Transportation Analysis

Horizon Pointe
DRI #2688

Gwinnett County, Georgia

Report Prepared:

June 2017

Prepared for:

Taylor & Mathis

T&M Properties V, LLC

Prepared by:

Kimley-Horn and Associates, Inc.
2 Sun Court, Suite 450
Peachtree Corners, Georgia 30092
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EXECUTIVE SUMMARY

This report presents the analysis of the anticipated traffic impacts of the *Horizon Pointe 400* development located in the Gwinnett County, Georgia. The approximately 51.0-acre site is located at the north terminus of Horizon Drive, a local road approximately 1/2-mile north of Old Peachtree Road and east of I-85. Horizon Drive, a dead-end roadway that connects to Old Peachtree Road, will provide access to the proposed development. The proposed development will be a single industrial warehouse facility with approximately 687,500 SF of warehousing space.

It should be noted that the proposed Rock Springs Park development just south of the proposed site is currently under construction to develop a 50-acre park and three soccer fields. This construction is scheduled to be completed in November 2017. Additionally, two industrial warehouse facilities with 264,550 SF each of warehousing space (Horizon Pointe DRI #2563) are also currently under construction adjacent to the proposed site. The project trips generated by the proposed Rock Springs Park will be included in the Existing 2017 conditions analysis. The project trips generated by the Horizon Pointe DRI #2563 will be included in the Projected 2019 No-Build conditions analysis.

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 a rezoning. The DRI for this development was triggered by the filing of the rezoning application on May 4, 2017. DRI Form 1 was filed on May 15, 2017.

According to GRTA's Procedures and Principles for GRTA Development of Regional Impact Review, 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 number 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 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 1,156 gross daily trips based on 687,500 SF of warehousing space. Since this DRI development is expected to generate more than one thousand (1,000) but no more than three thousand (3,000) gross daily trips, it is being submitted for approval under GRTA's Expedited Review process.

The proposed development is expected to be completed by 2019 (approximately 2 years), and this analysis will consider the full build-out of the proposed site in 2019. The proposed site consists of the following land use and density:

- Warehouse Square Footage: 687,500 SF

Capacity analyses were performed throughout the study network for the Existing 2017 conditions, the Projected 2019 No-Build conditions, Projected 2019 Build conditions, and the Projected 2019 Build Alternative conditions:

- Existing 2017 conditions represent existing traffic volumes at three (3) intersections during the AM and PM peak with the addition of the estimated project trips generated by the proposed Rock Springs Park development (currently under construction, to be completed November 2017).

- Projected 2019 No-Build conditions represent the 2017 traffic volumes grown for two (2) years at 0.5 percent per year throughout the study network and the addition of the estimated project trips generated by the Horizon Pointe DRI #2563 (currently under construction).

- Projected 2019 Build conditions represent the Projected 2019 No-Build conditions plus the addition of the project trips that are anticipated to be generated by the *Horizon Pointe 400* development (DRI #2688).

- Projected 2019 Build Alternative conditions represent the Projected 2019 Build conditions with the proposed intersection restriping plan at the intersection of Old Peachtree Road at Horizon Drive, as requested by Gwinnett County.

Based on the **Existing 2017** conditions (*present conditions plus the proposed Rock Springs Park development; i.e. includes estimated project trips from the proposed Rock Springs Park development, but excludes background traffic growth, estimated project trips from Horizon Pointe DRI #2563, and the estimated project trips from the Horizon Pointe 400 DRI*), all but one of the three (3) study intersections operate within the acceptable level-of-service (LOS) standard D during the AM and PM peak hours. One (1) study intersection (Intersection #3: Old Peachtree Road at Collins Hill Road / Proposed Rock Springs Park Driveway) operates at LOS E during the PM peak hour, thus the LOS standard for that peak period is LOS E.

Based on the **Projected 2019 No-Build** conditions (*includes background traffic growth, the estimated project trips from the proposed Rock Springs Park development and Horizon Pointe DRI #2563, but excludes the estimated project trips from the Horizon Pointe 400 DRI*), all three (3) study intersections are projected to operate within the acceptable LOS standard during the AM and PM peak hours.

Based on the **Projected 2019 Build** conditions (*includes background traffic growth, the estimated project trips from DRI #2563 and the proposed Rock Springs Park development, and the estimated project trips from the Horizon Pointe 400 DRI*) all three (3) study intersections are projected to operate at or above their acceptable level-of-service standard during the AM and PM peak hours.

Based on the **Projected 2019 Build Alternative** conditions (*includes background traffic growth, the estimated project trips from the proposed Rock Springs Park development, Horizon Pointe DRI #2563, and Horizon Pointe 400 DRI, plus the proposed Gwinnett County intersection restriping plan at the intersection of Old Peachtree Road at Horizon Drive)* all study intersections are projected to operate at or above their acceptable level-of-service standard during the AM and PM peak hours.

It should be noted that the intersection is projected to operate at a better LOS during the AM peak with less delay with the proposed intersection restriping plan compared to the Projected 2019 Build conditions with the existing laneage. The intersection is projected to operate at similar LOS during the PM peak.

Additionally, the westbound left queue lengths improve with the proposed intersection restriping plan from approximately 1,150 feet of queue with existing laneage under the Projected 2019 Build conditions to approximately 400 feet of queue with the proposed intersection restriping laneage under the Projected 2019 Build Alternative conditions during the AM peak. The westbound left queue lengths improve from approximately 330 feet of queue under the Projected 2019 Build conditions to approximately 225 feet of queue under the Projected 2019 Build Alternative conditions during the PM peak.

The proposed intersection restriping plan consists of the following:

- Intersection #1: Old Peachtree Road at Horizon Drive
    - Restripe the eastbound approach to consist of two (2) left-turn lanes and one (1) shared through/right-turn lane.
    - Restripe the northbound approach to consist of one (1) shared through/left-turn lane and two (2) right-turn lanes.

1.0 PROJECT DESCRIPTION

1.1 Introduction

This report presents the analysis of the anticipated traffic impacts of the *Horizon Pointe 400* development located in the Gwinnett County, Georgia. The approximately 51.0-acre site is located at the north terminus of Horizon Drive, a local road approximately 1/2-mile north of Old Peachtree Road and east of I-85. Horizon Drive, a dead-end roadway that connects to Old Peachtree Road, will provide access to the proposed development. The proposed development will be a single industrial warehouse facility with approximately 687,500 SF of warehousing space.

It should be noted that the proposed Rock Springs Park development just south of the proposed site is currently under construction to develop a 50-acre park and three soccer fields. This construction is scheduled to be completed in November 2017. Additionally, two industrial warehouse facilities with 264,550 SF each of warehousing space (Horizon Pointe DRI #2563) are also currently under construction adjacent to the proposed site. The project trips generated by the proposed Rock Springs Park will be included in the Existing 2017 conditions analysis. The project trips generated by the Horizon Pointe DRI #2563 will be included in the Projected 2019 No-Build conditions analysis.

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 a rezoning.

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

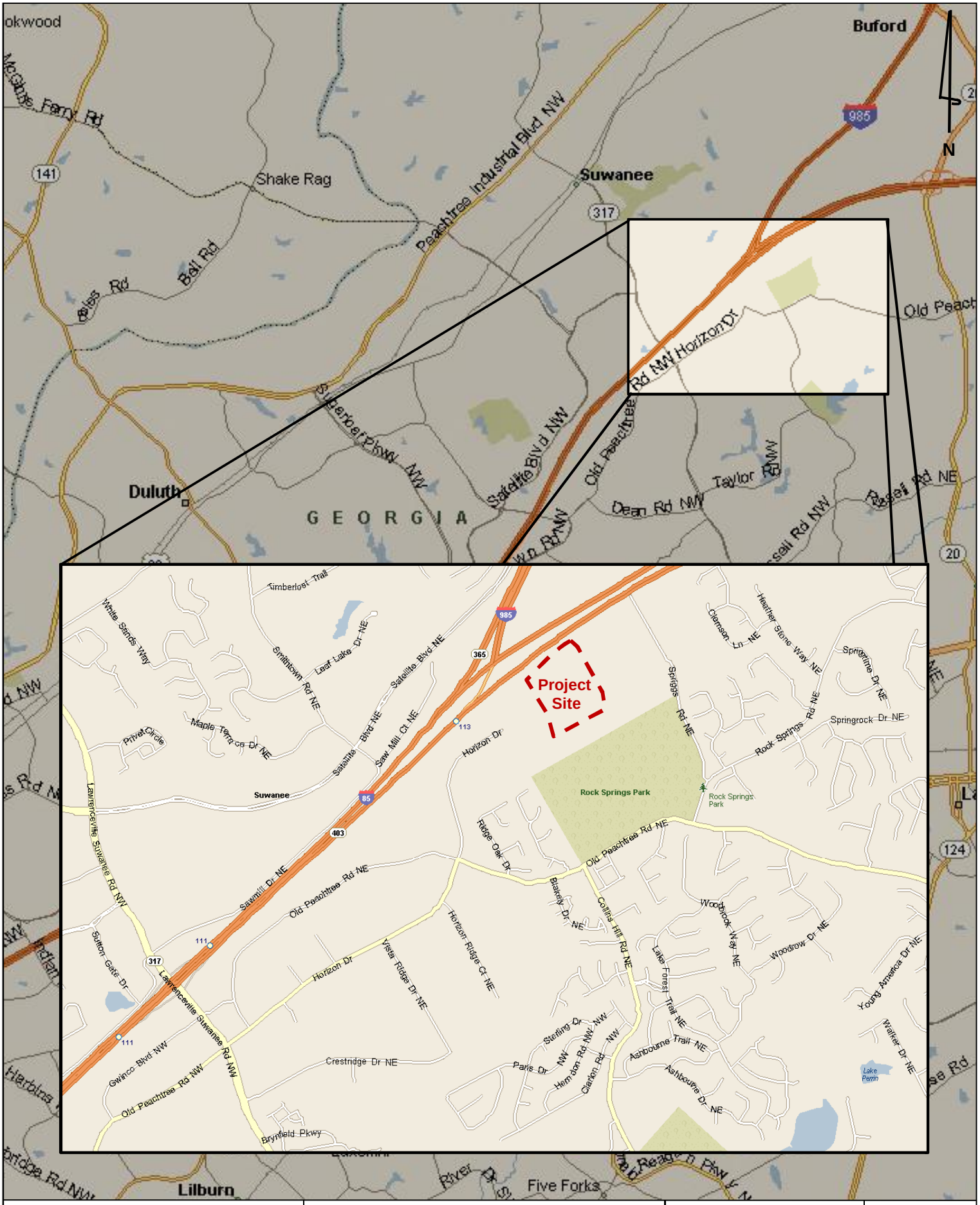
> *…the land uses within the proposed DRI are such that the number of trips generated by the development is likely to have minimal impact on the road network.*
>
> 1. *No more than one thousand (1,000) gross daily trips generated by the DRI based on a trip generation memorandum; or,*
> 2. ***More than 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 1,156 gross daily trips based on 687,500 SF of warehousing space. Since this DRI development is expected to generate more than one thousand (1,000) but no more than three thousand (3,000) gross daily trips, it is being submitted for approval under GRTA's Expedited Review process.

Figure 1 provides the site location of the *Horizon Pointe 400* DRI project. **Figure 2** and **Figure 3** provide aerial views of the project site and surrounding area.

The proposed project is expected to be completed by 2019, and this analysis will consider the full build-out of the proposed site in 2019. A summary of the proposed land-use and density can be found below in **Table 1**.

Table 1: Proposed Land Uses	
Warehouse	687,500 SF



Kimley»Horn	***Horizon Pointe 400*** ***DRI #2688*** ***Transportation Analysis***	**Site Location Map**	**Figure 1**
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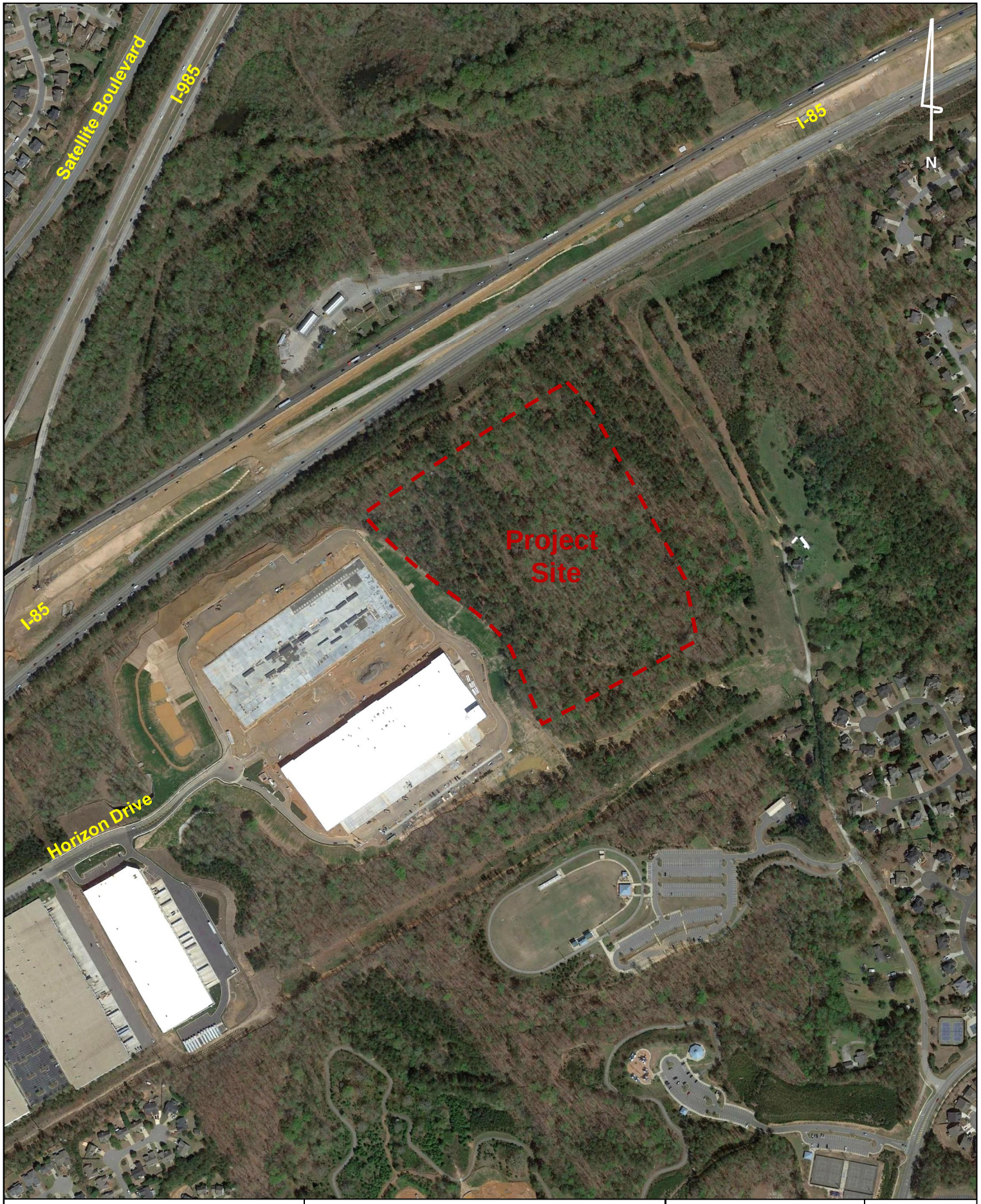

Kimley»Horn	*Horizon Pointe 400* *DRI #2688* *Transportation Analysis*	**Site Aerial - 2**	**Figure 2**
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Kimley»Horn	*Horizon Pointe 400* *DRI #2688* *Transportation Analysis*	**Site Aerial - 2**	**Figure 3** **Page 8**

1.2 Site Plan Review

The proposed development is an approximately 51.0-acre site in Gwinnett County. The project site is located at the end of Horizon Drive, a local road approximately 1/2-mile north of Old Peachtree Road and east of I-85. Horizon Drive, a dead-end roadway that connects to Old Peachtree Road, will provide access to the proposed development. The proposed development will be an industrial warehouse facility with approximately 687,500 SF of warehousing space.

The property is currently zoned to the Single-Family Residence Zero Lot Line/Townhouse District (R-ZT) classification according to the Gwinnett County zoning map and is proposed to be zoned M-1.

The Gwinnett County Future Development Map identifies the area as a Preferred Office Mixed-Use Area, and the ARC's *Unified Growth Policy Map* identifies the project site as being in an Established Suburbs place type area. Please refer to the Land Use and Zoning maps in Appendix A.

A reference of the proposed site plan can be found in Appendix B. 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

As currently envisioned, the project site is located at the end of Horizon Drive, a local road approximately 1/2-mile north of Old Peachtree Road and east of I-85. Horizon Drive, a dead-end roadway that connects to Old Peachtree Road, will provide access to the proposed development. Old Peachtree Road connects to Buford Drive (SR 20), a principal arterial, on the east and Lawrenceville-Suwanee Road (SR 317), a minor arterial, on the west. Interstate 85 is accessible via Lawrenceville-Suwanee Road (SR 317) approximately ¼-mile north of Old Peachtree Road on Lawrenceville-Suwanee Road (SR 317). Interstate 85 is also accessible via Buford Drive (SR 20) approximately 1.5 miles north of Old Peachtree Road on Buford Drive (SR 20).

1.4 Bicycle and Pedestrian Facilities

Sidewalks currently exist along both sides of Horizon Drive. Bicycle facilities do not currently exist along the project site frontage. According to the DRI site plan, no bicycle or pedestrian facilities are proposed.

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.

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 0.5 percent per year background traffic growth rate was used for all roadways.

In addition to the background growth rate, the addition of the following development was incorporated into the background traffic:

- Horizon Pointed DRI #2563 (currently under construction)

2.2 Traffic Data Collection

Weekday peak hour turning movement counts were collected on Tuesday, March 22, 2016, and on Tuesday, May 23, 2017 at three (3) intersections during the AM and PM peak periods. The morning and afternoon peak hours varied some between the intersections. Peak hours for all intersections are shown in **Table 2**.

Table 2: Peak Hour Summary

Intersection	AM Peak Hour	PM Peak Hour
1. Old Peachtree Road at Horizon Drive	7:00 AM - 8:00 AM	5:00 PM - 6:00 PM
2. Lawrenceville-Suwanee Road at Old Peachtree Road	7:30 AM - 8:30 AM	4:30 PM - 5:30 PM
3. Old Peachtree Road at Collins Hill Road	7:00 AM - 8:00 AM	5:00 PM - 6:00 PM

The March 2016 turning movement counts were higher than the May 2017 turning movement counts with the exception of vehicles turning into and out of Horizon Drive at the intersection of Old Peachtree Road at Horizon Drive. The May 2017 turning movement counts were used for the movements turning into and out of Horizon Drive at the intersection of Old Peachtree Road at Horizon Drive only, and the March 2016 turning movement counts were used for all other movements for the analysis.

The collected peak hour turning movement traffic counts are shown in Appendix G.

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 9.0*.

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.

3.0 STUDY NETWORK

3.1 Gross Trip Generation

Traffic for the proposed land uses and densities were estimated using the *Institute of Transportation Engineers' (ITE) Trip Generation Manual, Ninth Edition, 2012*, using equations where available. Trip generation for this proposed development is calculated based upon Land Use Code 152, High-Cube Warehouse/Distribution Center. Please refer to Appendix C for details. Gross trips generated are displayed below in **Table 3**.

Table 3: Gross Trip Generation

Land Use	Density	ITE Code	Daily Traffic			AM Peak Hour		PM Peak Hour	
			Total	Enter	Exit	Enter	Exit	Enter	Exit
High-Cube Warehouse	687,500 SF	*152*	1,156	578	578	49	22	27	59
Total Gross Trips			**1,156**	**578**	**578**	**49**	**22**	**27**	**59**

3.2 Trip Distribution

The directional distribution and assignment of new project trips and estimated project trips of the currently under construction Rock Springs Park development and industrial warehouse facility were based on the project land uses, a review of the land use densities and road facilities in the area, engineering judgment, existing traffic count data, and methodology discussions with the Georgia Regional Transportation Authority (GRTA), Atlanta Regional Commission (ARC), Georgia Department of Transportation (GDOT), and Gwinnett County. (See Section 5.0 – Trip Distribution and Assignment.)

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, consistent with the GRTA Letter of Understanding.

3.4 Study Network Determination

A general study area was determined using engineering judgement and the GRTA 7% rule. This rule recommends that all intersections and segments be analyzed which are impacted to the extent that the traffic from the proposed site is 7% or more of the service volume of the facility (at a previously established LOS standard, typically LOS D) be considered for analysis. The study area was agreed upon during methodology discussions with GRTA, ARC, GDOT, and Gwinnett County staff.

The study network includes three (3) signalized intersections as noted in **Table 4**. The site location and study intersections can be found in **Figure 4.**

Table 4: Intersection Control Summary

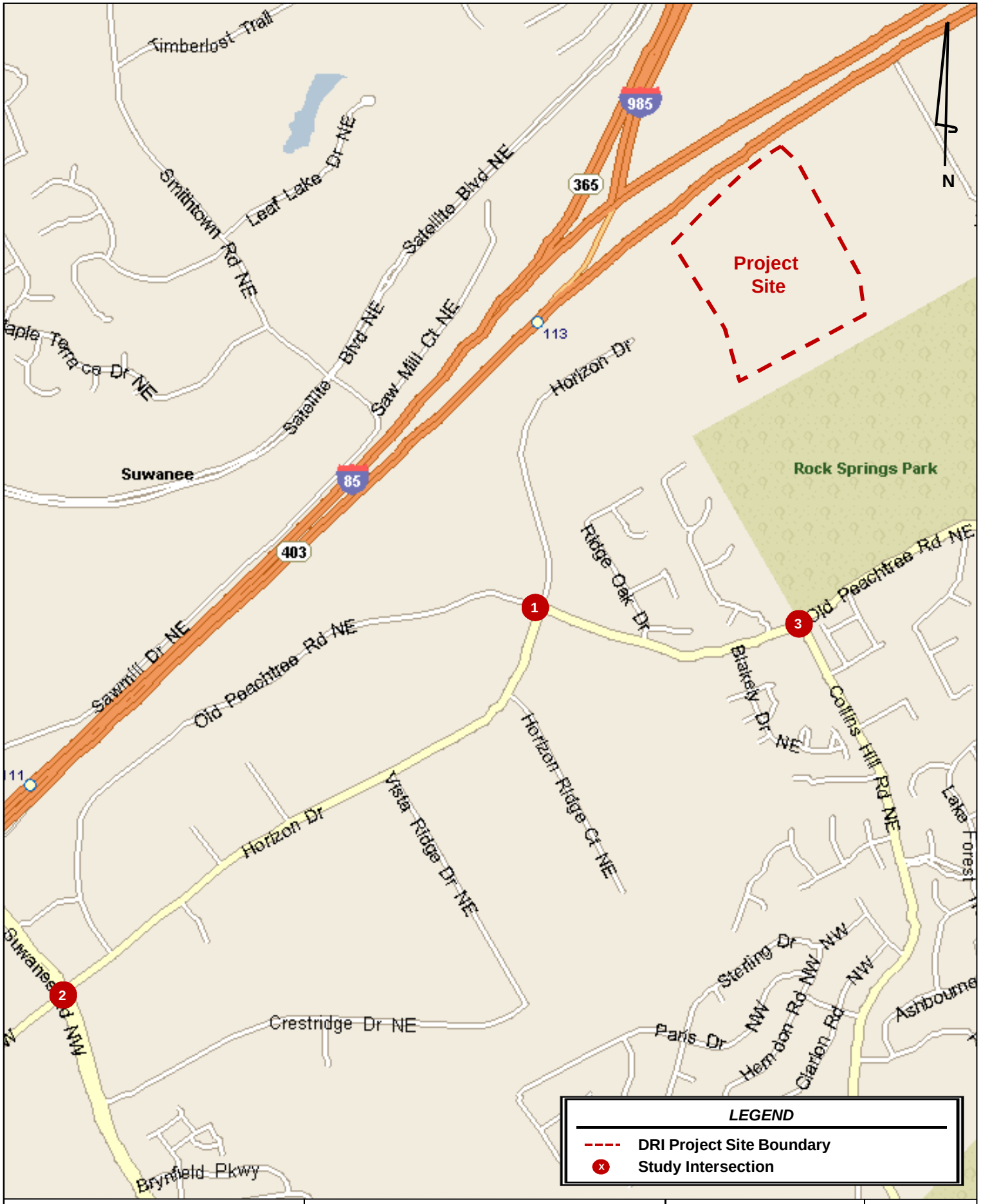
Intersection	Control
1. Old Peachtree Road at Horizon Drive	Signal
2. Lawrenceville-Suwanee Road at Old Peachtree Road	Signal
3. Old Peachtree Road at Collins Hill Road	Signal

Each of the above listed intersections was analyzed for the Existing 2017 conditions, the Projected 2019 No-Build conditions, and the Projected 2019 Build conditions.

The Existing 2017 conditions represent the Existing 2017 traffic volumes and the addition of the estimated project trips associated with proposed Rock Springs Park development.

The Projected 2019 No-Build conditions represent the Existing 2017 traffic volumes grown for two (2) years at 0.5 percent per year throughout the study network and the addition of the estimated project trips associated with the Horizon Pointe DRI #2563.

The Projected 2019 Build conditions add the project trips associated with the proposed 687,500 SF *Horizon Pointe 400* development to the Projected 2019 No-Build conditions.



Kimley»Horn	*Horizon Pointe 400* *DRI #2688* *Transportation Analysis*	**Study Intersections**	**Figure 4**
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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: Roadway Classifications

Roadway	No. of Lanes	Posted Speed Limit (MPH)	Functional Classification	
			GDOT	Gwinnett County*
Horizon Drive (north of Old Peachtree Road)	**3**	**35**	**Local Road**	**Local Road**
Horizon Drive (south of Old Peachtree Road)	5	45	Major Collector	Local Road
Old Peachtree Road	2	45	Major Collector	Major Arterial
Lawrenceville-Suwanee Road	4	45	Minor Arterial	Major Arterial
Collins Hill Road	2	40	Major Collector	Minor Arterial

**Note: Gwinnett County Classifications are currently being updated as part of the Comprehensive Transportation Plan.*

It should be noted that the Proposed Rock Springs Park Driveway is currently under construction and will serve as the fourth leg to the existing three-leg intersection of Old Peachtree at Collin Hill Road. The driveway will have one (1) exclusive left-turn lane and one (1) shared through/right-turn lane.

4.0 TRIP GENERATION

As stated previously, gross trips associated with the proposed development were estimated using the *Institute of Transportation Engineers' (ITE) Trip Generation Manual, Ninth Edition, 2012*, using equations where available. Trip generation for this proposed development is calculated based upon Land Use Code 152 (High-Cube Warehouse/Distribution Center). Internal capture reductions, alternative transportation mode (walking, bicycle, and transit), and pass-by trip reductions were not applied for this study. Please refer to Appendix C for details.

The total trips generated and analyzed in this report associated with the *Horizon Pointe 400* development are listed in **Table 6**.

Table 6: Trip Generation

	Daily Traffic			AM Peak Hour		PM Peak Hour	
	Total	**Enter**	**Exit**	**Enter**	**Exit**	**Enter**	**Exit**
Heavy Vehicle (Truck) Trips	440	220	220	14	7	28	9
Employee (Car) Trips	716	358	358	35	15	58	18
Total Trips	**1,156**	**578**	**578**	**49**	**22**	**86**	**27**

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

It should be noted that under the Existing 2017 conditions, the estimated project trips associated with the proposed Rock Springs Park development were added to the roadway network. The proposed Rock Springs Park development is also currently under construction and is expected to generate: 328 daily trips, 5 trips during the AM peak, and 95 trips during the PM peak. Please see Appendix F for the traffic memorandum for the proposed Rock Springs Park development.

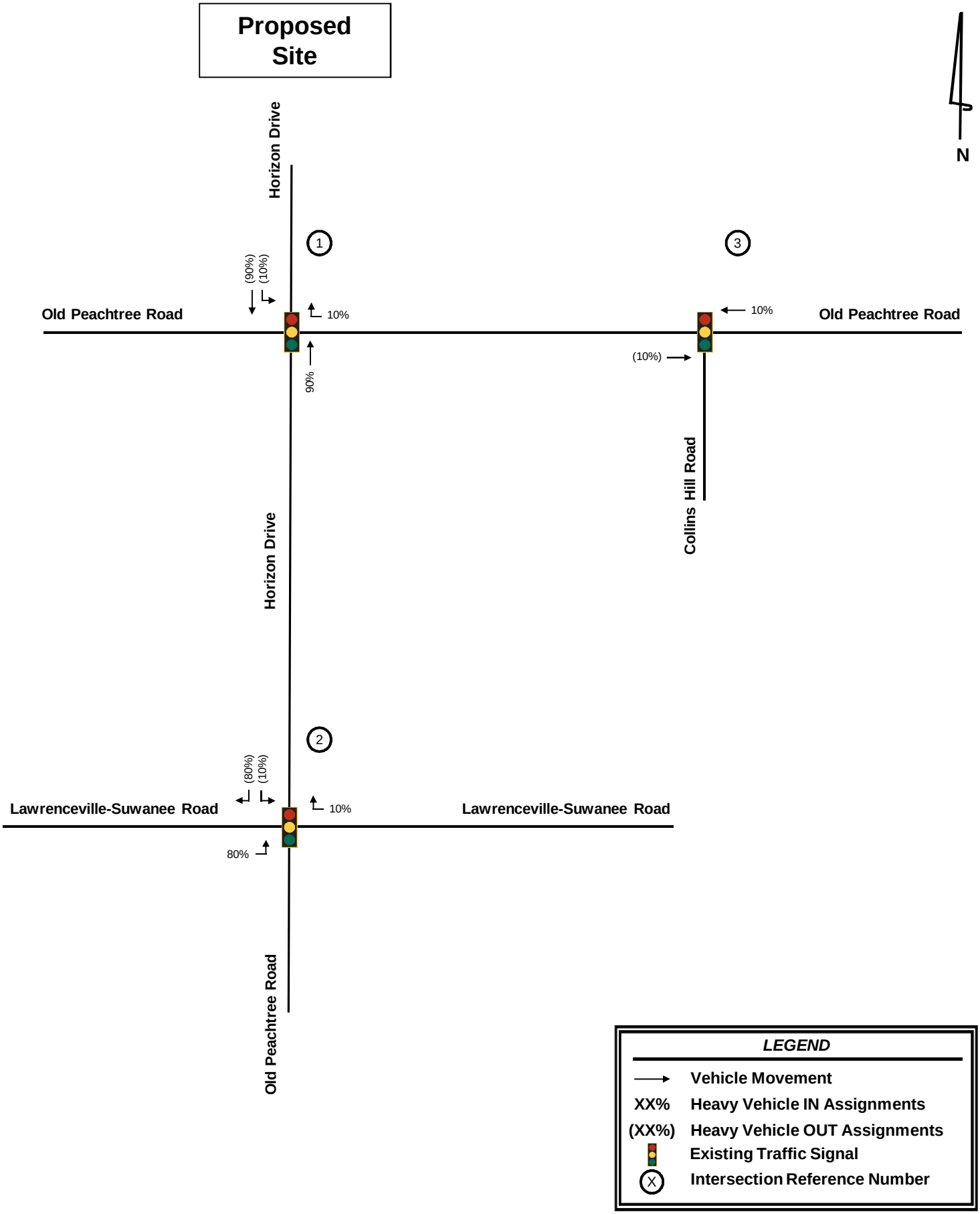
Additionally, under the Projected 2019 No-Build conditions, the trips associated with the *Horizon Pointe DRI #2563 (currently under construction)* were added to the roadway network. *Horizon Pointe DRI #2563* is expected to generate: 1,490 daily trips, 134 trips during the AM peak, and 120 trips during the PM peak.

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 Gwinnett County staff. **Figure 5** and **Figure 6** display the projected trip distribution and assignments for heavy vehicles (trucks) and employee trips (cars), respectively.

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 peak hour project trips by turning movement throughout the study network, generated by the proposed *Horizon Pointe 400* development, are shown in **Figure 7**.

Detailed intersection volume worksheets can also be found in Appendix D.



