage 2	-	-	-	-	753 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	956	-	-	-	398 635
Mov Cap-2 Maneuver	-	-	-	-	398 -
Stage 1	-	-	-	-	521 -
Stage 2	-	-	-	-	753 -

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	14.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	956	-	-	-	398	635
HCM Lane V/C Ratio	0.015	-	-	-	0.104	0.014
HCM Control Delay (s)	8.8	-	-	-	15.1	10.8
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3	0

HCM 6th Signalized Intersection Summary

3: Moreland Ave & Anvil Block Rd

Fort Gillem
Existing 2022 Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	78	35	142	213	292	41	428	139	208	259	76
Future Volume (veh/h)	40	78	35	142	213	292	41	428	139	208	259	76
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1307	1278	1604	1663	1722	1796	1678	1767	1559	1678	1693	1693
Adj Flow Rate, veh/h	44	87	15	158	237	176	46	476	44	231	288	-7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	40	42	20	16	12	7	15	9	23	15	14	14
Cap, veh/h	127	237	40	289	313	223	612	1749	689	530	1821	812
Arrive On Green	0.04	0.11	0.11	0.10	0.17	0.17	0.03	0.52	0.52	0.08	0.57	0.00
Sat Flow, veh/h	1245	2078	350	1584	1824	1300	1598	3357	1321	1598	3216	1434
Grp Volume(v), veh/h	44	50	52	158	212	201	46	476	44	231	288	-7
Grp Sat Flow(s),veh/h/ln	1245	1214	1215	1584	1636	1488	1598	1678	1321	1598	1608	1434
Q Serve(g_s), s	4.4	5.3	5.6	12.0	17.2	18.2	1.9	11.1	2.3	9.1	6.0	0.0
Cycle Q Clear(g_c), s	4.4	5.3	5.6	12.0	17.2	18.2	1.9	11.1	2.3	9.1	6.0	0.0
Prop In Lane	1.00		0.29	1.00		0.87	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	127	138	139	289	281	255	612	1749	689	530	1821	812
V/C Ratio(X)	0.35	0.36	0.38	0.55	0.75	0.79	0.08	0.27	0.06	0.44	0.16	-0.01
Avail Cap(c_a), veh/h	198	326	326	289	439	400	714	1749	689	560	1821	812
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	52.6	57.3	57.4	47.0	55.2	55.6	14.5	18.7	16.6	12.9	14.5	0.0
Incr Delay (d2), s/veh	3.5	3.4	3.6	3.8	8.4	11.0	0.0	0.4	0.2	0.6	0.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	1.7	1.8	5.0	7.6	7.5	0.7	4.3	0.7	3.2	2.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.1	60.6	61.0	50.9	63.6	66.6	14.6	19.1	16.8	13.5	14.7	0.0
LnGrp LOS	E	E	E	D	E	E	B	B	B	B	B	A
Approach Vol, veh/h		146			571			566			512	
Approach Delay, s/veh		59.4			61.1			18.5			14.3	
Approach LOS		E			E			B			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.1	85.6	20.0	23.4	17.4	79.3	12.0	31.4				
Change Period (Y+Rc), s	6.9	6.3	6.6	7.4	6.1	6.3	* 6.7	7.4				
Max Green Setting (Gmax), s	13.1	48.7	13.4	37.6	13.9	48.7	* 13	37.6				
Max Q Clear Time (g_c+I1), s	3.9	8.0	14.0	7.6	11.1	13.1	6.4	20.2				
Green Ext Time (p_c), s	0.0	3.6	0.0	1.0	0.2	6.6	0.1	3.9				
Intersection Summary												
HCM 6th Ctrl Delay				34.2								
HCM 6th LOS				C								
Notes												
User approved pedestrian interval to be less than phase max green.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔			↔↔			↔			↔	
Traffic Vol, veh/h	1	438	14	27	257	0	10	0	43	8	0	3
Future Vol, veh/h	1	438	14	27	257	0	10	0	43	8	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	2	13	21	22	25	2	20	2	7	25	2	33
Mvmt Flow	1	548	18	34	321	0	13	0	54	10	0	4

