

Corporate Ridge Phase II DRI #2477

Douglas County, Georgia

Report Prepared:

March 2015

Prepared for:

Industrial Solutions Group

Prepared by:



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Transportation Analysis

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EXECUTIVE SUMMARY

This report presents the analysis of the anticipated traffic impacts of the Corporate Ridge Phase II DRI development located in Douglas County, Georgia. The approximate 123-acre site is located at the end of Trae Lane, a local road that is located approximately ¼-mile west of Thornton Rd (SR 6) via Bob Arnold Blvd in Douglas County, Georgia. The proposed development will be an industrial warehouse facility with approximately 1,436,820 SF of warehousing space. The project is a Development of Regional Impact (DRI) and is subject to Georgia Regional Transportation Authority (GRTA) and Atlanta Regional Commission (ARC) review due to the project size greater than 500,000 SF for a Wholesale & Distribution proposed land use. The DRI for this development was triggered by the filing of the rezoning application with Douglas County, and the filing of DRI Form 1 on February 23, 2015.

According to the *GRTA Procedures and Principles for GRTA DRI Review, 2013*, the proposed DRI complies with the **Expedited Review Criteria** in **Section 3-102**, **Part B – Limited Trip Generation**, which states:

The land uses within the proposed DRI are such that the amount of trips generated by the development is likely to have minimal impact on the road network: 1) No more than one thousand (1,000) gross daily trips will be generated by the DRI based on a trip generation memorandum; or, 2) More than one thousand (1,000) but no more than three thousand (3,000) gross daily trips will be generated by the DRI based on a trip generation memorandum and requires the submittal of an Access Analysis; or, 3) The proposed DRI is projected to generate no more than one hundred (100) gross PM peak hour weekday trips based on a trip generation memorandum.

This development is proposed to generate a total of 2,414 gross daily trips, which is more than 1,000 trips, but fewer than 3,000 trips, allowing it to qualify for expedited review with the requirement of the submission of an access analysis.

The proposed redevelopment project is expected to be completed by 2017 (approximately 2 years), and this analysis will consider the full build-out of the proposed site in 2017. The proposed site consists of the following land use and density:

Warehouse Square Footage: 1,436,820 SF

Capacity analyses were performed throughout the study network for the 2015 Existing conditions, the projected 2017 No-Build conditions, and the projected 2017 Build conditions.

- 2015 Existing conditions represent traffic volumes that were collected in February 2015 by performing AM and PM peak hour turning movement counts.
- Projected 2017 No-Build conditions represent the existing traffic volumes grown for two (2) years at 2.0 percent per year throughout the study network. Also included, are the programmed improvements for the Lee Road Bridge Construction Project and the subsequent rerouting of traffic associated with the project.
- Projected 2017 Build conditions represent the projected 2017 No-Build conditions with the addition of the project trips that are anticipated to be generated by the Corporate Ridge Phase II development.

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Based on the 2015 Existing conditions (present conditions; i.e. <u>excludes</u> background traffic growth and <u>excludes</u> the Corporate Ridge Phase II DRI project traffic), three (3) of the six (6) study intersections operate below the acceptable level-of-service (LOS) standard of D.

Based on the projected 2017 No-Build conditions (<u>includes</u> background traffic growth plus programmed improvements from the Lee Road Bridge Construction Project but <u>excludes</u> the Corporate Ridge Phase II DRI project traffic) the following recommended improvements were identified in order to obtain an acceptable level-of-service (LOS D) at all intersections within the study network.

- SR 6/Thornton Rd at Bob Arnold Blvd (Int. #2)
 - Install a traffic signal (when warranted). (Note: The intersection meets Warrant 3 Peak Hour Warrant for the projected 2017 No-Build conditions during the PM Peak Hour. See Appendix F for the Traffic Signal Warrant Analysis spreadsheets.) It should be noted that for all requests for new signals, an alternative solution that considers a roundabout is required to be investigated. This location may be an appropriate location for either a traffic signal or a multi-lane roundabout.
 - In combination with the traffic signal installation and per the GDOT requirements, convert the eastbound and westbound approaches from a shared left-turn/through/right-turn lane to a left-turn lane with a shared through/right-turn lane.
 - Increase the existing northbound left-turn storage lane along SR 6/Thornton Rd (310 feet of storage minimum with 100 feet of taper).
- Blairs Bridge Rd at Bob Arnold Blvd (Int. #3)
 - Install a traffic signal (when warranted). (Note: The intersection meets Warrant 3 Peak Hour Warrant for the projected 2017 No-Build conditions during the PM Peak Hour. See Appendix F for the Traffic Signal Warrant Analysis spreadsheets.) It should be noted that for all requests for new signals, an alternative solution that considers a roundabout is required to be investigated. This location may be an appropriate location for either a traffic signal or a single-lane roundabout.

Based on the projected 2017 Build conditions (<u>includes</u> background traffic growth plus programmed improvements from the Lee Road Bridge Construction Project and <u>includes</u> the Corporate Ridge Phase II DRI project traffic), combined with the above noted No-Build improvements, no additional improvements are recommended, as all intersections are anticipated to operate at or above the acceptable level-of-service.

1.0 PROJECT DESCRIPTION

1.1 Introduction

This report presents the analysis of the anticipated traffic impacts of the Corporate Ridge Phase II DRI development located in Douglas County, Georgia. The approximately 123-acre site is located at the end of Trae Lane, a local road that is located approximately ¼-mile west of Thornton Rd (SR 6) via Bob Arnold Blvd. The project will exceed 500,000 square feet of wholesale & distribution development in a Developing Suburbs area type, therefore, the proposed development is a Development of Regional Impact (DRI) and is subject to Georgia Regional Transportation Authority (GRTA) and Atlanta Regional Commission (ARC) review.

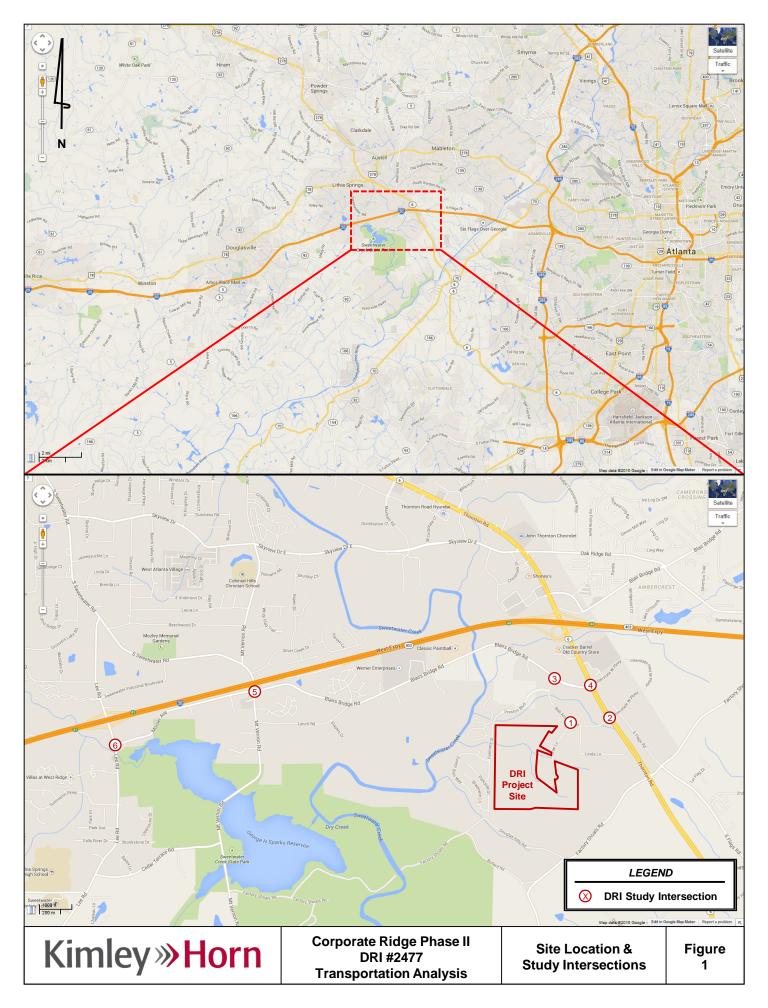
This 1,436,820 SF warehouse development is proposed to generate a total of 2,414 gross daily trips, which is more than 1,000 trips, but fewer than 3,000 trips, allowing it to qualify for expedited review with the requirement of submittal of the Access Analysis study in this report under *GRTA Procedures and Principles for GRTA DRI Review, 2013* via the **Expedited Review Criteria** in **Section 3-102**, **Parts B – Limited Trip Generation** which states:

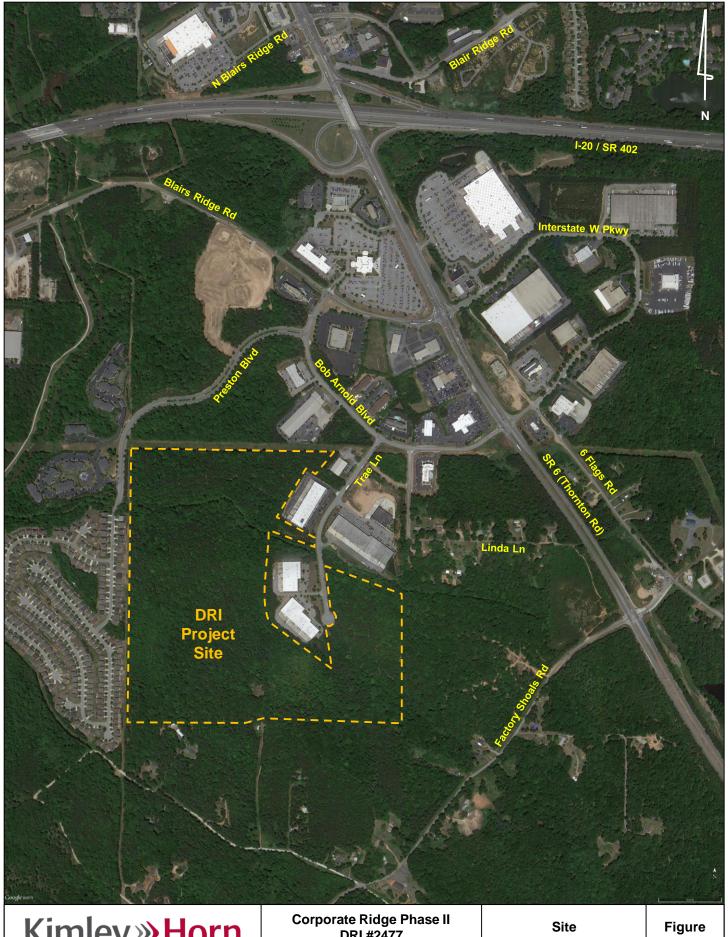
The land uses within the proposed DRI are such that the amount of trips generated by the development is likely to have minimal impact on the road network: 1) No more than one thousand (1,000) gross daily trips will be generated by the DRI based on a trip generation memorandum; or, 2) More than one thousand (1,000) but no more than three thousand (3,000) gross daily trips will be generated by the DRI based on a trip generation memorandum and requires the submittal of an Access Analysis; or, 3) The proposed DRI is projected to generate no more than one hundred (100) gross PM peak hour weekday trips based on a trip generation memorandum.

Figure 1 provides the site location and study intersections of the Corporate Ridge Phase II DRI project, and Figure 2 provides an aerial view of the project site and surrounding area. Field review photographs taken within the vicinity of the study network are located in the site photo log in Appendix A. The land use maps from Douglas County Zoning, the Douglas County Future Land Use Map, and ARC's *PLAN 2040 Unified Growth Policy Map* are included in Appendix B.

The proposed project is expected to be completed by 2017, and this analysis will consider the full buildout of the proposed site in 2017. A summary of the proposed land-use and density can be found below in Table 1.