Kimley»Horn	*Horizon Pointe 400* DRI #2688 Transportation Analysis	Heavy Vehicle Trip Distribution & Assignment	Figure 5
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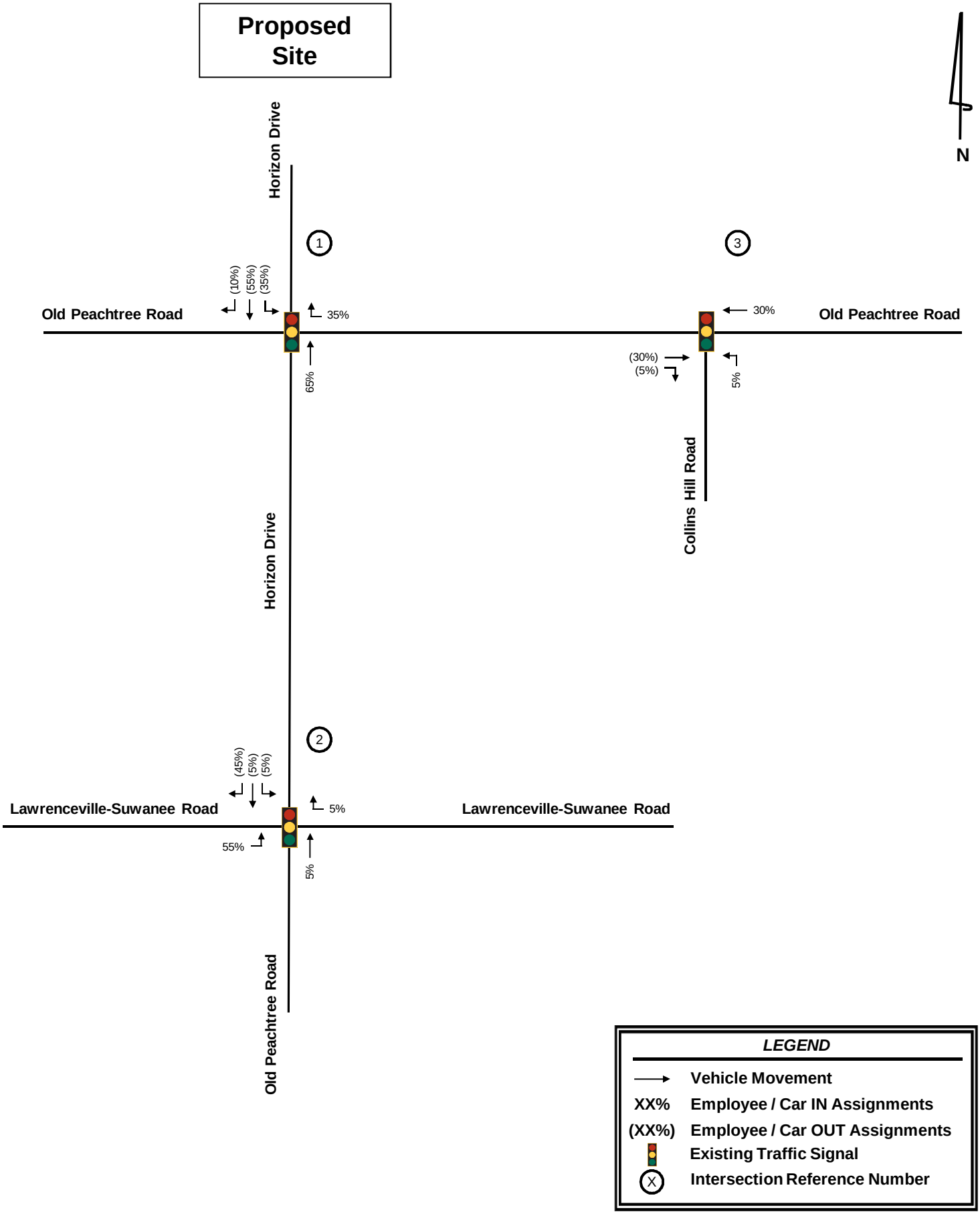

Kimley»Horn	*Horizon Pointe 400* DRI #2688 Transportation Analysis	Employee (Car) Trip Distribution & Assignment	Figure 6
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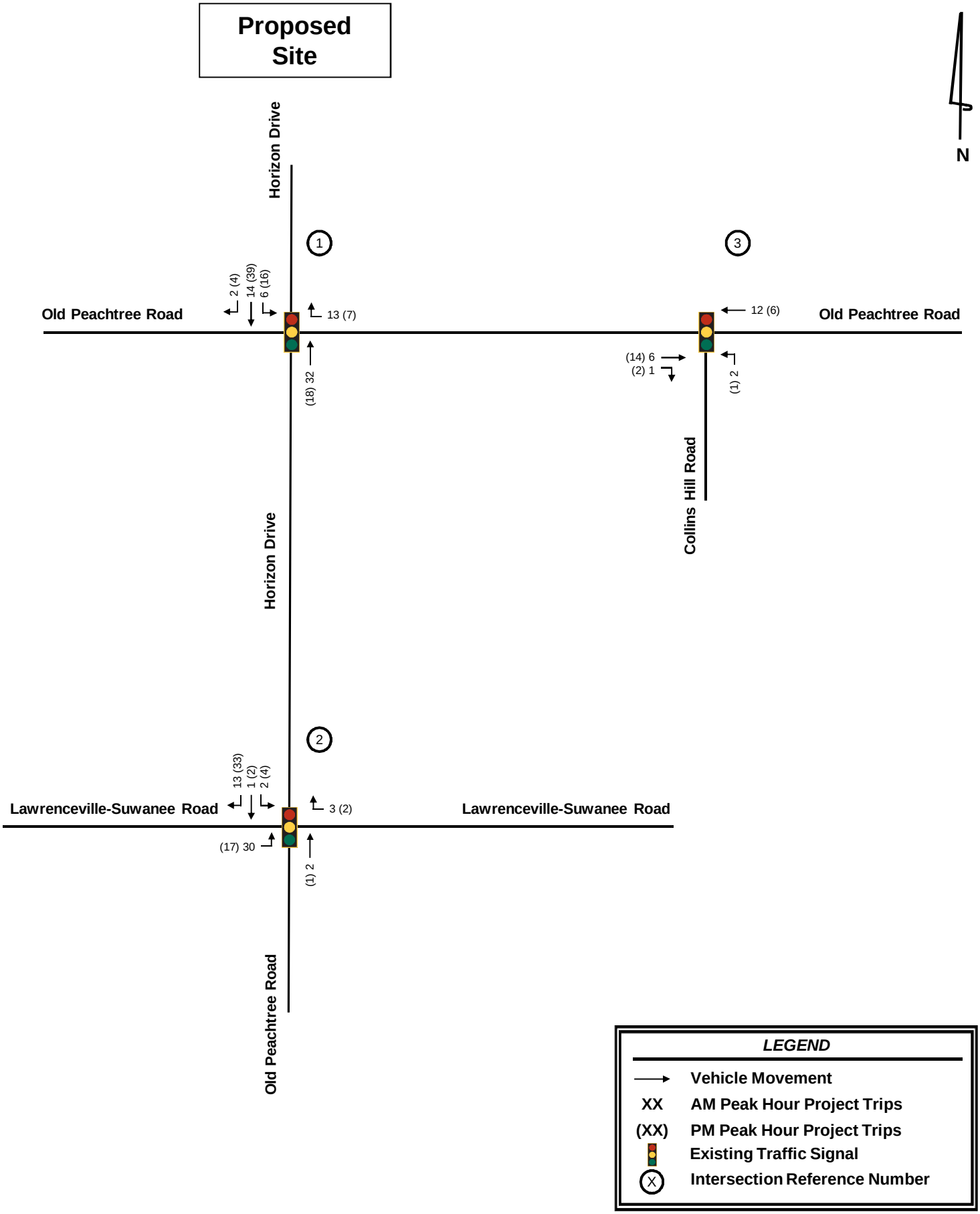

Kimley»Horn	*Horizon Pointe 400* DRI #2688 Transportation Analysis	Project Trips	Figure 7
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6.0 TRAFFIC ANALYSIS

6.1 Existing 2017 Conditions

The observed existing peak hour traffic volumes were entered into *Synchro 9.0,* and capacity analyses were performed for the AM and PM peak hours. The May 2017 turning movement counts were used for the movements turning into and out of Horizon Drive at the intersection of Old Peachtree Road at Horizon Drive only, and the March 2016 turning movement counts were used for all other movements for the analysis. Additionally, the estimated project trips of the proposed Rock Springs Park development (currently under construction, to be completed November 2017) was included.

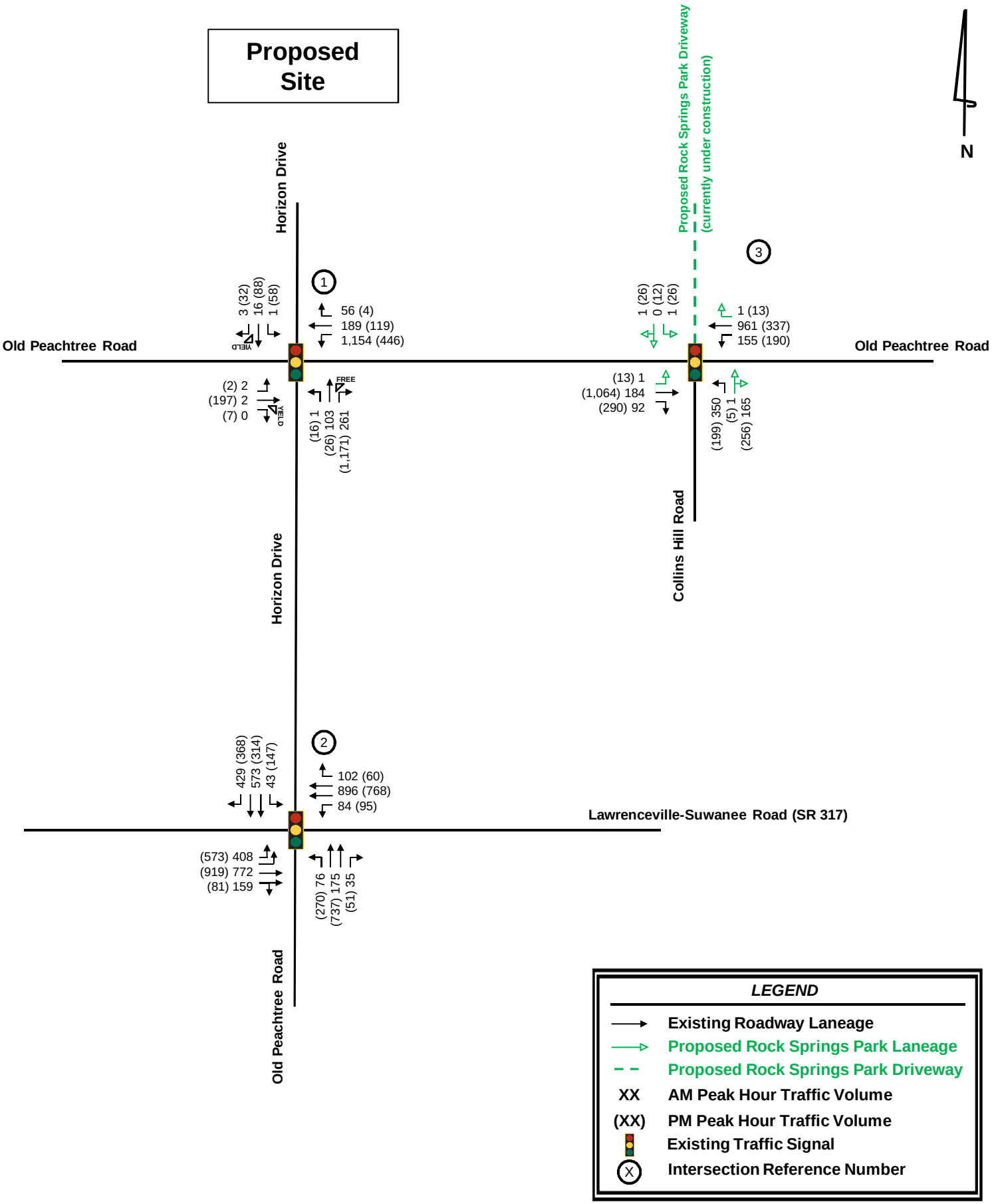
The Existing 2017 conditions were analyzed using existing roadway geometry, plus the proposed Rock Springs Park Driveway at the intersection of Old Peachtree Road at Collins Hill Road, and existing intersection control types.

The intersection laneage and the peak hour traffic volumes for the Existing 2017 conditions are shown in **Figure 8**. The results of the capacity analyses for the Existing 2017 conditions are shown in **Table 7**. Detailed *Synchro* analysis reports are shown in Appendix H.

Table 7: Existing 2017 Levels-of-Service Summary
LOS (delay in seconds)

Intersection	Control	LOS Standard		AM Peak Hour	PM Peak Hour
1. Old Peachtree Road at Horizon Drive	Signal	D		B (16.8)	B (11.1)
2. Lawrenceville-Suwanee Road at Old Peachtree Road	Signal	D		D (40.6)	D (48.6)
3. Old Peachtree Road at Collins Hill Road / Proposed Rock Springs Park Driveway	Signal	AM	PM	D (42.6)	E (60.1)
		D	E		

As shown in **Table 7**, all study intersections currently operate at or above their acceptable level-of-service standard during the AM and PM peak hours for the Existing 2017 conditions. Therefore, there are no recommended improvements for the Existing 2017 conditions scenario.



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Horizon Pointe 400
DRI #2688
Transportation Analysis

Existing 2017 Traffic Conditions

Figure 8

6.2 Projected 2019 No-Build Conditions

To account for growth near the proposed development, the existing traffic volumes were increased for two (2) years at 0.5 percent per year throughout the study network. Additionally, the estimated project trips from *Horizon Pointe DRI #2563 (currently under construction)* was included. These volumes were entered into *Synchro 9.0*, and capacity analyses were performed.

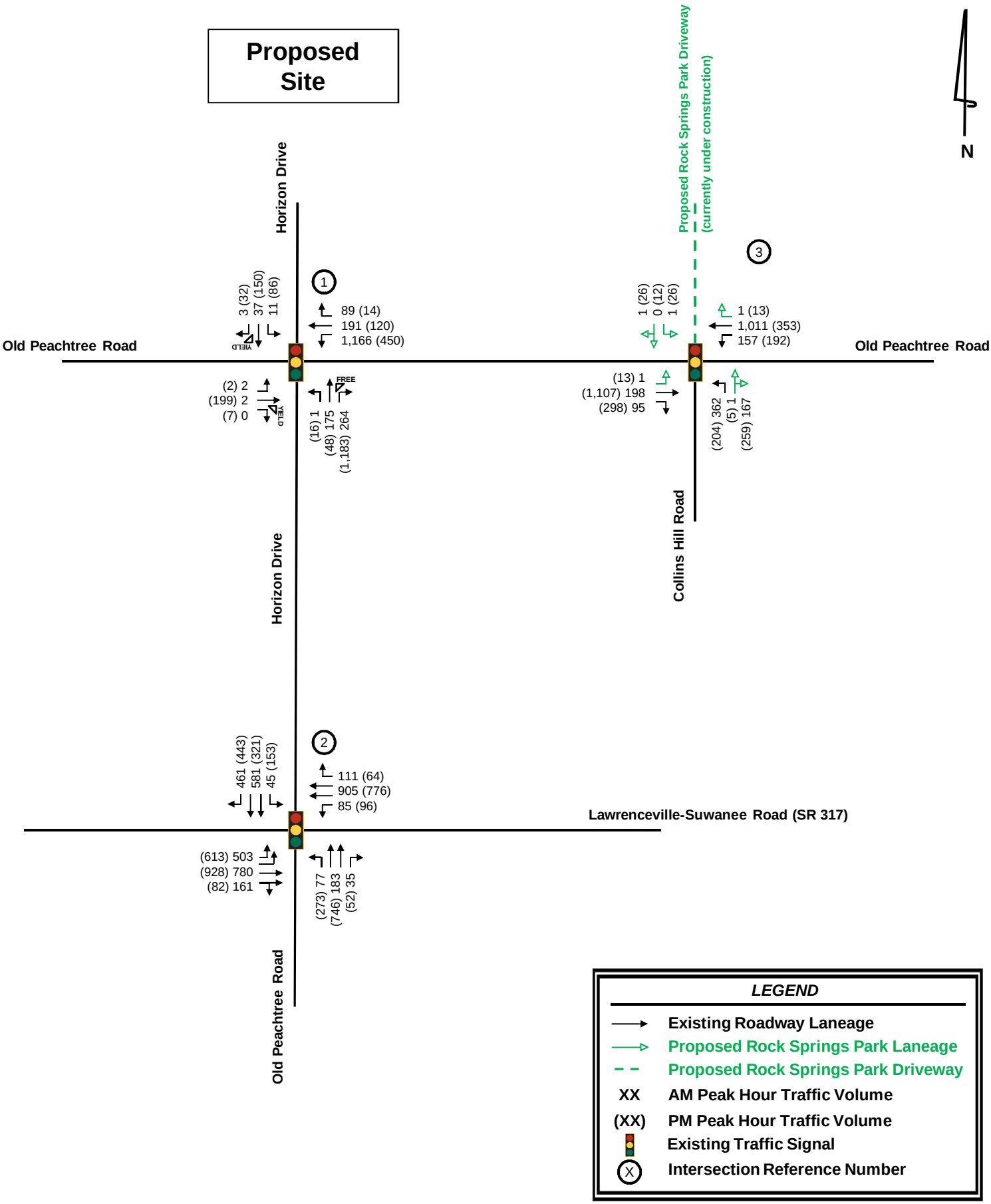
The Projected 2019 No-Build conditions were analyzed using existing roadway geometry, plus the proposed Rock Springs Park Driveway at the intersection of Old Peachtree Road at Collins Hill Road, and existing intersection control types.

The intersection laneage and the peak hour traffic volumes for the Projected 2019 No-Build conditions are shown in **Figure 9**. The results of the capacity analyses for the Projected 2019 No-Build conditions are shown in **Table 8**. Detailed *Synchro* analysis reports are shown in Appendix H.

Table 8: Projected 2019 No-Build Intersection Levels-of-Service
LOS (delay in seconds)

Intersection	Control	LOS Standard		AM Peak Hour	PM Peak Hour
1. Old Peachtree Road at Horizon Drive	Signal	D		C (23.2)	B (14.2)
2. Lawrenceville-Suwanee Road at Old Peachtree Road	Signal	D		D (41.6)	D (51.6)
3. Old Peachtree Road at Collins Hill Road / Proposed Rock Springs Park Driveway	Signal	AM	PM	D (46.5)	E (62.1)
		D	E		

As shown in **Table 8**, all study intersections currently are projected to operate at or above their acceptable level-of-service standard during the AM and PM peak hours for the Projected 2019 No-Build conditions. Therefore, there are no recommended improvements for the Projected 2019 No-Build conditions scenario.



Kimley»Horn	*Horizon Pointe 400* *DRI #2688* Transportation Analysis	Projected 2019 No-Build Traffic Conditions	Figure 9
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6.3 Projected 2019 Build Conditions

The traffic associated with the proposed *Horizon Pointe 400* development was added to the Projected 2019 No-Build volumes. These volumes were then entered into *Synchro 9.0*, and capacity analyses were performed.

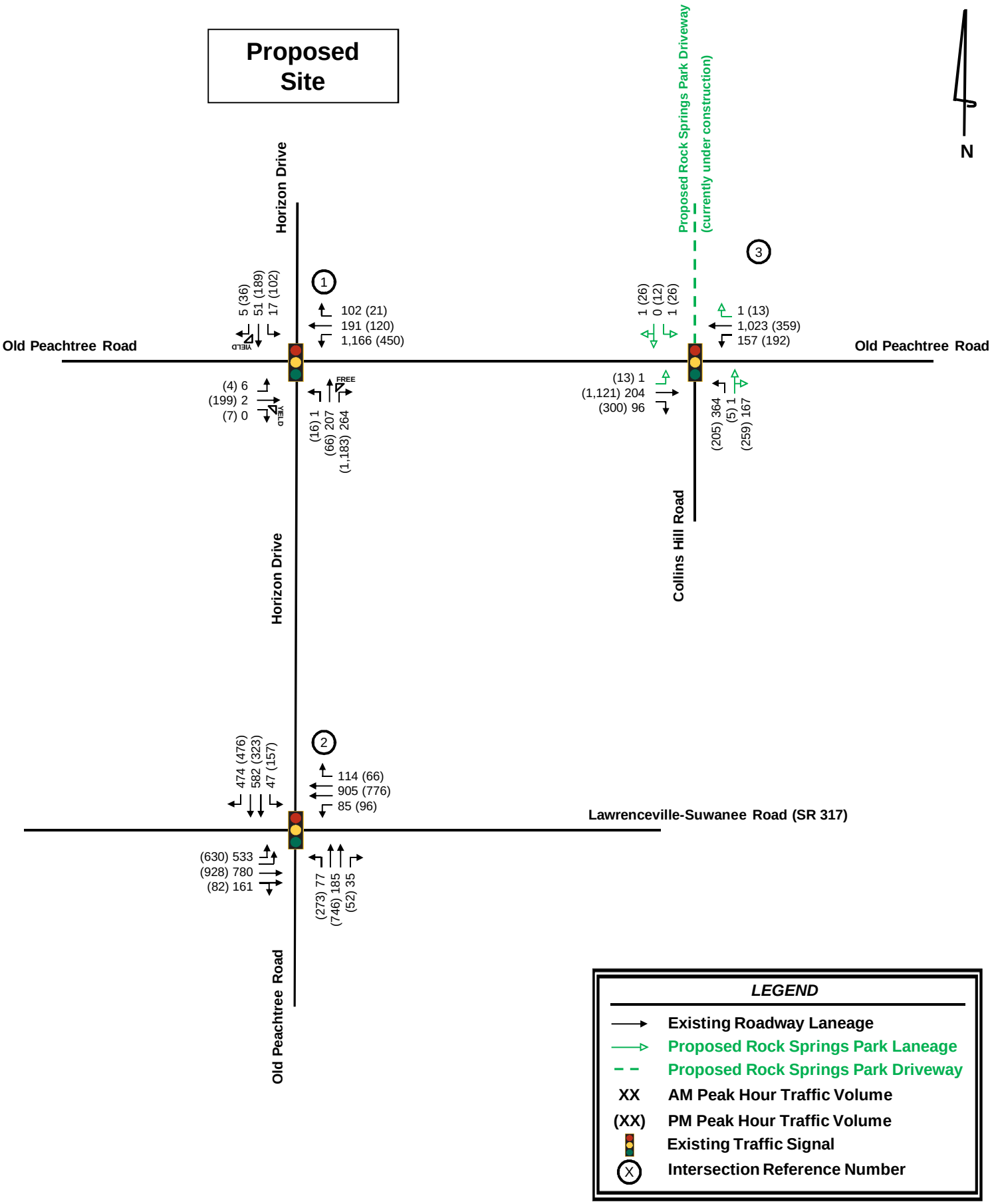
The Projected 2019 Build conditions were analyzed using existing roadway geometry, plus the proposed Rock Springs Park driveway at the intersection of Old Peachtree Road at Collins Hill Road, and existing intersection control types.

The intersection laneage and peak traffic volumes for the Projected 2019 Build conditions are shown in **Figure 10.** The results of the capacity analyses for the Projected 2019 Build conditions are shown in **Table 9**. Detailed *Synchro* analysis reports are shown in Appendix H.

Table 9: Projected 2019 Build Intersection Levels-of-Service
LOS (delay in seconds)

Intersection	Control	LOS Standard		AM Peak Hour	PM Peak Hour
1. Old Peachtree Road at Horizon Drive	Signal	D		C (30.7)	B (16.7)
2. Lawrenceville-Suwanee Road at Old Peachtree Road	Signal	D		D (42.4)	D (52.3)
3. Old Peachtree Road at Collins Hill Road / Proposed Rock Springs Park Driveway	Signal	AM	PM	D (51.9)	E (69.5)
		D	E		

As shown in **Table 9**, all study intersections currently operate at or above their acceptable level-of-service standard during the AM and PM peak hours for the Projected 2019 Build conditions. Therefore, there are no recommended improvements for the Projected 2019 Build conditions scenario.



Kimley»Horn	*Horizon Pointe 400* *DRI #2688* Transportation Analysis	Projected 2019 Build Traffic Conditions	Figure 10
			Page 24

6.4 Projected 2019 Build Alternative - Supplemental Analysis

Per the request of Gwinnett County, a Supplemental Analysis was performed for the Projected 2019 Build Alternative conditions. Gwinnett County is proposing an intersection restriping plan for the intersection of Old Peachtree Road at Horizon Drive. The proposed intersection restriping plan includes the following:

- Intersection #1: Old Peachtree Road at Horizon Drive
  - Restripe the eastbound approach to consist of two (2) left-turn lanes and one (1) shared through/right-turn lane.
  - Restripe the northbound approach to consist of one (1) shared through/left-turn lane and two (2) right-turn lanes.

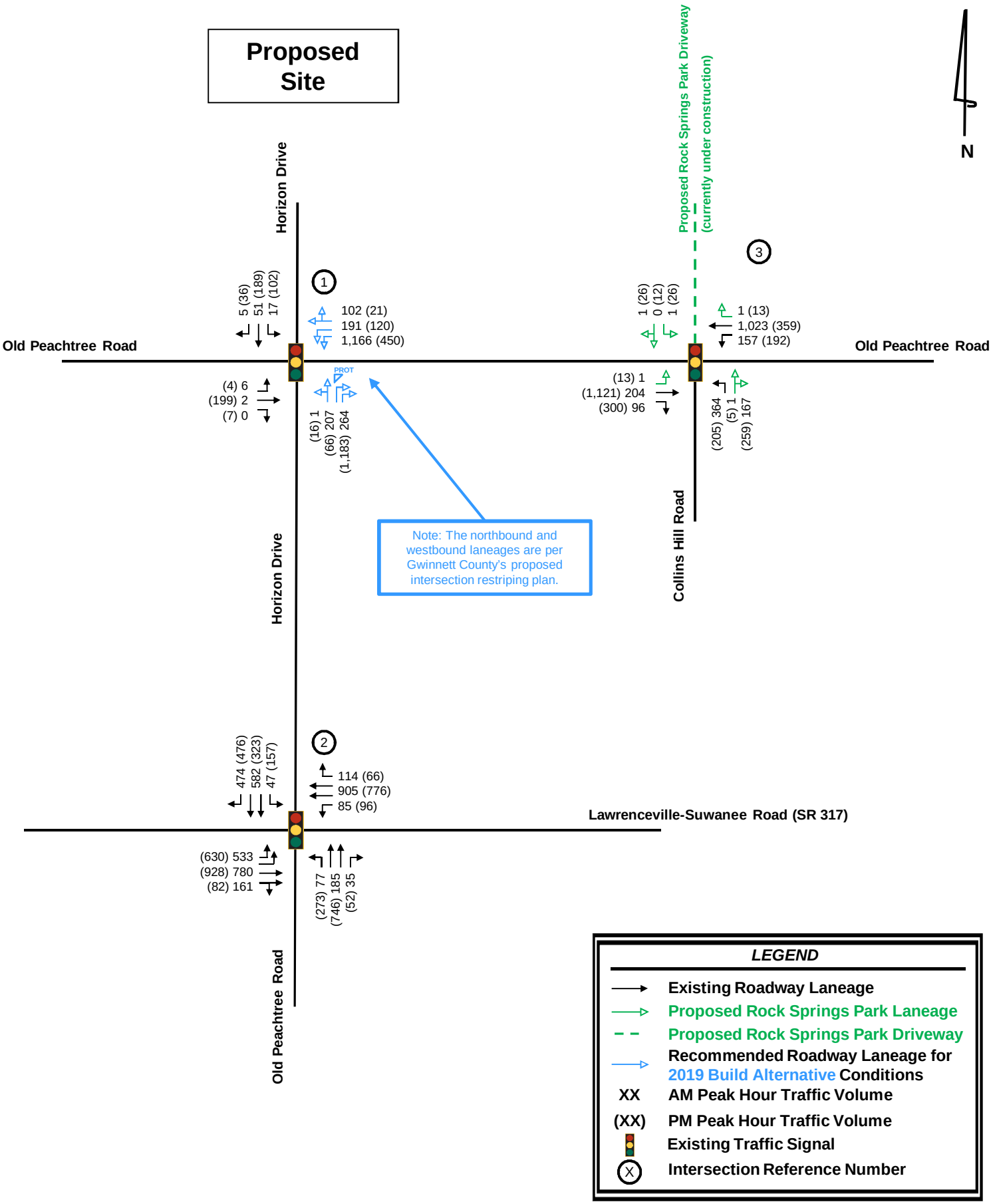
For purposes of this analysis the LOS, control delay, and queue will be compared to that of the 2019 Build conditions. The Projected 2019 Build volumes were applied to the proposed roadway laneage and analyzed at AM and PM peak hours. These volumes were then entered into *Synchro 9.0*, and capacity analyses were performed.

The intersection laneage and peak traffic volumes for the Projected 2019 Build Alternative conditions are shown in **Figure 11**. The results of the capacity analyses and the queuing analyses for the Projected 2019 Build Alternative conditions are shown in **Table 10** and in **Table 11**, respectively. Detailed *Synchro* analysis reports are shown in Appendix H.

Table 10: Level-of-Service Comparison (Projected 2019 Build vs Build Alternative)
LOS (delay in seconds)

Intersection	Control	LOS Standard	AM Peak Hour	PM Peak Hour
Projected 2019 Build Conditions				
1. Old Peachtree Road at Horizon Drive	Signal	D	C (30.7)	B (16.7)
Projected 2019 Build Alternative Conditions				
1. Old Peachtree Road at Horizon Drive	Signal	D	B (14.8)	B (18.7)

As shown in **Table 10**, all study intersections are projected to operate at or above their acceptable level-of-service standard during the AM and PM peak hours for the Projected 2019 Build Alternative conditions. Additionally, the intersection is projected to operate at a better LOS during the AM peak with less delay with the proposed intersection restriping plan compared to the Projected 2019 Build conditions with the existing laneage. The intersection is projected to operate at similar LOS during the PM peak.



Kimley»Horn	*Horizon Pointe 400* *DRI #2688* Transportation Analysis	Projected 2019 Build - Alternative Traffic Conditions	Figure 11
			Page 26

Table 11 : Queuing Analysis (Projected 2019 Build vs Build Alternative) *95th Percentile Queue Lengths, in feet*				
Intersection	**Control**	**Approach**	**AM Peak Queue**	**PM Peak Queue**
Projected 2019 Build Conditions				
1. Old Peachtree Road at Horizon Drive	Signal	WB Left	1,150’	330’
		NB Right	-*	-*
Projected 2019 Build Alternative Conditions				
1. Old Peachtree Road at Horizon Drive	Signal	WB Left	400’	225’
		NB Right	25’	190’

**Note: Due to the northbound right-turn lane being a free-flow lane under existing conditions, Synchro analysis shows no queue for this movement.*

As shown in **Table 11**, the westbound left queue lengths improve with the proposed intersection restriping plan from approximately 1,150 feet of queue with existing laneage under the Projected 2019 Build conditions to approximately 400 feet of queue with the proposed intersection restriping laneage under the Projected 2019 Build Alternative conditions during the AM peak. The westbound left queue lengths improve from approximately 330 feet of queue under the Projected 2019 Build conditions to approximately 225 feet of queue under the Projected 2019 Build Alternative conditions during the PM peak.

7.0 IDENTIFICATION OF PROGRAMMED PROJECTS

According to ARC's Transportation Improvement Program (TIP), GDOT Statewide TIP (STIP), *Plan 2040* Regional Transportation Program (RTP), GDOT's Construction Work Program, and Gwinnett County's Comprehensive Transportation Plan (CTP) 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: Programmed Improvements

#	Year	Project Number	Project Description
1	2017	T105	Rock Springs Park driveway addition at Old Peachtree Road @ Collins Hill Road intersection
2	TBD	F-1118-01	Old Peachtree Road & Rock Springs Pedestrian Sidewalk Improvement
3	2020	AR-ML-410	I-85 managed lanes from Old Peachtree Road to Hamilton Mill Road.
4	2020	GW-406	SR 324 improvements and widening at SR 124.
5	2024	GW-388	I-85 North new interchange at SR 324 (Gravel Springs Road).
6	2030	GW-020D	SR 20 (Buford Drive) widening from four lanes to eight lanes from I-85 North to Rock Springs Road.
8	2040	GW-308B	Sugarloaf Parkway extension from SR 316 east of Lawrenceville to I-85.
9	2040	GW-308C	Sugarloaf Parkway extension from I-85 to Peachtree Industrial Boulevard.
10	TBD	GW-390C	Gwinnett County ATMS/ITS infrastructure expansion along Old Peachtree Road from Sugarloaf Parkway to North Brown Road.
11	TBD	ASP-AR-ML-420	I-85 North Managed Lanes from I-285 to I-985. This project would include increasing the managed lanes from two lanes to four lanes.

The improvements associated with these projects in **Table 12** were not specifically considered for this DRI Transportation Analysis because they are not immediately within the study network or expected to be completed by 2019.

8.0 INGRESS/EGRESS ANALYSIS

Vehicular access to the *Horizon Pointe 400* development during the AM and PM peak periods includes the following signalized intersection:

- Old Peachtree Road at Horizon Drive

Capacity analyses were conducted for the site access intersection identified above for the Existing 2017 conditions, Projected 2019 No-Build conditions, Projected 2019 Build conditions, and the Projected 2019 Build Alternative conditions. The intersection laneage (geometry) and traffic volumes for the study intersection is shown in **Figure 8**, **Figure 9**, **Figure 10,** and **Figure 11**, respectively, for each scenario, including the proposed intersection restriping laneage from Gwinnett County. The levels-of-service determined using existing geometry for the site access intersection can be found in **Table 7**, **Table 8**, **Table 9**, and **Table 10** for the Existing 2017 conditions, Projected 2019 No-Build conditions, Projected 2019 Build conditions, and the Projected 2019 Build Alternative conditions respectively.

Based on the Existing 2017 conditions, Projected 2019 No-Build conditions, Projected 2019 Build conditions, and the Projected 2019 Build Alternative conditions, the studied site access intersection 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 can be found in Appendix B and a full-sized site plan is attached to the report.

The *Horizon Pointe 400* development is not mixed-use in nature and will have no mixed-use reductions taken.

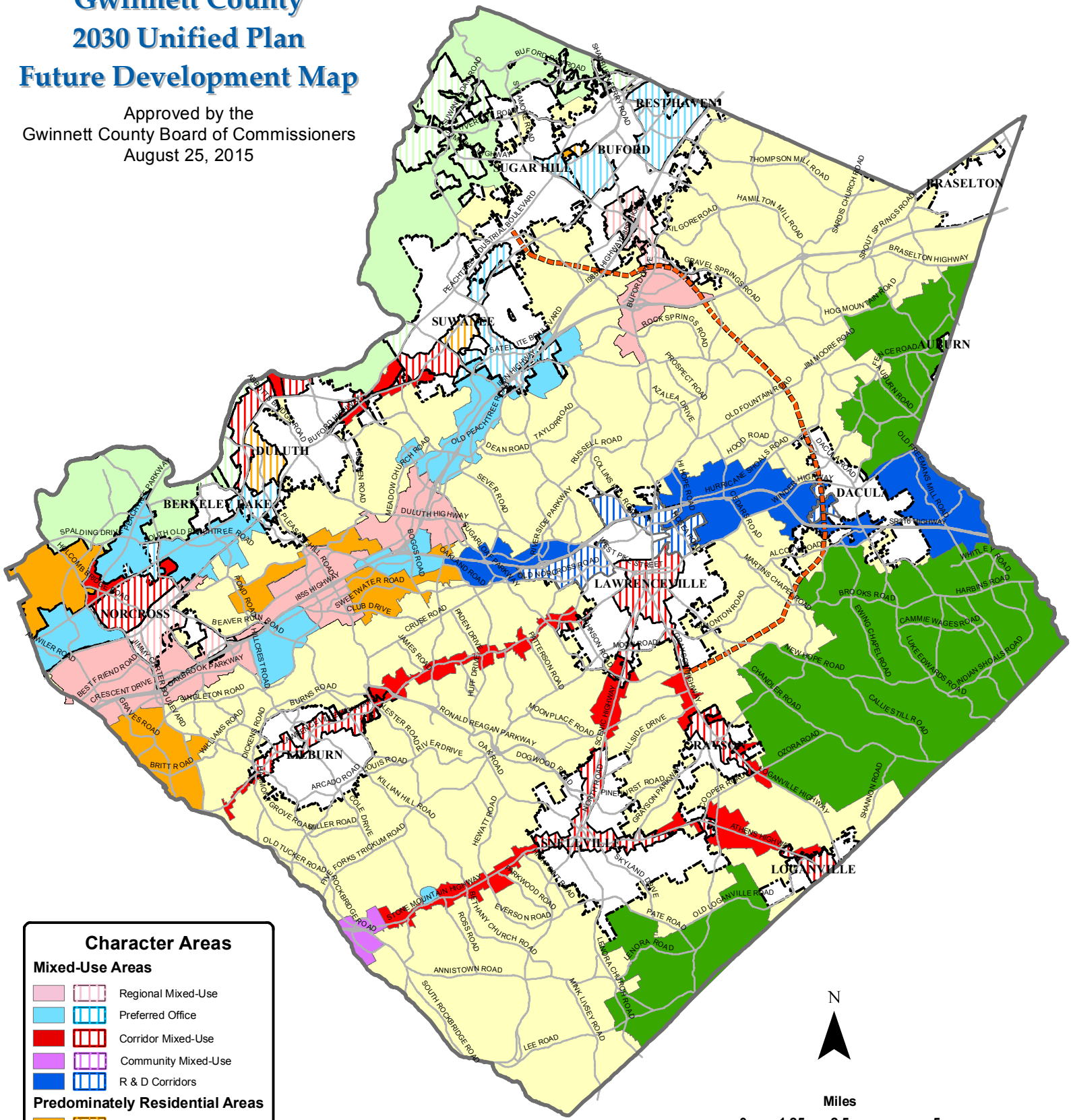
10.0 COMPLIANCE WITH COMPREHENSIVE PLAN ANALYSIS

The current Gwinnett County zoning is Single Family Residence Zero Lot Line/Townhouse District (R-ZT), which will require rezoning. The Gwinnett County Future Development Map identifies the area as a Preferred Office Mixed-Use Area, and the ARC's *PLAN 2040 Unified Growth Policy Map* identifies the project site as being in an Established Suburbs place type area. Please refer to the Land Use and Zoning maps in Appendix A.