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	321	0	0	566	0	0	788	948	283	665	957	161
Stage 1	-	-	-	-	-	-	559	559	-	389	389	-
Stage 2	-	-	-	-	-	-	229	389	-	276	568	-
Critical Hdwy	4.14	-	-	4.54	-	-	7.9	6.54	7.04	8	6.54	7.56
Critical Hdwy Stg 1	-	-	-	-	-	-	6.9	5.54	-	7	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.9	5.54	-	7	5.54	-
Follow-up Hdwy	2.22	-	-	2.42	-	-	3.7	4.02	3.37	3.75	4.02	3.63
Pot Cap-1 Maneuver	1236	-	-	876	-	-	252	259	699	304	256	766
Stage 1	-	-	-	-	-	-	438	509	-	548	607	-
Stage 2	-	-	-	-	-	-	704	607	-	646	505	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1236	-	-	876	-	-	242	247	699	270	244	766
Mov Cap-2 Maneuver	-	-	-	-	-	-	392	418	-	436	400	-
Stage 1	-	-	-	-	-	-	438	508	-	547	578	-
Stage 2	-	-	-	-	-	-	668	578	-	596	504	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	0		1.1		11.6		12.5	
HCM LOS					B		B	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	609	1236	-	-	876	-	-	494
HCM Lane V/C Ratio	0.109	0.001	-	-	0.039	-	-	0.028
HCM Control Delay (s)	11.6	7.9	0	-	9.3	0.2	-	12.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0.1	-	-	0.1

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑↑	↑↑		↘	↘
Traffic Vol, veh/h	7	471	265	18	30	3
Future Vol, veh/h	7	471	265	18	30	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	77	77	77	77	77	77
Heavy Vehicles, %	28	14	21	56	17	67
Mvmt Flow	9	612	344	23	39	4























Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	367	0	-	0	680
Stage 1	-	-	-	-	356
Stage 2	-	-	-	-	324
Critical Hdwy	4.66	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	6.14
Critical Hdwy Stg 2	-	-	-	-	6.14
Follow-up Hdwy	2.48	-	-	-	3.67
Pot Cap-1 Maneuver	1022	-	-	-	353
Stage 1	-	-	-	-	637
Stage 2	-	-	-	-	663
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1022	-	-	-	350
Mov Cap-2 Maneuver	-	-	-	-	350
Stage 1	-	-	-	-	631
Stage 2	-	-	-	-	663

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	16
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1022	-	-	-	350	658
HCM Lane V/C Ratio	0.009	-	-	-	0.111	0.006
HCM Control Delay (s)	8.6	-	-	-	16.6	10.5
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0	-	-	-	0.4	0

HCM 6th Signalized Intersection Summary
3: Moreland Ave & Anvil Block Rd

Fort Gillem
Existing 2022 Conditions - PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	106	304	44	155	179	179	36	291	157	431	614	84
Future Volume (veh/h)	106	304	44	155	179	179	36	291	157	431	614	84
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1633	1752	1767	1722	1559	1530	1648	1752	1752	1856	1841	1544
Adj Flow Rate, veh/h	115	330	39	168	195	80	39	316	74	468	667	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	18	10	9	12	23	25	17	10	10	3	4	24
Cap, veh/h	214	415	49	211	303	120	407	1647	735	689	2037	762
Arrive On Green	0.08	0.14	0.14	0.08	0.15	0.15	0.03	0.49	0.49	0.12	0.58	0.58
Sat Flow, veh/h	1555	3001	352	1640	2072	820	1570	3328	1485	1767	3497	1309
Grp Volume(v), veh/h	115	182	187	168	137	138	39	316	74	468	667	20
Grp Sat Flow(s),veh/h/ln	1555	1664	1688	1640	1481	1411	1570	1664	1485	1767	1749	1309
Q Serve(g_s), s	10.0	16.9	17.2	13.4	14.0	14.8	2.0	8.5	4.2	18.9	15.7	1.0
Cycle Q Clear(g_c), s	10.0	16.9	17.2	13.4	14.0	14.8	2.0	8.5	4.2	18.9	15.7	1.0
Prop In Lane	1.00		0.21	1.00		0.58	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	214	230	233	211	216	206	407	1647	735	689	2037	762
V/C Ratio(X)	0.54	0.79	0.80	0.80	0.63	0.67	0.10	0.19	0.10	0.68	0.33	0.03
Avail Cap(c_a), veh/h	226	339	344	211	302	288	545	1647	735	689	2037	762
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.1	66.7	66.8	56.0	64.3	64.6	18.9	22.6	21.5	16.9	17.2	14.2
Incr Delay (d2), s/veh	4.5	13.0	13.8	21.1	6.4	7.7	0.0	0.3	0.3	2.7	0.4	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	8.0	8.2	7.0	5.6	5.7	0.7	3.4	1.5	8.8	6.3	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.6	79.7	80.6	77.1	70.7	72.3	18.9	22.8	21.8	19.6	17.7	14.2
LnGrp LOS	E	E	F	E	E	E	B	C	C	B	B	B
Approach Vol, veh/h		484			443			429			1155	
Approach Delay, s/veh		75.0			73.6			22.3			18.4	
Approach LOS		E			E			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	99.5	20.0	29.5	25.0	85.5	18.7	30.8				
Change Period (Y+Rc), s	6.9	6.3	6.6	7.4	6.1	6.3	* 6.7	7.4				
Max Green Setting (Gmax), s	18.1	68.7	13.4	32.6	18.9	68.7	* 13	32.6				
Max Q Clear Time (g_c+I1), s	4.0	17.7	15.4	19.2	20.9	10.5	12.0	16.8				
Green Ext Time (p_c), s	0.0	10.1	0.0	2.9	0.0	4.8	0.1	2.3				
Intersection Summary												
HCM 6th Ctrl Delay			39.7									
HCM 6th LOS			D									
Notes												
User approved pedestrian interval to be less than phase max green.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	5	205	31	67	487	53	10	0	19	44	0	2
Future Vol, veh/h	5	205	31	67	487	53	10	0	19	44	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	2	35	23	6	17	2	2	2	33	100	2	100
Mvmt Flow	6	230	35	75	547	60	11	0	21	49	0	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	607	0	0	265	0	0	684	1017	133	854	1004	304
Stage 1	-	-	-	-	-	-	260	260	-	727	727	-
Stage 2	-	-	-	-	-	-	424	757	-	127	277	-
Critical Hdwy	4.14	-	-	4.22	-	-	7.54	6.54	7.56	9.5	6.54	8.9
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	8.5	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	8.5	5.54	-
Follow-up Hdwy	2.22	-	-	2.26	-	-	3.52	4.02	3.63	4.5	4.02	4.3
Pot Cap-1 Maneuver	967	-	-	1267	-	-	335	236	801	137	240	471
Stage 1	-	-	-	-	-	-	722	692	-	219	427	-
Stage 2	-	-	-	-	-	-	578	414	-	641	680	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	967	-	-	1267	-	-	309	213	801	124	217	471
Mov Cap-2 Maneuver	-	-	-	-	-	-	462	341	-	203	349	-
Stage 1	-	-	-	-	-	-	717	687	-	217	389	-
Stage 2	-	-	-	-	-	-	523	377	-	620	675	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			1.1			10.9			27.9		
HCM LOS							B			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	639	967	-	-	1267	-	-	208
HCM Lane V/C Ratio	0.051	0.006	-	-	0.059	-	-	0.248
HCM Control Delay (s)	10.9	8.7	0	-	8	0.3	-	27.9
HCM Lane LOS	B	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.2	0	-	-	0.2	-	-	0.9