Table 1: Corporate Ridge Phase II DRI Proposed Land Uses				
Warehouse (Total in four buildings)	1,436,820 SF			





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Corporate Ridge Phase II DRI #2477 **Transportation Analysis**

Aerial

Figure 2

1.2 Site Plan Review

The proposed development is approximately a 123-acre site at the end of Trae Lane, a local road that is located approximately ¼-mile west of Thornton Rd (SR 6) via Bob Arnold Blvd. The project will include four warehousing buildings with associated truck and employee parking facilities. A reference of the proposed site plan can be found in Appendix C. A full-sized site plan consistent with GRTA's Site Plan Guidelines is also being submitted as part of the review package.

1.3 Site Access

The official site driveway analyzed for the purposes of this study is the intersection of Bob Arnold Blvd at Trae Lane. Vehicular access to the development is proposed at four locations along Trae Lane, which currently exists as a cul-de-sac.

Trae Lane provides vehicular access to the entire development. Internal private roadways throughout the site provide access to all buildings and parking facilities. See the referenced site plan in Appendix C for a visual representation of vehicular access and circulation throughout the proposed development.

The site driveways mentioned above provide access to all parking on the site. Parking will be provided throughout the development as follows:

Employee Parking Provided: 1,271 spaces
Trailer Parking Provided: 252 spaces

1.4 Bicycle and Pedestrian Facilities

Sidewalks are sporadically located along Bob Arnold Blvd. There are currently no sidewalks along Trae Lane. The Douglas County Comprehensive Transportation Plan proposed an extension and improvement of the Bicycle/Pedestrian facilities along SR 6/Thornton Rd between I-20 and Riverside Parkway.

1.5 Transit Facilities

There are no direct transit routes located within the vicinity of the project site, and therefore, there were no alternative mode reductions taken. There is a rideshare parking facility at Thornton Rd (south of I-20) and Riverside Parkway, where the Douglas County Rideshare program provides parking to individuals who join vanpool ridesharing.

2.0 TRAFFIC ANALYSES, METHODOLOGY AND ASSUMPTIONS

2.1 Growth Rate

Background traffic is defined as expected traffic on the roadway network in future year(s) absent the construction and opening of the proposed project. Background traffic can include a base growth rate based on historical count data as well as population growth data and estimates as well as trips anticipated from nearby or adjacent other projects. Based on methodology outlined in the GRTA Letter of Understanding (LOU), a 2.0 percent per year background traffic growth rate was used for all roadways.

2.2 Traffic Data Collection

Weekday peak hour turning movement counts were collected in February 2015 at six (6) intersections during the AM and PM peak periods. The morning peak hours were the same for all six intersections studied and the afternoon peak hours varied some between intersections. Peak hours for all intersections are shown in Table 2.

Table 2: Corporate Ridge Phase II DRI Peak Hour Summary								
Intersection	AM Peak Hour	PM Peak Hour						
Bob Arnold Blvd at Trae Lane (site driveway)	7:15-8:15	4:30-5:30						
2. SR 6/Thornton Rd at Bob Arnold Blvd	7:15-8:15	4:45-5:45						
3. Blairs Bridge Rd at Bob Arnold Blvd	7:15-8:15	4:45-5:45						
4. SR 6/Thornton Rd at Blairs Bridge Rd	7:15-8:15	4:45-5:45						
5. Blairs Bridge Rd/Monier Ave at Mt. Vernon Rd	7:15-8:15	4:45-5:45						
6. Lee Rd at Monier Ave	7:15-8:15	4:45-5:45						

All raw traffic count data is available upon request.

To be conservative in the traffic analysis, a five percent increase in existing trips was added to the turning movement counts for all movements in the <u>AM peak hour</u> for the four intersections closest to the project site (intersections one through four). Five percent was utilized based on historical AM hourly detector volume throughput reports for the intersection of SR 6/Thornton Rd at Blairs Bridge Rd (GDOT Regional Traffic Operations Program Project).

2.3 Detailed 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. Level-of-service analyses were conducted at all intersections within the study network using *Synchro Professional, Version 8.0.*

Levels-of-service for signalized intersections are reported for the intersection as a whole. One or more movements at an intersection may experience a low level-of-service, while the intersection as a whole may operate acceptably.

Levels-of-service for unsignalized intersections, with stop control on the minor street only, are reported for the side street approaches. Low levels-of-service for side street approaches are not uncommon, as vehicles may experience significant delays in turning onto a major roadway.

3.0 STUDY NETWORK

3.1 Gross Trip Generation

Traffic for the proposed land uses and densities were calculated using methodology contained in the *Institute of Transportation Engineers' (ITE) Trip Generation Manual, Ninth Edition.* Gross trips generated are displayed below in Table 3.

Table 3: Corporate Ridge Phase II DRI Gross Trip Generation							
Land Use	ITE	Daily	Traffic	AM Pea	ak Hour	PM Pea	ak Hour
(Intensity)		Enter	Exit	Enter	Exit	Enter	Exit
High Cube Warehouse (1,436,820 SF)	152	1,207	1,207	121	55	57	126
Total Gross Trips		1,207	1,207	121	55	57	126

3.2 Trip Distribution

The directional distribution and assignment of new project trips was based on the project land use, a review of the land use densities and road facilities in the area, engineering judgment, and methodology discussions with the Georgia Regional Transportation Authority (GRTA), Atlanta Regional Commision (ARC), Georgia Department of Transportation (GDOT), and Douglas County.

3.3 Level-of-Service Standards

For the purposes of this traffic analysis, a level-of-service standard of D was assumed for all intersections and segments within the study network. If, however, an intersection or segment currently operates at LOS E or LOS F during an existing peak period, the LOS standard for that peak period becomes LOS E.

3.4 Study Network Determination

Per Expedited Review criteria, GRTA requires the evaluation of site driveways plus the adjacent intersections. Trae Lane is considered the single site driveway for the purposes of this study, as agreed upon by GRTA in the Letter of Understanding (LOU). In addition to the site driveway (Trae Lane at Bob Arnold Blvd), there are five (5) intersections included in the study network.

The access analysis study network is as follows:

- Bob Arnold Boulevard at Trae Lane (site driveway)
- SR 6/Thornton Road) at Bob Arnold Road
- Blairs Bridge Road at Bob Arnold Boulevard
- SR 6/Thornton Road) at Blairs Bridge Road existing traffic signal
- Blairs Bridge Road/Monier Ave at Mt. Vernon Road existing traffic signal
- Lee Road at Monier Ave

The study network includes two (2) signalized intersections and four (4) two-way stop controlled intersections as noted in Table 4. The site location and study intersections can be found in Figure 1.

Table 4: Corporate Ridge Phase II DRI Intersection Control Summary	
Intersection	Control
Bob Arnold Blvd at Trae Lane (site driveway)	TWSC
2. SR 6/Thornton Rd at Bob Arnold Blvd	TWSC
3. Blairs Bridge Rd at Bob Arnold Blvd	TWSC
4. SR 6/Thornton Rd at Blairs Bridge Rd	Signal
5. Blairs Bridge Rd/Monier Ave at Mt. Vernon Rd	Signal
6. Lee Rd at Monier Ave	TWSC

*Note: TWSC = Two-Way Stop Control

Each of the above listed intersections was analyzed for the Existing 2015 conditions, the projected 2017 No-Build conditions, and the projected 2017 Build conditions. The projected 2017 No-Build conditions represent the existing traffic volumes grown for two (2) years at 2.0 percent per year throughout the study network plus programmed improvements from the Lee Road Bridge Construction Project. The projected 2017 Build conditions add the project trips associated with the Corporate Ridge Phase II development to the projected 2017 No-Build conditions.

3.5 Existing Roadway Facilities

Roadway classification descriptions for the entire study area are provided in Table 5 (bolded roadways run adjacent to the site).

Table 5: Corporate Ridge Phase II DRI Roadway Classification									
Roadway	No. of Lanes	Posted Speed Limit (MPH)	Douglas County Roadway Classification	GDOT Functional Classification					
Trae Lane	2	35	Local	Local					
Bob Arnold Blvd	2	35	Local	Local					
Blairs Bridge Rd	2	45	Minor Arterial	Minor Arterial					
SR 6/Thornton Rd	6	55	Principal Arterial	Principal Arterial					
Monier Ave	2	45	Minor Arterial	Minor Arterial					
Lee Rd	2	45	Minor Arterial	Minor Arterial					
Mt. Vernon Rd	2	40	Minor Arterial	Minor Arterial					

4.0 Trip Generation

As stated previously, trips associated with the proposed development were estimated using the *Institute of Transportation Engineers' (ITE) Trip Generation Manual, Ninth Edition, 2012.* Trip generation for this proposed development is calculated based upon High Cube Warehouse/ Distribution Center (ITE 152). Due to the land-use of the proposed site, an estimate of 75 percent employee (car) and 25 percent heavy vehicle (truck) trips was applied to the total gross trips.

Alternative transportation mode reduction was not applied for this study.

Pass-by trip reductions were not applied for this project.

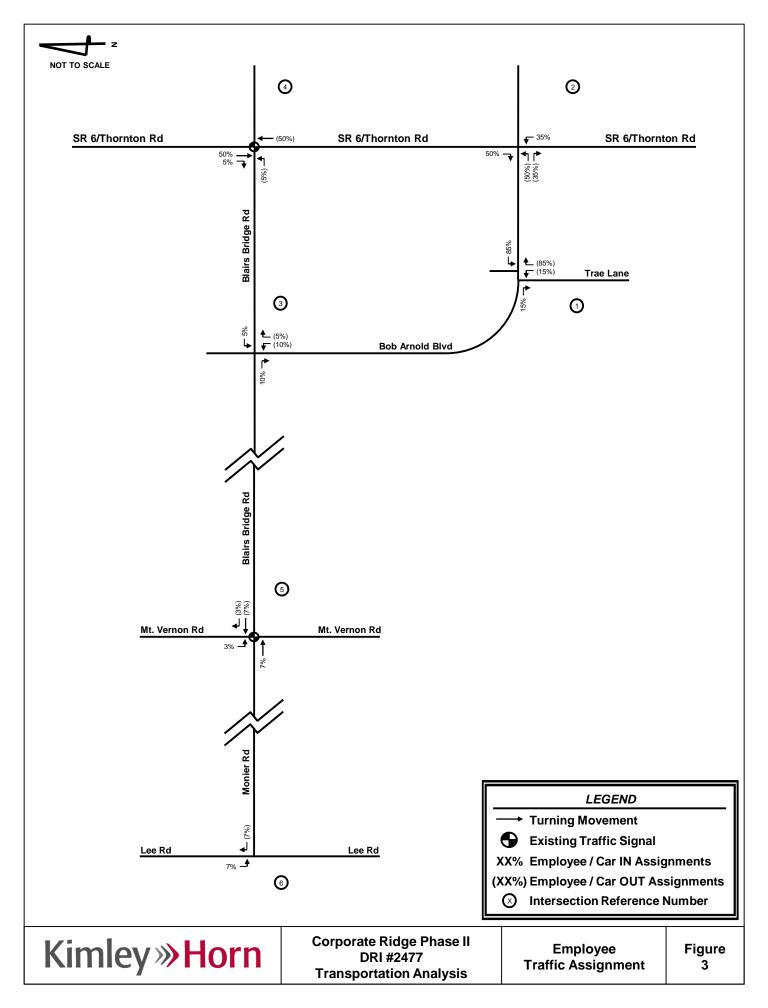
The total (net) trips generated and analyzed in this report are listed in Table 6.