Appendix A
Land Use and Zoning Maps

Gwinnett County
2030 Unified Plan
Future Development Map

Approved by the
Gwinnett County Board of Commissioners
August 25, 2015



Character Areas

Mixed-Use Areas

- Regional Mixed-Use
- Preferred Office
- Corridor Mixed-Use
- Community Mixed-Use
- R & D Corridors

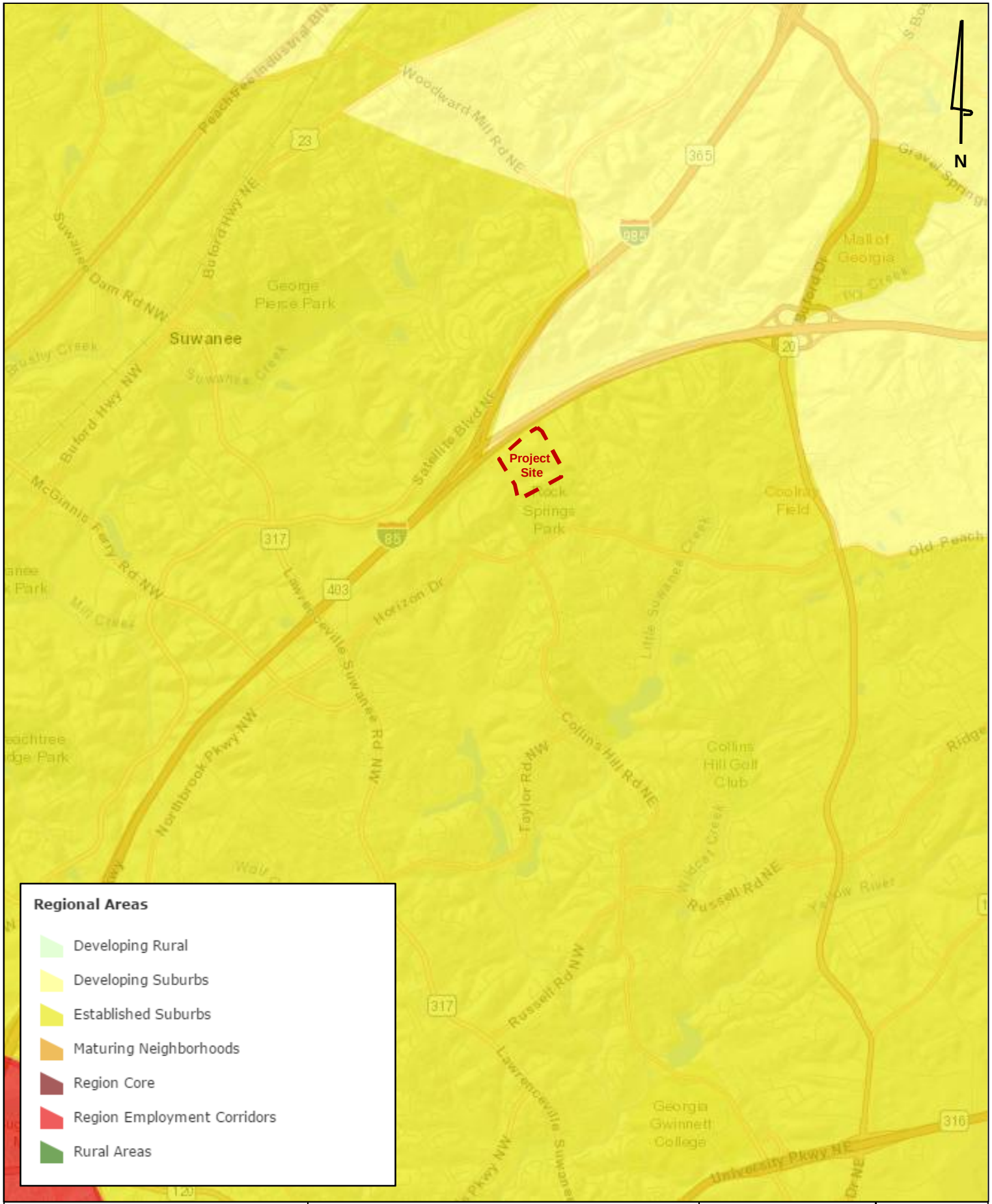
Predominately Residential Areas

- Mixed Housing Types
- Existing/Emerging Suburban
- Chattahoochee River Area
- Rural Estate Areas

Hatched color treatment indentifies where a character area is within corporate limits.

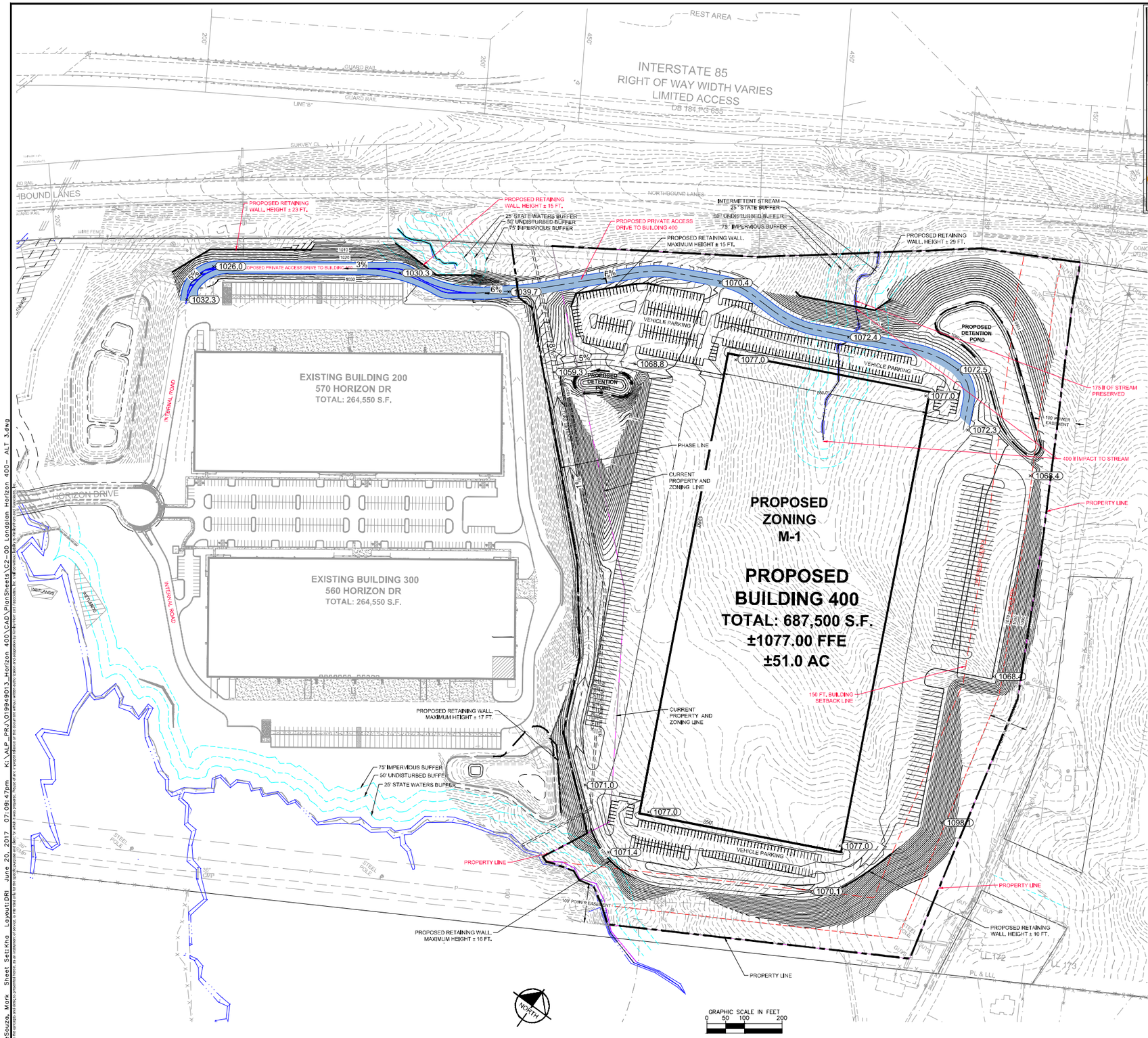
This map shows those areas that will be most subject to major policy interventions to achieve Unified Plan goals.

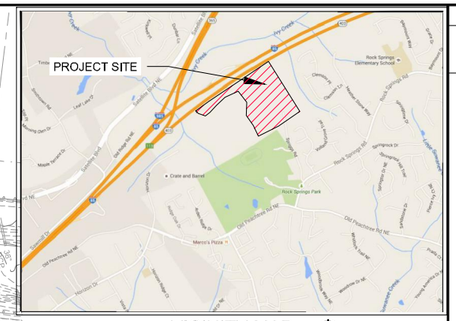
Gwinnett County
Department of Planning and Development
Long Range Planning Section
Planning Data Services Section
Date Printed: September 28, 2015



Kimley»Horn	***Horizon Pointe 400*** ***DRI #2688*** ***Transportation Analysis***	**ARC Unified Growth Policy Map**	**Figure A** **Appendix A**

Appendix B
Proposed Site Plan





VICINITY MAP

NORTH

SITE DATA - DRI # 2688:

SITE ADDRESS:	7TH DISTRICT, LAND LOT 172, PARCEL NO. 7172 009
ZONING:	
CURRENT:	RZT SINGLE-FAMILY ZERO LOT LINE/TOWNHOUSE DISTRICT
PROPOSED:	M1 (LIGHT INDUSTRY DISTRICT)
LAND AREA:	51.0 ACRES

PROJECT CONTACTS:

APPLICANT:

TAYLOR & MATHIS
245 TOWN PARK DRIVE
KENNESAW, GA 30144
PHONE: (707)-795-1330
CONTACT: MIKE IRBY

TRAFFIC ENGINEER:

KIMLEY-HORN & ASSOCIATES, INC.
2 SUN COURT, SUITE 450
PEACHTREE CORNERS, GA 30092
PHONE: (404)-201-6157
CONTACT: JOHN WALKER

CIVIL ENGINEER:

KIMLEY-HORN & ASSOCIATES, INC.
10 ROSWELL STREET
SUITE 210
ALPHARETTA, GA 30009
PHONE: (470)-299-7045
CONTACT: GREG MAXEY

PARKING SUMMARY:

REQUIRED PARKING SPACES:	MINIMUM: 1 PER 2500 S.F. MAXIMUM: 1 PER 1000 S.F
BUILDING AREA:	BUILDING 200: 687,500 SF

PARKING CALCULATIONS:
MINIMUM: (687,500/2500) =275 PARKING SPACES (FOR EACH BUILDINGS)
MAXIMUM: (687,500/1000) =688 PARKING SPACES (FOR EACH BUILDINGS)

PARKING PROVIDED:		
	442	CAR SPACES
	37	110' X 12' TRAILER SPACES
	114	55' X12' TRAILER SPACES

REQUIRED HANDICAP SPACES: 9
PROVIDED HANDICAP SPACES: 9

LOADING SPACES REQUIRED: 9 (3 PER 65,000 OF GROSS FLOOR AREA SF + 2 PER 103,564 SF OF ADDITIONAL AREA)

NOTE: PARKING PER SECTION 240-20.3 OF THE UNIFIED DEVELOPMENT ORDINANCE, USE WAREHOUSE (INCLUDING OFFICE) OVER 250,000 S.F.

No.	REVISIONS	DATE	BY

Kimley»Horn

10 ROSWELL STREET, SUITE 210
ALPHARETTA, GEORGIA 30009
PHONE (770) 619-4280
WWW.KIMLEY-HORN.COM

PRELIMINARY
NOT FOR CONSTRUCTION

GSWCC LEVEL II #: 0000000130

SCALE:	AS NOTED
DRAWN BY:	SD
DESIGNED BY:	SD
CHECKED BY:	GWM

CLIENT:

TAYLOR&MATHIS
245 TownPark Drive, Suite 575
Kennesaw, GA 30144

PROJECT:
HORIZON POINTE BUILDING 400
HORIZON DRIVE
7th DISTRICT, LAND LOT 172, PARCEL NO. 7172 009

TITLE:
HORIZON 400 CONCEPT GRADING PLAN

DATE
06/20/2017

PROJECT NO.
019949008

SHEET NUMBER
DRI

Appendix C
Trip Generation Analysis

Trip Generation Analysis (9th Ed.)
Horizon Pointe 400 DRI #2688
Gwinnett County, Georgia

Land Use	Intensity	Daily Trips	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
Proposed Site Traffic								
152 High-Cube Warehouse/Distribution Center	687,500 gross s.f.	1,156	71	49	22	86	27	59
Gross Trips		**1,156**	**71**	**49**	**22**	**86**	**27**	**59**
Truck Trips (per ITE Weighted Average Truck Trip Generation)		440	21	14	7	28	9	19
Mixed-Use Reductions		*0*				*0*	*0*	*0*
Alternative Mode Reductions		*0*	*0*	*0*	*0*	*0*	*0*	*0*
Adjusted Trips		440	21	14	7	28	9	19
Employee Trips		716	50	35	15	58	18	40
Mixed-Use Reductions		*0*				*0*	*0*	*0*
Alternative Mode Reductions		*0*	*0*	*0*	*0*	*0*	*0*	*0*
Adjusted Trips		716	50	35	15	58	18	40
Mixed-Use Reductions - TOTAL		*0*	*0*	*0*	*0*	*0*	*0*	*0*
Alternative Mode Reductions - TOTAL		*0*	*0*	*0*	*0*	*0*	*0*	*0*
New Trips		**1,156**	**71**	**49**	**22**	**86**	**27**	**59**
Driveway Volumes		**1,156**	**71**	**49**	**22**	**86**	**27**	**59**

k:\atl_tpto\019949012 horizon pointe warehouse, bldg 400, may 2017, gwinnett_dri phase ii\analysis\[horizon pointe 400_analysis_2016 counts.xls]trip generation

Appendix D
Intersection Volume Worksheets

INTERSECTION VOLUME DEVELOPMENT

Intersection #1: Horizon Drive @ Old Peachtree Road

AM PEAK HOUR

Description	Horizon Drive Northbound			Horizon Drive Southbound			Old Peachtree Road Eastbound			Old Peachtree Road Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed 2017 Traffic Volumes	1	103	260	1	16	3	2	2	0	1,153	189	56
Pedestrians												
Conflicting Pedestrians	0		0	0		0	0		0	0		0
Heavy Vehicles	0	4	3	0	4	0	0	0	0	2	0	0
Heavy Vehicle %	2%	4%	2%	2%	25%	2%	2%	2%	0%	2%	2%	2%
Peak Hour Factor		0.91			0.56			0.50			0.95	
Currently Under Construction Rock Springs Park			1							1		
Adjusted 2017 Volumes	1	103	261	1	16	3	2	2	0	1154	189	56
Annual Growth Rate	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Growth Factor	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010
Currently Under Construction DRI #2563 (Truck Trips)	0	21	0	2	6	0	0	0	0	0	0	5
Currently Under Construction Warehouse DRI #2563 (Car Tri	0	50	0	8	15	0	0	0	0	0	0	27
2019 Background Traffic	1	175	264	11	37	3	2	2	0	1,166	191	89
2019 No-Build Heavy Vehicle %	0%	14%	1%	18%	27%	0%	0%	0%	0%	0%	0%	6%
Project Trips (Future Development Only)												
Trip Distribution IN		90%										10%
Trip Distribution OUT				10%	90%							
Truck Trips	0	13	0	1	6	0	0	0	0	0	0	1
Trip Distribution IN		55%					10%					35%
Trip Distribution OUT				35%	55%	10%						
Car Trips	0	19	0	5	8	2	4	0	0	0	0	12
Total Project Trips	0	32	0	6	14	2	4	0	0	0	0	13
2019 Buildout Total	1	207	264	17	51	5	6	2	0	1,166	191	102
2019 Buildout Heavy Vehicle %	2%	10%	2%	7%	30%	2%	1%	2%	0%	2%	2%	3%

PM PEAK HOUR

Description	Horizon Drive Northbound			Horizon Drive Southbound			Old Peachtree Road Eastbound			Old Peachtree Road Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed 2017 Traffic Volumes	16	26	1,158	58	88	32	2	197	7	420	119	4
Pedestrians												
Conflicting Pedestrians	0		0	0		0	0		0	0		0
Heavy Vehicles	0	3	0	0	5	0	0	0	0	1	0	0
Heavy Vehicle %	2%	12%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Peak Hour Factor		0.96			0.50			0.84			0.89	
Currently Under Construction Rock Springs Park			13							26		
Adjusted 2017 Volumes	16	26	1171	58	88	32	2	197	7	446	119	4
Annual Growth Rate	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Growth Factor	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010
Currently Under Construction DRI #2563 (Truck Trips)	0	6	0	4	18	0	0	0	0	0	0	2
Currently Under Construction Warehouse DRI #2563 (Car Tri	0	16	0	23	43	0	0	0	0	0	0	8
2019 Background Traffic	16	48	1,183	86	150	32	2	199	7	450	120	14
2019 No-Build Heavy Vehicle %	0%	19%	0%	5%	15%	0%	0%	0%	0%	0%	0%	14%
Project Trips (Future Development Only)												
Trip Distribution IN		90%										10%
Trip Distribution OUT				10%	90%							
Truck Trips	0	8	0	2	17	0	0	0	0	0	0	1
Trip Distribution IN		55%					10%					35%
Trip Distribution OUT				35%	55%	10%						
Car Trips	0	10	0	14	22	4	2	0	0	0	0	6
Total Project Trips	0	18	0	16	39	4	2	0	0	0	0	7
2019 Buildout Total	16	66	1,183	102	189	36	4	199	7	450	120	21
2019 Buildout Heavy Vehicle %	2%	21%	2%	4%	14%	2%	1%	2%	2%	2%	2%	6%

INTERSECTION VOLUME DEVELOPMENT

Intersection #2: Old Peachtree Road @ Lawerenceville-Suwanee Rd
AM PEAK HOUR

Description	Old Peachtree Road Northbound			Old Peachtree Road Southbound			Lawerenceville-Suwanee Rd Eastbound			Lawerenceville-Suwanee Rd Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed 2017 Traffic Volumes	76	175	35	42	573	429	407	772	159	84	896	102
Pedestrians												
Conflicting Pedestrians	0		0	0		0	0		0	0		0
Heavy Vehicles	3	3	1	0	5	15	14	6	3	0	14	2
Heavy Vehicle %	4%	2%	3%	2%	2%	3%	3%	2%	2%	2%	2%	2%
Peak Hour Factor		0.89			0.93			0.89			0.91	
Currently Under Construction Rock Springs Park				1			1					
Adjusted 2017 Volumes	76	175	35	43	573	429	408	772	159	84	896	102
Annual Growth Rate	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Growth Factor	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010
Currently Under Construction DRI #2563 (Truck Trips)	0	0	0	0	0	6	19	0	0	0	0	1
Currently Under Construction Warehouse DRI #2563 (Car Trips	0	4	0	1	1	13	42	0	0	0	0	4
Warehouse (under construction in 2016)	0	0	0	0	0	3	9	0	0	0	0	1
Warehouse (under construction in 2016)	0	2	0	1	1	6	21	0	0	0	0	2
2019 Background Traffic	77	183	35	45	581	461	503	780	161	85	905	111
2019 No-Build Heavy Vehicle %	4%	2%	3%	0%	1%	5%	7%	1%	2%	0%	2%	3%
Project Trips (Future Development Only)												
Trip Distribution IN							80%					10%
Trip Distribution OUT				10%		80%						
Truck Trips	0	0	0	1	0	6	11	0	0	0	0	1
Trip Distribution IN		5%					55%					5%
Trip Distribution OUT				5%	5%	45%						
Car Trips	0	2	0	1	1	7	19	0	0	0	0	2
Total Project Trips	0	2	0	2	1	13	30	0	0	0	0	3
2019 Buildout Total	77	185	35	47	582	474	533	780	161	85	905	114
2019 Buildout Heavy Vehicle %	4%	2%	3%	4%	2%	5%	5%	2%	2%	2%	2%	3%

PM PEAK HOUR

Description	Old Peachtree Road Northbound			Old Peachtree Road Southbound			Lawerenceville-Suwanee Rd Eastbound			Lawerenceville-Suwanee Rd Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed 2017 Traffic Volumes	270	733	51	139	305	359	569	919	81	95	768	55
Pedestrians												
Conflicting Pedestrians	0		0	0		0	0		0	0		0
Heavy Vehicles	4	6	3	0	9	9	16	8	0	1	8	3
Heavy Vehicle %	2%	2%	6%	2%	3%	3%	3%	2%	2%	2%	2%	5%
Peak Hour Factor		0.91			0.91			0.92			0.95	
Currently Under Construction Rock Springs Park		4		8	9	9	4					5
Adjusted 2017 Volumes	270	737	51	147	314	368	573	919	81	95	768	60
Annual Growth Rate	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Growth Factor	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010
Currently Under Construction DRI #2563 (Truck Trips)	0	0	0	1	0	17	6	0	0	0	0	0
Currently Under Construction Warehouse DRI #2563 (Car Trips	0	1	0	3	3	36	13	0	0	0	0	1
Warehouse (under construction in 2016)	0	0	0	0	0	3	9	0	0	0	0	1
Warehouse (under construction in 2016)	0	1	0	1	1	15	6	0	0	0	0	1
2019 Background Traffic	273	746	52	153	321	443	613	928	82	96	776	64
2019 No-Build Heavy Vehicle %	1%	1%	6%	1%	3%	6%	4%	1%	0%	1%	1%	5%
Project Trips (Future Development Only)												
Trip Distribution IN							80%					10%
Trip Distribution OUT				10%		80%						
Truck Trips	0	0	0	2	0	15	7	0	0	0	0	1
Trip Distribution IN		5%					55%					5%
Trip Distribution OUT				5%	5%	45%						
Car Trips	0	1	0	2	2	18	10	0	0	0	0	1
Total Project Trips	0	1	0	4	2	33	17	0	0	0	0	2
2019 Buildout Total	273	747	52	157	323	476	630	928	82	96	776	66
2019 Buildout Heavy Vehicle %	2%	2%	6%	3%	3%	5%	4%	2%	2%	2%	2%	7%

INTERSECTION VOLUME DEVELOPMENT

Intersection #3: Old Peachtree Road @ Collins Hill Road / Rock Springs Park Dwy

AM PEAK HOUR

Description	Collins Hill Road Northbound			Rock Springs Park Dwy Southbound			Old Peachtree Road Eastbound			Old Peachtree Road Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed 2017 Traffic Volumes	350	0	165					184	92	155	961	
Pedestrians												
Conflicting Pedestrians	0		0	0		0	0		0	0		0
Heavy Vehicles	0	0	0	0	0	0	0	0	1	0	1	0
Heavy Vehicle %	2%	0%	2%	0%	0%	0%	0%	2%	2%	2%	2%	0%
Peak Hour Factor		0.82			0.88			0.89			0.96	
Currently Under Construction Rock Springs Park	0	1	0	1	0	1	1	0	0	0	0	1
Adjusted 2017 Volumes	350	1	165	1	0	1	1	184	92	155	961	1
Annual Growth Rate	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Growth Factor	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010
Currently Under Construction DRI #2563 (Truck Trips)	1	0	0	0	0	0	0	1	0	0	4	0
Currently Under Construction Warehouse DRI #2563 (Car Trips	4	0	0	0	0	0	0	7	1	0	23	0
Warehouse (under construction in 2016)	1	0	0	0	0	0	0	1	0	0	2	0
Warehouse (under construction in 2016)	2	0	0	0	0	0	0	3	1	0	11	0
2019 Background Traffic	362	1	167	1	0	1	1	198	95	157	1,011	1
2019 No-Build Heavy Vehicle %	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%
Project Trips (Future Development Only)												
Trip Distribution IN											10%	
Trip Distribution OUT								10%				
Truck Trips	0	0	0	0	0	0	0	1	0	0	1	0
Trip Distribution IN	5%										30%	
Trip Distribution OUT								30%	5%			
Car Trips	2	0	0	0	0	0	0	5	1	0	11	0
Total Project Trips	2	0	0	0	0	0	0	6	1	0	12	0
2019 Buildout Total	364	1	167	1	0	1	1	204	96	157	1,023	1
2019 Buildout Heavy Vehicle %	2%	0%	2%	0%	0%	0%	0%	2%	2%	2%	2%	0%

PM PEAK HOUR

Description	Collins Hill Road Northbound			Rock Springs Park Dwy Southbound			Old Peachtree Road Eastbound			Old Peachtree Road Westbound		
	Left	Through	Right	Left	Through	Right	Left	Through	Right	Left	Through	Right
Observed 2017 Traffic Volumes	199	0	256					1,064	290	190	337	
Pedestrians												
Conflicting Pedestrians	0		0	0		0	0		0	0		0
Heavy Vehicles	1	0	0	0	0	0	0	0	0	0	0	0
Heavy Vehicle %	2%	0%	2%	0%	0%	0%	0%	2%	2%	2%	2%	0%
Peak Hour Factor		0.84			0.88			0.96			0.87	
Currently Under Construction Rock Springs Park	0	5	0	26	12	26	13	0	0	0	0	13
Adjusted 2017 Volumes	199	5	256	26	12	26	13	1064	290	190	337	13
Annual Growth Rate	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%	0.5%
Growth Factor	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010	1.010
Currently Under Construction DRI #2563 (Truck Trips)	0	0	0	0	0	0	0	3	1	0	1	0
Currently Under Construction Warehouse DRI #2563 (Car Trips	1	0	0	0	0	0	0	20	3	0	7	0
Warehouse (under construction in 2016)	1	0	0	0	0	0	0	1	0	0	2	0
Warehouse (under construction in 2016)	1	0	0	0	0	0	0	8	1	0	3	0
2019 Background Traffic	204	5	259	26	12	26	13	1,107	298	192	353	13
2019 No-Build Heavy Vehicle %	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Project Trips (Future Development Only)												
Trip Distribution IN											10%	
Trip Distribution OUT								10%				
Truck Trips	0	0	0	0	0	0	0	2	0	0	1	0
Trip Distribution IN	5%										30%	
Trip Distribution OUT								30%	5%			
Car Trips	1	0	0	0	0	0	0	12	2	0	5	0
Total Project Trips	1	0	0	0	0	0	0	14	2	0	6	0
2019 Buildout Total	205	5	259	26	12	26	13	1,121	300	192	359	13
2019 Buildout Heavy Vehicle %	2%	0%	2%	0%	0%	0%	0%	2%	2%	2%	2%	0%

Appendix E
Programmed Project Fact Sheets

AR-ML-410

Atlanta Region's Plan RTP (2016) PROJECT FACT SHEET

Short Title	I-85 NORTH MANAGED LANES - INCLUDING SOUTHBOUND AUXILIARY LANE FROM SR 20 TO SR 317 AND NORTHBOUND AUXILIARY LANE FROM SR 20 TO SR 324 (GRAVEL SPRINGS ROAD) FROM OLD PEACHTREE ROAD TO HAMILTON MILL ROAD
GDOT Project No.	110600-
Federal ID No.	NHIM0-0085-02(164)
Status	Programmed
Service Type	Roadway / Managed Lanes
Sponsor	GDOT
Jurisdiction	Regional - Northeast
Analysis Level	In the Region's Air Quality Conformity Analysis

Existing Thru Lane	0	**LCI**		**Network Year**	2020
Planned Thru Lane	2	**Flex**		**Corridor Length**	14.0 miles

Detailed Description and Justification

Project involves the construction of a single concurrent managed lane in each direction along I-85 from Old Peachtree Road to Hamilton Mill Road. The project also involves the reconstruction of the I-85/I-985 interchange to allow for a right-hand general purpose lane exit from northbound I-85 to northbound I-985 and the conversion of the existing left-hand exit to a northbound I-85 to northbound I-985 Managed Lane system-level exit. Managed lanes along I-985 would extend north of I-85 a distance sufficient to taper them out - a distance of approximately 1.5 - 2.0 miles. The project would extend concurrent Managed Lanes along I-85 North, which have recently been extended as HOV2+ lanes from SR 316 to Old Peachtree Road as part of the I-85/SR 316 interchange project and which will be converted to HOT3+ lanes as part of the ongoing HOV2HOT conversion initiative. One new southbound general purpose/auxiliary lane will be constructed from SR 20 to SR 317. And one new northbound general purpose/auxiliary lane will be constructed from SR 20 to Gravel Springs Road.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
PE	National Highway System	AUTH	2001	**$7,900,000**	~~$6,320,000~~	~~$1,580,000~~	~~$0,000~~	~~$0,000~~
PE	National Highway Performance Program (NHPP)	AUTH	2013	**$1,090,184**	~~$872,147~~	~~$218,037~~	~~$0,000~~	~~$0,000~~
CST	National Highway Performance Program (NHPP)	AUTH	2013	**$6,484,816**	~~$5,187,853~~	~~$1,296,963~~	~~$0,000~~	~~$0,000~~
CST	Congestion Mitigation & Air Quality Improvement (CMAQ)	AUTH	2015	**$82,510,005**	~~$66,008,004~~	~~$16,502,001~~	~~$0,000~~	~~$0,000~~
CST	National Highway Performance Program (NHPP)	AUTH	2015	**$73,129,756**	~~$58,503,805~~	~~$14,625,951~~	~~$0,000~~	~~$0,000~~
CST	National Highway Performance Program (NHPP)	AUTH	2017	**$3,000,000**	~~$2,400,000~~	~~$600,000~~	~~$0,000~~	~~$0,000~~
CST	National Highway Performance Program (NHPP)		2018	**$13,000,000**	$10,400,000	$2,600,000	$0,000	$0,000
				$187,114,761	**$149,691,809**	**$37,422,952**	**$0,000**	**$0,000**

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquistion
UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases

? For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.

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AR-ML-420

Atlanta Region's Plan RTP (2016) PROJECT FACT SHEET

Short Title	I-85 NORTH MANAGED LANES FROM I-285 TO OLD PEACHTREE ROAD
GDOT Project No.	TBD
Federal ID No.	N/A
Status	Long Range
Service Type	Roadway / Managed Lanes
Sponsor	GDOT
Jurisdiction	Regional - Northeast
Analysis Level	In the Region's Air Quality Conformity Analysis

Existing Thru Lane	2	**LCI**		**Network Year**	2040
Planned Thru Lane	4	**Flex**		**Corridor Length**	17.0 miles

Detailed Description and Justification

This is a managed lanes project along I-85 North fromm I-285 to Old Peachtree Road.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
ALL	General Federal Aid 2022-2040		LR 2031-2040	**$183,000,000**	$146,400,000	$36,600,000	$0,000	$0,000
ALL	Toll Revenue Bonds		LR 2031-2040	**$150,000,000**	$0,000	$0,000	$150,000,000	$0,000
				$333,000,000	**$146,400,000**	**$36,600,000**	**$150,000,000**	**$0,000**

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquistion
UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases

? For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.

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GW-020D

Atlanta Region's Plan RTP (2016) PROJECT FACT SHEET

Short Title	SR 20 (BUFORD DRIVE) WIDENING FROM I-85 NORTH TO ROCK SPRINGS ROAD
GDOT Project No.	0007850
Federal ID No.	CSSTP-0007-00(850)
Status	Long Range
Service Type	Roadway / General Purpose Capacity
Sponsor	GDOT
Jurisdiction	Regional - Northeast
Analysis Level	In the Region's Air Quality Conformity Analysis

Existing Thru Lane	4	**LCI**	
Planned Thru Lane	8	**Flex**	

Network Year	2030
Corridor Length	0.8 miles

Detailed Description and Justification

This project involves adding 2 lanes in each direction along SR 20 (Buford Drive) between I-85 North and Rock Springs Road.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
ALL	General Federal Aid 2022-2040		LR 2022-2030	**$14,281,187**	$11,424,950	$2,856,237	$0,000	$0,000
				$14,281,187	**$11,424,950**	**$2,856,237**	**$0,000**	**$0,000**

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquistion
UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases

? For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.