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↕		↖	↕			↗	↗		↗	↗
Traffic Vol, veh/h	15	251	26	114	574	59	2	0	9	42	0	9
Future Vol, veh/h	15	251	26	114	574	59	2	0	9	42	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	100	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	38	35	2	2	15	17	2	2	2	65	2	75
Mvmt Flow	17	282	29	128	645	66	2	0	10	47	0	10

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	711	0	0	311	0	0	910	1298	156	1109	1279	356
Stage 1	-	-	-	-	-	-	331	331	-	934	934	-
Stage 2	-	-	-	-	-	-	579	967	-	175	345	-
Critical Hdwy	4.86	-	-	4.14	-	-	7.54	6.54	6.94	8.8	6.54	8.4
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	7.8	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	7.8	5.54	-
Follow-up Hdwy	2.58	-	-	2.22	-	-	3.52	4.02	3.32	4.15	4.02	4.05
Pot Cap-1 Maneuver	682	-	-	1246	-	-	230	160	862	102	165	470
Stage 1	-	-	-	-	-	-	656	644	-	187	343	-
Stage 2	-	-	-	-	-	-	468	331	-	656	635	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	682	-	-	1246	-	-	204	140	862	91	144	470
Mov Cap-2 Maneuver	-	-	-	-	-	-	204	140	-	91	144	-
Stage 1	-	-	-	-	-	-	640	628	-	182	308	-
Stage 2	-	-	-	-	-	-	411	297	-	632	619	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			1.3			11.7			69		
HCM LOS							B			F		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	204	862	682	-	-	1246	-	-	91	470
HCM Lane V/C Ratio	0.011	0.012	0.025	-	-	0.103	-	-	0.519	0.022
HCM Control Delay (s)	22.8	9.2	10.4	-	-	8.2	-	-	81	12.8
HCM Lane LOS		C	A	B	-	-	A	-	F	B
HCM 95th %tile Q(veh)		0	0	0.1	-	-	0.3	-	2.3	0.1