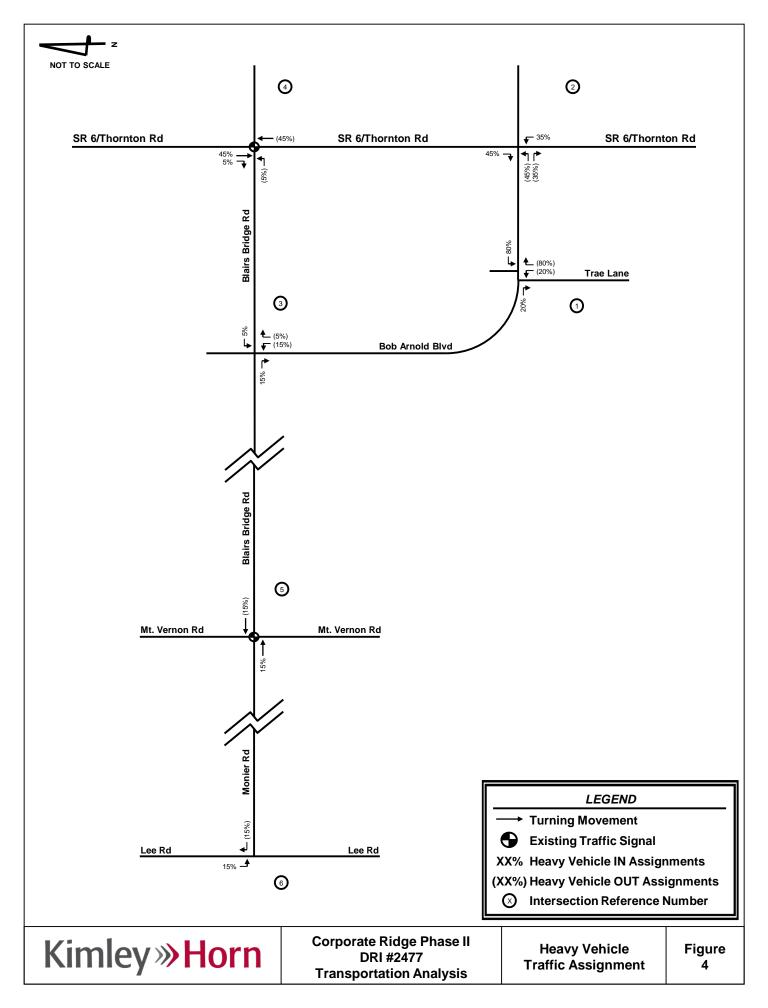
Table 6: Corporate Ridge Phase II DRI Trip Generation								
	Da	aily Traffic	C	AM Pea	ak Hour	PM Pea	ak Hour	
	TOTAL	Enter	Exit	Enter	Exit	Enter	Exit	
Gross Project Trips	2,414	1,208	1,207	121	55	57	126	
Employee (Car)Trips	1,810	905	905	91	41	43	95	
Heavy Vehicle (Truck) Trips	604	302	302	30	14	14	31	
Mixed-Use Reduction	0	0	0	0	0	0	0	
Alternative Mode Reduction	0	0	0	0	0	0	0	
Pass-By Reduction	0	0	0	0	0	0	0	
Net New Trips	2,414	1,208	1,207	121	55	57	126	

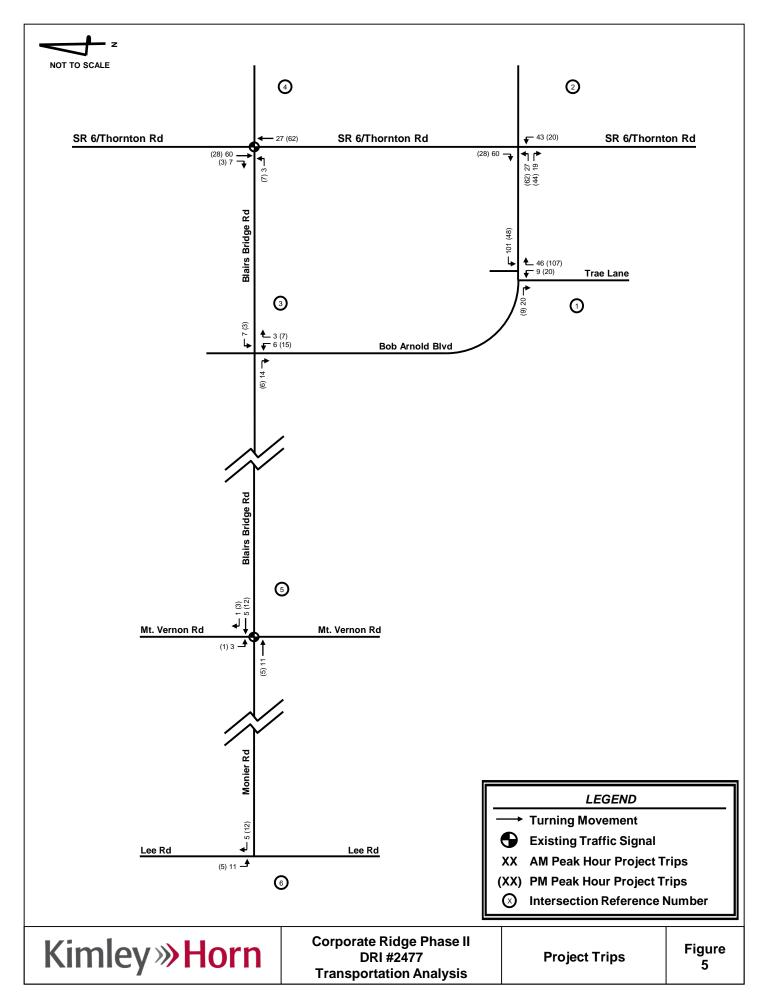
A more detailed trip generation analysis summary table is provided in Appendix D.

5.0 TRIP DISTRIBUTION AND ASSIGNMENT

New trips were distributed onto the roadway network using the percentages agreed to during methodology discussions with GRTA, ARC, GDOT, and Douglas County. Figure 3 displays the projected assignments for employee trips, and Figure 4 displays projected assignments for heavy vehicle trips. These percentages were applied to the net new trips expected to be generated by the development, and the volumes were assigned to the roadway network. The expected combined project trips throughout the study network, generated by the proposed by the proposed Corporate Ridge Phase II development, are shown in Figure 5. Detailed intersection volume worksheets can also be found in Appendix E.







6.0 TRAFFIC ANALYSIS

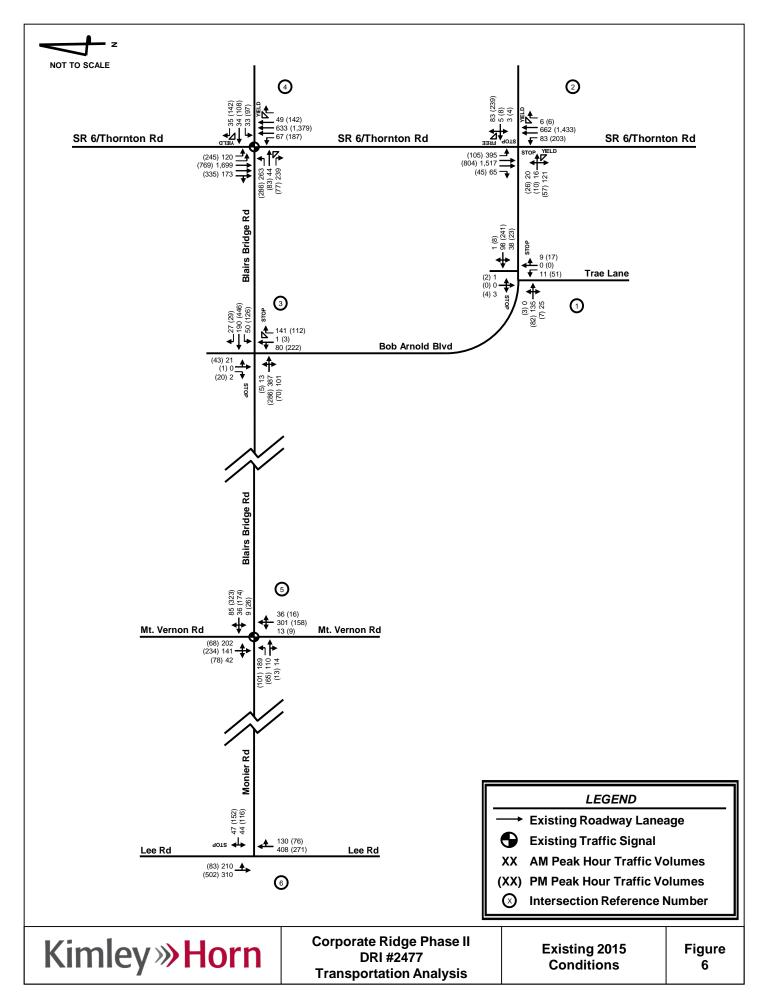
6.1 2015 Existing Conditions

The observed existing peak hour traffic volumes were entered into *Synchro 8.0*, and capacity analyses were performed for the AM and PM peak hours. The existing peak hour traffic volumes are displayed in, and the results of the capacity analyses for the 2015 Existing conditions are shown in Table 7.

Table 7: Corporate Ridge Phase II DRI 2015 Existing Intersection Levels-of-Service LOS (delay in seconds)								
Intersection	Intersection Control		LOS Std.	AM Peak Hour	PM Peak Hour			
Bob Arnold Blvd at Trae Lane (site driveway)	TWSC	NB	D	B (10.2)	B (11.2)			
DOD ATTIOID DIVID AT TTAC LATTE (SILE UTIVEWAY)	10030	SB	D	A (9.3)	B (10.2)			
SR 6/Thornton Rd at Bob Arnold Blvd	TWSC	EB	D	F (Error)	F (Error)			
2. SR 6/THOMROIT RU AL BOD AMOID BIVU		WB	D	F (Error)	F (223.9)			
Blairs Bridge Rd at Bob Arnold Blvd	TWSC	NB	D	C (18.5)	F (400.0)			
Blairs Bridge Rd at Bob Arnold Blvd		SB	D	D (26.7)	F (65.6)			
4. SR 6/Thornton Rd at Blairs Bridge Rd	Signa	I	D	C (32.3)	D (51.0)			
5. Blairs Bridge Rd/Monier Ave at Mt. Vernon Rd	Signa	ı	D	C (21.0)	C (26.1)			
6. Lee Rd at Monier Ave	TWSC	WB	D	E (37.7)	F (54.2)			

^{*} Error = excessive delays (outside Synchro limitations) due to stop control on minor street only with heavy major street volume.

As shown in Table 7, analyses indicate that the unsignalized intersection approaches for SR 6/Thornton Rd at Bob Arnold Blvd operate at LOS F with long vehicular delays during the AM and PM peak hours for 2015 Existing conditions. The unsignalized intersection approaches for Blairs Bridge Rd at Bob Arnold Blvd operate at an acceptable LOS during the AM peak hour, but operate at LOS F with long vehicular delays during the AM and PM peak hours for 2015 Existing conditions. The unsignalized intersection approach for Lee Rd at Monier Ave operates at LOS E and LOS F with long vehicular delays during the AM and PM peak hours for 2015 Existing conditions. All other study intersections operate at an acceptable LOS during the AM and PM peak hours for 2015 Existing conditions.



6.2 Projected 2017 No-Build Conditions

To account for growth in the vicinity of the proposed development, the existing traffic volumes were increased for two (2) years at 2.0 percent per year throughout the study network. These volumes were entered into *Synchro 8.0*, and capacity analyses were performed. The projected 2017 No-Build conditions were analyzed using existing roadway geometry and existing intersection control types, as well as the programmed improvements currently under construction for the Lee Road Bridge project. The intersection laneage and traffic volumes for the projected 2017 No-Build conditions are shown in Figure 7.

The Lee Road Bridge project as it pertains to the study intersections, includes the restriction of westbound left-turns at the intersection of Lee Rd and Montier Ave. To accommodate for this restriction, the westbound left-turns at Lee Rd were rerouted to the westbound left-turn movement at Mt. Vernon Rd. The Lee Road Bridge project completion is anticipated for October 2015 and thus was considered in both the projected 2017 No-Build and 2017 Build conditions.

As shown in Table 8, two (2) intersections are projected to operate below their acceptable level-of-service standard during the AM Peak Hour and/or PM Peak Hour. Based on the projected 2017 No-Build conditions, the following improvements result in the below listed intersections operating at or above their LOS standard.