ARC

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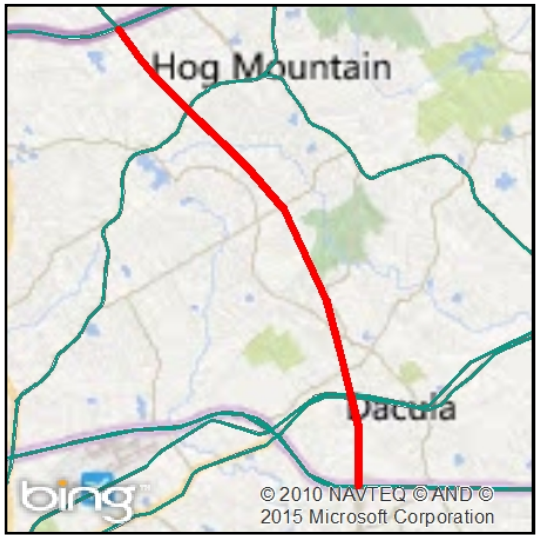
GW-308B

Atlanta Region's Plan RTP (2016) PROJECT FACT SHEET

Short Title	SUGARLOAF PARKWAY EXTENSION: PHASE 2 - NEW ALIGNMENT FROM SR 316 EAST OF LAWRENCEVILLE TO I-85
GDOT Project No.	0006924
Federal ID No.	CSSTP-0006-00(924)
Status	Programmed
Service Type	Roadway / General Purpose Capacity
Sponsor	Gwinnett County
Jurisdiction	Regional - Northeast
Analysis Level	In the Region's Air Quality Conformity Analysis



Existing Thru Lane	0	**LCI**		**Network Year**	2040
Planned Thru Lane	4	**Flex**		**Corridor Length**	6.8 miles

Detailed Description and Justification

This Buford/Dacula/East-Cross County Connector project consists of constructing a new 6.8 miles roadway from SR 316 east of Lawrenceville to I 85. The road will include a 4 lane divided highway with a raised median, bicycle and pedestrian facilities, turn lanes as well as grade separation at I-85, SR 124, Old Fountain Rd., Old Peachtree Rd, Fence Rd, SR 8, and SR 316. The project will add need roadway capacity and address peak period congestion in the northern part of the county experiencing rapid population and employment growth.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
PE	Local Jurisdiction/Municipality Funds	AUTH	2006	**$10,000,000**	~~$0,000~~	~~$0,000~~	~~$0,000~~	~~$10,000,000~~
PE-OV	STP - Statewide Flexible (GDOT)	AUTH	2011	**$50,000**	~~$40,000~~	~~$10,000~~	~~$0,000~~	~~$0,000~~
ROW	Local Jurisdiction/Municipality Funds	AUTH	2010	**$17,000,000**	~~$0,000~~	~~$0,000~~	~~$0,000~~	~~$17,000,000~~
ROW	Federal Earmark Funding		2019	**$5,624,375**	$4,499,500	$0,000	$0,000	$1,124,875
ROW	Local Jurisdiction/Municipality Funds		2019	**$39,597,000**	$0,000	$0,000	$0,000	$39,597,000
UTL	Local Jurisdiction/Municipality Funds		LR 2031-2040	**$10,355,000**	$0,000	$0,000	$0,000	$10,355,000
CST	General Federal Aid 2022-2040		LR 2031-2040	**$179,647,295**	$143,717,836	$35,929,459	$0,000	$0,000
				$262,273,670	**$148,257,336**	**$35,939,459**	**$0,000**	**$78,076,875**

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquistion
UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases

? For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.

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GW-308C

Atlanta Region's Plan RTP (2016) PROJECT FACT SHEET

Short Title	SUGARLOAF PARKWAY EXTENSION: PHASE 3 - NEW ALIGNMENT FROM I-85 TO PEACHTREE INDUSTRIAL BOULEVARD
GDOT Project No.	0006925
Federal ID No.	CSSTP-0006-00(925)
Status	Programmed
Service Type	Roadway / General Purpose Capacity
Sponsor	Gwinnett County
Jurisdiction	Gwinnett County
Analysis Level	In the Region's Air Quality Conformity Analysis

Existing Thru Lane	0	**LCI**		**Network Year**	2040
Planned Thru Lane	4	**Flex**		**Corridor Length**	5.8 miles

Detailed Description and Justification

This East-Cross County Connector project consists of constructing a new roadway from I-85 to Peachtree Industrial Blvd. The road will include a 4 lane divided highway with a raised median, bicycle and pedestrian facilities, turn lanes as well as grade separation at Norfolk Southern Railroad, Buford Hwy, Satellite Blvd. and I-985. The project will add roadway capacity and address peak period congestion in the northern part of the county experiencing rapid population and employment growth.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
PE	Local Jurisdiction/Municipality Funds	AUTH	2006	**$8,000,000**	~~$0,000~~	~~$0,000~~	~~$0,000~~	~~$8,000,000~~
ROW	Local Jurisdiction/Municipality Funds	AUTH	2010	**$8,000,000**	~~$0,000~~	~~$0,000~~	~~$0,000~~	~~$8,000,000~~
UTL	Local Jurisdiction/Municipality Funds		LR 2031-2040	**$6,106,500**	$0,000	$0,000	$0,000	$6,106,500
CST	Local Jurisdiction/Municipality Funds		LR 2031-2040	**$109,415,586**	$0,000	$0,000	$0,000	$109,415,586
				$131,522,086	**$0,000**	**$0,000**	**$0,000**	**$131,522,086**

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquistion
UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases

? For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.

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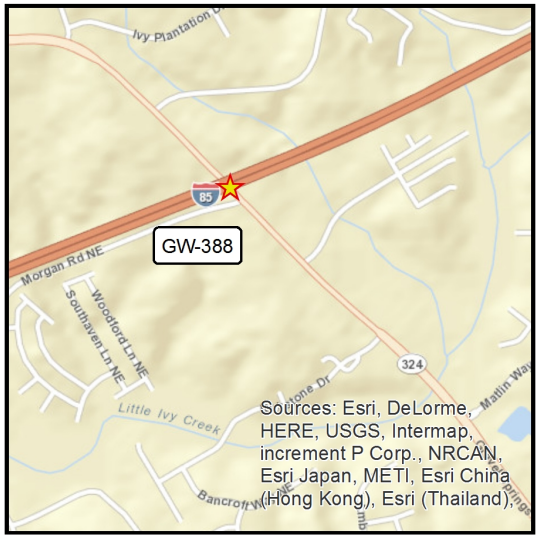
GW-388

Atlanta Region's Plan RTP (2016) PROJECT FACT SHEET

Short Title	I-85 NORTH - NEW INTERCHANGE AT SR 324 (GRAVEL SPRINGS ROAD)
GDOT Project No.	0012698
Federal ID No.	N/A
Status	Programmed
Service Type	Roadway / Interchange Capacity
Sponsor	Gwinnett County
Jurisdiction	Gwinnett County
Analysis Level	In the Region's Air Quality Conformity Analysis



Existing Thru Lane	N/A	**LCI**		**Network Year**	2024
Planned Thru Lane	N/A	**Flex**		**Corridor Length**	N/A miles

Detailed Description and Justification

The project serves trips to/from multiple jurisdictions including Gwinnett, Hall, Barrow and Jackson Counties and also serves freight traffic traveling in the southeastern United States. This new interchange will provide access to existing development within the area and provide a solution to address the anticipated increase in local traffic volume (including trucks) resulting from planned development. The project serves origins or destinations of trips to/from and within major existing and proposed employment and activity centers throughout the region. The project improves one of the most congested regional corridors as determined through ARC's Congestion Management Process. SR 324 (Gravel Springs Road) is a facility on the Regional Strategic Transportation System. ARC regional travel demand model calculations indicate that the completed project will reduce congestion on Hamilton Mill Road north of I?85 by 15% compared to future conditions without the project. I-85 North is included on GDOT's official Freight Corridor Network and therefore designated as a key strategic highway route that handles the flow of freight to and from locations in Georgia.The Interchange Justification Report (IJR) has been approved by both GDOT and FHWA. The selected alternative is full diamond interchange. The recent road widening on SR 324 and new bridge construction over I-85 were designed and constructed to accommodate a future interchange at this location. Also, right-of-way acquisitions for the roadway and bridge projects considered a future interchange at this location.

Phase Status & Funding Information		**Status**	**FISCAL YEAR**	**TOTAL PHASE COST**	**BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE**			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
PE	Local Jurisdiction/Municipality Funds	AUTH	2014	**$1,000,000**	~~$0,000~~	~~$0,000~~	~~$0,000~~	~~$1,000,000~~
PE	STP - Statewide Flexible (GDOT)	AUTH	2015	**$50,000**	~~$40,000~~	~~$10,000~~	~~$0,000~~	~~$0,000~~
ROW	Repurposed Earmark		2017	**$3,159,760**	$2,159,760	$1,000,000	$0,000	$0,000
ROW	Surface Transportation Block Grant (STBG) Program - Urban (>200K) (ARC)		2017	**$5,000,000**	$4,000,000	$1,000,000	$0,000	$0,000
UTL	Local Jurisdiction/Municipality Funds		2019	**$82,000**	$0,000	$0,000	$0,000	$82,000
CST	Surface Transportation Block Grant (STBG) Program Flex (GDOT)		2019	**$13,441,856**	$10,753,485	$2,688,371	$0,000	$0,000
				$22,733,616	**$16,953,245**	**$4,698,371**	**$0,000**	**$1,082,000**

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquistion
UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases

? For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.

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GW-390C

Atlanta Region's Plan RTP (2016) PROJECT FACT SHEET

Short Title	GWINNETT COUNTY ATMS/ITS INFRASTRUCTURE EXPANSION - OLD PEACHTREE ROAD FROM SUGARLOAF PARKWAY TO NORTH BROWN ROAD/NORTHBROOK PARKWAY
GDOT Project No.	0013324
Federal ID No.	N/A
Status	Programmed
Service Type	Roadway / Operations & Safety
Sponsor	Gwinnett County
Jurisdiction	Gwinnett County
Analysis Level	Exempt from Air Quality Analysis (40 CFR 93)

Existing Thru Lane	N/A	**LCI**		**Network Year**	TBD
Planned Thru Lane	N/A	**Flex**		**Corridor Length**	3.3 miles

Detailed Description and Justification

In addition to the ATMS/ITS infrastructure already in place, the proposed CMAQ-funded ATMS/ITS expansion enables critical monitoring ability of almost every major travel corridor in Gwinnett County, significantly improving travel in the northeast Atlanta region. Traffic signalization and intersection improvement projects are designed to reduce traffic congestion, increase travel speeds, and/or reduce delay thus meeting both goals of the CMAQ program: decreasing congestion and reducing air pollution. Interconnecting traffic signals improves both peak and off peak travel speeds and reduces congestion at intersections. Fiber optic cable installation for traffic signal optimization will occur along four major travel corridors in Gwinnett County: Old Peachtree Road, from North Brown Road to Sugarloaf Parkway; Ronald Reagan Parkway, from SR 124 to US 29; Five Forks Trickum Road, from Sugarloaf Parkway to Rockbridge Road; SR 316, from Hi-Hope Road to Barrow County line.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
PE	Local Jurisdiction/Municipality Funds	AUTH	2015	**$200,000**	~~$0,000~~	~~$0,000~~	~~$0,000~~	~~$200,000~~
CST	Congestion Mitigation & Air Quality Improvement (CMAQ)		2018	**$696,413**	$557,130	$0,000	$0,000	$139,283
CST	Surface Transportation Block Grant (STBG) Program - Urban (>200K) (ARC)		2018	**$76,875**	$61,500	$0,000	$0,000	$15,375
				$973,288	**$618,630**	**$0,000**	**$0,000**	**$354,658**

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquistion
UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases

? For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.

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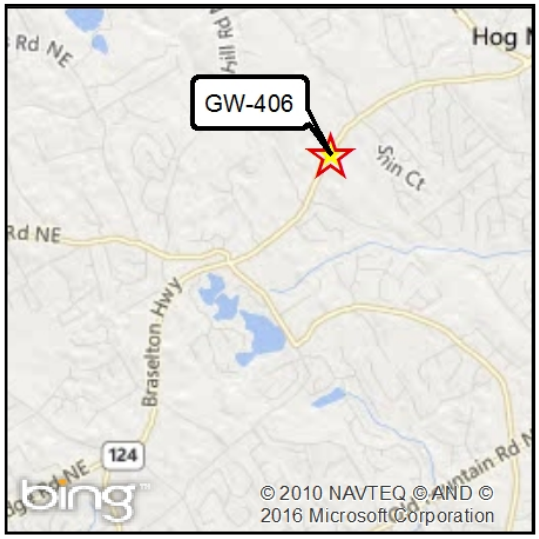
GW-406

Atlanta Region's Plan RTP (2016) PROJECT FACT SHEET

Short Title	SR 324 IMPROVEMENTS AND WIDENING AT SR 124
GDOT Project No.	TBD
Federal ID No.	N/A
Status	Programmed
Service Type	Roadway / General Purpose Capacity
Sponsor	Gwinnett County
Jurisdiction	Gwinnett County
Analysis Level	In the Region's Air Quality Conformity Analysis



Existing Thru Lane	2	**LCI**		**Network Year**	2020
Planned Thru Lane	3/4	**Flex**		**Corridor Length**	0.6 miles

Detailed Description and Justification

This project will provide operational improvements at the interseciton of SR 324 at SR 124. Additionally, the project includes widening SR 324 east and west of its intersection with SR 124 from 2 to 3 & 4 lanes.

Phase Status & Funding Information		Status	FISCAL YEAR	TOTAL PHASE COST	BREAKDOWN OF TOTAL PHASE COST BY FUNDING SOURCE			
					FEDERAL	STATE	BONDS	LOCAL/PRIVATE
PE	Local Jurisdiction/Municipality Funds	AUTH	2016	**$300,000**	~~$0,000~~	~~$0,000~~	~~$0,000~~	~~$300,000~~
ROW	Local Jurisdiction/Municipality Funds		2017	**$900,000**	$0,000	$0,000	$0,000	$900,000
CST	Local Jurisdiction/Municipality Funds		2018	**$1,800,000**	$0,000	$0,000	$0,000	$1,800,000
				$3,000,000	**$0,000**	**$0,000**	**$0,000**	**$3,000,000**

SCP: Scoping PE: Preliminary engineering / engineering / design / planning PE-OV: GDOT oversight services for engineering ROW: Right-of-way Acquistion
UTL: Utility relocation CST: Construction / Implementation ALL: Total estimated cost, inclusive of all phases

? For additional information about this project, please call (404) 463-3100 or email transportation@atlantaregional.com.

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Appendix F

Traffic Memorandum for the Proposed Rock Springs Park development

GCA

Memorandum

To: David Blackley, ASLA, LEED AP – McFarland Dyer & Associates, Inc.
From: Naveed Jaffar, P.E., PTOE
CC:
Date: October 22, 2014
Re: Left Turn Warrant Analysis for the Intersection of Old Peachtree Road at Collins Hill Road Gwinnett County, Georgia

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The purpose of this memorandum is to document the analyses performed for the intersection of Old Peachtree Road at Collins Hill Road in Gwinnett County, Georgia in order to determine whether left-turn phases are warranted with the development of the proposed Rock Springs Park. Rock Springs Park is a 50-acre park on the northside of Old Peachtree Road. Access to the park will be via a driveway on Old Peachtree Road. The driveway will form the forth leg of the existing three-leg intersection of Old Peachtree Road at Collins Hill Road. The intersection will be analyzed for left turn phases for the proposed conditions with the proposed park open and access provided via Old Peachtree Road.

Analysis Methodology

Warrant analysis for left turn phases was performed for the intersection of Old Peachtree Road at Collins Hill Road using the criteria outlined in *GDOT Policy 6785-2-Left Turn Phasing.* Based on *GDOT Policy 6785-2*, **protected left-turn phasing** should be **considered** in **the following criteria:**

1. The **cross-product,** one hour left turn **volume** times the **opposing** one **hour through movement volume divided** by the **number** of lanes for **the opposing through movement,** is **greater** than **50,000.**
2. The left-turn **volume exceeds** 125 **vehicles** per **hour.**
3. **Correctable crashes** equal or **exceed** 4 **crashes** in one year or 6 **crashes in** two **years.**
4. **Additional criteria including** but not limited to sight **distance,** speed of **opposing traffic,** number of left turn lanes, number of **opposing through lanes,** delay, the angle of the left turn and **if the** signal is **included** in **a coordinated signal system.**

Existing Conditions and Traffic Volumes

Old Peachtree Road and Collins Hill Road intersect to form a three-leg signalized intersection. Both Old Peachtree Road and Collins Hill Road are two-lane roadways. The eastbound Old Peachtree Road approach has a through lane and a right-turn lane. The westbound Old Peachtree Road approach has a left-turn lane and a through lane. The northbound Collins Hill Road approach has a left-turn lane and a right-turn lane. The westbound approach has a protected/permissive left-turn phase.

Weekday traffic counts were collected at the study intersection on Thursday, October 25, 2014. Table 1 shows the A.M., midday and P.M. peak hour traffic volumes.

Table 1 - 2014 Existing Peak Hour Traffic Volumes

Peak Hour	Collins Hill Rd						Old Peachtree Rd					
	nb-l	nb-t	nb-r	sb-l	sb-t	sb-r	eb-l	eb-t	eb-r	wb-l	wb-t	wb-r
AM	376	0	169	0	0	0	0	168	99	183	913	0
Midday	185	0	171	0	0	0	0	687	168	151	291	0
PM	203	0	335	0	0	0	0	1,051	278	220	374	0

Proposed Rock Springs Park Development

The Rock Spring Park development will consist of: an approximately 50-acre county park and three soccer fields. Rock Springs Park will have access to the external road network via a full movement driveway on Old Peachtree Road directly opposite Collins Hill Road. The park access driveway will form the northern forth-leg at the signalized intersection of Old Peachtree Road at Collins Hill Road.

The estimated trip generation for Rock Springs Park was developed using the *Institute of Transportation Engineers (ITE) Trip Generation*. This is the standard methodology used to calculate new vehicular trips for new developments. The results of the trip generation are shown in Table 1.

Table 1 – Trip Generation

Land Use (ITE Code)	Intensity	Daily			AM Peak Hour Adjacent Street			PM Peak Hour Adjacent Street (Midday)			PM Peak Hour Generator		
		In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
County Park (412)	50 acres	57	57	114	1	0	1	1	2	3	10	20	30
Soccer Complex (488)	3 Fields	107	107	214	2	2	4	43	19	62	21	44	65
TOTAL		**164**	**164**	**328**	**3**	**2**	**5**	**44**	**21**	**65**	**31**	**64**	**95**

The trip distribution is the percentage of site traffic that travels on each of the various roadways to and from a site. The trip distribution was based on the existing traffic volume patterns at the study intersection. The trip distribution was applied to the AM, midday and PM peak hour site generated trips in order to develop the AM, midday and PM peak hour site generated volumes at the study intersection. Since the *Trip Generation* manual does not provide rates for the midday period for these land uses, and that the midday trip generation is anticipated to be less the P.M. peak hour, the P.M. peak hour of adjacent street traffic generation was applied to the midday peak hour and the P.M. peak hour of traffic generator was applied to the P.M. peak hour. Also, the A.M. peak hour of adjacent street traffic generation was applied to the A.M. peak hour. The expected trips generated from the proposed development are shown in Table 2.

Table 2 – Rock Springs Park Traffic Volumes

Peak Hour	Collins Hill Rd/Rock Springs Park driveway						Old Peachtree Rd					
	nb-l	nb-t	nb-r	sb-l	sb-t	sb-r	eb-l	eb-t	eb-r	wb-l	wb-t	wb-r
AM	0	1	0	1	0	1	1	0	0	0	0	1
Midday	0	8	0	8	5	8	18	0	0	0	0	18
PM	0	5	0	26	12	26	13	0	0	0	0	13

Proposed Traffic Volumes

The estimated traffic from Rock Springs Park development was added to the existing traffic volumes to represent the traffic expected in the area in the future when the development is fully complete. The proposed traffic volumes are shown in Table 3.

Table 3 – Proposed Peak Hour Traffic Volumes

Peak Hour	Collins Hill Rd/Rock Springs Park driveway						Old Peachtree Rd					
	nb-l	nb-t	nb-r	sb-l	sb-t	sb-r	eb-l	eb-t	eb-r	wb-l	wb-t	wb-r
AM	376	1	169	1	0	1	1	168	99	183	913	1
Midday	185	8	171	8	5	8	18	687	168	151	291	18
PM	203	5	335	26	12	26	13	1,051	278	220	374	13

Left Turn Warrant Analysis

Warrant analysis for left turn phases was performed for the intersection of Old Peachtree Road at Collins Hill Road/Rock Springs Park driveway using the proposed peak hour traffic volumes shown in Table 3. Table 4 shows Criteria 1, the cross product volumes, as defined in *GDOT Policy 6785-2-Left Turn Phasing.*

Table 4 – Left Turn Warrant Analysis – Cross Product Volumes

Time	Street	Direction of Travel	Left Turn Volume	Opposing Conflict Volume	Number of Opposing Lanes	Cross Product	Criteria Met
7:00 AM - 8:00 AM	Old Peachtree Rd	EB	1	913	1	913	**NO**
		WB	183	168	1	30,744	**NO**
	Collins Hill Rd	NB	376	0	1	0	**NO**
	Park entrance drv	SB	1	1	1	1	**NO**
2:00 PM - 3:00 PM	Old Peachtree Rd	EB	18	291	1	5,238	**NO**
		WB	151	687	1	103,737	**YES**
	Collins Hill Rd	NB	185	5	1	925	**NO**
	Park entrance drv	SB	8	8	1	64	**NO**
6:00 PM - 7:00 PM	Old Peachtree Rd	EB	13	374	1	4,862	**NO**
		WB	220	1,051	1	231,220	**YES**
	Collins Hill Rd	NB	203	12	1	2,436	**NO**
	Park entrance drv	SB	26	5	1	130	**NO**

As shown in Table 4, the intersection meets Criteria 1 for left turn phases for the westbound Old Peachtree Road approach.

Criteria 2 of *GDOT Policy 6785-2-Left Turn Phasing* requires left turning volumes of 125 vehicles per hour. A review of the left turn volumes shown in Table 4 shows that the northbound Collins Hill Road approach and the westbound Old Peachtree Road approach meet the requirements of Criteria 2 for left turn phases.

Since the analysis conducted is for proposed conditions at the study intersection, Criteria 3, crash analysis, was not evaluated.

Similarly, Criteria 4, additional criteria was not evaluated as part of this analysis.

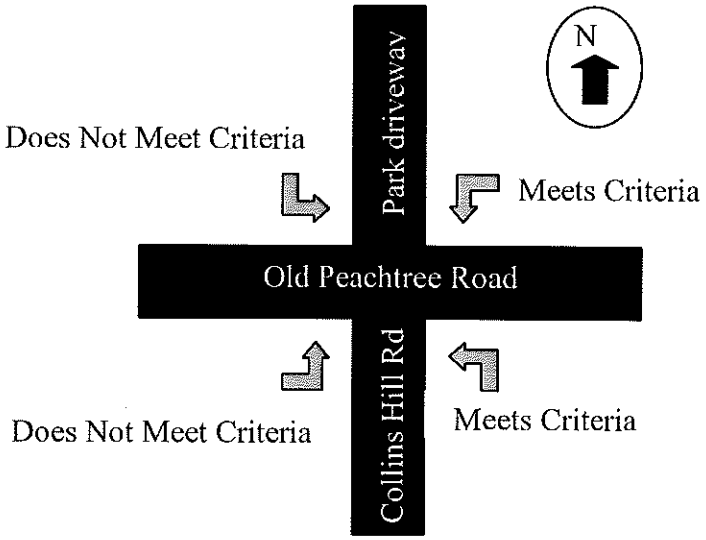
Summary

Based on the findings of this study, the intersection of Old Peachtree Road at Collins Hill Road/Rock Springs Park driveway meets the criteria for installing a protected/permissive left-turn phase for the Old Peachtree Road westbound approach; and the Collins Hill Road

northbound approach for the proposed conditions. Per current Gwinnett County DOT criteria, it is preferred to install a flashing yellow (FYA) left turn signal head where a protected/permissive left-turn operation is warranted.

However, the criteria for installing a protected/permissive left-turn phase is not met for the Old Peachtree Road eastbound approach; and the Rock Springs Park driveway southbound approach. Figure 1 summarizes the findings of the left-turn warrant analysis at the intersection of Old Peachtree Road at Collins Hill Road/Rock Springs Park driveway for the four approaches.

Figure 1: Summary of Left-Turn Warrant Analysis



Recommendations

It is recommended to install a flashing yellow left-turn signal head for the Collins Hill Road northbound approach and to replace the five section signal head for the Old Peachtree Road westbound approach with a flashing yellow left turn signal head.

APPENDIX

TRAFFIC COUNTS

Project ID: 14-9266-001
Location: Collins Hill Rd & Old Peachtree Rd
City: Suwanee

Day: Thursday
Date: 9/25/2014

Peak Start Times	
AM	7:00 AM
MD	10:00 AM
PM	3:00 PM

Groups Printed - Cars, PU, Vans - Heavy Trucks

	Collins Hill Rd Northbound					Collins Hill Rd Southbound					Old Peachtree Rd Eastbound					Old Peachtree Rd Westbound					
Start Time	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Int. Total
7:00 AM	127	0	48	0	175	0	0	0	0	0	0	30	22	0	52	34	210	0	0	244	471
7:15 AM	84	0	37	0	121	0	0	0	0	0	0	50	33	0	83	44	239	0	0	283	487
7:30 AM	77	0	41	0	118	0	0	0	0	0	0	46	19	0	65	44	215	0	0	259	442
7:45 AM	88	0	43	0	131	0	0	0	0	0	0	42	25	0	67	61	249	0	0	310	508
Total	376	0	169	0	545	0	0	0	0	0	0	168	99	0	267	183	913	0	0	1096	1908
8:00 AM	64	0	23	0	87	0	0	0	0	0	0	36	26	0	62	48	232	0	0	280	429
8:15 AM	77	0	15	0	92	0	0	0	0	0	0	41	25	0	66	37	186	0	0	223	381
8:30 AM	67	0	33	0	100	0	0	0	0	0	0	47	19	0	66	40	189	0	0	229	395
8:45 AM	70	0	39	0	109	0	0	0	0	0	0	45	40	0	85	34	161	0	0	195	389
Total	278	0	110	0	388	0	0	0	0	0	0	169	110	0	279	159	768	0	0	927	1594
9:00 AM	56	0	28	0	84	0	0	0	0	0	0	49	24	0	73	41	139	0	0	180	337
9:15 AM	45	0	17	0	62	0	0	0	0	0	0	37	24	0	61	26	121	0	0	147	270
9:30 AM	70	0	27	0	97	0	0	0	0	0	0	55	17	0	72	21	117	0	0	138	307
9:45 AM	35	0	28	0	63	0	0	0	0	0	0	46	13	0	59	24	70	0	0	94	216
Total	206	0	100	0	306	0	0	0	0	0	0	187	78	0	265	112	447	0	0	559	1130
BREAK																					
10:00 AM	40	0	25	0	65	0	0	0	0	0	0	41	28	0	69	31	83	0	0	114	248
10:15 AM	40	0	25	0	65	0	0	0	0	0	0	33	20	0	53	19	62	0	0	81	199
10:30 AM	39	0	26	0	65	0	0	0	0	0	0	46	21	0	67	21	57	0	0	78	210
10:45 AM	46	0	24	0	70	0	0	0	0	0	0	51	31	0	82	12	68	0	0	80	232
Total	165	0	100	0	265	0	0	0	0	0	0	171	100	0	271	83	270	0	0	353	889
11:00 AM	33	0	28	0	61	0	0	0	0	0	0	54	25	0	79	16	70	0	0	86	226
11:15 AM	38	0	32	0	70	0	0	0	0	0	0	62	19	0	81	22	72	0	0	94	245
11:30 AM	31	0	33	0	64	0	0	0	0	0	0	83	25	0	108	23	80	0	0	103	275
11:45 AM	27	0	37	0	64	0	0	0	0	0	0	79	37	0	116	53	97	0	0	150	330
Total	129	0	130	0	259	0	0	0	0	0	0	278	106	0	384	114	319	0	0	433	1076
12:00 PM	44	0	32	0	76	0	0	0	0	0	0	118	33	0	151	40	82	0	0	122	349
12:15 PM	56	0	41	0	97	0	0	0	0	0	0	90	36	0	126	27	88	0	0	115	338
12:30 PM	38	0	35	0	73	0	0	0	0	0	0	110	41	0	151	31	91	0	0	122	346
12:45 PM	29	0	44	0	73	0	0	0	0	0	0	95	41	0	136	40	85	0	0	125	334
Total	167	0	152	0	319	0	0	0	0	0	0	413	151	0	564	138	346	0	0	484	1367
1:00 PM	33	0	45	0	78	0	0	0	0	0	0	96	21	0	117	35	85	0	0	120	315
1:15 PM	46	0	27	0	73	0	0	0	0	0	0	74	35	0	109	32	87	0	0	119	301
1:30 PM	28	0	28	0	56	0	0	0	0	0	0	124	21	0	145	35	61	0	0	96	297
1:45 PM	32	0	34	0	66	0	0	0	0	0	0	147	32	0	179	38	86	0	0	124	369
Total	139	0	134	0	273	0	0	0	0	0	0	441	109	0	550	140	319	0	0	459	1282
2:00 PM	46	0	36	0	82	0	0	0	0	0	0	148	33	0	181	32	65	0	0	97	360
2:15 PM	44	0	26	0	70	0	0	0	0	0	0	168	38	0	206	44	71	0	0	115	391
2:30 PM	65	0	61	0	126	0	0	0	0	0	0	170	46	0	216	36	77	0	0	113	455
2:45 PM	30	0	48	0	78	0	0	0	0	0	0	201	51	0	252	39	78	0	0	117	447
Total	185	0	171	0	356	0	0	0	0	0	0	687	168	0	855	151	291	0	0	442	1653
BREAK																					
3:00 PM	33	0	51	0	84	0	0	0	0	0	0	230	52	0	282	51	75	0	0	126	492
3:15 PM	49	0	74	0	123	0	0	0	0	0	0	233	50	0	283	54	82	0	0	136	542
3:30 PM	55	0	71	0	126	0	0	0	0	0	0	241	60	0	301	42	86	0	0	128	555
3:45 PM	44	0	68	0	112	0	0	0	0	0	0	226	53	0	279	53	92	0	0	145	536
Total	181	0	264	0	445	0	0	0	0	0	0	930	215	0	1145	200	335	0	0	535	2125
4:00 PM	41	0	50	0	91	0	0	0	0	0	0	199	62	0	261	35	72	0	0	107	459
4:15 PM	49	0	59	0	108	0	0	0	0	0	0	208	65	0	273	45	62	0	0	107	488
4:30 PM	37	0	59	0	96	0	0	0	0	0	0	258	72	0	330	56	86	0	0	142	568
4:45 PM	50	0	66	0	116	0	0	0	0	0	0	254	65	0	319	38	78	0	0	116	551
Total	177	0	234	0	411	0	0	0	0	0	0	919	264	0	1183	174	298	0	0	472	2066
5:00 PM	55	0	75	0	130	0	0	0	0	0	0	280	61	0	341	48	82	0	0	130	601
5:15 PM	50	0	82	0	132	0	0	0	0	0	0	279	55	0	334	47	93	0	0	140	606
5:30 PM	56	0	90	0	146	0	0	0	0	0	0	272	73	0	345	54	101	0	0	155	646
5:45 PM	41	0	89	0	130	0	0	0	0	0	0	269	58	0	327	56	68	0	0	124	581
Total	202	0	336	0	538	0	0	0	0	0	0	1100	247	0	1347	205	344	0	0	549	2434
6:00 PM	41	0	101	0	142	0	0	0	0	0	0	255	76	0	331	69	79	0	0	148	621
6:15 PM	64	0	81	0	145	0	0	0	0	0	0	255	58	0	313	56	91	0	0	147	605
6:30 PM	66	0	79	0	145	0	0	0	0	0	0	266	72	0	338	47	105	0	0	152	635
6:45 PM	32	0	74	0	106	0	0	0	0	0	0	275	72	0	347	48	99	0	0	147	600
Total	203	0	335	0	538	0	0	0	0	0	0	1051	278	0	1329	220	374	0	0	594	2461
Grand Total	2408	0	2235	0	4643	0	0	0	0	0	0	6514	1925	0	8439	1879	5024	0	0	6903	19985
Apprch %	51.9	0.0	48.1	0.0		0.0	0.0	0.0	0.0		0.0	77.2	22.8	0.0		27.2	72.8	0.0	0.0		
Total %	12.0	0.0	11.2	0.0	23.2	0.0	0.0	0.0	0.0	0.0	0.0	32.6	9.6	0.0	42.2	9.4	25.1	0.0	0.0	34.5	
Cars, PU, Vans	2405	0	2232	0	4637	0	0	0	0	0	0	6490	1923	0	8413	1879	5008	0	0	6887	19937
% Cars, PU, Vans	99.9	0.0	99.9	0.0	99.9	0.0	0.0	0.0	0.0	0.0	0.0	99.6	99.9	0.0	99.7	100.0	99.7	0.0	0.0	99.8	99.8
Heavy Trucks	3	0	3		6	0	0	0		0	0	24	2		26	0	16	0		16	48
%Heavy Trucks	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1	0.0	0.3	0.0	0.3	0.0	0.0	0.2	0.2

Project ID: 14-9266-001
Location: Collins Hill Rd & Old Peac
City: Suwanee

PEAK HOURS

Day: Thursday
Date: 9/25/2014

AM

	Collins Hill Rd Northbound				Collins Hill Rd Southbound				Old Peachtree Rd Eastbound				Old Peachtree Rd Westbound				
Start Time	Left	Thru	Rgt	App Total	Left	Thru	Rgt	App Total	Left	Thru	Rgt	App Total	Left	Thru	Rgt	App Total	nt. Total
Peak Hour Analysis from 07:00 AM to 10:00 AM																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
7:00 AM	127	0	48	175	0	0	0	0	0	30	22	52	34	210	0	244	471
7:15 AM	84	0	37	121	0	0	0	0	0	50	33	83	44	239	0	283	487
7:30 AM	77	0	41	118	0	0	0	0	0	46	19	65	44	215	0	259	442
7:45 AM	88	0	43	131	0	0	0	0	0	42	25	67	61	249	0	310	508
Total Volume	376	0	169	545	0	0	0	0	0	168	99	267	183	913	0	1096	1908
% App. Total	69.0	0.0	31.0	100	0.0	0.0	0.0	0	0.0	62.9	37.1	100	16.7	83.3	0.0	100	
PHF				0.779				0.000				0.804				0.884	
Cars, PU, Vans	376	0	169	545	0	0	0	0	0	167	99	266	183	913	0	1096	1907
% Cars, PU, Vans	100.0	0.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	99.4	100.0	99.6	100.0	100.0	0.0	100.0	99.9
Heavy Trucks	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1
%Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.4	0.0	0.0	0.0	0.0	0.1