HCM 6th Signalized Intersection Summary
3: Moreland Ave & Anvil Block Rd

Fort Gillem
Build 2032 Conditions - AM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	74	155	63	182	432	332	101	494	149	237	376	206
Future Volume (veh/h)	74	155	63	182	432	332	101	494	149	237	376	206
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1307	1278	1604	1663	1722	1796	1678	1767	1559	1678	1693	1693
Adj Flow Rate, veh/h	82	172	33	202	480	271	112	549	35	263	418	73
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	40	42	20	16	12	7	15	9	23	15	14	14
Cap, veh/h	143	464	87	365	525	295	418	1305	514	411	1372	612
Arrive On Green	0.06	0.23	0.23	0.10	0.26	0.26	0.06	0.39	0.39	0.10	0.43	0.43
Sat Flow, veh/h	1245	2039	383	1584	2020	1134	1598	3357	1321	1598	3216	1434
Grp Volume(v), veh/h	82	101	104	202	388	363	112	549	35	263	418	73
Grp Sat Flow(s),veh/h/ln	1245	1214	1209	1584	1636	1518	1598	1678	1321	1598	1608	1434
Q Serve(g_s), s	7.0	9.8	10.2	13.4	32.3	32.5	5.9	16.7	2.3	13.9	12.0	4.3
Cycle Q Clear(g_c), s	7.0	9.8	10.2	13.4	32.3	32.5	5.9	16.7	2.3	13.9	12.0	4.3
Prop In Lane	1.00		0.32	1.00		0.75	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	143	276	275	365	425	395	418	1305	514	411	1372	612
V/C Ratio(X)	0.57	0.37	0.38	0.55	0.91	0.92	0.27	0.42	0.07	0.64	0.30	0.12
Avail Cap(c_a), veh/h	183	326	325	365	439	408	478	1305	514	411	1372	612
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.1	45.6	45.7	37.5	50.3	50.4	23.4	31.3	26.9	23.0	26.4	24.2
Incr Delay (d2), s/veh	7.5	1.7	1.8	3.1	24.1	26.4	0.1	1.0	0.3	3.3	0.6	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	3.1	3.2	5.6	15.7	14.9	2.2	6.8	0.8	5.4	4.6	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.6	47.3	47.5	40.6	74.4	76.8	23.5	32.2	27.1	26.3	27.0	24.6
LnGrp LOS	D	D	D	D	E	E	C	C	C	C	C	C
Approach Vol, veh/h		287			953			696			754	
Approach Delay, s/veh		47.7			68.1			30.6			26.5	
Approach LOS		D			E			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.7	66.0	20.0	39.3	20.0	60.7	15.5	43.8				
Change Period (Y+Rc), s	6.9	6.3	6.6	7.4	6.1	6.3	* 6.7	7.4				
Max Green Setting (Gmax), s	13.1	48.7	13.4	37.6	13.9	48.7	* 13	37.6				
Max Q Clear Time (g_c+I1), s	7.9	14.0	15.4	12.2	15.9	18.7	9.0	34.5				
Green Ext Time (p_c), s	0.1	5.9	0.0	2.1	0.0	7.2	0.1	1.9				
Intersection Summary												
HCM 6th Ctrl Delay			44.6									
HCM 6th LOS			D									
Notes												
User approved pedestrian interval to be less than phase max green.												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	1	675	18	34	374	55	17	0	58	45	0	3
Future Vol, veh/h	1	675	18	34	374	55	17	0	58	45	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	80	80	80	80	80	80	80	80	80	80	80	80
Heavy Vehicles, %	2	13	21	22	25	2	20	2	7	25	2	33
Mvmt Flow	1	844	23	43	468	69	21	0	73	56	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	537	0	0	867	0	0	1178	1481	434	1013	1458	269
Stage 1	-	-	-	-	-	-	858	858	-	589	589	-
Stage 2	-	-	-	-	-	-	320	623	-	424	869	-
Critical Hdwy	4.14	-	-	4.54	-	-	7.9	6.54	7.04	8	6.54	7.56
Critical Hdwy Stg 1	-	-	-	-	-	-	6.9	5.54	-	7	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.9	5.54	-	7	5.54	-
Follow-up Hdwy	2.22	-	-	2.42	-	-	3.7	4.02	3.37	3.75	4.02	3.63
Pot Cap-1 Maneuver	1027	-	-	658	-	-	127	124	556	164	128	644
Stage 1	-	-	-	-	-	-	283	372	-	409	494	-
Stage 2	-	-	-	-	-	-	618	476	-	521	367	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1027	-	-	658	-	-	117	112	556	132	116	644
Mov Cap-2 Maneuver	-	-	-	-	-	-	253	286	-	300	269	-
Stage 1	-	-	-	-	-	-	282	371	-	408	448	-
Stage 2	-	-	-	-	-	-	557	431	-	452	366	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			1.1			15.5			19.4		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	437	1027	-	-	658	-	-	310
HCM Lane V/C Ratio	0.215	0.001	-	-	0.065	-	-	0.194
HCM Control Delay (s)	15.5	8.5	0	-	10.8	0.4	-	19.4
HCM Lane LOS	C	A	A	-	B	A	-	C
HCM 95th %tile Q(veh)	0.8	0	-	-	0.2	-	-	0.7