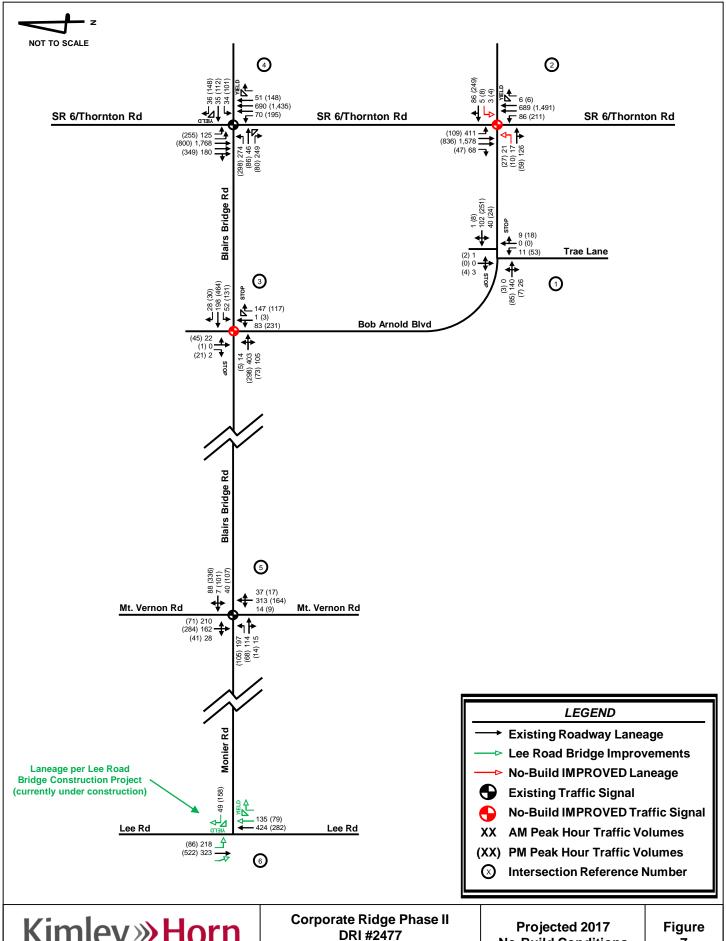
- SR 6/Thornton Rd at Bob Arnold Blvd (Int. #2)
 - Install a traffic signal (when warranted). (Note: The intersection meets Warrant 3 Peak Hour Warrant for the projected 2017 No-Build conditions during the PM Peak Hour. See Appendix F for the Traffic Signal Warrant Analysis spreadsheets.) It should be noted that for all requests for new signals, an alternative solution that considers a roundabout is required to be investigated. This location may be an appropriate location for either a traffic signal or a multi-lane roundabout.
 - In combination with the traffic signal installation and per the GDOT requirements, convert the eastbound and westbound approaches from a shared left-turn/through/right-turn lane to a left-turn lane with a shared through/right-turn lane.
 - Increase the existing northbound left-turn storage lane along SR 6/Thornton Rd (310 feet of storage minimum with 100 feet of taper).
- Blairs Bridge Rd at Bob Arnold Blvd (Int. #3)
 - Install a traffic signal (when warranted). (Note: The intersection meets Warrant 3 Peak Hour Warrant for the projected 2017 No-Build conditions during the PM Peak Hour. See Appendix F for the Traffic Signal Warrant Analysis spreadsheets.) It should be noted that for all requests for new signals, an alternative solution that considers a roundabout is required to be investigated. This location may be an appropriate location for either a traffic signal or a single-lane roundabout.

The projected 2017 No-Build conditions LOS with existing geometry and the Lee Road Bridge improvements are displayed in Table 8; the LOS with the 2017 No-Build improvements stated above are shown in Table 9.

Table 8: Corporate Ridge Phase II DRI Projected 2017 No-Build Intersection Levels-of-Service LOS (delay in seconds)								
Intersection		Control		AM Peak Hour	PM Peak Hour			
Bob Arnold Blvd at Trae Lane (site driveway)	TWSC	NB	D	B (10.3)	B (11.3)			
DOD AITIOIU DIVU AL TTAE LAITE (SILE UTIVEWAY)	10050	SB	D	A (9.4)	B (10.2)			
2 SR 6/Thornton Rd at Bob Arnold Blvd	TWSC	EB	Е	F (Error)	F (Error)			
2. SR 6/Thornton Rd at Bob Arnold Blvd		WB	Е	F (Error)	F (341.3)			
2. Diaina Driidana Del at Dala Arraald Divid	TWSC	NB	AM=D PM=E	C (19.8)	F (495.9)			
Blairs Bridge Rd at Bob Arnold Blvd		SB	AM=D PM=E	D (29.3)	F (85.0)			
4. SR 6/Thornton Rd at Blairs Bridge Rd	Signa	l	D	C (33.5)	D (52.5)			
5. Blairs Bridge Rd/Monier Ave at Mt. Vernon Rd	Signal		D	C (21.3)	C (30.0)			
6. Lee Rd at Monier Ave	TWSC	WB	D	B (10.1)	B (10.3)			

^{*} Error = excessive delays (outside *Synchro* limitations) due to stop control on minor street only with heavy major street volume.

Table 9: Corporate Ridge Phase II DRI Projected 2017 No-Build Intersection Levels-of-Service - IMPROVED LOS (delay in seconds)							
Intersection Control LOS AM Peak Hour Hour							
2. SR 6/Thornton Rd at Bob Arnold Blvd	Signal	D	C (21.9)	C (32.2)			
3. Blairs Bridge Rd at Bob Arnold Blvd	Signal	D	B (13.0)	B (15.1)			



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Transportation Analysis

No-Build Conditions

7

6.3 Projected 2017 Build Conditions

The traffic associated with the proposed Corporate Ridge Phase II DRI development was added to the projected 2017 No-Build volumes. These volumes were then entered into Synchro 8.0, and capacity analyses were performed. The projected 2017 Build conditions were analyzed using existing roadway geometry and existing intersection control types, as well as the programmed improvements currently under construction for the Lee Road Bridge project. The intersection laneage and traffic volumes used for the projected 2017 Build conditions are shown in Figure 8.

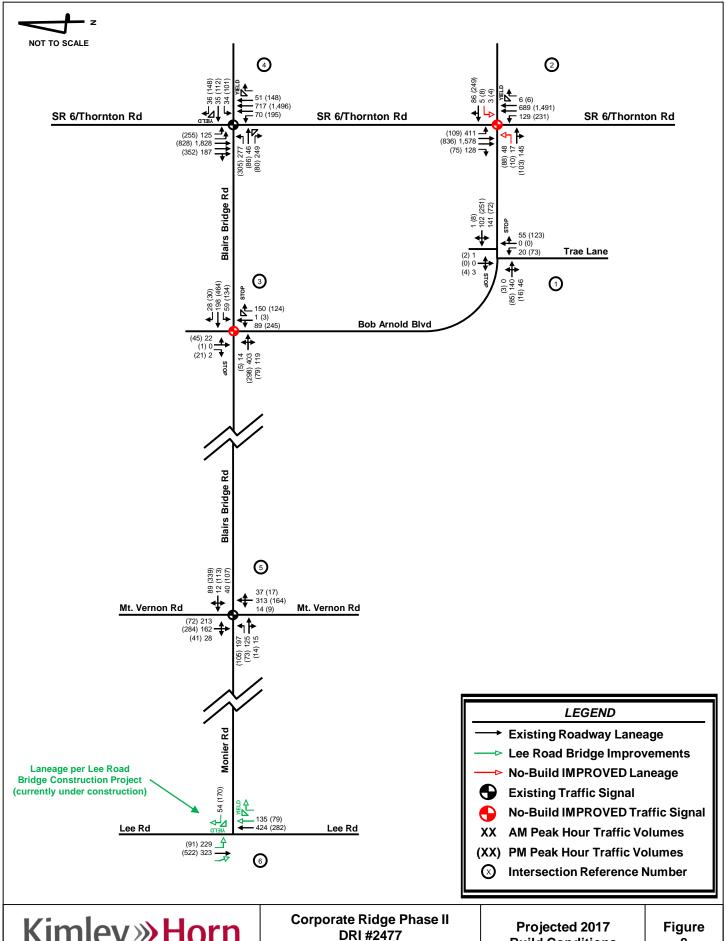
Two (2) intersections are projected to operate below the acceptable level-of-service standard during the AM Peak Hour and/or PM Peak Hour. Following implementation of the improvements recommended in the projected 2017 No-Build conditions analyses, all intersection are anticipated to operate at or above their LOS standard.

The projected 2017 Build conditions LOS with existing geometry and the Lee Road Bridge improvements are displayed in Table 8; the LOS with the addition of the 2017 No-Build improvements stated above in section 6.2 are shown in Table 9.

Table 10: Corporate Ridge Phase II DRI Projected 2017 Build Intersection Levels-of-Service LOS (delay in seconds)								
Intersection	Control		LOS Std.	AM Peak Hour	PM Peak Hour			
Bob Arnold Blvd at Trae Lane (site driveway)	TWSC	NB	D	B (11.3)	B (12.3)			
		SB	D	B (10.3)	B (11.8)			
2. SR 6/Thornton Rd at Bob Arnold Blvd	TWSC	EB	Е	F (Error)	F (Error)			
		WB	Е	F (Error)	F (Error)			
O. Dising Driving Date (Date Associated Disale	TWSC	NB	AM=D PM=E	C (21.5)	F (565.4)			
Blairs Bridge Rd at Bob Arnold Blvd		SB	AM=D PM=E	D (31.1)	F (92.4)			
4. SR 6/Thornton Rd at Blairs Bridge Rd	Signal		D	C (33.5)	D (53.5)			
5. Blairs Bridge Rd/Monier Ave at Mt. Vernon Rd	Signal		D	C (21.9)	C (31.3)			
6. Lee Rd at Monier Ave	TWSC WB		D	B (10.2)	B (10.5)			

^{*} Error = excessive delays (outside *Synchro* limitations) due to stop control on minor street only with heavy major street volume.

Table 11: Corporate Ridge Phase II DRI Projected 2017 Build Intersection Levels-of-Service - IMPROVED LOS (delay in seconds)						
Intersection	Intersection Control		AM Peak Hour	PM Peak Hour		
2. SR 6/Thornton Rd at Bob Arnold Blvd	Signal	D	C (24.4)	D (40.8)		
3. Blairs Bridge Rd at Bob Arnold Blvd	Signal	D	B (16.4)	B (18.7)		



Kimley » Horn

Transportation Analysis

Build Conditions

8

7.0 Identification of Programmed Projects

According to ARC's Transportation Improvement Program, the Regional Transportation Improvement Program, GDOT's Construction Work Program (none at this time), Douglas County's programmed projects, and the STIP the following projects are programmed or planned to be completed by the respective years: within the vicinity of the proposed development. The identified projects are listed in Table 12 below.

	Table 12: Corporate Ridge Phase II DRI Programmed Improvements				
#	Year	Project Number	Project Description		
1	2015	NHS00-0001-00(917)	Lee Road Bridge Construction		
2	2015	TIA-DO-002	I-20 West from I-285 West to SR 5 – ITS and Western Regional Traffic Control Center to Connect SR 6 to the GDOT Navigator System for Advanced Traffic Management Systems and Fiber optic Communication Capabilities		
3	2016	DO-295	SR 6/Thornton Rd congestion reduction and traffic flow improvements from I-20 in Douglas County to Garrett Rd in Cobb County		
4	2019	TIA-DO-018	SR 6/Thornton Rd from Paulding County Line to Riverside Parkway – Truck Friendly Lanes, ITS, Intersection Improvements and Partial Widening Roadway		
5	2020- 2030	DO-299	SR 6/Thornton Rd truck friendly lanes from I-20 West in Douglas County to SR 6 spur (Garrett Rd) in Cobb County		
6	2020- 2030	FS-003	SR 70/Fulton Industrial Blvd widening from SR 6/Camp Creek Pkw to I-20 West		
7	2031- 2040	FS-225	SR 70/Fulton Industrial Blvd widening from SR 166/Campbellton Rd to SR 6/Camp Creek Pkwy		
8	*	CTP-4	Signage augmentation and striping at and around the I-20/ SR 6/Thornton Rd interchange.		
9	*	CTP-20	Widen Blairs Bridge Rd/Monier Ave from SR 6/Thornton Rd to Mt. Vernon Rd and construct new roadway to extend Monier Ave to North County Line Rd		

^{*} Completion date has yet to be determined for many Douglas County Comprehensive Transportation Plan (CTP) projects.