NOON

	Collins Hill Rd Northbound				Collins Hill Rd Southbound				Old Peachtree Rd Eastbound				Old Peachtree Rd Westbound				
Start Time	Left	Thru	Rgt	App Total	Left	Thru	Rgt	App Total	Left	Thru	Rgt	App Total	Left	Thru	Rgt	App Total	nt. Total
Peak Hour Analysis from 10:00 AM to 03:00 PM																	
Peak Hour for Entire Intersection Begins at 02:00 PM																	
2:00 PM	46	0	36	82	0	0	0	0	0	148	33	181	32	65	0	97	360
2:15 PM	44	0	26	70	0	0	0	0	0	168	38	206	44	71	0	115	391
2:30 PM	65	0	61	126	0	0	0	0	0	170	46	216	36	77	0	113	455
2:45 PM	30	0	48	78	0	0	0	0	0	201	51	252	39	78	0	117	447
Total Volume	185	0	171	356	0	0	0	0	0	687	168	855	151	291	0	442	1653
% App. Total	52.0	0.0	48.0	100	0.0	0.0	0.0	0	0.0	80.4	19.6	100	34.2	65.8	0.0	100	
PHF				0.706				0.000				0.848				0.944	
Cars, PU, Vans	185	0	171	356	0	0	0	0	0	685	168	853	151	284	0	435	1644
% Cars, PU, Vans	100.0	0.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	99.7	100.0	99.8	100.0	97.6	0.0	98.4	99.5
Heavy Trucks	0	0	0	0	0	0	0	0	0	2	0	2	0	7	0	7	9
%Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.2	0.0	2.4	0.0	1.6	0.5

PM

	Collins Hill Rd Northbound				Collins Hill Rd Southbound				Old Peachtree Rd Eastbound				Old Peachtree Rd Westbound				
Start Time	Left	Thru	Rgt	App Total	Left	Thru	Rgt	App Total	Left	Thru	Rgt	App Total	Left	Thru	Rgt	App Total	nt. Total
Peak Hour Analysis from 03:00 PM to 07:00 PM																	
Peak Hour for Entire Intersection Begins at 06:00 PM																	
6:00 PM	41	0	101	142	0	0	0	0	0	255	76	331	69	79	0	148	621
6:15 PM	64	0	81	145	0	0	0	0	0	255	58	313	56	91	0	147	605
6:30 PM	66	0	79	145	0	0	0	0	0	266	72	338	47	105	0	152	635
6:45 PM	32	0	74	106	0	0	0	0	0	275	72	347	48	99	0	147	600
Total Volume	203	0	335	538	0	0	0	0	0	1051	278	1329	220	374	0	594	2461
% App. Total	37.7	0.0	62.3	100	0.0	0.0	0.0	0	0.0	79.1	20.9	100	37.0	63.0	0.0	100	
PHF				0.928				0.000				0.957				0.977	
Cars, PU, Vans	202	0	335	537	0	0	0	0	0	1049	278	1327	220	374	0	594	2458
% Cars, PU, Vans	99.5	0.0	100.0	99.8	0.0	0.0	0.0	0.0	0.0	99.8	100.0	99.8	100.0	100.0	0.0	100.0	99.9
Heavy Trucks	1	0	0	1	0	0	0	0	0	2	0	2	0	0	0	0	3
%Heavy Trucks	0.5	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.1

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Collins Hill Rd and Old Peachtree Rd , Suwanee

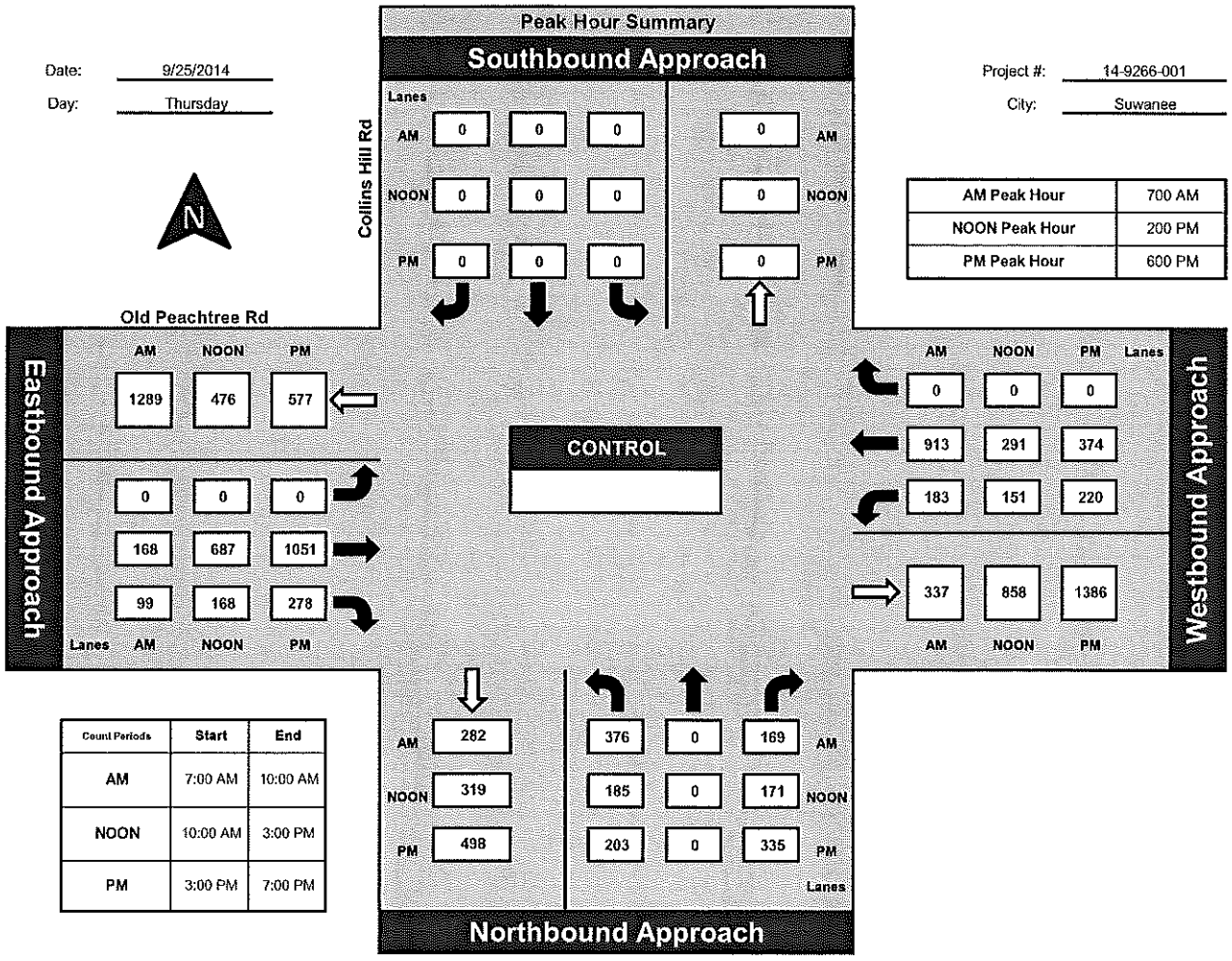
Date: 9/25/2014

Day: Thursday

Project #: 14-9266-001

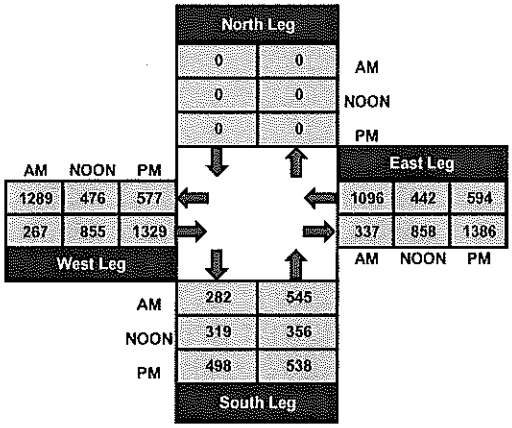
City: Suwanee

AM Peak Hour	700 AM
NOON Peak Hour	200 PM
PM Peak Hour	600 PM

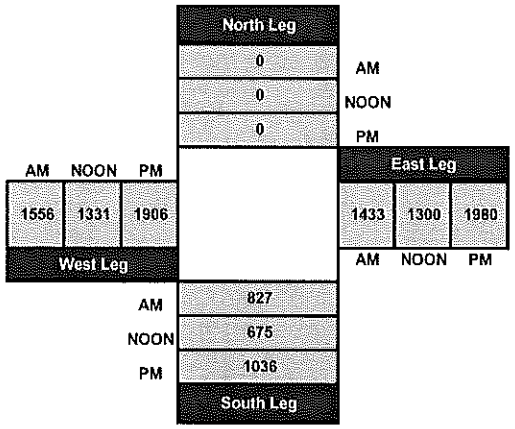


Count Periods	Start	End
AM	7:00 AM	10:00 AM
NOON	10:00 AM	3:00 PM
PM	3:00 PM	7:00 PM

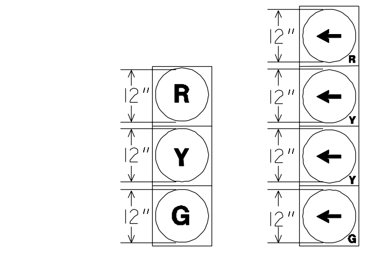
Total Ins & Outs



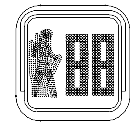
Total Volume Per Leg



PROPOSED SIGNAL HEADS W/YELLOW REFLECTIVE BORDERS ON BACKPLATES

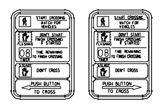


COUNTDOWN PEDESTRIAN CROSSING



P2, P4, P6, P8

PEDESTRIAN SIGNS

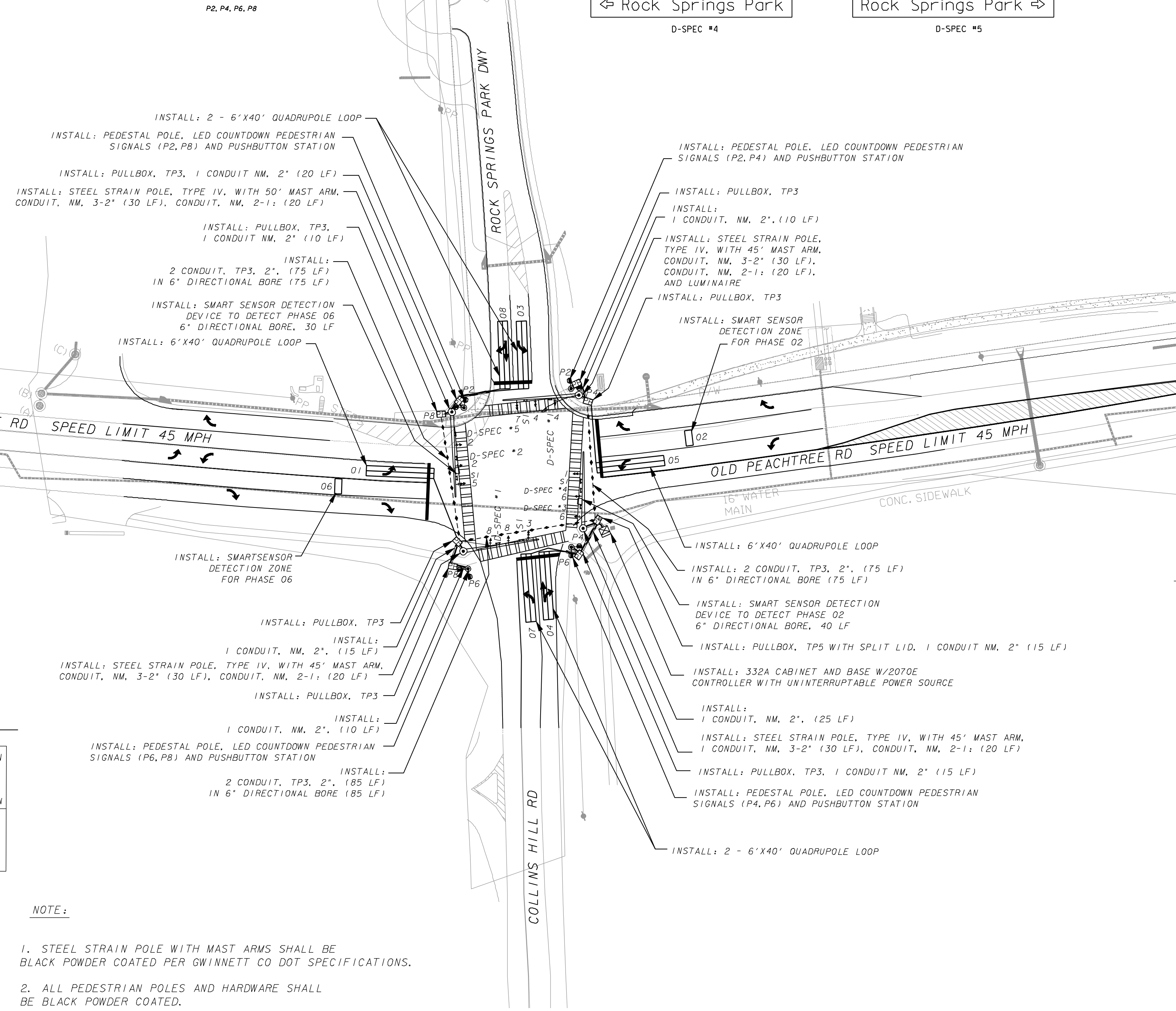


R10-3E(L) 9" X 15"

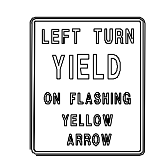
R10-3E(R) 9" X 15"

STREET NAME SIGNS

Sign	Legend
D-SPEC #1	Old Peachtree Rd
D-SPEC #2	⇦ Collins Hill Rd
D-SPEC #3	Collins Hill Rd ⇨
D-SPEC #4	⇦ Rock Springs Park
D-SPEC #5	Rock Springs Park ⇨

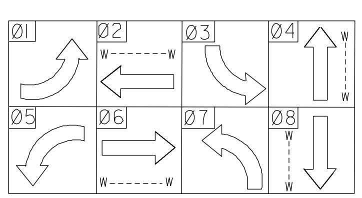


SIGNS



R10-5A
SI
(30" X 36")

PHASING DIAGRAM



NOTE:

1. STEEL STRAIN POLE WITH MAST ARMS SHALL BE BLACK POWDER COATED PER GWINNETT CO DOT SPECIFICATIONS.
2. ALL PEDESTRIAN POLES AND HARDWARE SHALL BE BLACK POWDER COATED.
3. USE GDOT TS-04 DETAIL DATED APRIL 2010 FOR LUMINAIRE ATTACHMENT ON POLE ON THE NORTHEAST CORNER.
4. LUMINAIRE ATTACHMENT AND HARDWARE SHALL BE BLACK POWDER COATED.

SCALE IN FEET
0 30 60 120

GCA, INC.
1800 PEACHTREE STREET, N.W.
SUITE 825
ATLANTA, GEORGIA 30309
PH. 404-355-4010 FAX 404-355-0604

24 HOUR CONTACT
LEE CROY
CONTACT NUMBER
(678) 576 - 9846

IF YOU DIG IN GEORGIA CALL US FIRST
(800) 282-7411
UTILITIES PROTECTION CENTER
IT'S THE LAW

MDA
McFARLAND-DYER & ASSOCIATES, INC.
4174 Silver Peak Parkway
Suwanee, Georgia 30024
Phone (770) 932-6550
Fax (770) 932-6551
WWW.GOMDA.NET

OWNER:
GWINNETT COUNTY DEPARTMENT OF COMMUNITY SERVICES
75 LANGLEY DRIVE
LAWRENCEVILLE, GA 30046
PHONE: (770) 822-8840
FAX: (770) 822-8835

PROJECT:
ROCK SPRINGS PARK PHASE II
LAND LOT: 149
DISTRICT: 7
PARCEL: 010A
COUNTY: GWINNETT
STATE: GEORGIA

DATE	DESCRIPTION
07-07-2015	BID SET
04-11-2016	CONSTRUCTION SET

JOB NO: 14-0205
DRAWN BY: DHB,MHB
CHECKED BY: JJD& KDW

TRAFFIC SIGNAL PLAN

T105

Appendix G
Raw Traffic Count Data

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Horizon Dr and Old Peactree Rd , Suwanee

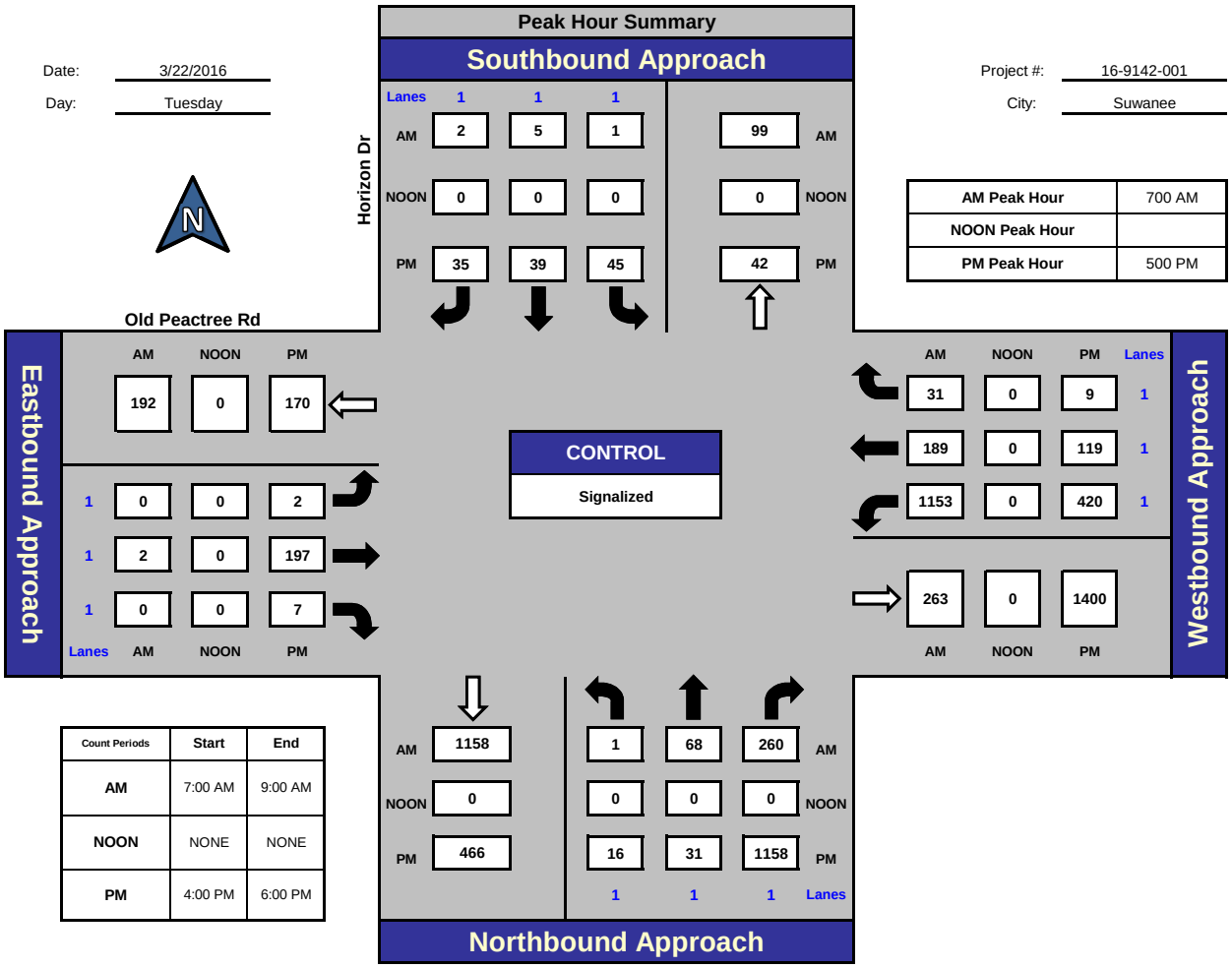
Date: 3/22/2016

Day: Tuesday

Project #: 16-9142-001

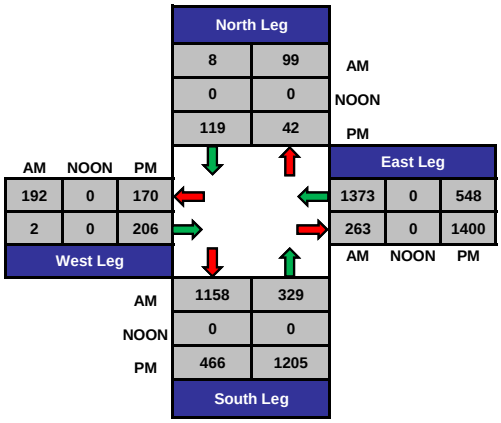
City: Suwanee

AM Peak Hour	700 AM
NOON Peak Hour	
PM Peak Hour	500 PM

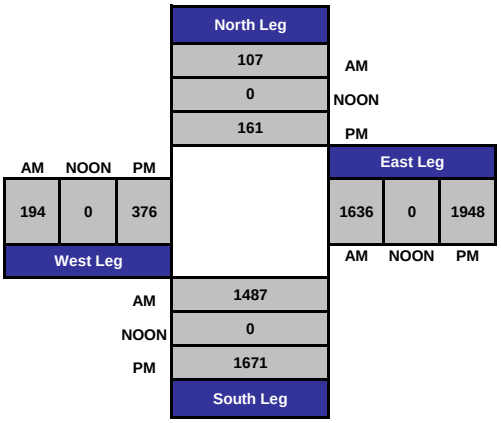


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



Project ID: 16-9142-001
Location: Horizon Dr & Old Peactree Rd
City: Suwanee

Day: Tuesday
Date: 3/22/2016

Peak Start Times	
AM	7:00 AM
MD	12:00 AM
PM	4:00 PM

Groups Printed - Cars, PU, Vans - Heavy Trucks

	Horizon Dr Northbound					Horizon Dr Southbound					Old Peactree Rd Eastbound					Old Peactree Rd Westbound					
Start Time	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Int. Total
7:00 AM	1	5	77	0	83	0	1	0	0	1	0	1	0	0	1	286	51	2	0	339	424
7:15 AM	0	11	61	0	72	0	1	1	0	2	0	1	0	0	1	299	40	6	0	345	420
7:30 AM	0	16	68	0	84	0	1	0	0	1	0	0	0	0	0	277	40	9	0	326	411
7:45 AM	0	36	54	0	90	1	2	1	0	4	0	0	0	0	0	291	58	14	0	363	457
Total	1	68	260	0	329	1	5	2	0	8	0	2	0	0	2	1153	189	31	0	1373	1712
8:00 AM	0	26	54	0	80	0	1	0	0	1	0	1	0	0	1	269	48	15	0	332	414
8:15 AM	0	24	71	0	95	0	2	0	0	2	0	4	0	0	4	264	57	6	0	327	428
8:30 AM	0	13	73	0	86	0	1	0	0	1	0	4	0	0	4	235	30	5	0	270	361
8:45 AM	1	14	82	0	97	1	2	0	0	3	0	2	0	0	2	232	40	3	0	275	377
Total	1	77	280	0	358	1	6	0	0	7	0	11	0	0	11	1000	175	29	0	1204	1580
BREAK																					
4:00 PM	1	4	262	0	267	1	7	2	0	10	1	4	0	0	5	116	19	3	0	138	420
4:15 PM	2	8	279	0	289	2	9	1	0	12	1	9	0	0	10	123	21	1	0	145	456
4:30 PM	2	10	296	0	308	17	27	2	0	46	0	10	1	0	11	119	20	0	0	139	504
4:45 PM	3	2	310	0	315	4	11	2	0	17	2	14	0	0	16	108	33	1	0	142	490
Total	8	24	1147	0	1179	24	54	7	0	85	4	37	1	0	42	466	93	5	0	564	1870
5:00 PM	5	5	304	0	314	15	16	13	0	44	0	45	3	0	48	100	29	0	0	129	535
5:15 PM	8	12	288	0	308	13	6	7	0	26	0	46	2	0	48	107	27	2	0	136	518
5:30 PM	2	9	283	0	294	12	8	9	0	29	1	60	0	0	61	94	32	3	0	129	513
5:45 PM	1	5	283	0	289	5	9	6	0	20	1	46	2	0	49	119	31	4	0	154	512
Total	16	31	1158	0	1205	45	39	35	0	119	2	197	7	0	206	420	119	9	0	548	2078
Grand Total	26	200	2845	0	3071	71	104	44	0	219	6	247	8	0	261	3039	576	74	0	3689	7240
Apprch %	0.8	6.5	92.6	0.0		32.4	47.5	20.1	0.0		2.3	94.6	3.1	0.0		82.4	15.6	2.0	0.0		
Total %	0.4	2.8	39.3	0.0	42.4	1.0	1.4	0.6	0.0	3.0	0.1	3.4	0.1	0.0	3.6	42.0	8.0	1.0	0.0	51.0	
Cars, PU, Vans	26	195	2841	0	3062	71	100	44	0	215	6	247	8	0	261	3031	576	74	0	3681	7219
% Cars, PU, Vans	100.0	97.5	99.9	0.0	99.7	100.0	96.2	100.0	0.0	98.2	100.0	100.0	100.0	0.0	100.0	99.7	100.0	100.0	0.0	99.8	99.7
Heavy Trucks	0	5	4		9	0	4	0		4	0	0	0		0	8	0	0		8	21
%Heavy Trucks	0.0	2.5	0.1	0.0	0.3	0.0	3.8	0.0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.2	0.3

Project ID: 16-9142-001
Location: Horizon Dr & Old Peactree Rd
City: Suwanee

PEAK HOURS

Day: Tuesday
Date: 3/22/2016

AM

	Horizon Dr Northbound				Horizon Dr Southbound				Old Peactree Rd Eastbound				Old Peactree Rd Westbound				
Start Time	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Int. Total
Peak Hour Analysis from 07:00 AM to 09:00 AM																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
7:00 AM	1	5	77	83	0	1	0	1	0	1	0	1	286	51	2	339	424
7:15 AM	0	11	61	72	0	1	1	2	0	1	0	1	299	40	6	345	420
7:30 AM	0	16	68	84	0	1	0	1	0	0	0	0	277	40	9	326	411
7:45 AM	0	36	54	90	1	2	1	4	0	0	0	0	291	58	14	363	457
Total Volume	1	68	260	329	1	5	2	8	0	2	0	2	1153	189	31	1373	1712
% App. Total	0.3	20.7	79.0	100	12.5	62.5	25.0	100	0.0	100.0	0.0	100	84.0	13.8	2.3	100	
PHF				0.914				0.500				0.500				0.946	
Cars, PU, Vans	1	68	257	326	1	5	2	8	0	2	0	2	1151	189	31	1371	1707
% Cars, PU, Vans	100.0	100.0	98.8	99.1	100.0	100.0	100.0	100.0	0.0	100.0	0.0	100.0	99.8	100.0	100.0	99.9	99.7
Heavy Trucks	0	0	3	3	0	0	0	0	0	0	0	0	2	0	0	2	5
%Heavy Trucks	0.0	0.0	1.2	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.3

PM

	Horizon Dr Northbound				Horizon Dr Southbound				Old Peactree Rd Eastbound				Old Peactree Rd Westbound				
Start Time	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Int. Total
Peak Hour Analysis from 04:00 PM to 06:00 PM																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
5:00 PM	5	5	304	314	15	16	13	44	0	45	3	48	100	29	0	129	535
5:15 PM	8	12	288	308	13	6	7	26	0	46	2	48	107	27	2	136	518
5:30 PM	2	9	283	294	12	8	9	29	1	60	0	61	94	32	3	129	513
5:45 PM	1	5	283	289	5	9	6	20	1	46	2	49	119	31	4	154	512
Total Volume	16	31	1158	1205	45	39	35	119	2	197	7	206	420	119	9	548	2078
% App. Total	1.3	2.6	96.1	100	37.8	32.8	29.4	100	1.0	95.6	3.4	100	76.6	21.7	1.6	100	
PHF				0.959				0.676				0.844				0.890	
Cars, PU, Vans	16	30	1158	1204	45	38	35	118	2	197	7	206	419	119	9	547	2075
% Cars, PU, Vans	100.0	96.8	100.0	99.9	100.0	97.4	100.0	99.2	100.0	100.0	100.0	100.0	99.8	100.0	100.0	99.8	99.9
Heavy Trucks	0	1	0	1	0	1	0	1	0	0	0	0	1	0	0	1	3
%Heavy Trucks	0.0	3.2	0.0	0.1	0.0	2.6	0.0	0.8	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.1

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Lawrenceville Suwanee Rd and Old Peactree Rd , Suwanee

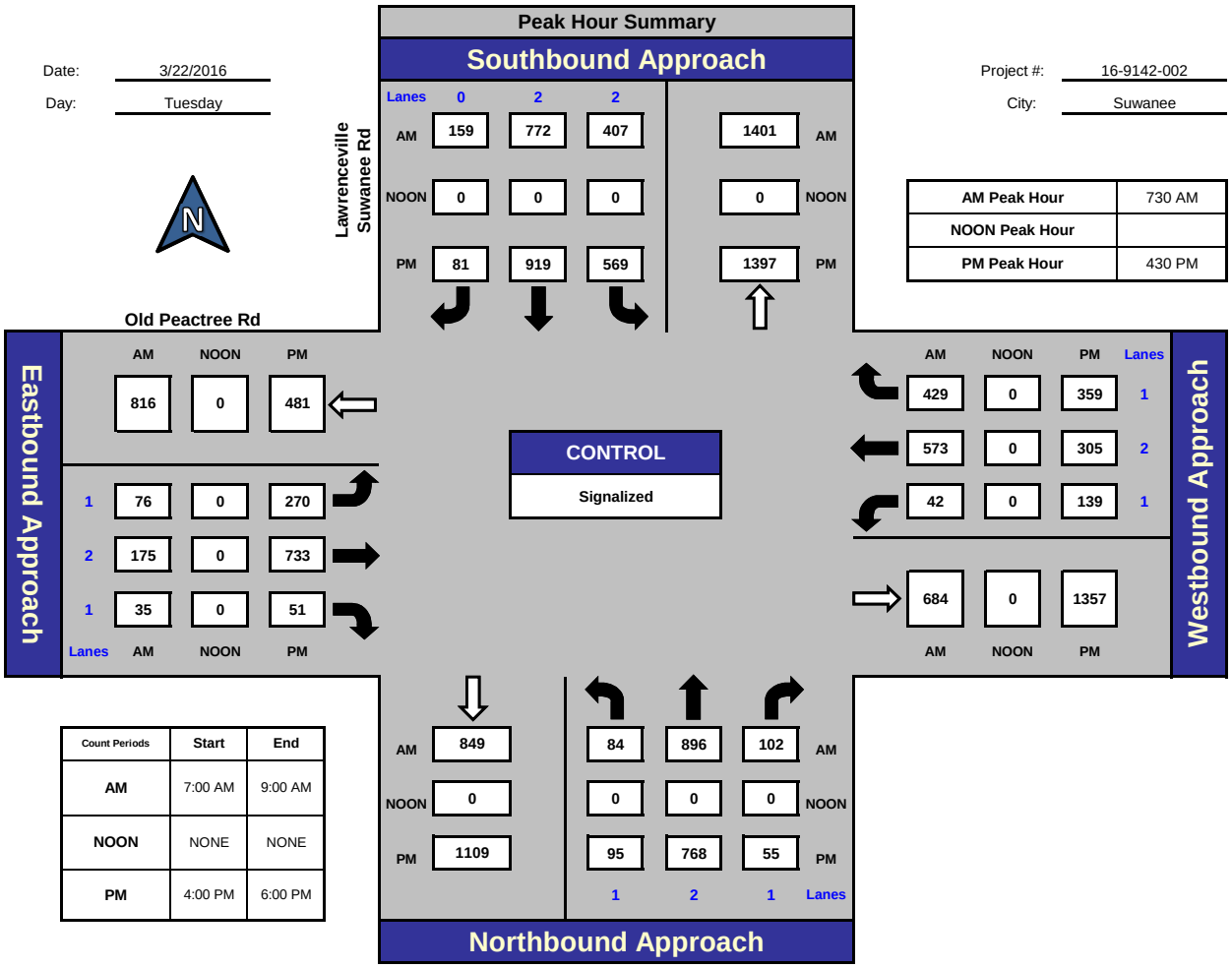
Date: 3/22/2016

Day: Tuesday

Project #: 16-9142-002

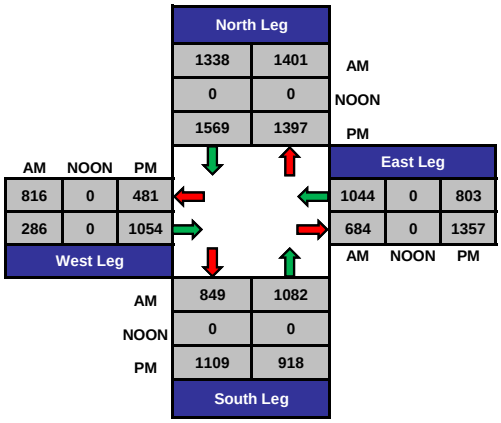
City: Suwanee

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	430 PM

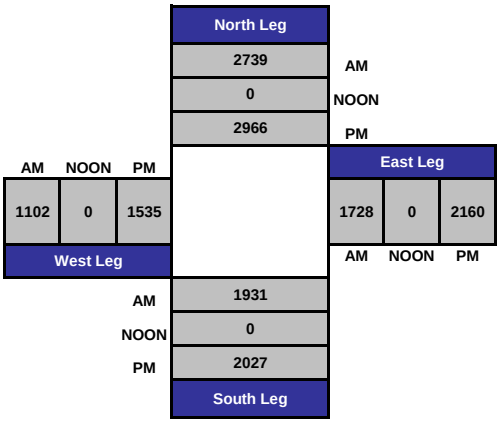


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



Project ID: 16-9142-002
Location: Lawrenceville Suwanee Rd & Old Peactree Rd
City: Suwanee