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗			↖	↖		↖	↖
Traffic Vol, veh/h	8	786	2	7	428	20	14	0	39	34	0	3
Future Vol, veh/h	8	786	2	7	428	20	14	0	39	34	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	100	-	-	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	77	77	77	77	77	77	77	77	77	77	77	77
Heavy Vehicles, %	28	14	2	2	21	56	2	2	2	17	2	67
Mvmt Flow	10	1021	3	9	556	26	18	0	51	44	0	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	582	0	0	1024	0	0	1339	1643	512	1118	1631	291
Stage 1	-	-	-	-	-	-	1043	1043	-	587	587	-
Stage 2	-	-	-	-	-	-	296	600	-	531	1044	-
Critical Hdwy	4.66	-	-	4.14	-	-	7.54	6.54	6.94	7.84	6.54	8.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.84	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.84	5.54	-
Follow-up Hdwy	2.48	-	-	2.22	-	-	3.52	4.02	3.32	3.67	4.02	3.97
Pot Cap-1 Maneuver	830	-	-	674	-	-	111	99	507	144	101	545
Stage 1	-	-	-	-	-	-	245	305	-	427	495	-
Stage 2	-	-	-	-	-	-	688	488	-	463	304	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	830	-	-	674	-	-	108	97	507	127	98	545
Mov Cap-2 Maneuver	-	-	-	-	-	-	108	97	-	127	98	-
Stage 1	-	-	-	-	-	-	242	301	-	422	489	-
Stage 2	-	-	-	-	-	-	674	482	-	412	300	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.2			21.4			44.8		
HCM LOS							C			E		

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	108	507	830	-	-	674	-	-	127	545
HCM Lane V/C Ratio	0.168	0.1	0.013	-	-	0.013	-	-	0.348	0.007
HCM Control Delay (s)	45	12.9	9.4	-	-	10.4	-	-	47.7	11.7
HCM Lane LOS	E	B	A	-	-	B	-	-	E	B
HCM 95th %tile Q(veh)	0.6	0.3	0	-	-	0	-	-	1.4	0

HCM 6th Signalized Intersection Summary

3: Moreland Ave & Anvil Block Rd

Fort Gillem
Build 2032 Conditions - PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	204	510	92	177	282	204	70	363	187	490	703	122
Future Volume (veh/h)	204	510	92	177	282	204	70	363	187	490	703	122
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1633	1752	1767	1722	1559	1530	1648	1752	1752	1856	1841	1544
Adj Flow Rate, veh/h	222	554	84	192	307	95	76	395	74	533	764	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	18	10	9	12	23	25	17	10	10	3	4	24
Cap, veh/h	268	620	94	223	479	146	314	1312	585	562	1677	628
Arrive On Green	0.10	0.21	0.21	0.10	0.21	0.21	0.04	0.39	0.39	0.13	0.48	0.48
Sat Flow, veh/h	1555	2899	438	1640	2238	680	1570	3328	1485	1767	3497	1309
Grp Volume(v), veh/h	222	317	321	192	201	201	76	395	74	533	764	5
Grp Sat Flow(s),veh/h/ln	1555	1664	1673	1640	1481	1437	1570	1664	1485	1767	1749	1309
Q Serve(g_s), s	15.3	29.6	29.8	14.6	19.8	20.4	4.6	13.1	5.1	20.9	23.3	0.3
Cycle Q Clear(g_c), s	15.3	29.6	29.8	14.6	19.8	20.4	4.6	13.1	5.1	20.9	23.3	0.3
Prop In Lane	1.00		0.26	1.00		0.47	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	268	356	358	223	317	307	314	1312	585	562	1677	628
V/C Ratio(X)	0.83	0.89	0.90	0.86	0.64	0.65	0.24	0.30	0.13	0.95	0.46	0.01
Avail Cap(c_a), veh/h	268	381	383	223	339	329	429	1312	585	562	1677	628
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.6	61.1	61.1	46.5	57.2	57.4	27.2	33.3	30.9	33.9	27.7	21.8
Incr Delay (d2), s/veh	20.9	23.1	23.7	29.1	5.4	6.2	0.1	0.6	0.4	25.5	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	14.7	14.9	7.7	7.8	7.8	1.7	5.3	1.9	13.9	9.8	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.5	84.1	84.8	75.6	62.6	63.6	27.4	33.9	31.4	59.4	28.6	21.8
LnGrp LOS	E	F	F	E	E	E	C	C	C	E	C	C
Approach Vol, veh/h		860			594			545			1302	
Approach Delay, s/veh		80.9			67.1			32.7			41.2	
Approach LOS		F			E			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.3	83.0	22.0	41.6	27.0	69.4	22.0	41.6				
Change Period (Y+Rc), s	6.9	6.3	6.6	7.4	6.1	6.3	* 6.7	7.4				
Max Green Setting (Gmax), s	18.1	62.7	15.4	36.6	20.9	60.7	* 15	36.6				
Max Q Clear Time (g_c+I1), s	6.6	25.3	16.6	31.8	22.9	15.1	17.3	22.4				
Green Ext Time (p_c), s	0.1	11.0	0.0	2.4	0.0	5.9	0.0	3.3				