A roadway plan sheet illustrating the laneage changes associated with the Lee Road Bridge Construction project is included in Appendix G. The other projects in Table 12 (projects 2-9) were not specifically considered for this DRI Transportation Analysis.

8.0 INGRESS/EGRESS ANALYSIS

Vehicular access to the Corporate Ridge Phase II development during the AM and PM peak periods includes the following six (6) intersections:

- Bob Arnold Boulevard at Trae Lane (site driveway)
- SR 6/Thornton Road) at Bob Arnold Road
- Blairs Bridge Road at Bob Arnold Boulevard
- SR 6/Thornton Road) at Blairs Bridge Road existing traffic signal
- Blairs Bridge Road/Monier Ave at Mt. Vernon Road existing traffic signal
- Lee Road at Monier Avenue

Direct site access includes the full-movement two-way-stop-controlled intersection of Bob Arnold Blvd at Trae Lane which serves as the site driveway for the purposes of this study. Four (4) internal site driveways on Trae Lane provide access to internal roadways which provide circulation throughout the site.

Capacity analyses were conducted for all six (6) study intersections identified above for the 2015 Existing conditions, projected 2017 No-Build conditions, and projected 2017 Build conditions. The intersection laneage (geometry) and traffic volumes for the site driveway and study intersections are shown in Figure 6, Figure 7, and Figure 8, respectively for each scenario. The levels-of-service determined using existing geometry for each of the intersections can be found in Table 7, Table 8, and Table 10 for the 2015 Existing conditions, projected 2017 No-Build conditions, and projected 2017 Build conditions, respectively.

Based on the 2015 Existing conditions, projected 2017 No-Build conditions, and projected 2017 Build conditions, the studied site driveway of Bob Arnold Blvd at Trae Lane is expected to operate at an acceptable level-of-service for all conditions.

9.0 Internal Circulation Analysis

Internal roadways throughout the site provide vehicular access to all warehousing buildings and parking on the site. A detailed copy of the proposed site plan with internal site driveway locations can be found in Appendix C and a full-sized site plan is attached to the report.

The Corporate Ridge Phase II development is not mixed-use in nature and will have no mixed-use reductions taken.

10.0 COMPLIANCE WITH COMPREHENSIVE PLAN ANALYSIS

The current Douglas County zoning is a combination of LI-C (Light Industrial Conditions) consistent with the proposed project and Residential-Agriculture (R-A) residential which must be re-zoned to LI-C. Two (2) parcels constitute the R-A residential portion of the proposed development site totaling approximately 43 acres, which are under review for re-zoning.

The Douglas County Future Land Use Map identifies the area as a Commerce Center, and the ARC Unified Growth Policy Map identifies the area as Developing Suburbs, with surrounding Industrial/Logistics Areas, which are consistent with the proposed land use intended with the Corporate Ridge Phase II development. The land use maps can be found in Appendix B.

Appendix A Site Photo Log



KHA Job No.: 019370002

Date: March 2015

Page: 1 of 5

Corporate Ridge Phase II DRI #2477

Photo No. 1



Comments: Monier Avenue westbound approach to Lee Road. Photo looking to the east. Photo documents recent construction and laneage reconfiguration at this intersection (westbound approach changed from a 2-lane approach to a 1-lane approach).

Photo No. 2



Comments: Eastbound approach to Mt. Vernon Road along Monier Avenue. Photo looking to the east depicting approach configuration.



KHA Job No.: 019370002
Date: March 2015

Page: 2 of 5

Corporate Ridge Phase II DRI #2477

Photo No. 3



Comments: Intersection of Monier Avenue / Blairs Ridge Road at Lee Road. Photo looking to the northeast. Photo documents recent signal modification (southbound left-turn phasing changed from permissive only to protected+permissive) and limitations to widening the southbound approach, if it were desired.

Photo No. 4



Comments: Mt. Vernon Road northbound approach to Monier Avenue/Blairs Ridge Road. Photo looking to the south. Photo documents recent signal modification (southbound left-turn phasing changed from permissive only to protected+permissive).



KHA Job No.: 019370002

Date: March 2015

Page: 3 of 5

Corporate Ridge Phase II DRI #2477

Photo No. 5



Comments: Westbound approach to Bob Arnold Boulevard along Blairs Ridge Road. Photo looking to the west.

Photo No. 6



Comments: Northbound approach to Blairs Ridge Road along Bob Arnold Boulevard. Photo looking to the north.

Photo documents intersection offset of the north and south legs.



KHA Job No.: 019370002

Date: March 2015

Page: 4 of 5

Corporate Ridge Phase II DRI #2477

Photo No. 7



Comments: Northbound approach to Bob Arnold Boulevard along Trae Lane (site driveway). Photo looking to the north.

Photo No. 8



Comments: Bob Arnold Boulevard westbound approach to Trae Lane (site driveway). Photo looking to the northeast from Trae Lane.



KHA Job No.: 019370002

Date: March 2015
Page: 5 of 5

Corporate Ridge Phase II DRI #2477

Photo No. 9



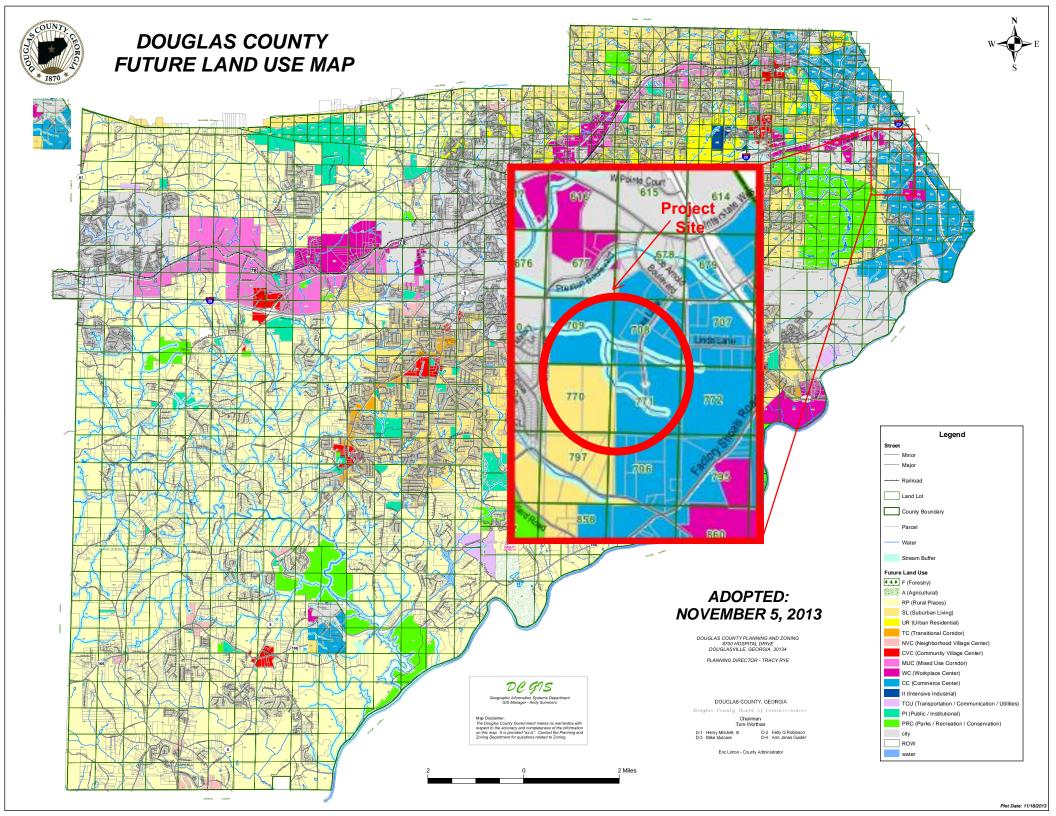
Comments: Eastbound approach to SR 6 along Bob Arnold Boulevard. Photo looking to the east.

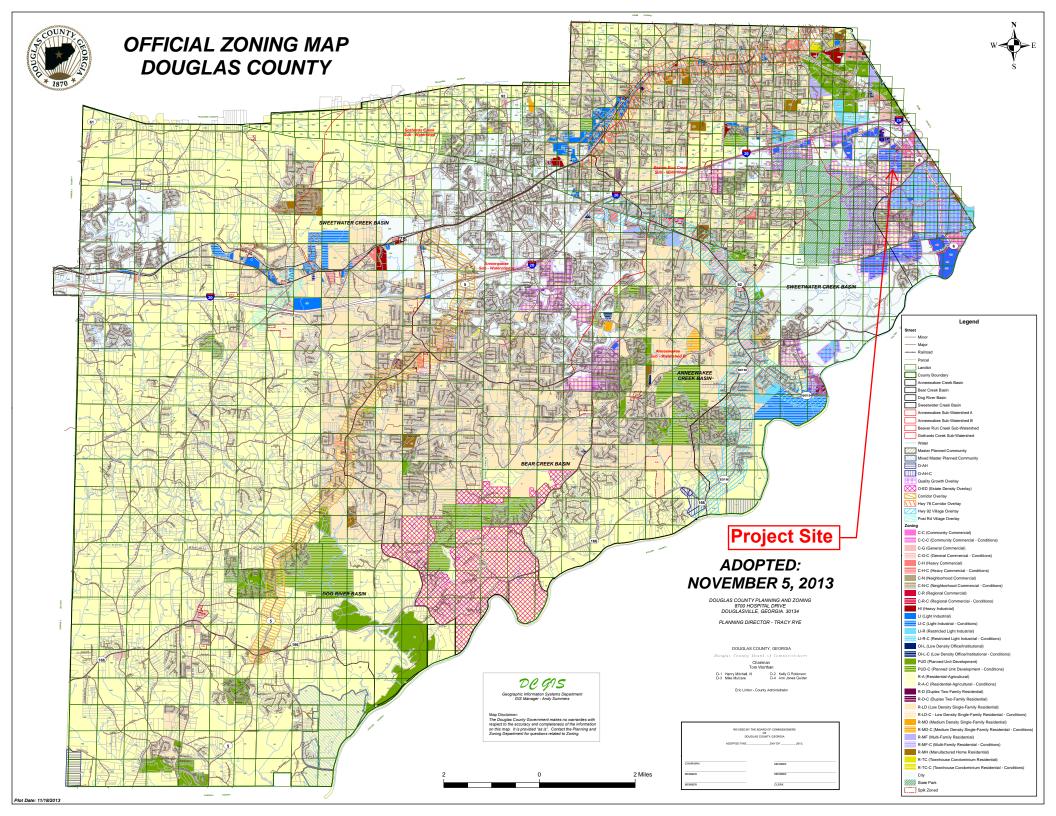
Photo No. 10



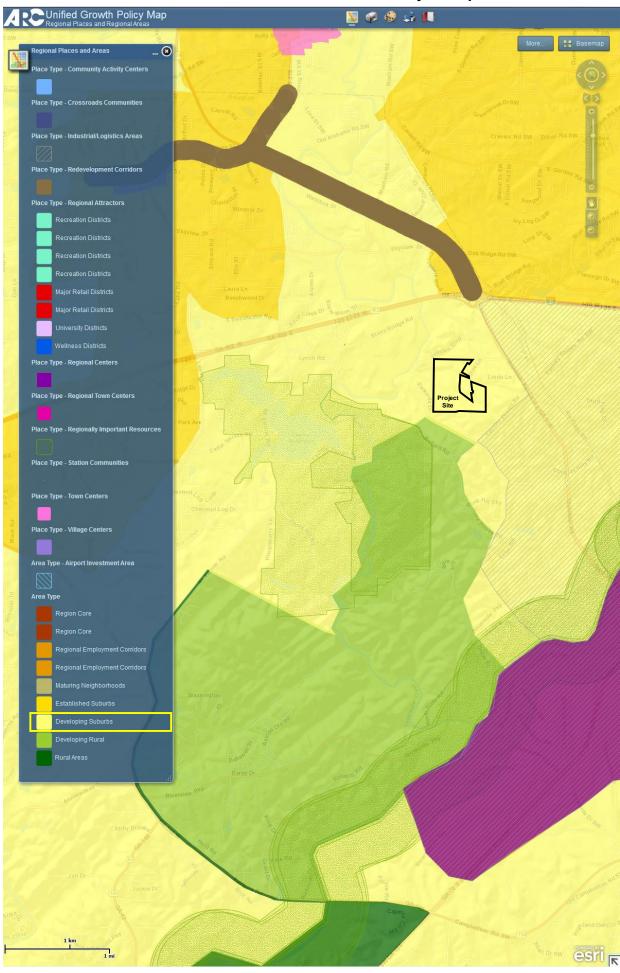
Comments: Eastbound approach to SR 6 along Bob Arnold Boulevard. Photo looking to the east. Photo documents poor sight distance across SR 6 to see the opposing side street approach.