Day: Tuesday
Date: 3/22/2016

Peak Start Times	
AM	7:00 AM
MD	12:00 AM
PM	4:00 PM

Groups Printed - Cars, PU, Vans - Heavy Trucks

	Lawrenceville Suwanee Rd Northbound					Lawrenceville Suwanee Rd Southbound					Old Peactree Rd Eastbound					Old Peactree Rd Westbound					
Start Time	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Int. Total
7:00 AM	23	166	23	0	212	76	141	28	0	245	18	40	6	0	64	14	142	129	0	285	806
7:15 AM	13	202	7	0	222	83	187	39	0	309	18	41	5	0	64	9	163	110	0	282	877
7:30 AM	14	249	34	0	297	79	192	48	0	319	19	49	7	0	75	12	153	108	0	273	964
7:45 AM	25	229	19	0	273	132	201	43	0	376	18	28	9	0	55	5	145	96	0	246	950
Total	75	846	83	0	1004	370	721	158	0	1249	73	158	27	0	258	40	603	443	0	1086	3597
8:00 AM	21	212	27	0	260	94	187	32	0	313	24	48	8	0	80	6	136	101	0	243	896
8:15 AM	24	206	22	1	252	102	192	36	0	330	15	50	11	0	76	19	139	124	0	282	940
8:30 AM	19	251	23	1	293	89	186	35	0	310	21	40	7	0	68	18	111	84	1	213	884
8:45 AM	21	193	26	0	240	116	179	17	0	312	22	63	9	0	94	13	128	107	1	248	894
Total	85	862	98	2	1045	401	744	120	0	1265	82	201	35	0	318	56	514	416	2	986	3614
BREAK																					
4:00 PM	24	176	9	1	209	142	213	23	0	378	67	153	11	0	231	40	56	95	1	191	1009
4:15 PM	19	200	17	0	236	159	226	34	0	419	59	136	21	0	216	14	57	92	0	163	1034
4:30 PM	29	178	11	0	218	141	220	19	0	380	74	189	13	0	276	43	79	99	0	221	1095
4:45 PM	24	201	16	0	241	139	239	22	0	400	53	173	16	0	242	28	64	88	0	180	1063
Total	96	755	53	1	904	581	898	98	0	1577	253	651	61	0	965	125	256	374	1	755	4201
5:00 PM	23	199	20	0	242	137	201	25	0	363	85	197	7	0	289	34	79	80	0	193	1087
5:15 PM	19	190	8	0	217	152	259	15	0	426	58	174	15	0	247	34	83	92	0	209	1099
5:30 PM	16	204	16	1	236	134	247	13	1	394	57	177	13	0	247	23	73	58	0	154	1031
5:45 PM	19	173	21	1	213	143	211	25	0	379	49	190	15	0	254	25	80	85	0	190	1036
Total	77	766	65	2	908	566	918	78	1	1562	249	738	50	0	1037	116	315	315	0	746	4253
Grand Total	333	3229	299	5	3861	1918	3281	454	1	5653	657	1748	173	0	2578	337	1688	1548	3	3573	15665
Apprch %	8.6	83.6	7.7	0.1		33.9	58.0	8.0	0.0		25.5	67.8	6.7	0.0		9.4	47.2	43.3	0.1		
Total %	2.1	20.6	1.9	0.0	24.6	12.2	20.9	2.9	0.0	36.1	4.2	11.2	1.1	0.0	16.5	2.2	10.8	9.9	0.0	22.8	
Cars, PU, Vans	330	3181	292	5	3803	1857	3248	445	1	5550	644	1735	169	0	2548	335	1664	1502	3	3501	15402
% Cars, PU, Vans	99.1	98.5	97.7	100.0	98.5	96.8	99.0	98.0	100.0	98.2	98.0	99.3	97.7	0.0	98.8	99.4	98.6	97.0	100.0	98.0	98.3
Heavy Trucks	3	48	7		58	61	33	9		103	13	13	4		30	2	24	46		72	263
%Heavy Trucks	0.9	1.5	2.3	0.0	1.5	3.2	1.0	2.0	0.0	1.8	2.0	0.7	2.3	0.0	1.2	0.6	1.4	3.0	0.0	2.0	1.7

Project ID: 16-9142-002
Location: Lawrenceville Suwanee Rd & C
City: Suwanee

PEAK HOURS

Day: Tuesday
Date: 3/22/2016

AM

	Lawrenceville Suwanee Rd Northbound				Lawrenceville Suwanee Rd Southbound				Old Peactree Rd Eastbound				Old Peactree Rd Westbound				
Start Time	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Int. Total
Peak Hour Analysis from 07:00 AM to 09:00 AM																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
7:30 AM	14	249	34	297	79	192	48	319	19	49	7	75	12	153	108	273	964
7:45 AM	25	229	19	273	132	201	43	376	18	28	9	55	5	145	96	246	950
8:00 AM	21	212	27	260	94	187	32	313	24	48	8	80	6	136	101	243	896
8:15 AM	24	206	22	252	102	192	36	330	15	50	11	76	19	139	124	282	940
Total Volume	84	896	102	1082	407	772	159	1338	76	175	35	286	42	573	429	1044	3750
% App. Total	7.8	82.8	9.4	100	30.4	57.7	11.9	100	26.6	61.2	12.2	100	4.0	54.9	41.1	100	
PHF				0.911				0.890				0.894				0.926	
Cars, PU, Vans	84	882	100	1066	393	766	156	1315	73	172	34	279	42	568	414	1024	3684
% Cars, PU, Vans	100.0	98.4	98.0	98.5	96.6	99.2	98.1	98.3	96.1	98.3	97.1	97.6	100.0	99.1	96.5	98.1	98.2
Heavy Trucks	0	14	2	16	14	6	3	23	3	3	1	7	0	5	15	20	66
%Heavy Trucks	0.0	1.6	2.0	1.5	3.4	0.8	1.9	1.7	3.9	1.7	2.9	2.4	0.0	0.9	3.5	1.9	1.8

PM

	Lawrenceville Suwanee Rd Northbound				Lawrenceville Suwanee Rd Southbound				Old Peactree Rd Eastbound				Old Peactree Rd Westbound				
Start Time	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Int. Total
Peak Hour Analysis from 04:00 PM to 06:00 PM																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
4:30 PM	29	178	11	218	141	220	19	380	74	189	13	276	43	79	99	221	1095
4:45 PM	24	201	16	241	139	239	22	400	53	173	16	242	28	64	88	180	1063
5:00 PM	23	199	20	242	137	201	25	363	85	197	7	289	34	79	80	193	1087
5:15 PM	19	190	8	217	152	259	15	426	58	174	15	247	34	83	92	209	1099
Total Volume	95	768	55	918	569	919	81	1569	270	733	51	1054	139	305	359	803	4344
% App. Total	10.3	83.7	6.0	100	36.3	58.6	5.2	100	25.6	69.5	4.8	100	17.3	38.0	44.7	100	
PHF				0.948				0.921				0.912				0.908	
Cars, PU, Vans	94	760	52	906	553	911	81	1545	266	727	48	1041	139	296	350	785	4277
% Cars, PU, Vans	98.9	99.0	94.5	98.7	97.2	99.1	100.0	98.5	98.5	99.2	94.1	98.8	100.0	97.0	97.5	97.8	98.5
Heavy Trucks	1	8	3	12	16	8	0	24	4	6	3	13	0	9	9	18	67
%Heavy Trucks	1.1	1.0	5.5	1.3	2.8	0.9	0.0	1.5	1.5	0.8	5.9	1.2	0.0	3.0	2.5	2.2	1.5

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Collins Hills Rd and Old Peactree Rd , Suwanee

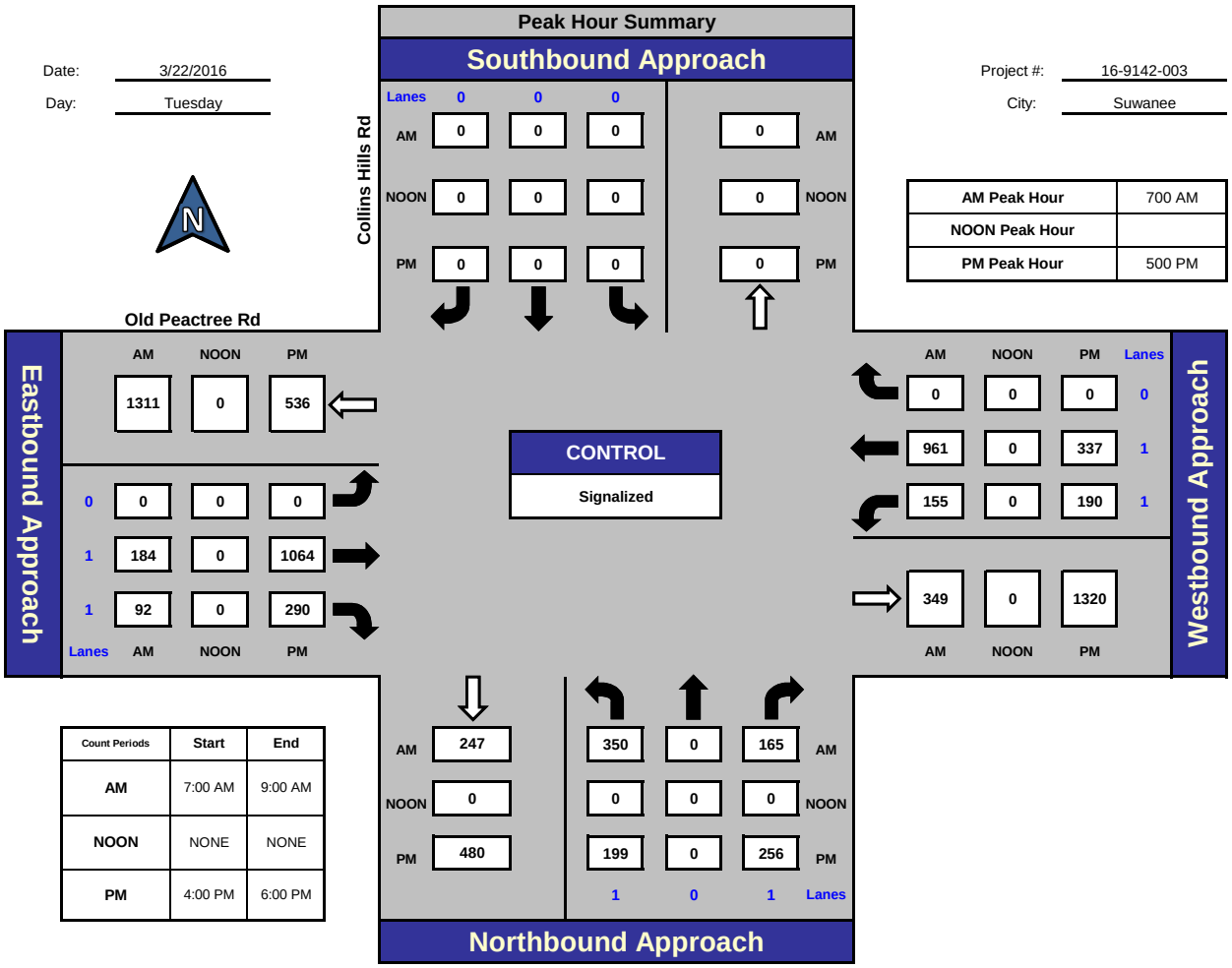
Date: 3/22/2016

Day: Tuesday

Project #: 16-9142-003

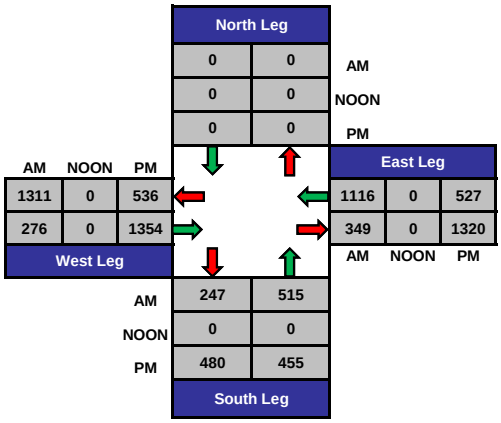
City: Suwanee

AM Peak Hour	700 AM
NOON Peak Hour	
PM Peak Hour	500 PM

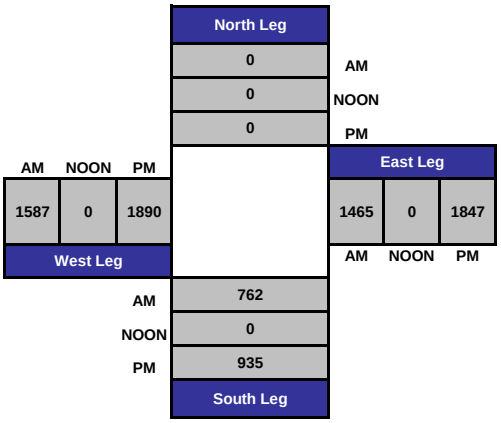


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON	NONE	NONE
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



Project ID: 16-9142-003
Location: Collins Hills Rd & Old Peactree Rd
City: Suwanee

Day: Tuesday
Date: 3/22/2016

Peak Start Times	
AM	7:00 AM
MD	12:00 AM
PM	4:00 PM

Groups Printed - Cars, PU, Vans - Heavy Trucks

	Collins Hills Rd Northbound					Collins Hills Rd Southbound					Old Peactree Rd Eastbound					Old Peactree Rd Westbound					
Start Time	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Int. Total
7:00 AM	101	0	57	0	158	0	0	0	0	0	0	51	27	0	78	46	229	0	0	275	511
7:15 AM	83	0	26	0	109	0	0	0	0	0	0	44	20	0	64	38	246	0	0	284	457
7:30 AM	81	0	38	0	119	0	0	0	0	0	0	45	19	0	64	31	235	0	0	266	449
7:45 AM	85	0	44	0	129	0	0	0	0	0	0	44	26	0	70	40	251	0	0	291	490
Total	350	0	165	0	515	0	0	0	0	0	0	184	92	0	276	155	961	0	0	1116	1907
8:00 AM	73	0	23	0	96	0	0	0	0	0	0	34	17	0	51	65	237	0	0	302	449
8:15 AM	85	0	23	0	108	0	0	0	0	0	0	52	20	0	72	30	219	0	0	249	429
8:30 AM	64	0	20	0	84	0	0	0	0	0	0	44	36	0	80	31	194	0	0	225	389
8:45 AM	75	0	32	0	107	0	0	0	0	0	0	53	30	0	83	41	183	0	0	224	414
Total	297	0	98	0	395	0	0	0	0	0	0	183	103	0	286	167	833	0	0	1000	1681
BREAK																					
4:00 PM	43	0	53	0	96	0	0	0	0	0	0	205	58	0	263	40	83	0	0	123	482
4:15 PM	55	0	43	0	98	0	0	0	0	0	0	215	53	0	268	52	79	0	0	131	497
4:30 PM	49	0	50	0	99	0	0	0	0	0	0	240	74	0	314	44	95	0	0	139	552
4:45 PM	50	0	58	1	108	0	0	0	0	0	0	238	62	0	300	36	77	0	2	113	521
Total	197	0	204	1	401	0	0	0	0	0	0	898	247	0	1145	172	334	0	2	506	2052
5:00 PM	64	0	71	0	135	0	0	0	0	0	0	258	64	0	322	43	70	0	0	113	570
5:15 PM	42	0	64	0	106	0	0	0	0	0	0	269	76	0	345	59	92	0	1	151	602
5:30 PM	43	0	52	0	95	0	0	0	0	0	0	284	67	0	351	43	85	0	0	128	574
5:45 PM	50	0	69	0	119	0	0	0	0	0	0	253	83	0	336	45	90	0	0	135	590
Total	199	0	256	0	455	0	0	0	0	0	0	1064	290	0	1354	190	337	0	1	527	2336
Grand Total	1043	0	723	1	1766	0	0	0	0	0	0	2329	732	0	3061	684	2465	0	3	3149	7976
Apprch %	59.1	0.0	40.9	0.1		0.0	0.0	0.0	0.0		0.0	76.1	23.9	0.0		21.7	78.3	0.0	0.1		
Total %	13.1	0.0	9.1	0.0	22.1	0.0	0.0	0.0	0.0	0.0	0.0	29.2	9.2	0.0	38.4	8.6	30.9	0.0	0.0	39.5	
Cars, PU, Vans	1042	0	723	1	1765	0	0	0	0	0	0	2328	730	0	3058	684	2459	0	3	3143	7966
% Cars, PU, Vans	99.9	0.0	100.0	100.0	99.9	0.0	0.0	0.0	0.0	0.0	0.0	100.0	99.7	0.0	99.9	100.0	99.8	0.0	100.0	99.8	99.9
Heavy Trucks	1	0	0		1	0	0	0		0	0	1	2		3	0	6	0		6	10
%Heavy Trucks	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.1	0.0	0.2	0.0	0.0	0.2	0.1

Project ID: 16-9142-003
Location: Collins Hills Rd & Old Peact
City: Suwanee

PEAK HOURS

Day: Tuesday
Date: 3/22/2016

AM

	Collins Hills Rd Northbound				Collins Hills Rd Southbound				Old Peactree Rd Eastbound				Old Peactree Rd Westbound				
Start Time	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Int. Total
Peak Hour Analysis from 07:00 AM to 09:00 AM																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
7:00 AM	101	0	57	158	0	0	0	0	0	51	27	78	46	229	0	275	511
7:15 AM	83	0	26	109	0	0	0	0	0	44	20	64	38	246	0	284	457
7:30 AM	81	0	38	119	0	0	0	0	0	45	19	64	31	235	0	266	449
7:45 AM	85	0	44	129	0	0	0	0	0	44	26	70	40	251	0	291	490
Total Volume	350	0	165	515	0	0	0	0	0	184	92	276	155	961	0	1116	1907
% App. Total	68.0	0.0	32.0	100	0.0	0.0	0.0	0	0.0	66.7	33.3	100	13.9	86.1	0.0	100	
PHF				0.815				0.000				0.885				0.959	
Cars, PU, Vans	350	0	165	515	0	0	0	0	0	184	91	275	155	960	0	1115	1905
% Cars, PU, Vans	100.0	0.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	100.0	98.9	99.6	100.0	99.9	0.0	99.9	99.9
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	2
%Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.4	0.0	0.1	0.0	0.1	0.1

PM

	Collins Hills Rd Northbound				Collins Hills Rd Southbound				Old Peactree Rd Eastbound				Old Peactree Rd Westbound				
Start Time	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Int. Total
Peak Hour Analysis from 04:00 PM to 06:00 PM																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
5:00 PM	64	0	71	135	0	0	0	0	0	258	64	322	43	70	0	113	570
5:15 PM	42	0	64	106	0	0	0	0	0	269	76	345	59	92	0	151	602
5:30 PM	43	0	52	95	0	0	0	0	0	284	67	351	43	85	0	128	574
5:45 PM	50	0	69	119	0	0	0	0	0	253	83	336	45	90	0	135	590
Total Volume	199	0	256	455	0	0	0	0	0	1064	290	1354	190	337	0	527	2336
% App. Total	43.7	0.0	56.3	100	0.0	0.0	0.0	0	0.0	78.6	21.4	100	36.1	63.9	0.0	100	
PHF				0.843				0.000				0.964				0.873	
Cars, PU, Vans	198	0	256	454	0	0	0	0	0	1064	290	1354	190	337	0	527	2335
% Cars, PU, Vans	99.5	0.0	100.0	99.8	0.0	0.0	0.0	0.0	0.0	100.0	100.0	100.0	100.0	100.0	0.0	100.0	100.0
Heavy Trucks	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
%Heavy Trucks	0.5	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Horizon Dr and Old Peachtree Rd NE , Suwanee

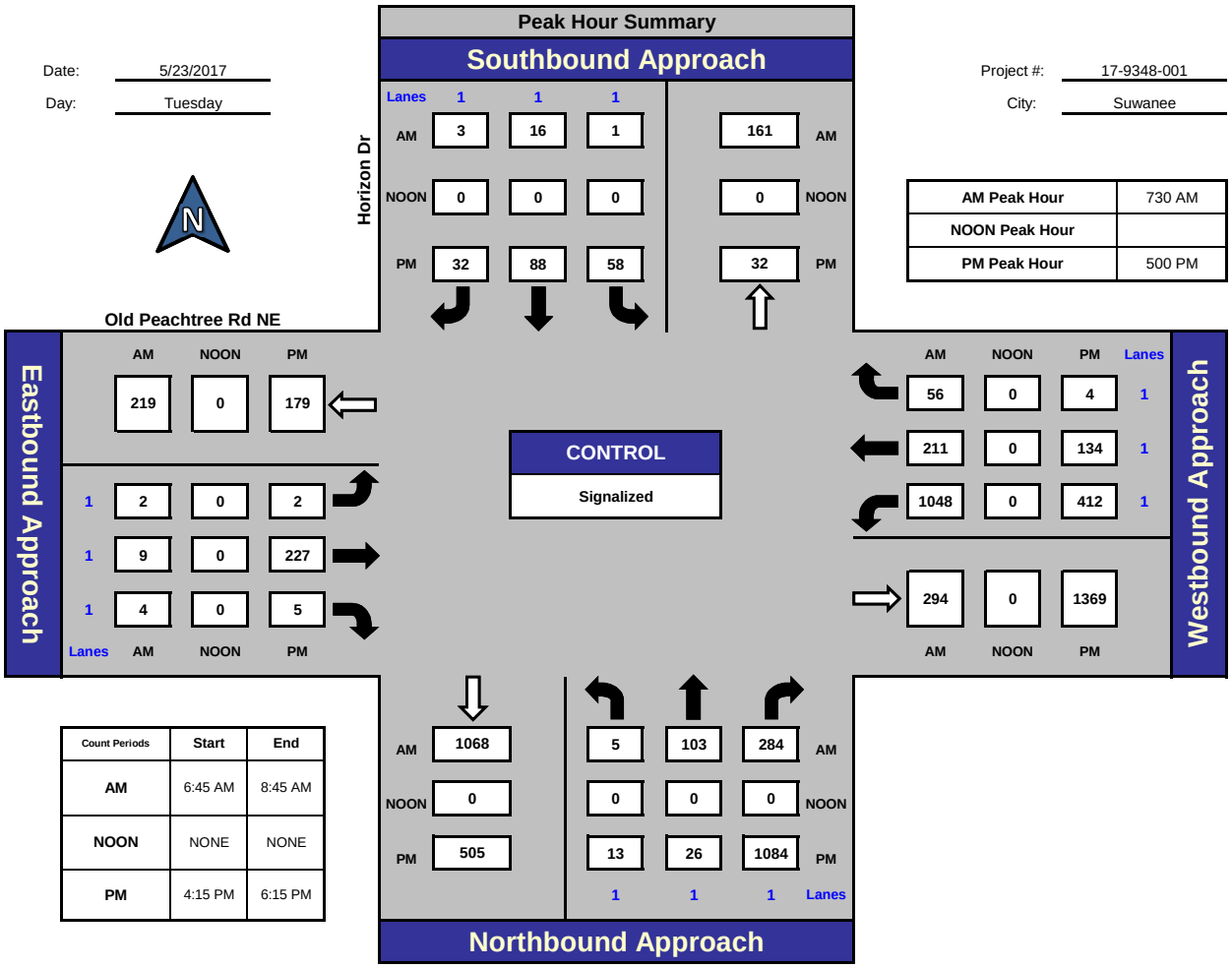
Date: 5/23/2017

Day: Tuesday

Project #: 17-9348-001

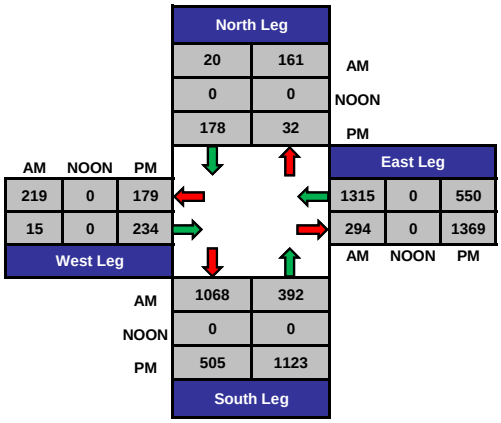
City: Suwanee

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	500 PM

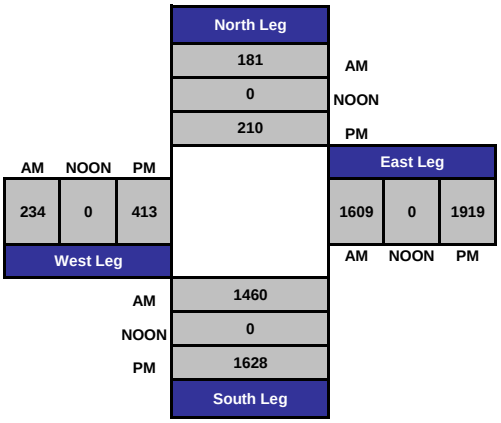


Count Periods	Start	End
AM	6:45 AM	8:45 AM
NOON	NONE	NONE
PM	4:15 PM	6:15 PM

Total Ins & Outs



Total Volume Per Leg



Project ID: 17-9348-001
Location: Horizon Dr & Old Peachtree Rd NE
City: Suwanee

Day: Tuesday
Date: 5/23/2017

Peak Start Times	
AM	6:45 AM
MD	12:00 AM
PM	4:15 PM

Groups Printed - Cars, PU, Vans - Heavy Trucks

	Horizon Dr Northbound					Horizon Dr Southbound					Old Peachtree Rd NE Eastbound					Old Peachtree Rd NE Westbound					
Start Time	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Int. Total
6:45 AM	0	26	74	0	100	0	0	0	0	0	1	3	0	0	4	268	37	9	0	314	418
7:00 AM	0	18	52	0	70	0	5	0	0	5	0	1	0	0	1	274	47	12	0	333	409
7:15 AM	0	24	59	0	83	0	4	1	0	5	1	1	0	0	2	268	63	7	0	338	428
7:30 AM	1	13	71	0	85	0	3	1	0	4	0	3	1	0	4	260	50	10	0	320	413
Total	1	81	256	0	338	0	12	2	0	14	2	8	1	0	11	1070	197	38	0	1305	1668
7:45 AM	3	34	74	0	111	1	6	0	0	7	1	2	2	0	5	261	68	19	0	348	471
8:00 AM	0	29	66	0	95	0	0	0	0	0	1	2	0	0	3	267	46	15	0	328	426
8:15 AM	1	27	73	0	101	0	7	2	0	9	0	2	1	0	3	260	47	12	0	319	432
8:30 AM	1	22	62	0	85	1	8	0	0	9	0	0	1	0	1	251	49	6	0	306	401
Total	5	112	275	0	392	2	21	2	0	25	2	6	4	0	12	1039	210	52	0	1301	1730
BREAK																					
4:15 PM	0	5	249	0	254	3	9	2	0	14	0	17	1	0	18	101	22	2	0	125	411
4:30 PM	2	6	289	0	297	7	15	3	0	25	1	11	0	0	12	105	31	0	0	136	470
4:45 PM	3	4	238	0	245	3	8	6	0	17	0	35	0	0	35	110	28	1	0	139	436
5:00 PM	4	8	287	0	299	24	45	20	0	89	1	55	1	0	57	93	31	1	0	125	570
Total	9	23	1063	0	1095	37	77	31	0	145	2	118	2	0	122	409	112	4	0	525	1887
5:15 PM	4	8	283	0	295	16	16	3	0	35	1	68	2	0	71	103	35	1	0	139	540
5:30 PM	4	6	268	0	278	15	18	8	0	41	0	51	1	0	52	114	33	2	0	149	520
5:45 PM	1	4	246	0	251	3	9	1	0	13	0	53	1	0	54	102	35	0	0	137	455
6:00 PM	0	4	250	0	254	7	8	5	0	20	0	43	2	0	45	108	49	0	0	157	476
Total	9	22	1047	0	1078	41	51	17	0	109	1	215	6	0	222	427	152	3	0	582	1991
Grand Total	24	238	2641	0	2903	80	161	52	0	293	7	347	13	0	367	2945	671	97	0	3713	7276
Apprch %	0.8	8.2	91.0	0.0		27.3	54.9	17.7	0.0		1.9	94.6	3.5	0.0		79.3	18.1	2.6	0.0		
Total %	0.3	3.3	36.3	0.0	39.9	1.1	2.2	0.7	0.0	4.0	0.1	4.8	0.2	0.0	5.0	40.5	9.2	1.3	0.0	51.0	
Cars, PU, Vans	24	222	2634	0	2880	78	147	52	0	277	7	347	13	0	367	2943	671	96	0	3710	7234
% Cars, PU, Vans	100.0	93.3	99.7	0.0	99.2	97.5	91.3	100.0	0.0	94.5	100.0	100.0	100.0	0.0	100.0	99.9	100.0	99.0	0.0	99.9	99.4
Heavy Trucks	0	16	7		23	2	14	0		16	0	0	0		0	2	0	1		3	42
%Heavy Trucks	0.0	6.7	0.3	0.0	0.8	2.5	8.7	0.0	0.0	5.5	0.0	0.0	0.0	0.0	0.0	0.1	0.0	1.0	0.0	0.1	0.6

Project ID: 17-9348-001
Location: Horizon Dr & Old Peachtree Rc
City: Suwanee

PEAK HOURS

Day: Tuesday
Date: 5/23/2017

AM

	Horizon Dr Northbound				Horizon Dr Southbound				Old Peachtree Rd NE Eastbound				Old Peachtree Rd NE Westbound				
Start Time	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Int. Total
Peak Hour Analysis from 06:45 AM to 08:45 AM																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
7:30 AM	1	13	71	85	0	3	1	4	0	3	1	4	260	50	10	320	413
7:45 AM	3	34	74	111	1	6	0	7	1	2	2	5	261	68	19	348	471
8:00 AM	0	29	66	95	0	0	0	0	1	2	0	3	267	46	15	328	426
8:15 AM	1	27	73	101	0	7	2	9	0	2	1	3	260	47	12	319	432
Total Volume	5	103	284	392	1	16	3	20	2	9	4	15	1048	211	56	1315	1742
% App. Total	1.3	26.3	72.4	100	5.0	80.0	15.0	100	13.3	60.0	26.7	100	79.7	16.0	4.3	100	
PHF				0.883				0.556				0.750				0.945	
Cars, PU, Vans	5	99	282	386	1	12	3	16	2	9	4	15	1047	211	56	1314	1731
% Cars, PU, Vans	100.0	96.1	99.3	98.5	100.0	75.0	100.0	80.0	100.0	100.0	100.0	100.0	99.9	100.0	100.0	99.9	99.4
Heavy Trucks	0	4	2	6	0	4	0	4	0	0	0	0	1	0	0	1	11
%Heavy Trucks	0.0	3.9	0.7	1.5	0.0	25.0	0.0	20.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.6

PM

	Horizon Dr Northbound				Horizon Dr Southbound				Old Peachtree Rd NE Eastbound				Old Peachtree Rd NE Westbound				
Start Time	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Int. Total
Peak Hour Analysis from 04:15 PM to 06:15 PM																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
5:00 PM	4	8	287	299	24	45	20	89	1	55	1	57	93	31	1	125	570
5:15 PM	4	8	283	295	16	16	3	35	1	68	2	71	103	35	1	139	540
5:30 PM	4	6	268	278	15	18	8	41	0	51	1	52	114	33	2	149	520
5:45 PM	1	4	246	251	3	9	1	13	0	53	1	54	102	35	0	137	455
Total Volume	13	26	1084	1123	58	88	32	178	2	227	5	234	412	134	4	550	2085
% App. Total	1.2	2.3	96.5	100	32.6	49.4	18.0	100	0.9	97.0	2.1	100	74.9	24.4	0.7	100	
PHF				0.939				0.500				0.824				0.923	
Cars, PU, Vans	13	23	1084	1120	58	83	32	173	2	227	5	234	411	134	4	549	2076
% Cars, PU, Vans	100.0	88.5	100.0	99.7	100.0	94.3	100.0	97.2	100.0	100.0	100.0	100.0	99.8	100.0	100.0	99.8	99.6
Heavy Trucks	0	3	0	3	0	5	0	5	0	0	0	0	1	0	0	1	9
%Heavy Trucks	0.0	11.5	0.0	0.3	0.0	5.7	0.0	2.8	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.2	0.4

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

Lawrenceville Suwanee Rd_SR 317 and Old Peachtree Rd NW , Suwanee

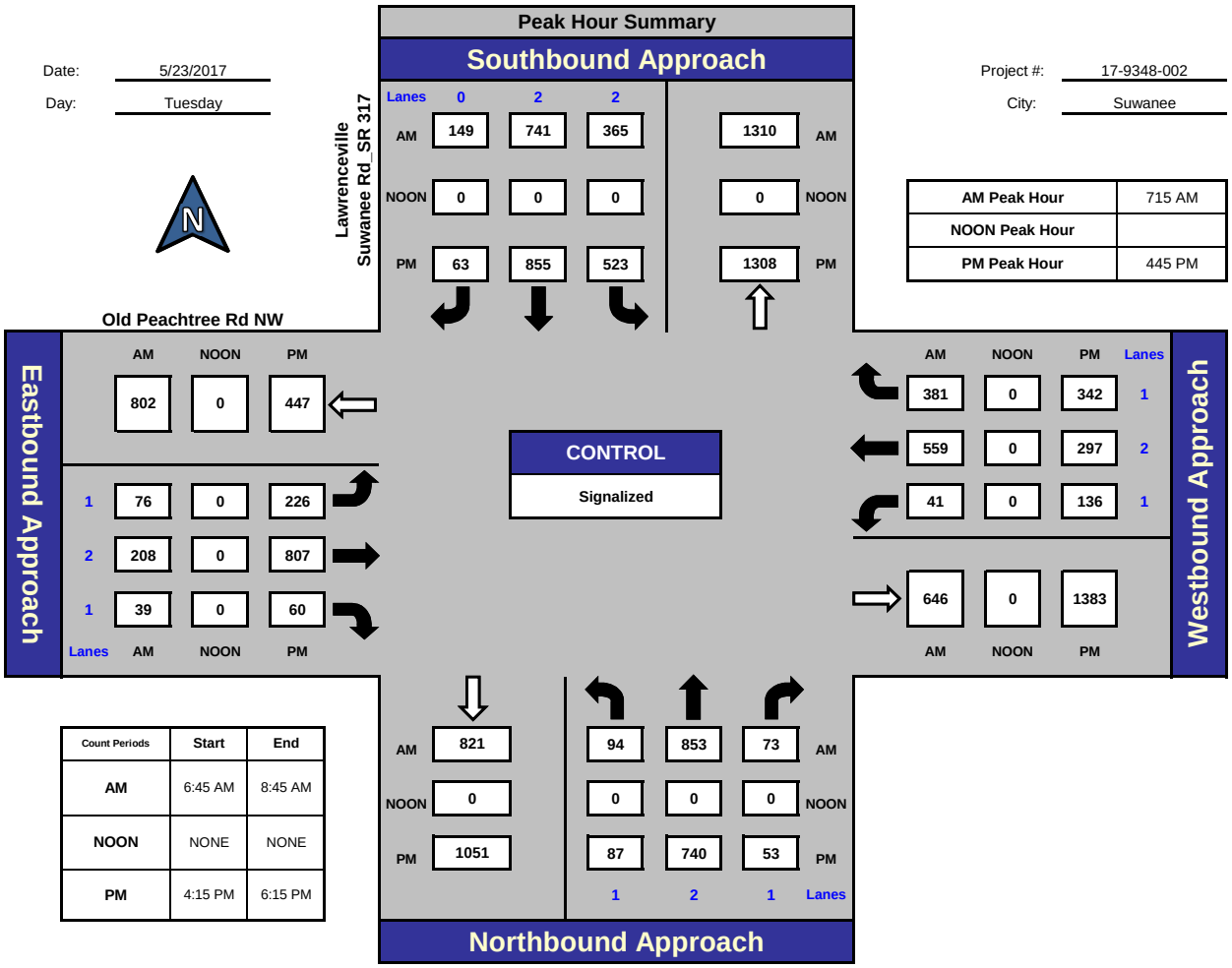
Date: 5/23/2017

Day: Tuesday

Project #: 17-9348-002

City: Suwanee

AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	445 PM



Count Periods	Start	End
AM	6:45 AM	8:45 AM
NOON	NONE	NONE
PM	4:15 PM	6:15 PM

Total Ins & Outs

North Leg		
1255	1310	AM
0	0	NOON
1441	1308	PM

West Leg			East Leg		
AM	NOON	PM	AM	NOON	PM
802	0	447	981	0	775
323	0	1093	646	0	1383