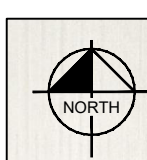
Intersection Summary

HCM 6th Ctrl Delay	54.8
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



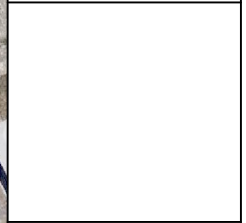
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ANVIL BLOCK ROAD

1ST STREET



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ALTERNATIVE #1
 TRAFFIC SIGNAL INSTALLATION



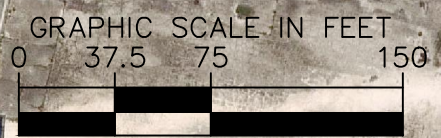


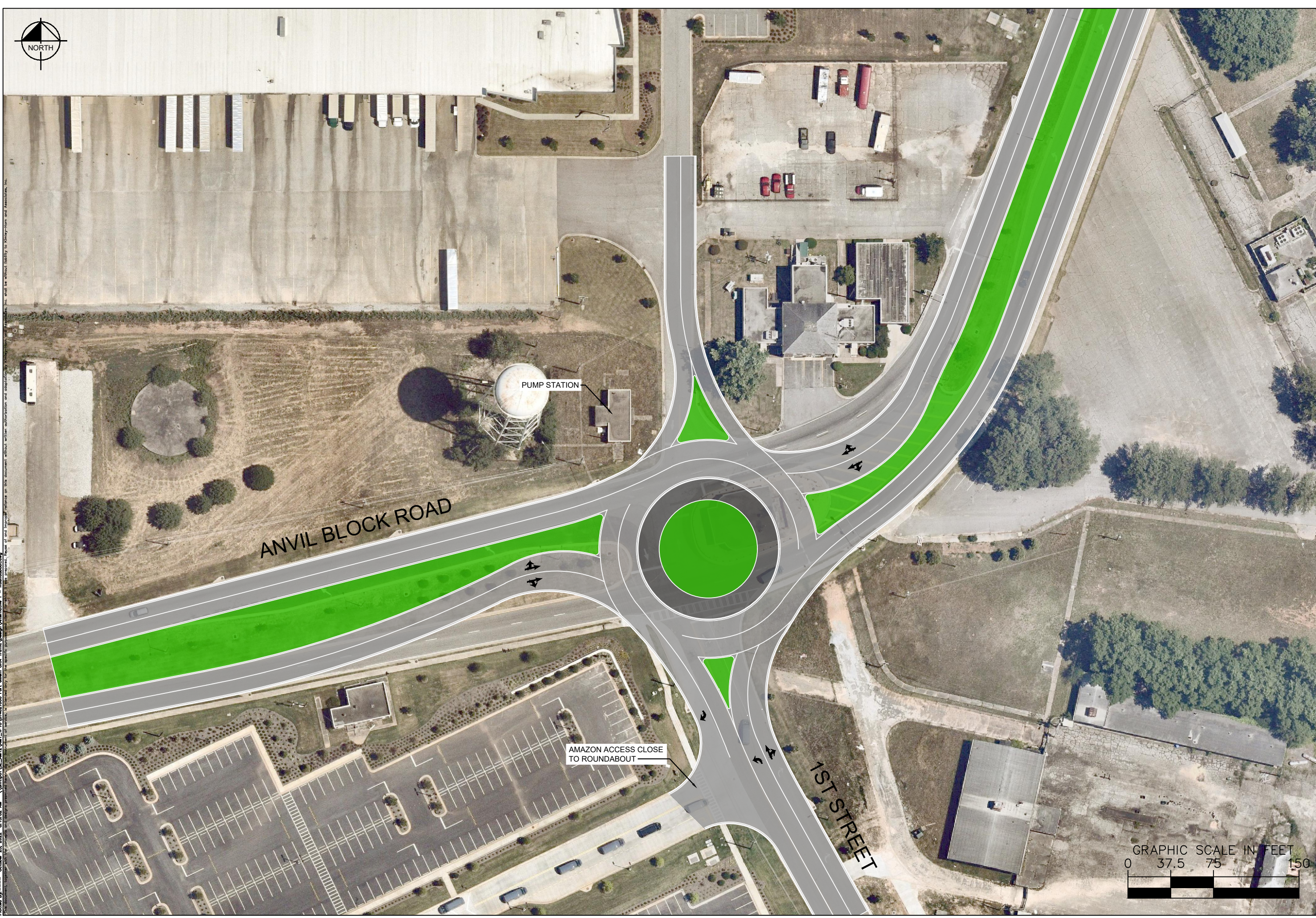
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**ALTERNATIVE #2
TRAFFIC SIGNAL INSTALLATION + ANVIL
BLOCK ROAD REALIGNMENT**