Appendix B Land Use and Zoning Maps

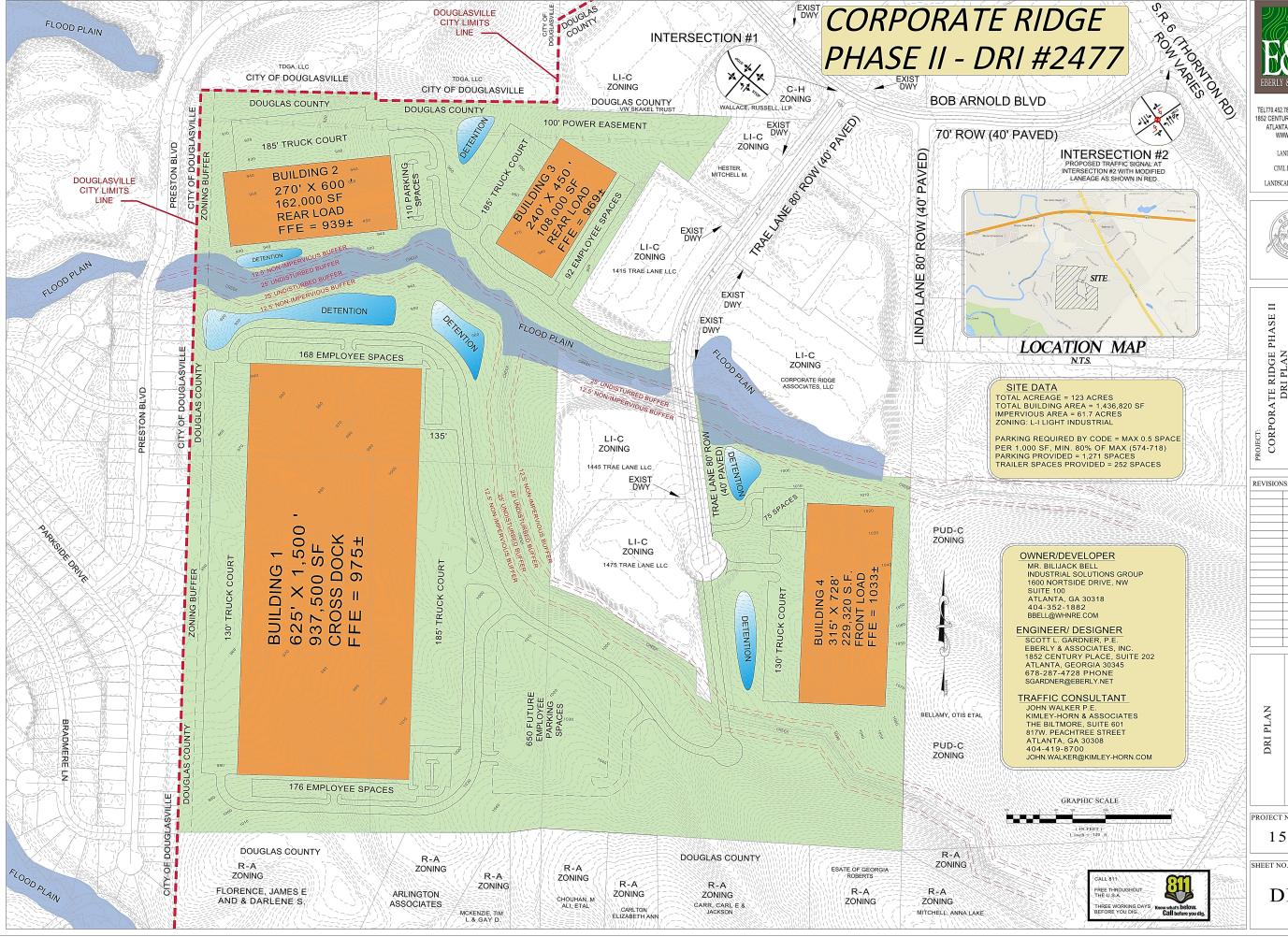




ARC Unified Growth Policy Map



Appendix C Proposed Site Plan





TEL770.452.7849 FAX770.452.0086 1852 CENTURY PLACE, SUITE 202 ATLANTA, GEORGIA 30345

LAND PLANNING ▼ CIVIL ENGINEERING

LANDSCAPE ARCHITECTURE



REV	ISION	S:			
		120'	/15	ER	ER

15-010

DRI 1

Appendix D Trip Generation Analysis

Trip Generation Analysis (9th Ed.) Corporate Ridge Phase II - DRI #2477 Douglas County, Georgia

Land Use	Intensity	Daily	AN	I Peak H	our	PM	Peak H	our
		Trips	Total	In	Out	Total	In	Out
Proposed Site Traffic								
152 High-Cube Warehouse/Distribution Center	1,436,820 gross s.f.	2,414	176	121	55	183	57	126
Gross Trips		2,414	176	121	55	183	57	126
Truck Volumes (25% of Warehousing Trips)		604	44	30	14	46	14	31
Car Volumes (75% of Warehousing Trips)		1,810	132	91	41	137	43	95
Mixed-Use Reductions		0	0	0	0	0	0	0
Alternative Mode Reductions		0	0	0	0	0	0	0
Pass-By Reductions		0	0	0	0	0	0	0
New Trips		2,414	176	121	55	183	57	126
Driveway Volumes		2,414	176	121	55	183	57	126

 $k: \exists t_tpto \ 019370002 \quad corporate \ ridge \ dri, \ douglas \ county, feb \ 2015 \ \exists trip \ generation$

Appendix E Intersection Volume Worksheets

Bob Arnold Blvd at Trae Lane

AM PEAK HOUR

		Trae Land orthbour	-	<u>Sc</u>	Motel 6 outhbour	<u>nd</u>		Arnold I astboun			Arnold E Vestboun	
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
			1		1							
Observed 2015 Traffic Volumes	10	0	9	1	0	3	0	129	24	36	93	1
Heavy Vehicles	2	0	2	0	0	0	0	0	0	1	0	0
Heavy Vehicle %	20%	2%	22%	2%	2%	2%	2%	2%	2%	3%	2%	2%
Peak Hour Factor		0.59			0.50			0.81			0.81	
Adjustment	1	0	0	0	0	0	0	6	1	2	5	0
Adjusted 2015 Volumes	11	0	9	1	0	3	0	135	25	38	98	1
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040
Other Proposed Developments												
2017 Background Traffic	11	0	9	1	0	3	0	140	26	40	102	1
Desired Takes												
Project Trips			1		1				000/	000/	1 1	
Trip Distribution IN	0.007		0.00/						20%	80%		
Trip Distribution OUT	20%		80%									_
Industrial/Warhousing Trips (Truck)	3	0	11	0	0	0	0	0	6	24	0	0
Trip Distribution IN									15%	85%		
Trip Distribution OUT	15%		85%									
Industrial/Warehousing Trips (Car)	6	0	35	0	0	0	0	0	14	77	0	0
Pass-By Trips	0	0	0	0	0	0	0	0	0	0	0	0
				_			_	_	_			_
Total Project Trips	9	0	46	0	0	0	0	0	20	101	0	0
					· -							
2017 Buildout Total	20	0	55	1	0	3	0	140	46	141	102	1
2017 Heavy Vehicle %	26%	0%	24%	2%	0%	2%	0%	2%	14%	18%	2%	2%

D	Trae Lane <u>Northbound</u> Left Through Right				Motel 6		<u>E</u>	Arnold l	<u>d</u>	<u>V</u>	Arnold I	<u>nd</u>
Description	Lett	Inrougn	Right	Left	Through	Right	Left	Through	Right	Left	Through	Rignt
Observed 2015 Traffic Volumes	51	0	17	2	0	4	3	82	7	23	241	8
Heavy Vehicles	1	0	1	0	0	0	0	0	0	2	3	0
Heavy Vehicle %	2%	2%	6%	2%	2%	2%	2%	2%	2%	9%	2%	2%
Peak Hour Factor	2.70	0.49	070	270	0.50	2.70	2,70	0.74	2.70	770	0.90	270
Adjustment												
Adjusted 2015 Volumes	51	0	17	2	0	4	3	82	7	23	241	8
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040
Other Proposed Developments												
2017 Background Traffic	53	0	18	2	0	4	3	85	7	24	251	8
Project Trips												
Trip Distribution IN									20%	80%		
Trip Distribution OUT	20%		80%									
Industrial/Warhousing Trips (Truck)	6	0	25	0	0	0	0	0	3	11	0	0
Trip Distribution IN									15%	85%		
Trip Distribution OUT	15%		85%									
Industrial/Warehousing Trips (Car)	14	0	80	0	0	0	0	0	6	37	0	0
Pass-By Trips	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Trips	20	0	105	0	0	0	0	0	9	48	0	0
2017 Buildout Total	73	0	123	2	0	4	3	85	16	72	251	8
2017 Heavy Vehicle %	10%	0%	21%	2%	0%	2%	2%	2%	20%	18%	2%	2%

SR 6/Thornton Rd at Bob Arnold Blvd

AM PEAK HOUR

		/Thornto			/Thornto			Arnold I astboun			tate Wes Vestboun	,
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed 2015 Traffic Volumes	79	630	6	376	1,445	62	19	15	115	3	5	79
Heavy Vehicles	1	69	0	3	74	0	1	0	1	0	0	4
Heavy Vehicle %	2%	11%	2%	2%	5%	2%	5%	2%	2%	2%	2%	5%
Peak Hour Factor		0.86			0.88			0.91			0.78	
Adjustment	4	32	0	19	72	3	1	1	6	0	0	4
Adjusted 2015 Volumes	83	662	6	395	1517	65	20	16	121	3	5	83
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040
Other Proposed Developments												
2017 Background Traffic	86	689	6	411	1,578	68	21	17	126	3	5	86
Project Trips												
Trip Distribution IN	35%					45%						
Trip Distribution OUT							45%		35%			
Industrial/Warhousing Trips (Truck)	11	0	0	0	0	14	6	0	5	0	0	0
Trip Distribution IN	35%				1	50%						
Trip Distribution IN	3370					3076	50%		35%			
Industrial/Warehousing Trips (Car)	32	0	0	0	0	46	21	0	14	0	0	0
industrial/ wai endusing mps (car)	32	U	U	U	U	40	21	U	14	U	U	U
Pass-By Trips	0	0	0	0	0	0	0	0	0	0	0	0
		1									ı	
Total Project Trips	43	0	0	0	0	60	27	0	19	0	0	0
2017 Buildout Total	129	689	6	411	1,578	128	48	17	145	3	5	86
2017 Buildout Total 2017 Heavy Vehicle %	10%	11%	2%	2%	5%	128	15%	2%	5%	2%	2%	5%
2017 Heavy Verlicie %	10%	1 1 70	2 70	2 70	570	1270	1370	Z 70	570	2 70	2 70	J 70