South Leg		
821	1020	AM
0	0	NOON
1051	880	PM

Total Volume Per Leg

North Leg	
2565	AM
0	NOON
2749	PM

West Leg			East Leg		
AM	NOON	PM	AM	NOON	PM
1125	0	1540	1627	0	2158

South Leg	
1841	AM
0	NOON
1931	PM

Project ID: 17-9348-002
Location: Lawrenceville Suwanee Rd_SR 317 & Old Peachtree Rd NW
City: Suwanee

Day: Tuesday
Date: 5/23/2017

Peak Start Times	
AM	6:45 AM
MD	12:00 AM
PM	4:15 PM

Groups Printed - Cars, PU, Vans - Heavy Trucks

	Lawrenceville Suwanee Rd_SR 317 Northbound					Lawrenceville Suwanee Rd_SR 317 Southbound					Old Peachtree Rd NW Eastbound					Old Peachtree Rd NW Westbound					
Start Time	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Int. Total
6:45 AM	4	176	27	0	207	125	162	28	0	315	13	29	3	0	45	4	125	98	0	227	794
7:00 AM	18	188	23	0	229	71	126	17	0	214	20	38	3	0	61	12	158	117	1	287	791
7:15 AM	27	167	17	0	211	80	165	28	0	273	18	39	17	0	74	4	150	103	0	257	815
7:30 AM	22	255	19	0	296	76	198	40	0	314	18	38	4	0	60	8	122	99	1	229	899
Total	71	786	86	0	943	352	651	113	0	1116	69	144	27	0	240	28	555	417	2	1000	3299
7:45 AM	29	199	18	0	246	130	190	44	0	364	26	67	12	0	105	15	157	88	0	260	975
8:00 AM	16	232	19	0	267	79	188	37	0	304	14	64	6	0	84	14	130	91	0	235	890
8:15 AM	11	179	22	0	212	58	145	25	1	228	27	48	13	0	88	14	131	128	0	273	801
8:30 AM	22	191	21	0	234	96	152	25	0	273	13	38	5	0	56	20	95	119	0	234	797
Total	78	801	80	0	959	363	675	131	1	1169	80	217	36	0	333	63	513	426	0	1002	3463
BREAK																					
4:15 PM	21	181	15	0	217	146	208	15	0	369	53	146	12	0	211	22	50	76	0	148	945
4:30 PM	14	199	18	0	231	127	194	5	1	326	59	172	9	0	240	30	57	94	0	181	978
4:45 PM	27	186	8	0	221	131	172	19	0	322	58	174	10	0	242	31	64	79	0	174	959
5:00 PM	21	198	18	1	237	119	228	21	0	368	69	202	16	1	287	35	79	103	0	217	1109
Total	83	764	59	1	906	523	802	60	1	1385	239	694	47	1	980	118	250	352	0	720	3991
5:15 PM	11	167	11	0	189	138	215	13	0	366	51	236	22	2	309	30	82	73	1	185	1049
5:30 PM	28	189	16	0	233	135	240	10	0	385	48	195	12	4	255	40	72	87	0	199	1072
5:45 PM	12	130	11	0	153	99	209	15	0	323	37	210	14	0	261	29	65	66	1	160	897
6:00 PM	15	156	5	0	176	168	248	16	0	432	28	146	13	0	187	35	84	95	0	214	1009
Total	66	642	43	0	751	540	912	54	0	1506	164	787	61	6	1012	134	303	321	2	758	4027
Grand Total	298	2993	268	1	3559	1778	3040	358	2	5176	552	1842	171	7	2565	343	1621	1516	4	3480	14780
Apprch %	8.4	84.1	7.5	0.0		34.4	58.7	6.9	0.0		21.5	71.8	6.7	0.3		9.9	46.6	43.6	0.1		
Total %	2.0	20.3	1.8	0.0	24.1	12.0	20.6	2.4	0.0	35.0	3.7	12.5	1.2	0.0	17.4	2.3	11.0	10.3	0.0	23.5	
Cars, PU, Vans	295	2964	263	1	3522	1714	3004	351	2	5069	546	1822	170	7	2538	337	1606	1466	4	3409	14538
% Cars, PU, Vans	99.0	99.0	98.1	100.0	99.0	96.4	98.8	98.0	100.0	97.9	98.9	98.9	99.4	100.0	98.9	98.3	99.1	96.7	100.0	98.0	98.4
Heavy Trucks	3	29	5		37	64	36	7		107	6	20	1		27	6	15	50		71	242
%Heavy Trucks	1.0	1.0	1.9	0.0	1.0	3.6	1.2	2.0	0.0	2.1	1.1	1.1	0.6	0.0	1.1	1.7	0.9	3.3	0.0	2.0	1.6

Project ID: 17-9348-002
Location: Lawrenceville Suwanee Rd_SR
City: Suwanee

PEAK HOURS

Day: Tuesday
Date: 5/23/2017

AM

	wrenceville Suwanee Rd_SR 3 Northbound				wrenceville Suwanee Rd_SR 3 Southbound				Old Peachtree Rd NW Eastbound				Old Peachtree Rd NW Westbound				
Start Time	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Int. Total
Peak Hour Analysis from 06:45 AM to 08:45 AM																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
7:15 AM	27	167	17	211	80	165	28	273	18	39	17	74	4	150	103	257	815
7:30 AM	22	255	19	296	76	198	40	314	18	38	4	60	8	122	99	229	899
7:45 AM	29	199	18	246	130	190	44	364	26	67	12	105	15	157	88	260	975
8:00 AM	16	232	19	267	79	188	37	304	14	64	6	84	14	130	91	235	890
Total Volume	94	853	73	1020	365	741	149	1255	76	208	39	323	41	559	381	981	3579
% App. Total	9.2	83.6	7.2	100	29.1	59.0	11.9	100	23.5	64.4	12.1	100	4.2	57.0	38.8	100	
PHF				0.861				0.862				0.769				0.943	
Cars, PU, Vans	94	849	71	1014	348	730	148	1226	74	201	39	314	40	558	369	967	3521
% Cars, PU, Vans	100.0	99.5	97.3	99.4	95.3	98.5	99.3	97.7	97.4	96.6	100.0	97.2	97.6	99.8	96.9	98.6	98.4
Heavy Trucks	0	4	2	6	17	11	1	29	2	7	0	9	1	1	12	14	58
%Heavy Trucks	0.0	0.5	2.7	0.6	4.7	1.5	0.7	2.3	2.6	3.4	0.0	2.8	2.4	0.2	3.1	1.4	1.6

PM

	wrenceville Suwanee Rd_SR 3 Northbound				wrenceville Suwanee Rd_SR 3 Southbound				Old Peachtree Rd NW Eastbound				Old Peachtree Rd NW Westbound				
Start Time	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Int. Total
Peak Hour Analysis from 04:15 PM to 06:15 PM																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
4:45 PM	27	186	8	221	131	172	19	322	58	174	10	242	31	64	79	174	959
5:00 PM	21	198	18	237	119	228	21	368	69	202	16	287	35	79	103	217	1109
5:15 PM	11	167	11	189	138	215	13	366	51	236	22	309	30	82	73	185	1049
5:30 PM	28	189	16	233	135	240	10	385	48	195	12	255	40	72	87	199	1072
Total Volume	87	740	53	880	523	855	63	1441	226	807	60	1093	136	297	342	775	4189
% App. Total	9.9	84.1	6.0	100	36.3	59.3	4.4	100	20.7	73.8	5.5	100	17.5	38.3	44.1	100	
PHF				0.928				0.936				0.884				0.893	
Cars, PU, Vans	86	730	52	868	507	845	62	1414	225	800	60	1085	134	290	330	754	4121
% Cars, PU, Vans	98.9	98.6	98.1	98.6	96.9	98.8	98.4	98.1	99.6	99.1	100.0	99.3	98.5	97.6	96.5	97.3	98.4
Heavy Trucks	1	10	1	12	16	10	1	27	1	7	0	8	2	7	12	21	68
%Heavy Trucks	1.1	1.4	1.9	1.4	3.1	1.2	1.6	1.9	0.4	0.9	0.0	0.7	1.5	2.4	3.5	2.7	1.6

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

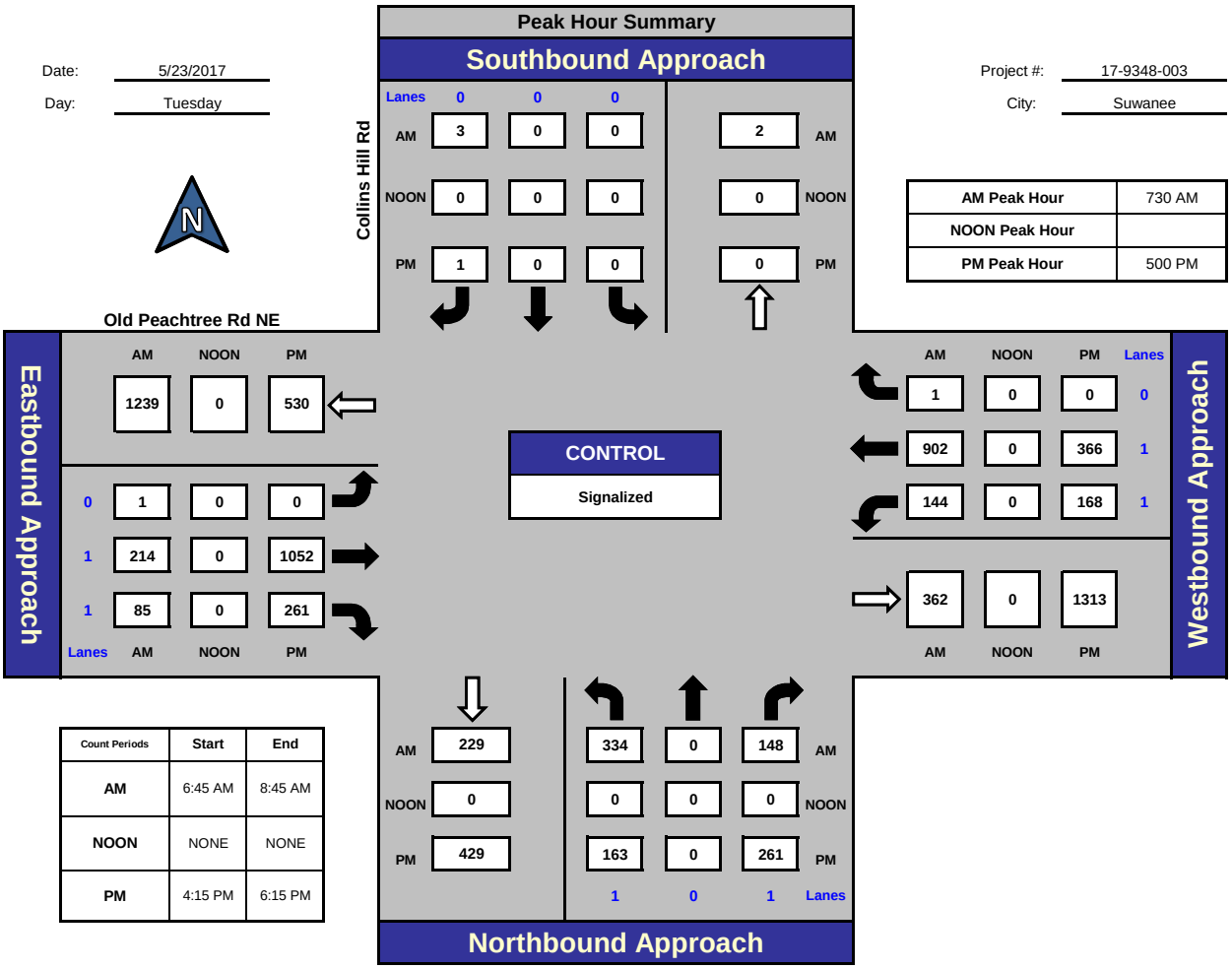
Collins Hill Rd and Old Peachtree Rd NE , Suwanee

Date: 5/23/2017

Day: Tuesday

Project #: 17-9348-003

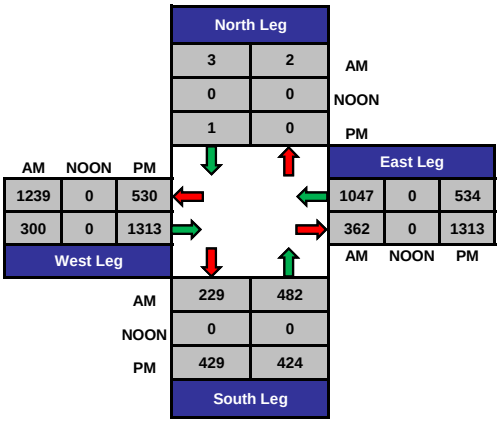
City: Suwanee



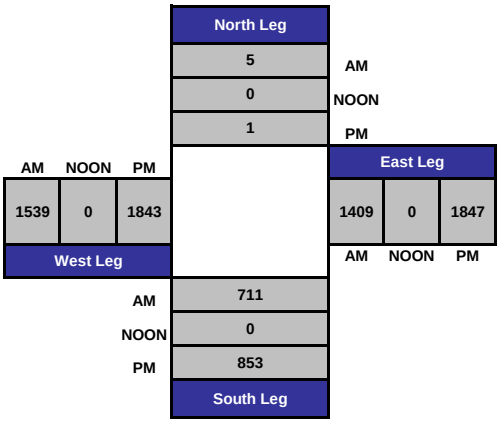
AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	500 PM

Count Periods	Start	End
AM	6:45 AM	8:45 AM
NOON	NONE	NONE
PM	4:15 PM	6:15 PM

Total Ins & Outs



Total Volume Per Leg



Project ID: 17-9348-003
Location: Collins Hill Rd & Old Peachtree Rd NE
City: Suwanee

Day: Tuesday
Date: 5/23/2017

Peak Start Times	
AM	6:45 AM
MD	12:00 AM
PM	4:15 PM

Groups Printed - Cars, PU, Vans - Heavy Trucks

	Collins Hill Rd Northbound					Collins Hill Rd Southbound					Old Peachtree Rd NE Eastbound					Old Peachtree Rd NE Westbound					
Start Time	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Left	Thru	Rgt	Peds	App. Total	Int. Total
6:45 AM	70	1	37	0	108	0	0	0	0	0	2	39	41	0	82	71	234	0	0	305	495
7:00 AM	91	0	55	0	146	0	0	3	0	3	1	37	15	0	53	38	206	0	0	244	446
7:15 AM	68	0	37	0	105	0	1	0	0	1	0	48	17	0	65	23	249	0	0	272	443
7:30 AM	91	0	38	0	129	0	0	0	0	0	0	54	18	0	72	26	215	0	0	241	442
Total	320	1	167	0	488	0	1	3	0	4	3	178	91	0	272	158	904	0	0	1062	1826
7:45 AM	89	0	57	0	146	0	0	1	0	1	1	55	25	0	81	37	229	0	0	266	494
8:00 AM	86	0	24	0	110	0	0	0	0	0	0	52	14	0	66	46	215	1	0	262	438
8:15 AM	68	0	29	0	97	0	0	2	0	2	0	53	28	0	81	35	243	0	0	278	458
8:30 AM	82	0	40	0	122	0	0	1	0	1	1	45	17	0	63	27	197	0	0	224	410
Total	325	0	150	0	475	0	0	4	0	4	2	205	84	0	291	145	884	1	0	1030	1800
BREAK																					
4:15 PM	33	0	60	0	93	0	0	0	0	0	0	222	63	0	285	35	84	0	0	119	497
4:30 PM	53	0	60	0	113	0	0	1	0	1	0	218	58	0	276	45	86	0	0	131	521
4:45 PM	40	0	45	0	85	0	0	0	0	0	0	212	57	0	269	39	96	0	0	135	489
5:00 PM	32	0	68	0	100	0	0	1	0	1	0	254	74	0	328	39	85	0	0	124	553
Total	158	0	233	0	391	0	0	2	0	2	0	906	252	0	1158	158	351	0	0	509	2060
5:15 PM	36	0	74	0	110	0	0	0	0	0	0	269	68	0	337	49	105	0	0	154	601
5:30 PM	47	0	57	0	104	0	0	0	0	0	0	279	58	0	337	46	82	0	0	128	569
5:45 PM	48	0	62	0	110	0	0	0	0	0	0	250	61	0	311	34	94	0	0	128	549
6:00 PM	53	0	59	0	112	0	0	0	0	0	0	212	76	0	288	41	83	0	0	124	524
Total	184	0	252	0	436	0	0	0	0	0	0	1010	263	0	1273	170	364	0	0	534	2243
Grand Total	987	1	802	0	1790	0	1	9	0	10	5	2299	690	0	2994	631	2503	1	0	3135	7929
Apprch %	55.1	0.1	44.8	0.0		0.0	10.0	90.0	0.0		0.2	76.8	23.0	0.0		20.1	79.8	0.0	0.0		
Total %	12.4	0.0	10.1	0.0	22.6	0.0	0.0	0.1	0.0	0.1	0.1	29.0	8.7	0.0	37.8	8.0	31.6	0.0	0.0	39.5	
Cars, PU, Vans	986	1	802	0	1789	0	1	9	0	10	5	2293	689	0	2987	631	2501	1	0	3133	7919
% Cars, PU, Vans	99.9	100.0	100.0	0.0	99.9	0.0	100.0	100.0	0.0	100.0	100.0	99.7	99.9	0.0	99.8	100.0	99.9	100.0	0.0	99.9	99.9
Heavy Trucks	1	0	0		1	0	0	0		0	0	6	1		7	0	2	0		2	10
%Heavy Trucks	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.2	0.0	0.1	0.0	0.0	0.1	0.1

Project ID: 17-9348-003
Location: Collins Hill Rd & Old Peachtree
City: Suwanee

PEAK HOURS

Day: Tuesday
Date: 5/23/2017

AM

	Collins Hill Rd Northbound				Collins Hill Rd Southbound				Old Peachtree Rd NE Eastbound				Old Peachtree Rd NE Westbound				
Start Time	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Int. Total
Peak Hour Analysis from 06:45 AM to 08:45 AM																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
7:30 AM	91	0	38	129	0	0	0	0	0	54	18	72	26	215	0	241	442
7:45 AM	89	0	57	146	0	0	1	1	1	55	25	81	37	229	0	266	494
8:00 AM	86	0	24	110	0	0	0	0	0	52	14	66	46	215	1	262	438
8:15 AM	68	0	29	97	0	0	2	2	0	53	28	81	35	243	0	278	458
Total Volume	334	0	148	482	0	0	3	3	1	214	85	300	144	902	1	1047	1832
% App. Total	69.3	0.0	30.7	100	0.0	0.0	100.0	100	0.3	71.3	28.3	100	13.8	86.2	0.1	100	
PHF				0.825				0.375				0.926				0.942	
Cars, PU, Vans	334	0	148	482	0	0	3	3	1	212	85	298	144	901	1	1046	1829
% Cars, PU, Vans	100.0	0.0	100.0	100.0	0.0	0.0	100.0	100.0	100.0	99.1	100.0	99.3	100.0	99.9	100.0	99.9	99.8
Heavy Trucks	0	0	0	0	0	0	0	0	0	2	0	2	0	1	0	1	3
%Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.7	0.0	0.1	0.0	0.1	0.2

PM

	Collins Hill Rd Northbound				Collins Hill Rd Southbound				Old Peachtree Rd NE Eastbound				Old Peachtree Rd NE Westbound				
Start Time	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Left	Thru	Rgt	App. Total	Int. Total
Peak Hour Analysis from 04:15 PM to 06:15 PM																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
5:00 PM	32	0	68	100	0	0	1	1	0	254	74	328	39	85	0	124	553
5:15 PM	36	0	74	110	0	0	0	0	0	269	68	337	49	105	0	154	601
5:30 PM	47	0	57	104	0	0	0	0	0	279	58	337	46	82	0	128	569
5:45 PM	48	0	62	110	0	0	0	0	0	250	61	311	34	94	0	128	549
Total Volume	163	0	261	424	0	0	1	1	0	1052	261	1313	168	366	0	534	2272
% App. Total	38.4	0.0	61.6	100	0.0	0.0	100.0	100	0.0	80.1	19.9	100	31.5	68.5	0.0	100	
PHF				0.964				0.250				0.974				0.867	
Cars, PU, Vans	163	0	261	424	0	0	1	1	0	1052	261	1313	168	365	0	533	2271
% Cars, PU, Vans	100.0	0.0	100.0	100.0	0.0	0.0	100.0	100.0	0.0	100.0	100.0	100.0	100.0	99.7	0.0	99.8	100.0
Heavy Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
%Heavy Trucks	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.2	0.0

Prepared by NDS/ATD

VOLUME

Horizon Dr N/O Old Peachtree Rd NE

Day: Tuesday
Date: 5/23/2017

City: Suwanee
Project #: GA17_9349_001

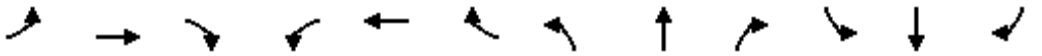
DAILY TOTALS	NB	SB	EB	WB	Total
	1,056	1,078	0	0	2,134

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	2		11						13		12:00	22		23						45	
00:15	0		0						0		12:15	21		19						40	
00:30	0		0						0		12:30	19		24						43	
00:45	0	2	0	11					0	13	12:45	24	86	22	88					46	174
01:00	1		2						3		13:00	21		13						34	
01:15	0		0						0		13:15	15		24						39	
01:30	1		1						2		13:30	18		12						30	
01:45	0	2	0	3					0	5	13:45	28	82	13	62					41	144
02:00	0		0						0		14:00	29		22						51	
02:15	0		0						0		14:15	32		16						48	
02:30	0		0						0		14:30	24		23						47	
02:45	0		0						0		14:45	16	101	26	87					42	188
03:00	0		0						0		15:00	22		47						69	
03:15	0		0						0		15:15	25		23						48	
03:30	0		0						0		15:30	5		57						62	
03:45	2	2	0						2	2	15:45	13	65	16	143					29	208
04:00	0		0						0		16:00	11		21						32	
04:15	0		0						0		16:15	7		16						23	
04:30	1		0						1		16:30	10		30						40	
04:45	4	5	0						4	5	16:45	9	37	20	87					29	124
05:00	0		1						1		17:00	10		94						104	
05:15	0		0						0		17:15	9		35						44	
05:30	4		1						5		17:30	9		41						50	
05:45	25	29	0	2					25	31	17:45	6	34	13	183					19	217
06:00	18		4						22		18:00	4		21						25	
06:15	14		1						15		18:15	5		16						21	
06:30	29		7						36		18:30	3		47						50	
06:45	36	97	0	12					36	109	18:45	2	14	7	91					9	105
07:00	29		5						34		19:00	4		2						6	
07:15	35		5						40		19:15	2		2						4	
07:30	20		4						24		19:30	4		12						16	
07:45	58	142	10	24					68	166	19:45	6	16	10	26					16	42
08:00	44		1						45		20:00	6		2						8	
08:15	38		12						50		20:15	2		8						10	
08:30	30		7						37		20:30	2		2						4	
08:45	35	147	14	34					49	181	20:45	0	10	3	15					3	25
09:00	28		8						36		21:00	1		0						1	
09:15	17		6						23		21:15	1		3						4	
09:30	5		13						18		21:30	2		4						6	
09:45	12	62	14	41					26	103	21:45	9	13	3	10					12	23
10:00	15		17						32		22:00	2		1						3	
10:15	12		13						25		22:15	0		0						0	
10:30	19		16						35		22:30	0		2						2	
10:45	14	60	15	61					29	121	22:45	3	5	2	5					5	10
11:00	9		21						30		23:00	0		6						6	
11:15	15		13						28		23:15	0		5						5	
11:30	9		20						29		23:30	2		0						2	
11:45	8	41	24	78					32	119	23:45	2	4	4	15					6	19
TOTALS		589		266						855	TOTALS		467		812						1279
SPLIT %		68.9%		31.1%						40.1%	SPLIT %		36.5%		63.5%						59.9%

DAILY TOTALS	NB	SB	EB	WB	Total
	1,056	1,078	0	0	2,134

AM Peak Hour	07:45	11:45			07:45	PM Peak Hour	13:45	16:45			16:45
AM Pk Volume	170	90			200	PM Pk Volume	113	190			227
Pk Hr Factor	0.733	0.938			0.735	Pk Hr Factor	0.883	0.505			0.546
7 - 9 Volume	289	58	0	0	347	4 - 6 Volume	71	270	0	0	341
7 - 9 Peak Hour	07:45	08:00			07:45	4 - 6 Peak Hour	16:30	16:45			16:45
7 - 9 Pk Volume	170	34	0	0	200	4 - 6 Pk Volume	38	190	0	0	227
Pk Hr Factor	0.733	0.607	0.000	0.000	0.735	Pk Hr Factor	0.950	0.505	0.000	0.000	0.546

Appendix H
Synchro Capacity Analyses

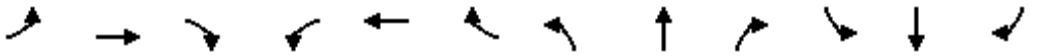


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	2	0	1154	189	56	1	103	261	1	16	3
Future Volume (vph)	2	2	0	1154	189	56	1	103	261	1	16	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863		1770	1863	1583	1770	1827	1583	1770	1520	1583
Flt Permitted	1.00	1.00		0.56	1.00	1.00	0.74	1.00	1.00	0.68	1.00	1.00
Satd. Flow (perm)	1863	1863		1049	1863	1583	1375	1827	1583	1275	1520	1583
Peak-hour factor, PHF	0.50	0.50	0.50	0.95	0.95	0.95	0.91	0.91	0.91	0.56	0.56	0.56
Adj. Flow (vph)	4	4	0	1215	199	59	1	113	287	2	29	5
RTOR Reduction (vph)	0	0	0	0	0	13	0	0	0	0	0	4
Lane Group Flow (vph)	4	4	0	1215	199	46	1	113	287	2	29	1
Heavy Vehicles (%)	2%	2%	0%	2%	2%	2%	2%	4%	2%	2%	25%	2%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Free	Perm	NA	Perm
Protected Phases		6		5	2			4			8	
Permitted Phases	6		6	2		2	4		Free	8		8
Actuated Green, G (s)	1.1	1.1		73.4	73.4	73.4	9.7	9.7	95.1	9.7	9.7	9.7
Effective Green, g (s)	1.1	1.1		73.4	73.4	73.4	9.7	9.7	95.1	9.7	9.7	9.7
Actuated g/C Ratio	0.01	0.01		0.77	0.77	0.77	0.10	0.10	1.00	0.10	0.10	0.10
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	21	21		1312	1437	1221	140	186	1583	130	155	161
v/s Ratio Prot		0.00		c0.65	0.11			c0.06			0.02	
v/s Ratio Perm	0.00			c0.07		0.03	0.00		0.18	0.00		0.00
v/c Ratio	0.19	0.19		0.93	0.14	0.04	0.01	0.61	0.18	0.02	0.19	0.00
Uniform Delay, d1	46.6	46.6		8.8	2.8	2.5	38.4	40.9	0.0	38.4	39.1	38.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.4	4.4		11.2	0.0	0.0	0.0	5.5	0.3	0.0	0.6	0.0
Delay (s)	50.9	50.9		20.0	2.8	2.6	38.4	46.4	0.3	38.5	39.7	38.4
Level of Service	D	D		B	A	A	D	D	A	D	D	D
Approach Delay (s)		50.9			16.9			13.4			39.4	
Approach LOS		D			B			B			D	

Intersection Summary			
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	95.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

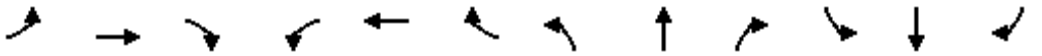
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	408	772	159	84	896	102	76	175	35	43	573	429
Future Volume (vph)	408	772	159	84	896	102	76	175	35	43	573	429
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3448		1770	3539	1583	1736	3539	1568	1770	3539	1568
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.17	1.00	1.00	0.63	1.00	1.00
Satd. Flow (perm)	3400	3448		1770	3539	1583	313	3539	1568	1170	3539	1568
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	458	867	179	92	985	112	85	197	39	46	616	461
RTOR Reduction (vph)	0	13	0	0	0	71	0	0	30	0	0	286
Lane Group Flow (vph)	458	1033	0	92	985	41	85	197	9	46	616	175
Heavy Vehicles (%)	3%	2%	2%	2%	2%	2%	4%	2%	3%	2%	2%	3%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases						2	4		4	8		8
Actuated Green, G (s)	17.6	52.2		8.7	43.3	43.3	33.6	26.2	26.2	31.2	25.0	25.0
Effective Green, g (s)	17.6	52.2		8.7	43.3	43.3	33.6	26.2	26.2	31.2	25.0	25.0
Actuated g/C Ratio	0.15	0.45		0.07	0.37	0.37	0.29	0.22	0.22	0.27	0.21	0.21
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	510	1534		131	1306	584	179	790	350	342	754	334
v/s Ratio Prot	c0.13	0.30		0.05	c0.28		c0.03	0.06		0.01	c0.17	
v/s Ratio Perm						0.03	0.11		0.01	0.03		0.11
v/c Ratio	0.90	0.67		0.70	0.75	0.07	0.47	0.25	0.02	0.13	0.82	0.52
Uniform Delay, d1	49.0	25.8		53.0	32.3	24.0	32.5	37.5	35.6	32.4	44.0	40.9
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.3	1.2		15.7	4.1	0.2	2.0	0.2	0.0	0.2	6.8	1.5
Delay (s)	67.3	27.0		68.7	36.4	24.2	34.5	37.6	35.6	32.6	50.8	42.3
Level of Service	E	C		E	D	C	C	D	D	C	D	D
Approach Delay (s)		39.2			37.8			36.6			46.6	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	40.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	117.3	Sum of lost time (s)	24.0
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	184	92	155	961	1	350	1	165	1	0	1
Future Volume (vph)	1	184	92	155	961	1	350	1	165	1	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1863	1583	1770	1863	1615	1770	1585		1805	1615	
Flt Permitted	0.07	1.00	1.00	0.58	1.00	1.00	0.58	1.00		1.00	1.00	
Satd. Flow (perm)	128	1863	1583	1078	1863	1615	1080	1585		1900	1615	
Peak-hour factor, PHF	0.89	0.89	0.89	0.96	0.96	0.96	0.82	0.82	0.82	0.88	0.88	0.88
Adj. Flow (vph)	1	207	103	161	1001	1	427	1	201	1	0	1
RTOR Reduction (vph)	0	0	49	0	0	0	0	160	0	0	1	0
Lane Group Flow (vph)	1	207	54	161	1001	1	427	42	0	1	0	0
Heavy Vehicles (%)	0%	2%	2%	2%	2%	0%	2%	0%	2%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		
Actuated Green, G (s)	60.2	59.3	59.3	68.4	63.4	63.4	30.1	23.2		1.8	0.9	
Effective Green, g (s)	60.2	59.3	59.3	68.4	63.4	63.4	30.1	23.2		1.8	0.9	
Actuated g/C Ratio	0.54	0.53	0.53	0.61	0.56	0.56	0.27	0.21		0.02	0.01	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	81	982	835	686	1050	910	431	327		29	12	
v/s Ratio Prot	0.00	0.11		c0.01	c0.54		c0.20	0.03		0.00	0.00	
v/s Ratio Perm	0.01		0.03	0.13		0.00	c0.06			0.00		
v/c Ratio	0.01	0.21	0.07	0.23	0.95	0.00	0.99	0.13		0.03	0.00	
Uniform Delay, d1	23.8	14.1	13.0	9.6	23.1	10.7	40.1	36.4		54.5	55.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1	0.0	0.2	18.6	0.0	40.8	0.8		0.5	0.0	
Delay (s)	23.9	14.2	13.0	9.8	41.7	10.7	80.8	37.2		55.0	55.3	
Level of Service	C	B	B	A	D	B	F	D		D	E	
Approach Delay (s)		13.9			37.2			66.8			55.2	
Approach LOS		B			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	42.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	112.4	Sum of lost time (s)	24.0
Intersection Capacity Utilization	95.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

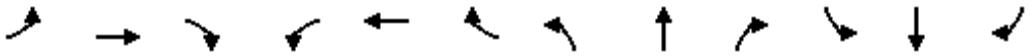


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	197	7	446	119	4	16	26	1171	58	88	32
Future Volume (vph)	2	197	7	446	119	4	16	26	1171	58	88	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	1696	1583	1770	1792	1583
Flt Permitted	0.67	1.00	1.00	0.35	1.00	1.00	0.62	1.00	1.00	0.74	1.00	1.00
Satd. Flow (perm)	1250	1863	1583	654	1863	1583	1152	1696	1583	1378	1792	1583
Peak-hour factor, PHF	0.84	0.84	0.84	0.89	0.89	0.89	0.96	0.96	0.96	0.50	0.50	0.50
Adj. Flow (vph)	2	235	8	501	134	4	17	27	1220	116	176	64
RTOR Reduction (vph)	0	0	6	0	0	1	0	0	0	0	0	53
Lane Group Flow (vph)	2	235	2	501	134	3	17	27	1220	116	176	11
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	12%	2%	2%	6%	2%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Free	Perm	NA	Perm
Protected Phases		6		5	2			4			8	
Permitted Phases	6		6	2		2	4		Free	8		8
Actuated Green, G (s)	14.5	14.5	14.5	48.3	48.3	48.3	12.4	12.4	72.7	12.4	12.4	12.4
Effective Green, g (s)	14.5	14.5	14.5	48.3	48.3	48.3	12.4	12.4	72.7	12.4	12.4	12.4
Actuated g/C Ratio	0.20	0.20	0.20	0.66	0.66	0.66	0.17	0.17	1.00	0.17	0.17	0.17
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	249	371	315	861	1237	1051	196	289	1583	235	305	270
v/s Ratio Prot		0.13		0.22	0.07			0.02			0.10	
v/s Ratio Perm	0.00		0.00	0.16		0.00	0.01		c0.77	0.08		0.01
v/c Ratio	0.01	0.63	0.01	0.58	0.11	0.00	0.09	0.09	0.77	0.49	0.58	0.04
Uniform Delay, d1	23.3	26.7	23.3	6.6	4.4	4.1	25.4	25.4	0.0	27.3	27.7	25.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	3.5	0.0	1.0	0.0	0.0	0.2	0.1	3.7	1.6	2.6	0.1
Delay (s)	23.3	30.2	23.3	7.7	4.5	4.1	25.6	25.6	3.7	28.9	30.4	25.2
Level of Service	C	C	C	A	A	A	C	C	A	C	C	C
Approach Delay (s)		29.9			7.0			4.5			29.0	
Approach LOS		C			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	72.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	60.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