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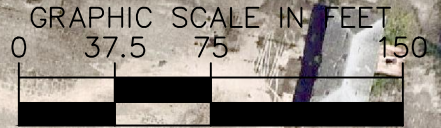


ANVIL BLOCK ROAD

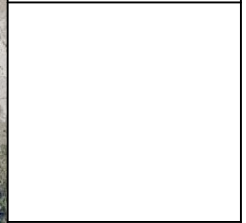
PUMP STATION

AMAZON ACCESS CLOSE TO ROUNDABOUT

1ST STREET



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**ALTERNATIVE #3
ROUNDABOUT**

PRJ_NAME	LENGTH_MI	PRJ_DESC	NOTES	Raw Cost	Contingency 20% ¹	PE (15%)	TOTAL	ESTIMATED TOTAL COST
Roundabout-Anvil Block Rd @ 1st St	0.3600			\$ 1,684,387.55	\$ 2,021,265.06	\$ 303,189.76	\$ 2,324,455	\$ 2,330,000
Signal	0.2000			\$ 1,512,945.75	\$ 1,815,534.90	\$ 272,330.24	\$ 2,087,865	\$ 2,090,000
Signal + Realignment	0.2500			\$ 1,734,209.25	\$ 2,081,051.10	\$ 312,157.67	\$ 2,393,209	\$ 2,400,000

Photograph Sheet

Site Name: Fort Gillem

Photo No. 1



Comments:

Looking northbound left from 1st Street

Photo No. 2



Comments:

Looking northbound from 1st Street

Photograph Sheet

Site Name: Fort Gillem

Photo No. 3



Comments:

Looking northbound from 1st Street (median)

Photo No. 4



Comments:

Looking northbound right from 1st Street (median)

Photograph Sheet

Site Name: Fort Gillem

Photo No. 5



Comments:

Looking southbound from 1st Street

Photo No. 6



Comments:

Looking southbound right from 1st Street

Photograph Sheet

Site Name: Fort Gillem

Photo No. 7



Comments:

Looking southbound left from 1st Street

Photo No. 8



Comments:

Looking southbound from 1st Street (median)

Photograph Sheet

Site Name: Fort Gillem

Photo No. 9



Comments:

Looking southbound right from 1st Street (median)

Photo No. 10



Comments:

Looking southbound left from 1st Street (median)