		/Thornto			/Thornto			Arnold I			ate Wes /estbour	
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed 2015 Traffic Volumes	203	1,433	6	105	804	45	26	10	57	4	8	239
Heavy Vehicles	2	76	0	3	89	1	0	0	1	0	0	4
Heavy Vehicle %	2%	5%	2%	3%	11%	2%	2%	2%	2%	2%	2%	2%
Peak Hour Factor		0.95			0.94			0.63			0.75	
Adjustment												
Adjusted 2015 Volumes	203	1433	6	105	804	45	26	10	57	4	8	239
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040
Other Proposed Developments												
2017 Background Traffic	211	1,491	6	109	836	47	27	10	59	4	8	249
Project Trips												
Trip Distribution IN	35%					45%						
Trip Distribution OUT							45%		35%			
Industrial/Warhousing Trips (Truck)	5	0	0	0	0	6	14	0	11	0	0	0
Trip Distribution IN	35%					50%						
Trip Distribution OUT							50%		35%			
Industrial/Warehousing Trips (Car)	15	0	0	0	0	22	47	0	33	0	0	0
Pass-By Trips	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Trips	20	0	0	0	0	28	61	0	44	0	0	0
2017 Buildout Total	231	1,491	6	109	836	75	88	10	103	4	8	249
2017 Heavy Vehicle %	4%	5%	2%	3%	11%	9%	17%	2%	12%	2%	2%	2%

Blairs Bridge Rd at Bob Arnold Blvd

AM PEAK HOUR

Description	Bob Arnold Blvd <u>Northbound</u> Left Through Right			<u>Sc</u>	ota Drive outhbour Through	<u>nd</u>	Blairs Bridge Rd <u>Eastbound</u> Left Through Right				irs Bridge Vestbour Through	<u>nd</u>
Observed 2015 Traffic Volumes	76	1	134	20	0	2	12	369	96	48	181	26
Heavy Vehicles	0	0	2	2	0	0	0	13	0	1	22	0
Heavy Vehicle %	2%	2%	2%	10%	2%	2%	2%	4%	2%	2%	12%	2%
Peak Hour Factor		0.91			0.92			0.90			0.78	
Adjustment	4	0	7	1	0	0	1	18	5	2	9	1
Adjusted 2015 Volumes	80	1	141	21	0	2	13	387	101	50	190	27
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040
Other Proposed Developments												
2017 Background Traffic	83	1	147	22	0	2	14	403	105	52	198	28
Project Trips			П		T			П	450/	F0/	T	
Trip Distribution IN	450/		E0/						15%	5%		
Trip Distribution OUT	15%		5%		_	_						
Industrial/Warhousing Trips (Truck)	2	0	1	0	0	0	0	0	5	2	0	0
Trip Distribution IN									10%	5%		
Trip Distribution OUT	10%		5%									
Industrial/Warehousing Trips (Car)	4	0	2	0	0	0	0	0	9	5	0	0
Pass-By Trips	0	0	0	0	0	0	0	0	0	0	0	0
T	,		I 0						- 44			
Total Project Trips	6	0	3	0	0	0	0	0	14	7	0	0
2017 Buildout Total	89	1	150	22	0	2	14	403	119	59	198	28
2017 Balladat Total 2017 Heavy Vehicle %	4%	2%	3%	10%	0%	2%	2%	4%	6%	5%	12%	2%

		Arnold I orthbour		-	ota Drive outhbour	-		rs Bridge astboun			irs Bridge Vestbour	
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed 2015 Traffic Volumes	222	3	112	43	1	20	5	286	70	126	446	29
Heavy Vehicles	2	0	3	0	0	0	0	31	0	0	17	1
Heavy Vehicle %	2%	2%	3%	2%	2%	2%	2%	11%	2%	2%	4%	3%
Peak Hour Factor		0.90			0.70			0.66			0.91	
Adjustment												
Adjusted 2015 Volumes	222	3	112	43	1	20	5	286	70	126	446	29
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040
Other Proposed Developments												
2017 Background Traffic	231	3	117	45	1	21	5	298	73	131	464	30
Project Trips												
Trip Distribution IN									15%	5%		
Trip Distribution OUT	15%		5%									
Industrial/Warhousing Trips (Truck)	5	0	2	0	0	0	0	0	2	1	0	0
Trip Distribution IN									10%	5%		
Trip Distribution OUT	10%		5%									
Industrial/Warehousing Trips (Car)	9	0	5	0	0	0	0	0	4	2	0	0
Pass-By Trips	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Trips	14	0	7	0	0	0	0	0	6	3	0	0
2017 Buildout Total	245	3	124	45	1	21	5	298	79	134	464	30
2017 Heavy Vehicle %	4%	2%	4%	2%	2%	2%	2%	11%	4%	3%	4%	3%

SR 6/Thornton Rd at Blairs Bridge Rd

AM PEAK HOUR

	No	/Thornto	<u>nd</u>	<u>Sc</u>	/Thornto	<u>nd</u>	<u>E</u>	rs Bridge astboun	<u>d</u>	<u>V</u>	tate Wes Vestboun	<u>ıd</u>
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed 2015 Traffic Volumes	/ /	/ 21	47	114	1 / 10	1/5	250	40	220	21	22	22
	64 13	631 55	47 3	2	1,618 68	165 11	250 9	42 3	228 5	31	32 0	33
Heavy Vehicles Heavy Vehicle %	20%	9%	6%	2%	4%	7%	4%	7%	2%	2%	2%	3%
Peak Hour Factor	20%	0.93	070	270	0.86	1 70	4 70	0.90	Z 70	270	0.77	3%
Adjustment	3	32	2	6	81	8	13	2	11	2	2	2
	67	663	49	120	1699	173	263	44	239	33	34	35
Adjusted 2015 Volumes Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040
Other Proposed Developments	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040
2017 Background Traffic	70	690	51	125	1.768	180	274	46	249	34	35	36
2017 Backyround Hamic	70	090	31	123	1,700	160	2/4	40	249	- 34	33	30
Project Trips												
Trip Distribution IN					45%	5%						
Trip Distribution OUT		45%					5%					
Industrial/Warhousing Trips (Truck)	0	6	0	0	14	2	1	0	0	0	0	0
Trip Distribution IN					50%	5%						
Trip Distribution OUT		50%					5%					
Industrial/Warehousing Trips (Car)	0	21	0	0	46	5	2	0	0	0	0	0
Pass-By Trips	0	0	0	0	0	0	0	0	0	0	0	0
					,						, ,	
Total Project Trips	0	27	0	0	60	7	3	0	0	0	0	0
2017 Buildout Total	70	717	51	125	1,828	187	277	46	249	34	35	36
2017 Heavy Vehicle %	20%	9%	6%	2%	5%	7%	4%	7%	2%	2%	2%	3%

		/Thornto			/Thornto			irs Bridge astboun			tate Wes Vestbour	-
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed 2015 Traffic Volumes	187	1,379	142	245	769	335	286	83	77	97	108	142
Heavy Vehicles	7	71	2	5	81	10	18	4	11	1	0	0
Heavy Vehicle %	4%	5%	2%	2%	11%	3%	6%	5%	14%	2%	2%	2%
Peak Hour Factor		0.94			0.95			0.79			0.84	
Adjustment												
Adjusted 2015 Volumes	187	1379	142	245	769	335	286	83	77	97	108	142
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040
Other Proposed Developments												
2017 Background Traffic	195	1,435	148	255	800	349	298	86	80	101	112	148
Project Trips												
Trip Distribution IN					45%	5%						
Trip Distribution OUT		45%					5%					
Industrial/Warhousing Trips (Truck)	0	14	0	0	6	1	2	0	0	0	0	0
Trip Distribution IN					50%	5%						
Trip Distribution OUT		50%					5%					
Industrial/Warehousing Trips (Car)	0	47	0	0	22	2	5	0	0	0	0	0
Pass-By Trips	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Trips	0	61	0	0	28	3	7	0	0	0	0	0
2017 Buildout Total	195	1,496	148	255	828	352	305	86	80	101	112	148
2017 Heavy Vehicle %	4%	6%	2%	2%	11%	3%	7%	5%	14%	2%	2%	2%

Monier Rd/Blairs Bridge Rd at Mt. Vernon Rd

AM PEAK HOUR

		. Vernon orthbou			t. Vernon outhbou			/lonier R astboun			irs Bridge Vestboun	
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
						1					1	
Observed 2015 Traffic Volumes	13	301	36	202	141	42	189	110	14	9	36	85
Heavy Vehicles	0	0	3	1	1	0	0	5	1	0	2	5
Heavy Vehicle %	2%	2%	8%	2%	2%	2%	2%	5%	7%	2%	6%	6%
Peak Hour Factor		0.83			0.94			0.99			0.76	
Adjustment	0	0	0	0	0	0	0	0	0	0	0	0
Adjusted 2015 Volumes	13	301	36	202	141	42	189	110	14	9	36	85
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040
New Road Adjustment					15	-15				29	-29	
2017 Background Traffic	14	313	37	210	162	28	197	114	15	40	7	88
Project Trips					1							
Trip Distribution IN								15%				
Trip Distribution OUT											15%	
Industrial/Warhousing Trips (Truck)	0	0	0	0	0	0	0	5	0	0	2	0
Trip Distribution IN				3%				7%				
Trip Distribution OUT											7%	3%
Industrial/Warehousing Trips (Car)	0	0	0	3	0	0	0	6	0	0	3	1
Pass-By Trips	0	0	0	0	0	0	0	0	0	0	0	0
						ı _						
Total Project Trips	0	0	0	3	0	0	0	11	0	0	5	1
2017 Buildout Total	14	313	37	213	162	28	197	125	15	40	12	89
2017 Buildout Total 2017 Heavy Vehicle %	2%	2%	8%	2%	2%	2%	2%	8%	7%	2%	20%	6%
ZUTT Fleavy Vehicle %	Z70	Z 70	070	Z70	Z 70	2 70	Z 70	070	1 70	2 70	ZU70	070

		. Vernon orthbour			. Vernon outhbou			∕lonier R astboun			irs Bridge Jestbour	
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed 2015 Traffic Volumes	9	158	16	68	234	78	101	65	13	26	174	323
Heavy Vehicles	0	2	0	3	3	0	0	3	1	0	3	2
Heavy Vehicle %	2%	2%	2%	4%	2%	2%	2%	5%	8%	2%	2%	2%
Peak Hour Factor		0.95			0.89			0.97			0.89	
Adjustment												
Adjusted 2015 Volumes	9	158	16	68	234	78	101	65	13	26	174	323
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040
New Road Adjustment					39	-39				77	-77	
2017 Background Traffic	9	164	17	71	284	41	105	68	14	107	101	336
Project Trips												
Trip Distribution IN								15%				
Trip Distribution OUT											15%	
Industrial/Warhousing Trips (Truck)	0	0	0	0	0	0	0	2	0	0	5	0
Tria Dialeffer Para IN		I		20/	I			70/			I	
Trip Distribution IN	1			3%				7%			7%	20/
Trip Distribution OUT	0	0	0	1	0	0	0	2	0	_	7%	3%
Industrial/Warehousing Trips (Car)	0	0	0	ı	0	0	0	3	0	0	1	3
Pass-By Trips	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Trips	0	0	0	1	0	0	0	5	0	0	12	3
Total Froject Hips	Ů		<u> </u>			<u> </u>					12	
2017 Buildout Total	9	164	17	72	284	41	105	73	14	107	113	339
2017 Heavy Vehicle %	2%	2%	2%	4%	2%	2%	2%	7%	8%	2%	6%	2%

Lee Rd at Monier Rd

AM PEAK HOUR

	N	Lee Rd orthbour	nd	Sc	Lee Rd	nd	F	astboun	d	Monier Rd Westbound		
Description		Through			Through	_		Through	_	_	Right	
						• •			• •			
Observed 2015 Traffic Volumes	0	408	130	210	310	0	0	0	0	44	0	47
Heavy Vehicles	0	3	0	5	4	0	0	0	0	0	0	2
Heavy Vehicle %	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	4%
Peak Hour Factor		0.95			0.94						0.71	
Adjustment	0	0	0	0	0	0	0	0	0	0	0	0
Adjusted 2015 Volumes	0	408	130	210	310	0	0	0	0	44	0	47
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040
New Road Adjustment										-44		
2017 Background Traffic	0	424	135	218	323	0	0	0	0	0	0	49
Draiget Trips												
Project Trips Trip Distribution IN				15%	1						1 1	
Trip Distribution OUT				13%								15%
Industrial/Warhousing Trips (Truck)	0	0	0	5	0	0	0	0	0	0	0	2
industrial/ warnousing mps (muck)	U	U	U	5	U	U	U	U	U	U	U	
Trip Distribution IN				7%								
Trip Distribution OUT												7%
Industrial/Warehousing Trips (Car)	0	0	0	6	0	0	0	0	0	0	0	3
Pass-By Trips	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Trips	0	0	0	11	0	0	0	0	0	0	0	5
2017 Buildout Total	0	424	135	229	323	0	0	0	0	0	0	54
2017 Heavy Vehicle %	0%	2%	2%	4%	2%	0%	0%	0%	0%	0%	0%	8%