Photograph Sheet

Site Name: Fort Gillem

Photo No. 11



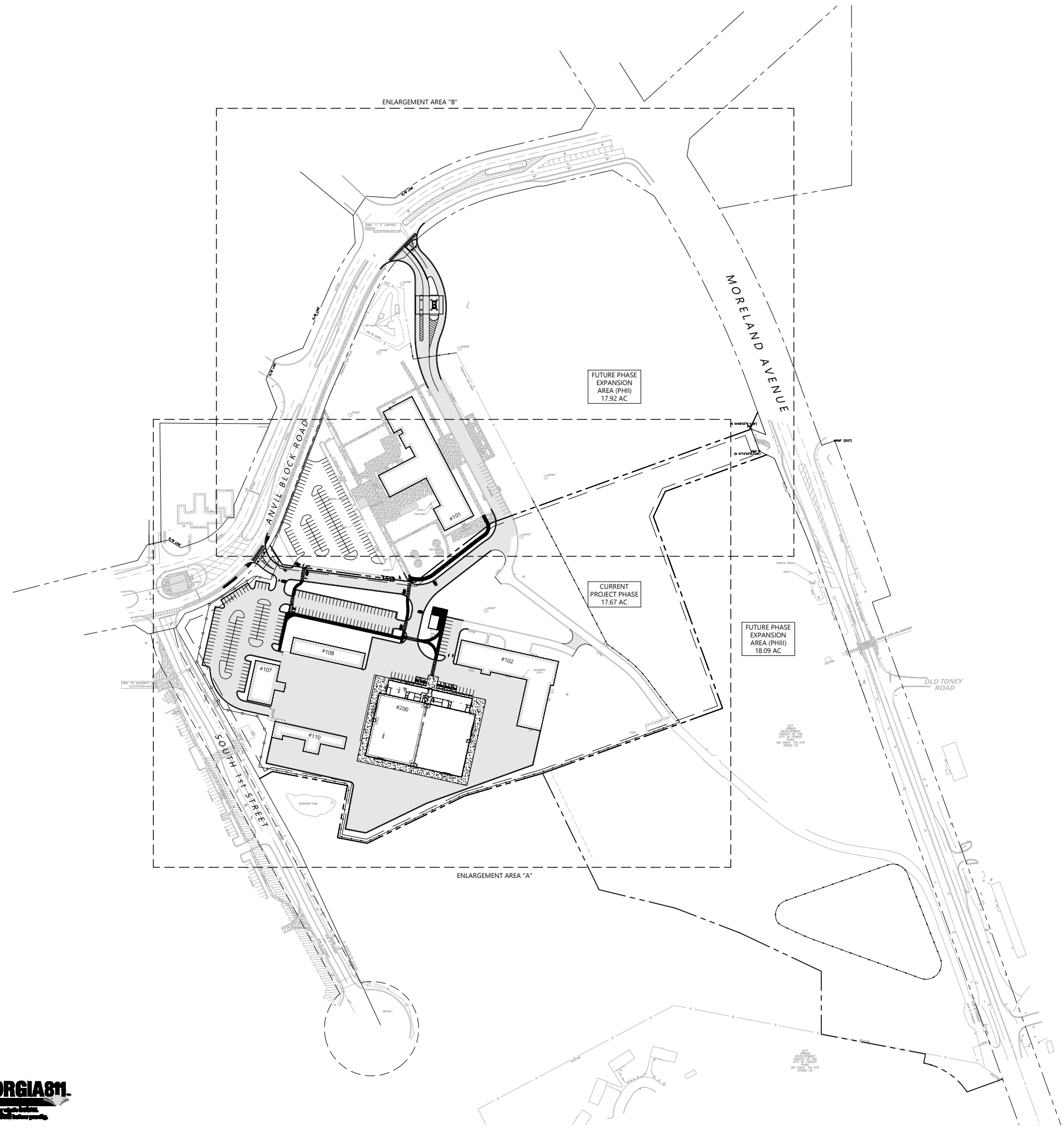
Comments:

Guard house

Photo No. 12

Comments:

Looking **DIRECTION** from **STREET/DRIVEWAY NAME** (Intersection #X)



ZONING DATA

PHASE 1 ZONING	GZ (GILLEM ZONING)
USE	FILM STUDIO
SITE AREA	1 AC
MIN PROPOSED	17.67 AC
LOT COVERAGE	50%
MAX PROPOSED	13%
OPEN SPACE	15%
MINIMUM PROPOSED	<15%
SETBACKS*	
FRONT	20'
SIDE	10'
REAR	25'
BUILDING HEIGHT	60'
MAX PROPOSED	<60'

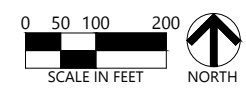
*ONCE FUTURE PHASE PARCELS ARE OWNED BY STUDIO OR RELATED ENTITY(IES), SETBACKS WILL NOT EXIST AT COMMON PROPERTY BOUNDARIES.


PARKING SUMMARY

PARKING SPACES	
PH1	184
HQ LEASE AREA	115
TOTAL	299
ACCESSIBLE SPACES	STD/VAN
REQ'D	7/2
PROVIDED	7/2

PAVING LEGEND

- PROPOSED ASPHALT
- PROPOSED CONCRETE
- PROPOSED SIDEWALK



<p>BARCLIFT CONSULTING Civil Engineering Site Planning</p> <p>404.771.0920 robert@barcliftconsulting.com barcliftconsulting.com</p>	<p>Project</p> <p>BLUE STAR FORT GILLEM</p>
<p>Sheet Title</p> <p>SITE PLAN OVERALL</p>	<p>Project</p> <p>BLUE STAR STUDIOS FORT GILLEM ANVIL BLOCK ROAD & SOUTH 1st STREET CITY OF FOREST PARK, GEORGIA</p>
	
<p>GSWCC LEVEL: 0 - 00209</p> <p>February 9, 2022</p> <p>C2.0</p> <p>Sheet Number</p>	