	<u>N</u>	Lee RdLee RdNorthboundSouthboundEastbound						Monier Rd <u>Westbound</u>				
Description	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left Through Right		
						_						
Observed 2015 Traffic Volumes	0	271	76	83	502	0	0	0	0	116	0	152
Heavy Vehicles	0	2	1	3	2	0	0	0	0	0	0	1
Heavy Vehicle %	2%	2%	2%	4%	2%	2%	2%	2%	2%	2%	2%	2%
Peak Hour Factor		0.88	•		0.90			•			0.87	
Adjustment												
Adjusted 2015 Volumes	0	271	76	83	502	0	0	0	0	116	0	152
Annual Growth Rate	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Growth Factor	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040	1.040
New Road Adjustment										-116		
2017 Background Traffic	0	282	79	86	522	0	0	0	0	0	0	158
Project Trips												
Trip Distribution IN				15%								
Trip Distribution OUT												15%
Industrial/Warhousing Trips (Truck)	0	0	0	2	0	0	0	0	0	0	0	5
Trip Distribution IN				7%								
Trip Distribution OUT				770								7%
Industrial/Warehousing Trips (Car)	0	0	0	3	0	0	0	0	0	0	0	7
madethan vvarenedesing mps (ear)		Ü	Ü		Ü		- ŭ	Ü	Ü			,
Pass-By Trips	0	0	0	0	0	0	0	0	0	0	0	0
Total Project Trips	0	0	0	5	0	0	0	0	0	0	0	12
2017 Buildout Total	0	282	79	91	522	0	0	0	0	0	0	170
2017 Heavy Vehicle %	0%	2%	2%	6%	2%	0%	0%	0%	0%	0%	0%	5%

Appendix F Signal Warrant Analyses (Peak Hours Only)

DCT Corporate Ridge Phase II - DRI #2477

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

Based on 2009 MUTCD

INTERSECTION NAME:	#2 - SR 6/Thornton Rd at Bob Arnold Blvd]	E: 03/0	04/15	
INTERSECTION CONDITION:	TWSC Intersection]			
MAJOR STREET: MINOR STREET:				# OF APPROACH LAN # OF APPROACH LAN		2
	ISOLATED COMMUNITY WITH POPULATION LE	,		USE 56% REDUCTION (Y OR	N):	N

					WAR	RANT 1, Cond	dition A	WAR	RANT 1, Cond	dition B	WARRANT 1, Combination Warrant						1	
			MAJOR ST	MINOR ST								CONDITION	A		CONDITION	В	WARRANT 2	WARRANT 3
			BOTH APPROACHES	HIGHEST APPROACH	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	WARNANI Z	Wildian
THRESHOLI	D VALUE	s —		→	420	140		630	70		480	160		720	80			
12:00 AM	то	01:00 AM																
01:00 AM	то	02:00 AM																
02:00 AM	то	03:00 AM																
03:00 AM	то	04:00 AM																
04:00 AM	то	05:00 AM																
05:00 AM	то	06:00 AM																
06:00 AM	то	07:00 AM																
07:00 AM	то	08:00 AM	2,267	58	Υ			Υ			Υ			Υ				
08:00 AM	то	09:00 AM																
09:00 AM	TO	10:00 AM																
10:00 AM	TO	11:00 AM																
11:00 AM	TO	12:00 PM																
12:00 PM	TO	01:00 PM																
01:00 PM	TO	02:00 PM																
02:00 PM	TO	03:00 PM																
03:00 PM	TO	04:00 PM																
04:00 PM	TO	05:00 PM																
05:00 PM	TO	06:00 PM	2,327	110	Υ			Υ	Υ	Υ	Υ			Υ	Υ	Υ	Y	Υ
06:00 PM	TO	07:00 PM																
07:00 PM	TO	08:00 PM																
08:00 PM	TO	09:00 PM																
09:00 PM	TO	10:00 PM																
10:00 PM	TO	11:00 PM																
11:00 PM	TO	12:00 AM																
			4,594	168			0	1				0 1				1	1	1
					8 H	HOURS NEED	DED	81	HOURS NEED	ED		8 HOURS OF	BOTH COND	. A AND CON	ID. B NEEDE)	4 HRS NEEDED	1 HRS NEEDED
					N	OT SATISFII	ED	N	OT SATISFI	ED			NOT SA	TISFIED			NOT SATISFIED	SATISFIED

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant

Condition A: Minimum Vehicular Volume Condition B: Interruption of Continuous Traffic

Combination: Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant (70% Factor)

WARRANT 3 -- Peak Hour Warrant (70% Factor)

DCT Corporate Ridge Phase II - DRI #2477

TRAFFIC SIGNAL VOLUME WARRANT ANALYSIS

Based on 2009 MUTCD

INTERSECTION NAME:	#3 - Blairs Bridge Rd at Bob Arnold Blvd]	DATE:						
INTERSECTION CONDITION:	TWSC Intersection]							
MAJOR STREET: MINOR STREET:			# OF APPROACH LANES: # OF APPROACH LANES:	1					
	ISOLATED COMMUNITY WITH POPULATION LE		USE 56% REDUCTION (Y OR N):	N					

					WARF	RANT 1, Cond	lition A	WAR	RANT 1, Cond	dition B	WARRANT 1, Combination Warrant							
			MAJOR ST	MINOR ST								CONDITION .	A		CONDITION	В	WARRANT 2	WARRANT 3
			BOTH APPROACHES	HIGHEST APPROACH	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		***************************************
THRESHOLI	D VALUE	s —			420	105		630	53		480	120		720	60			
12:00 AM	TO	01:00 AM																
01:00 AM	TO	02:00 AM																
02:00 AM	TO	03:00 AM																
03:00 AM	TO	04:00 AM																
04:00 AM	TO	05:00 AM																
05:00 AM	TO	06:00 AM																
06:00 AM	TO	07:00 AM																
07:00 AM	то	08:00 AM	800	84	Y			Υ	Υ	Υ	Υ			Υ	Y	Υ	Υ	
08:00 AM	TO	09:00 AM																
09:00 AM	TO	10:00 AM																
10:00 AM	TO	11:00 AM																
11:00 AM	TO	12:00 PM																
12:00 PM	TO	01:00 PM																
01:00 PM	TO	02:00 PM																
02:00 PM	TO	03:00 PM																
03:00 PM	TO	04:00 PM																
04:00 PM	TO	05:00 PM																
05:00 PM	TO	06:00 PM	1,001	234	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Υ	Y	Υ
06:00 PM	TO	07:00 PM																
07:00 PM	TO	08:00 PM																
08:00 PM	TO	09:00 PM																
09:00 PM	TO	10:00 PM																
10:00 PM	TO	11:00 PM																
11:00 PM	TO	12:00 AM																
			1,801	318			1			2			1			2	2	1
					8 H	OURS NEED	ED	81	HOURS NEED	DED		8 HOURS OF	BOTH COND	. A AND CON	ID. B NEEDEI)	4 HRS NEEDED	1 HRS NEEDED
						OT SATISFII			OT SATISFI				NOT SA				NOT SATISFIED	SATISFIED

WARRANT 1 -- Eight-Hour Vehicular Volume Warrant

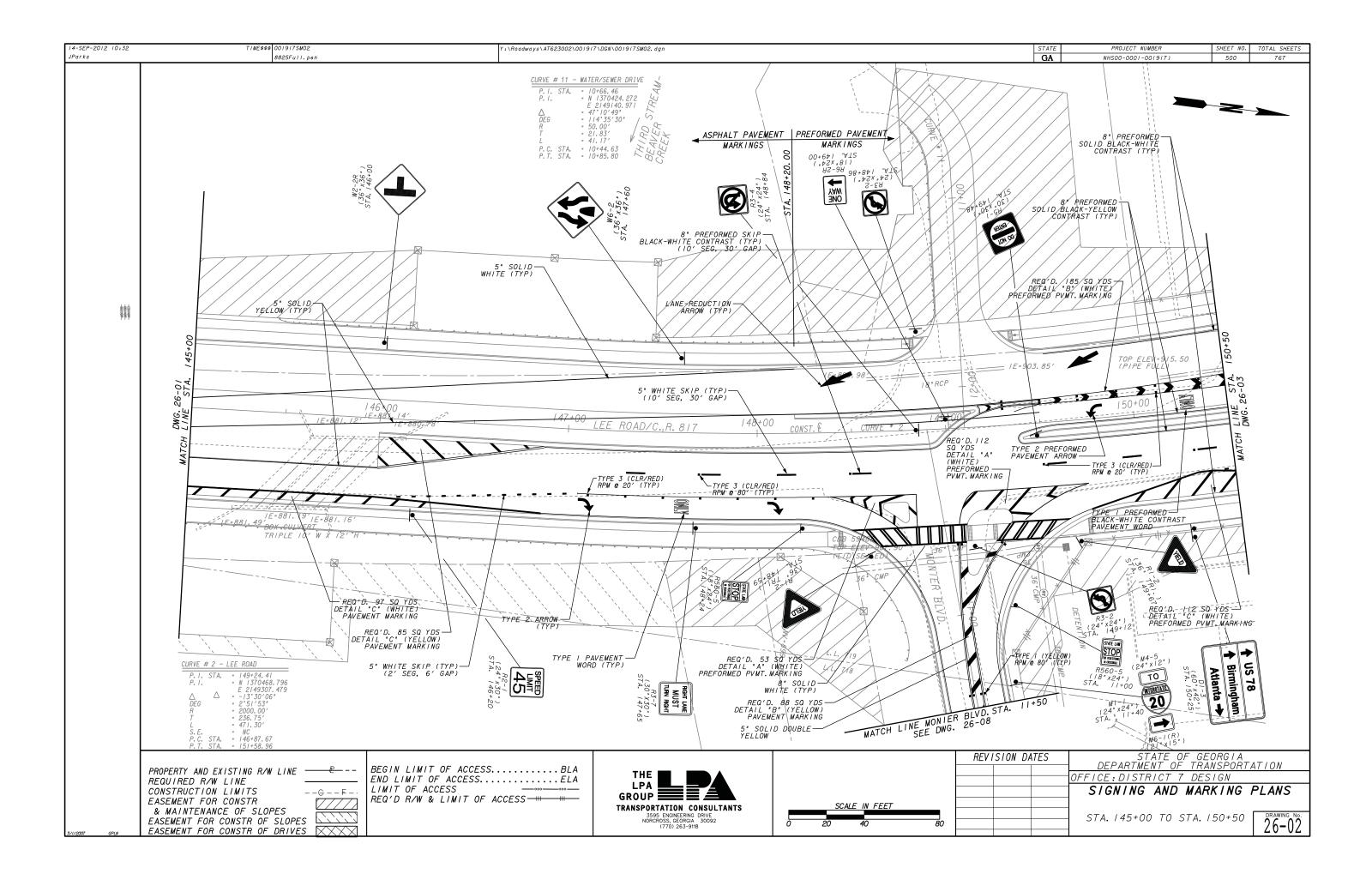
Condition A: Minimum Vehicular Volume Condition B: Interruption of Continuous Traffic

Combination: Combination of Condition A and Condition B

WARRANT 2 -- Four-Hour Vehicular Volume Warrant (70% Factor)

WARRANT 3 -- Peak Hour Warrant (70% Factor)

Appendix G Lee Road Bridge Construction Project Document



Available Upon Request

Raw Traffic Counts (Peak Hour Turning Movements)

Synchro Capacity Analyses