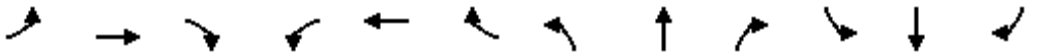
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	573	919	81	95	768	60	270	737	51	147	314	368
Future Volume (vph)	573	919	81	95	768	60	270	737	51	147	314	368
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3400	3496		1770	3539	1538	1770	3539	1524	1770	3505	1568
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.38	1.00	1.00	0.16	1.00	1.00
Satd. Flow (perm)	3400	3496		1770	3539	1538	712	3539	1524	299	3505	1568
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	623	999	88	100	808	63	297	810	56	162	345	404
RTOR Reduction (vph)	0	5	0	0	0	45	0	0	42	0	0	320
Lane Group Flow (vph)	623	1082	0	100	808	18	297	810	14	162	345	84
Heavy Vehicles (%)	3%	2%	2%	2%	2%	5%	2%	2%	6%	2%	3%	3%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases						2	4		4	8		8
Actuated Green, G (s)	23.7	48.1		9.6	34.0	34.0	41.9	28.9	28.9	33.9	24.9	24.9
Effective Green, g (s)	23.7	48.1		9.6	34.0	34.0	41.9	28.9	28.9	33.9	24.9	24.9
Actuated g/C Ratio	0.20	0.40		0.08	0.28	0.28	0.35	0.24	0.24	0.28	0.21	0.21
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	673	1406		142	1006	437	364	855	368	195	729	326
v/s Ratio Prot	c0.18	c0.31		0.06	c0.23		c0.09	c0.23		0.06	0.10	
v/s Ratio Perm						0.01	0.20		0.01	0.17		0.05
v/c Ratio	0.93	0.77		0.70	0.80	0.04	0.82	0.95	0.04	0.83	0.47	0.26
Uniform Delay, d1	47.1	30.9		53.6	39.7	31.0	32.3	44.6	34.7	35.4	41.6	39.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	18.7	2.6		14.7	6.8	0.2	13.2	19.0	0.0	24.9	0.5	0.4
Delay (s)	65.7	33.5		68.3	46.5	31.2	45.4	63.6	34.7	60.3	42.1	40.0
Level of Service	E	C		E	D	C	D	E	C	E	D	D
Approach Delay (s)		45.3			47.7			57.6			44.4	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	48.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	119.6	Sum of lost time (s)	24.0
Intersection Capacity Utilization	86.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



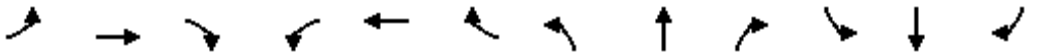
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	1064	290	190	337	13	199	5	256	26	12	26
Future Volume (vph)	13	1064	290	190	337	13	199	5	256	26	12	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1863	1583	1770	1863	1615	1770	1589		1805	1706	
Flt Permitted	0.53	1.00	1.00	0.05	1.00	1.00	0.36	1.00		0.78	1.00	
Satd. Flow (perm)	1012	1863	1583	92	1863	1615	671	1589		1490	1706	
Peak-hour factor, PHF	0.96	0.96	0.96	0.87	0.87	0.87	0.84	0.84	0.84	0.88	0.88	0.88
Adj. Flow (vph)	14	1108	302	218	387	15	237	6	305	30	14	30
RTOR Reduction (vph)	0	0	120	0	0	5	0	167	0	0	29	0
Lane Group Flow (vph)	14	1108	182	218	387	10	237	144	0	30	15	0
Heavy Vehicles (%)	0%	2%	2%	2%	2%	0%	2%	0%	2%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		
Actuated Green, G (s)	76.8	74.8	74.8	89.8	81.8	81.8	22.1	13.2		8.0	5.1	
Effective Green, g (s)	76.8	74.8	74.8	89.8	81.8	81.8	22.1	13.2		8.0	5.1	
Actuated g/C Ratio	0.62	0.60	0.60	0.72	0.66	0.66	0.18	0.11		0.06	0.04	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	640	1124	955	188	1229	1066	217	169		103	70	
v/s Ratio Prot	0.00	0.59		c0.08	0.21		c0.10	0.09		0.01	0.01	
v/s Ratio Perm	0.01		0.12	c0.75		0.01	c0.10			0.01		
v/c Ratio	0.02	0.99	0.19	1.16	0.31	0.01	1.09	0.85		0.29	0.22	
Uniform Delay, d1	9.0	24.0	11.0	44.4	9.0	7.2	49.2	54.4		55.1	57.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	23.2	0.1	115.2	0.7	0.0	87.9	38.7		1.6	1.6	
Delay (s)	9.0	47.2	11.1	159.6	9.7	7.2	137.1	93.1		56.7	59.0	
Level of Service	A	D	B	F	A	A	F	F		E	E	
Approach Delay (s)		39.2			62.4			112.1			58.1	
Approach LOS		D			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	60.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	123.9	Sum of lost time (s)	24.0
Intersection Capacity Utilization	103.1%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			



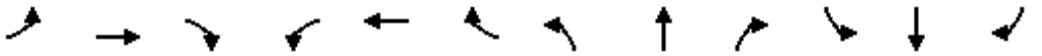
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	2	0	1166	191	89	1	175	264	11	37	3
Future Volume (vph)	2	2	0	1166	191	89	1	175	264	11	37	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1900		1805	1900	1524	1805	1667	1599	1530	1496	1615
Flt Permitted	1.00	1.00		0.56	1.00	1.00	0.71	1.00	1.00	0.42	1.00	1.00
Satd. Flow (perm)	1900	1900		1056	1900	1524	1357	1667	1599	679	1496	1615
Peak-hour factor, PHF	0.50	0.50	0.50	0.95	0.95	0.95	0.91	0.91	0.91	0.56	0.56	0.56
Adj. Flow (vph)	4	4	0	1227	201	94	1	192	290	20	66	5
RTOR Reduction (vph)	0	0	0	0	0	24	0	0	0	0	0	4
Lane Group Flow (vph)	4	4	0	1227	201	70	1	192	290	20	66	1
Heavy Vehicles (%)	0%	0%	0%	0%	0%	6%	0%	14%	1%	18%	27%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Free	Perm	NA	Perm
Protected Phases		6		5	2			4			8	
Permitted Phases	6		6	2		2	4		Free	8		8
Actuated Green, G (s)	1.2	1.2		81.2	81.2	81.2	15.2	15.2	108.4	15.2	15.2	15.2
Effective Green, g (s)	1.2	1.2		81.2	81.2	81.2	15.2	15.2	108.4	15.2	15.2	15.2
Actuated g/C Ratio	0.01	0.01		0.75	0.75	0.75	0.14	0.14	1.00	0.14	0.14	0.14
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	21	21		1302	1423	1141	190	233	1599	95	209	226
v/s Ratio Prot		0.00		c0.64	0.11			c0.12			0.04	
v/s Ratio Perm	0.00			c0.06		0.05	0.00		0.18	0.03		0.00
v/c Ratio	0.19	0.19		0.94	0.14	0.06	0.01	0.82	0.18	0.21	0.32	0.00
Uniform Delay, d1	53.1	53.1		11.6	3.8	3.6	40.1	45.3	0.0	41.3	41.9	40.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.4	4.4		13.5	0.0	0.0	0.0	20.5	0.2	1.1	0.9	0.0
Delay (s)	57.5	57.5		25.0	3.9	3.6	40.1	65.8	0.2	42.4	42.8	40.1
Level of Service	E	E		C	A	A	D	E	A	D	D	D
Approach Delay (s)		57.5			20.9			26.4			42.6	
Approach LOS		E			C			C			D	

Intersection Summary			
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	108.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	90.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	503	780	161	85	905	111	77	183	35	45	581	461
Future Volume (vph)	503	780	161	85	905	111	77	183	35	45	581	461
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3273	3477		1805	3539	1568	1736	3539	1568	1805	3574	1538
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.17	1.00	1.00	0.62	1.00	1.00
Satd. Flow (perm)	3273	3477		1805	3539	1568	302	3539	1568	1183	3574	1538
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	565	876	181	93	995	122	87	206	39	48	625	496
RTOR Reduction (vph)	0	14	0	0	0	80	0	0	30	0	0	305
Lane Group Flow (vph)	565	1043	0	93	995	42	87	206	9	48	625	191
Heavy Vehicles (%)	7%	1%	2%	0%	2%	3%	4%	2%	3%	0%	1%	5%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases						2	4		4	8		8
Actuated Green, G (s)	23.5	54.1		10.4	41.0	41.0	31.6	26.6	26.6	29.4	25.5	25.5
Effective Green, g (s)	23.5	54.1		10.4	41.0	41.0	31.6	26.6	26.6	29.4	25.5	25.5
Actuated g/C Ratio	0.20	0.45		0.09	0.34	0.34	0.27	0.22	0.22	0.25	0.21	0.21
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	646	1580		157	1219	540	140	791	350	312	765	329
v/s Ratio Prot	c0.17	0.30		0.05	c0.28		c0.03	0.06		0.01	c0.17	
v/s Ratio Perm						0.03	0.14		0.01	0.03		0.12
v/c Ratio	0.87	0.66		0.59	0.82	0.08	0.62	0.26	0.02	0.15	0.82	0.58
Uniform Delay, d1	46.3	25.3		52.3	35.6	26.3	35.0	38.1	36.1	34.7	44.5	42.0
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.6	1.0		5.9	6.1	0.3	8.3	0.2	0.0	0.2	6.8	2.6
Delay (s)	58.9	26.3		58.1	41.7	26.5	43.3	38.3	36.1	34.9	51.3	44.6
Level of Service	E	C		E	D	C	D	D	D	C	D	D
Approach Delay (s)		37.7			41.4			39.3			47.8	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	41.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	119.0	Sum of lost time (s)	24.0
Intersection Capacity Utilization	79.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

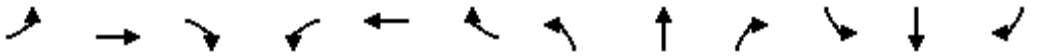


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	198	95	157	1011	1	362	1	167	1	0	1
Future Volume (vph)	1	198	95	157	1011	1	362	1	167	1	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1881	1599	1805	1900	1615	1805	1616		1805	1615	
Flt Permitted	0.07	1.00	1.00	0.57	1.00	1.00	0.58	1.00		1.00	1.00	
Satd. Flow (perm)	126	1881	1599	1078	1900	1615	1101	1616		1900	1615	
Peak-hour factor, PHF	0.89	0.89	0.89	0.96	0.96	0.96	0.82	0.82	0.82	0.88	0.88	0.88
Adj. Flow (vph)	1	222	107	164	1053	1	441	1	204	1	0	1
RTOR Reduction (vph)	0	0	50	0	0	0	0	164	0	0	1	0
Lane Group Flow (vph)	1	222	57	164	1053	1	441	41	0	1	0	0
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		
Actuated Green, G (s)	61.2	60.3	60.3	69.4	64.4	64.4	29.0	22.1		1.8	0.9	
Effective Green, g (s)	61.2	60.3	60.3	69.4	64.4	64.4	29.0	22.1		1.8	0.9	
Actuated g/C Ratio	0.54	0.54	0.54	0.62	0.57	0.57	0.26	0.20		0.02	0.01	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	82	1010	858	698	1089	926	422	318		29	12	
v/s Ratio Prot	0.00	0.12		c0.01	c0.55		c0.21	0.03		0.00	0.00	
v/s Ratio Perm	0.01		0.04	0.13		0.00	c0.06			0.00		
v/c Ratio	0.01	0.22	0.07	0.23	0.97	0.00	1.05	0.13		0.03	0.00	
Uniform Delay, d1	25.8	13.7	12.5	9.2	22.9	10.2	40.7	37.2		54.4	55.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1	0.0	0.2	20.4	0.0	56.0	0.8		0.5	0.0	
Delay (s)	25.8	13.8	12.5	9.3	43.3	10.2	96.8	38.0		54.9	55.3	
Level of Service	C	B	B	A	D	B	F	D		D	E	
Approach Delay (s)		13.4			38.7			78.1			55.1	
Approach LOS		B			D			E			E	

Intersection Summary			
HCM 2000 Control Delay	46.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	112.3	Sum of lost time (s)	24.0
Intersection Capacity Utilization	99.1%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

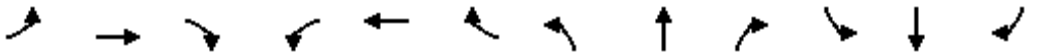
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	199	7	450	120	14	16	48	1183	86	150	32
Future Volume (vph)	2	199	7	450	120	14	16	48	1183	86	150	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1805	1900	1615	1805	1900	1417	1805	1597	1615	1719	1652	1615
Flt Permitted	0.67	1.00	1.00	0.33	1.00	1.00	0.39	1.00	1.00	0.72	1.00	1.00
Satd. Flow (perm)	1274	1900	1615	628	1900	1417	746	1597	1615	1311	1652	1615
Peak-hour factor, PHF	0.84	0.84	0.84	0.89	0.89	0.89	0.96	0.96	0.96	0.50	0.50	0.50
Adj. Flow (vph)	2	237	8	506	135	16	17	50	1232	172	300	64
RTOR Reduction (vph)	0	0	6	0	0	6	0	0	0	0	0	48
Lane Group Flow (vph)	2	237	2	506	135	10	17	50	1232	172	300	16
Heavy Vehicles (%)	0%	0%	0%	0%	0%	14%	0%	19%	0%	5%	15%	0%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Free	Perm	NA	Perm
Protected Phases		6		5	2			4			8	
Permitted Phases	6		6	2		2	4		Free	8		8
Actuated Green, G (s)	16.4	16.4	16.4	51.4	51.4	51.4	20.9	20.9	84.3	20.9	20.9	20.9
Effective Green, g (s)	16.4	16.4	16.4	51.4	51.4	51.4	20.9	20.9	84.3	20.9	20.9	20.9
Actuated g/C Ratio	0.19	0.19	0.19	0.61	0.61	0.61	0.25	0.25	1.00	0.25	0.25	0.25
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	247	369	314	787	1158	863	184	395	1615	325	409	400
v/s Ratio Prot		0.12		0.22	0.07			0.03			0.18	
v/s Ratio Perm	0.00		0.00	0.17		0.01	0.02		c0.76	0.13		0.01
v/c Ratio	0.01	0.64	0.00	0.64	0.12	0.01	0.09	0.13	0.76	0.53	0.73	0.04
Uniform Delay, d1	27.4	31.2	27.4	10.0	6.9	6.5	24.4	24.6	0.0	27.4	29.1	24.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	3.8	0.0	1.8	0.0	0.0	0.2	0.1	3.5	1.6	6.7	0.0
Delay (s)	27.4	35.0	27.4	11.8	7.0	6.5	24.6	24.8	3.5	29.0	35.8	24.1
Level of Service	C	D	C	B	A	A	C	C	A	C	D	C
Approach Delay (s)		34.7			10.7			4.6			32.2	
Approach LOS		C			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	84.3	Sum of lost time (s)	18.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	613	928	82	96	776	64	273	746	52	153	321	443
Future Volume (vph)	613	928	82	96	776	64	273	746	52	153	321	443
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.88
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3367	3534		1787	3574	1538	1787	3574	1524	1787	3505	2682
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.33	1.00	1.00	0.18	1.00	1.00
Satd. Flow (perm)	3367	3534		1787	3574	1538	628	3574	1524	333	3505	2682
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	666	1009	89	101	817	67	300	820	57	168	353	487
RTOR Reduction (vph)	0	6	0	0	0	49	0	0	42	0	0	393
Lane Group Flow (vph)	666	1092	0	101	817	18	300	820	15	168	353	94
Heavy Vehicles (%)	4%	1%	0%	1%	1%	5%	1%	1%	6%	1%	3%	6%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases						2	4		4	8		8
Actuated Green, G (s)	22.1	45.3		8.8	32.0	32.0	45.5	31.5	31.5	30.6	22.6	22.6
Effective Green, g (s)	22.1	45.3		8.8	32.0	32.0	45.5	31.5	31.5	30.6	22.6	22.6
Actuated g/C Ratio	0.19	0.39		0.07	0.27	0.27	0.39	0.27	0.27	0.26	0.19	0.19
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	632	1361		133	972	418	409	957	408	185	673	515
v/s Ratio Prot	c0.20	c0.31		0.06	c0.23		c0.11	c0.23		0.06	0.10	
v/s Ratio Perm						0.01	0.18		0.01	0.17		0.03
v/c Ratio	1.05	0.80		0.76	0.84	0.04	0.73	0.86	0.04	0.91	0.52	0.18
Uniform Delay, d1	47.7	32.2		53.4	40.4	31.5	27.3	40.9	31.8	37.8	42.7	39.8
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	50.8	3.5		21.7	8.7	0.2	6.7	7.6	0.0	40.7	0.7	0.2
Delay (s)	98.5	35.7		75.1	49.1	31.7	34.0	48.6	31.9	78.5	43.4	39.9
Level of Service	F	D		E	D	C	C	D	C	E	D	D
Approach Delay (s)		59.4			50.6			44.0			47.6	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	51.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	117.6	Sum of lost time (s)	24.0
Intersection Capacity Utilization	88.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	1107	298	192	353	13	204	5	259	26	12	26
Future Volume (vph)	13	1107	298	192	353	13	204	5	259	26	12	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1900	1615	1805	1900	1615	1805	1620		1805	1706	
Flt Permitted	0.52	1.00	1.00	0.05	1.00	1.00	0.36	1.00		0.69	1.00	
Satd. Flow (perm)	995	1900	1615	95	1900	1615	680	1620		1310	1706	
Peak-hour factor, PHF	0.96	0.96	0.96	0.87	0.87	0.87	0.84	0.84	0.84	0.88	0.88	0.88
Adj. Flow (vph)	14	1153	310	221	406	15	243	6	308	30	14	30
RTOR Reduction (vph)	0	0	125	0	0	5	0	158	0	0	29	0
Lane Group Flow (vph)	14	1153	185	221	406	10	243	156	0	30	15	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		
Actuated Green, G (s)	75.8	73.8	73.8	88.8	80.8	80.8	23.0	14.1		8.7	5.8	
Effective Green, g (s)	75.8	73.8	73.8	88.8	80.8	80.8	23.0	14.1		8.7	5.8	
Actuated g/C Ratio	0.61	0.60	0.60	0.72	0.65	0.65	0.19	0.11		0.07	0.05	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	622	1132	962	192	1240	1054	228	184		103	79	
v/s Ratio Prot	0.00	0.61		c0.08	0.21		c0.10	0.10		0.01	0.01	
v/s Ratio Perm	0.01		0.11	c0.74		0.01	c0.10			0.01		
v/c Ratio	0.02	1.02	0.19	1.15	0.33	0.01	1.07	0.85		0.29	0.20	
Uniform Delay, d1	9.4	25.0	11.4	44.1	9.5	7.5	48.6	53.8		54.4	56.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	31.5	0.1	111.5	0.7	0.0	78.1	36.0		1.6	1.2	
Delay (s)	9.4	56.5	11.5	155.6	10.2	7.5	126.7	89.8		56.0	58.0	
Level of Service	A	E	B	F	B	A	F	F		E	E	
Approach Delay (s)		46.6			60.2			105.9			57.2	
Approach LOS		D			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	62.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.21		
Actuated Cycle Length (s)	123.8	Sum of lost time (s)	24.0
Intersection Capacity Utilization	105.5%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	12	4	1227	201	107	1	227	290	30	91	9
v/c Ratio	0.11	0.04	0.96	0.14	0.09	0.01	0.90	0.18	0.38	0.43	0.03
Control Delay	55.0	53.5	31.8	4.2	0.8	45.0	84.6	0.3	61.2	52.4	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	53.5	31.8	4.2	0.8	45.0	84.6	0.3	61.2	52.4	0.2
Queue Length 50th (ft)	8	3	612	34	0	1	154	0	19	57	0
Queue Length 95th (ft)	17	8	#1150	54	12	6	#342	0	33	72	0
Internal Link Dist (ft)		1482		1776			5522			849	
Turn Bay Length (ft)	135		200		180	110		145	125		190
Base Capacity (vph)	120	118	1312	1563	1333	189	252	1583	79	213	301
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.03	0.94	0.13	0.08	0.01	0.90	0.18	0.38	0.43	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	2	0	1166	191	102	1	207	264	17	51	5
Future Volume (vph)	6	2	0	1166	191	102	1	207	264	17	51	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1863		1770	1863	1568	1770	1727	1583	1687	1462	1583
Flt Permitted	1.00	1.00		0.47	1.00	1.00	0.70	1.00	1.00	0.30	1.00	1.00
Satd. Flow (perm)	1881	1863		866	1863	1568	1300	1727	1583	541	1462	1583
Peak-hour factor, PHF	0.50	0.50	0.50	0.95	0.95	0.95	0.91	0.91	0.91	0.56	0.56	0.56
Adj. Flow (vph)	12	4	0	1227	201	107	1	227	290	30	91	9
RTOR Reduction (vph)	0	0	0	0	0	26	0	0	0	0	0	8
Lane Group Flow (vph)	12	4	0	1227	201	81	1	227	290	30	91	1
Heavy Vehicles (%)	1%	2%	0%	2%	2%	3%	2%	10%	2%	7%	30%	2%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Free	Perm	NA	Perm
Protected Phases		6		5	2			4			8	
Permitted Phases	6		6	2		2	4		Free	8		8
Actuated Green, G (s)	2.6	2.6		86.0	86.0	86.0	16.1	16.1	114.1	16.1	16.1	16.1
Effective Green, g (s)	2.6	2.6		86.0	86.0	86.0	16.1	16.1	114.1	16.1	16.1	16.1
Actuated g/C Ratio	0.02	0.02		0.75	0.75	0.75	0.14	0.14	1.00	0.14	0.14	0.14
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	42	42		1265	1404	1181	183	243	1583	76	206	223
v/s Ratio Prot		0.00		c0.66	0.11			c0.13			0.06	
v/s Ratio Perm	0.01			c0.07		0.05	0.00		0.18	0.06		0.00
v/c Ratio	0.29	0.10		0.97	0.14	0.07	0.01	0.93	0.18	0.39	0.44	0.01
Uniform Delay, d1	54.8	54.6		13.6	3.9	3.6	42.1	48.5	0.0	44.6	44.9	42.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.7	1.0		18.3	0.0	0.0	0.0	39.8	0.3	3.4	1.5	0.0
Delay (s)	58.6	55.6		31.9	3.9	3.7	42.1	88.3	0.3	47.9	46.4	42.1
Level of Service	E	E		C	A	A	D	F	A	D	D	D
Approach Delay (s)		57.8			26.3			38.9			46.5	
Approach LOS		E			C			D			D	

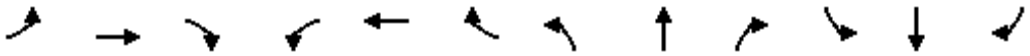
Intersection Summary			
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	1.01		
Actuated Cycle Length (s)	114.1	Sum of lost time (s)	18.0
Intersection Capacity Utilization	95.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	533	780	161	85	905	114	77	185	35	47	582	474
Future Volume (vph)	533	780	161	85	905	114	77	185	35	47	582	474
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3335	3448		1770	3539	1568	1736	3539	1568	1736	3539	1538
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.16	1.00	1.00	0.62	1.00	1.00
Satd. Flow (perm)	3335	3448		1770	3539	1568	297	3539	1568	1135	3539	1538
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	599	876	181	93	995	125	87	208	39	51	626	510
RTOR Reduction (vph)	0	14	0	0	0	82	0	0	30	0	0	314
Lane Group Flow (vph)	599	1043	0	93	995	43	87	208	9	51	626	196
Heavy Vehicles (%)	5%	2%	2%	2%	2%	3%	4%	2%	3%	4%	2%	5%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases						2	4		4	8		8
Actuated Green, G (s)	24.0	54.6		10.4	41.0	41.0	31.6	26.6	26.6	29.4	25.5	25.5
Effective Green, g (s)	24.0	54.6		10.4	41.0	41.0	31.6	26.6	26.6	29.4	25.5	25.5
Actuated g/C Ratio	0.20	0.46		0.09	0.34	0.34	0.26	0.22	0.22	0.25	0.21	0.21
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	669	1575		154	1214	537	138	787	349	298	755	328
v/s Ratio Prot	c0.18	0.30		0.05	c0.28		c0.03	0.06		0.01	c0.18	
v/s Ratio Perm						0.03	0.14		0.01	0.04		0.13
v/c Ratio	0.90	0.66		0.60	0.82	0.08	0.63	0.26	0.02	0.17	0.83	0.60
Uniform Delay, d1	46.5	25.3		52.6	35.9	26.5	35.3	38.4	36.3	35.0	44.9	42.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.5	1.1		6.5	6.3	0.3	9.0	0.2	0.0	0.3	7.5	2.9
Delay (s)	61.0	26.3		59.1	42.1	26.8	44.3	38.5	36.3	35.3	52.4	45.3
Level of Service	E	C		E	D	C	D	D	D	D	D	D
Approach Delay (s)		38.9			41.8			39.8			48.6	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	42.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	119.5	Sum of lost time (s)	24.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	204	96	157	1023	1	364	1	167	1	0	1
Future Volume (vph)	1	204	96	157	1023	1	364	1	167	1	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1863	1583	1770	1863	1615	1770	1585		1805	1615	
Flt Permitted	0.07	1.00	1.00	0.56	1.00	1.00	0.58	1.00		1.00	1.00	
Satd. Flow (perm)	126	1863	1583	1046	1863	1615	1080	1585		1900	1615	
Peak-hour factor, PHF	0.89	0.89	0.89	0.96	0.96	0.96	0.82	0.82	0.82	0.88	0.88	0.88
Adj. Flow (vph)	1	229	108	164	1066	1	444	1	204	1	0	1
RTOR Reduction (vph)	0	0	50	0	0	0	0	164	0	0	1	0
Lane Group Flow (vph)	1	229	58	164	1066	1	444	41	0	1	0	0
Heavy Vehicles (%)	0%	2%	2%	2%	2%	0%	2%	0%	2%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		
Actuated Green, G (s)	61.2	60.3	60.3	69.4	64.4	64.4	29.0	22.1		1.8	0.9	
Effective Green, g (s)	61.2	60.3	60.3	69.4	64.4	64.4	29.0	22.1		1.8	0.9	
Actuated g/C Ratio	0.54	0.54	0.54	0.62	0.57	0.57	0.26	0.20		0.02	0.01	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	82	1000	849	678	1068	926	414	311		29	12	
v/s Ratio Prot	0.00	0.12		c0.01	c0.57		c0.21	0.03		0.00	0.00	
v/s Ratio Perm	0.01		0.04	0.14		0.00	c0.07			0.00		
v/c Ratio	0.01	0.23	0.07	0.24	1.00	0.00	1.07	0.13		0.03	0.00	
Uniform Delay, d1	25.8	13.7	12.5	9.2	23.9	10.2	40.7	37.2		54.4	55.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1	0.0	0.2	27.1	0.0	64.9	0.9		0.5	0.0	
Delay (s)	25.8	13.8	12.5	9.4	51.0	10.2	105.7	38.1		54.9	55.3	
Level of Service	C	B	B	A	D	B	F	D		D	E	
Approach Delay (s)		13.5			45.4			84.3			55.1	
Approach LOS		B			D			F			E	

Intersection Summary			
HCM 2000 Control Delay	51.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	112.3	Sum of lost time (s)	24.0
Intersection Capacity Utilization	99.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

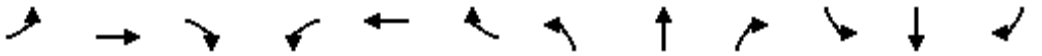


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	5	237	8	506	135	24	17	69	1232	204	378	72
v/c Ratio	0.02	0.70	0.02	0.69	0.12	0.03	0.11	0.16	0.78	0.56	0.80	0.14
Control Delay	37.0	50.1	0.1	18.9	10.3	3.7	29.2	28.0	3.8	36.3	46.1	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.0	50.1	0.1	18.9	10.3	3.7	29.2	28.0	3.8	36.3	46.1	5.8
Queue Length 50th (ft)	3	135	0	158	32	0	8	31	0	105	212	0
Queue Length 95th (ft)	13	235	0	328	77	11	28	73	0	98	171	0
Internal Link Dist (ft)		1482			1776			5522			849	
Turn Bay Length (ft)	135		150	200		180	110		145	125		190
Base Capacity (vph)	361	534	512	848	1405	1156	257	720	1583	597	765	770
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.44	0.02	0.60	0.10	0.02	0.07	0.10	0.78	0.34	0.49	0.09

Intersection Summary

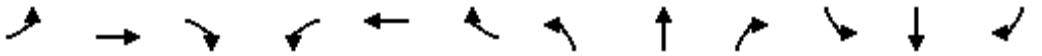
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	199	7	450	120	21	16	66	1183	102	189	36
Future Volume (vph)	4	199	7	450	120	21	16	66	1183	102	189	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	4.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1863	1583	1770	1863	1524	1770	1570	1583	1736	1667	1583
Flt Permitted	0.67	1.00	1.00	0.31	1.00	1.00	0.30	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	1262	1863	1583	587	1863	1524	561	1570	1583	1301	1667	1583
Peak-hour factor, PHF	0.84	0.84	0.84	0.89	0.89	0.89	0.96	0.96	0.96	0.50	0.50	0.50
Adj. Flow (vph)	5	237	8	506	135	24	17	69	1232	204	378	72
RTOR Reduction (vph)	0	0	6	0	0	10	0	0	0	0	0	52
Lane Group Flow (vph)	5	237	2	506	135	14	17	69	1232	204	378	20
Heavy Vehicles (%)	1%	2%	2%	2%	2%	6%	2%	21%	2%	4%	14%	2%
Turn Type	Perm	NA	Perm	pm+pt	NA	Perm	Perm	NA	Free	Perm	NA	Perm
Protected Phases		6		5	2			4			8	
Permitted Phases	6		6	2		2	4		Free	8		8
Actuated Green, G (s)	17.3	17.3	17.3	53.7	53.7	53.7	26.1	26.1	91.8	26.1	26.1	26.1
Effective Green, g (s)	17.3	17.3	17.3	53.7	53.7	53.7	26.1	26.1	91.8	26.1	26.1	26.1
Actuated g/C Ratio	0.19	0.19	0.19	0.58	0.58	0.58	0.28	0.28	1.00	0.28	0.28	0.28
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	237	351	298	735	1089	891	159	446	1583	369	473	450
v/s Ratio Prot		0.13		0.23	0.07			0.04			0.23	
v/s Ratio Perm	0.00		0.00	0.17		0.01	0.03		c0.78	0.16		0.01
v/c Ratio	0.02	0.68	0.01	0.69	0.12	0.02	0.11	0.15	0.78	0.55	0.80	0.05
Uniform Delay, d1	30.4	34.6	30.3	12.3	8.5	8.0	24.2	24.6	0.0	27.9	30.4	23.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	5.1	0.0	2.7	0.1	0.0	0.3	0.2	3.8	1.8	9.2	0.0
Delay (s)	30.4	39.7	30.3	15.0	8.6	8.0	24.5	24.8	3.8	29.7	39.6	23.9
Level of Service	C	D	C	B	A	A	C	C	A	C	D	C
Approach Delay (s)		39.2			13.5			5.2			34.8	
Approach LOS		D			B			A			C	

Intersection Summary			
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	91.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	630	928	82	96	776	66	273	747	52	157	323	476
Future Volume (vph)	630	928	82	96	776	66	273	747	52	157	323	476
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3367	3496		1770	3539	1509	1770	3539	1524	1752	3505	1538
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.36	1.00	1.00	0.16	1.00	1.00
Satd. Flow (perm)	3367	3496		1770	3539	1509	670	3539	1524	298	3505	1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	685	1009	89	101	817	69	300	821	57	173	355	523
RTOR Reduction (vph)	0	6	0	0	0	51	0	0	43	0	0	376
Lane Group Flow (vph)	685	1092	0	101	817	18	300	821	14	173	355	147
Heavy Vehicles (%)	4%	2%	2%	2%	2%	7%	2%	2%	6%	3%	3%	5%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases						2	4		4	8		8
Actuated Green, G (s)	24.0	46.4		9.6	32.0	32.0	44.6	29.7	29.7	34.8	24.8	24.8
Effective Green, g (s)	24.0	46.4		9.6	32.0	32.0	44.6	29.7	29.7	34.8	24.8	24.8
Actuated g/C Ratio	0.20	0.39		0.08	0.27	0.27	0.37	0.25	0.25	0.29	0.21	0.21
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	675	1355		141	946	403	386	878	378	208	726	318
v/s Ratio Prot	c0.20	0.31		0.06	c0.23		c0.10	c0.23		0.07	0.10	
v/s Ratio Perm						0.01	0.19		0.01	0.17		0.10
v/c Ratio	1.01	0.81		0.72	0.86	0.05	0.78	0.94	0.04	0.83	0.49	0.46
Uniform Delay, d1	47.9	32.6		53.7	41.8	32.5	29.2	44.1	34.2	35.0	41.9	41.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	38.4	3.6		15.9	10.3	0.2	9.5	16.7	0.0	23.7	0.5	1.1
Delay (s)	86.2	36.3		69.6	52.1	32.7	38.7	60.7	34.2	58.7	42.4	42.7
Level of Service	F	D		E	D	C	D	E	C	E	D	D
Approach Delay (s)		55.5			52.5			53.8			45.2	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	52.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	119.7	Sum of lost time (s)	24.0
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

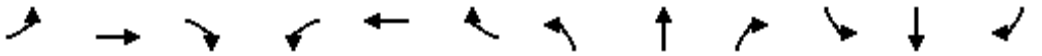


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	1121	300	192	359	13	205	5	259	26	12	26
Future Volume (vph)	13	1121	300	192	359	13	205	5	259	26	12	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1863	1583	1770	1863	1615	1770	1589		1805	1706	
Flt Permitted	0.52	1.00	1.00	0.05	1.00	1.00	0.36	1.00		0.78	1.00	
Satd. Flow (perm)	981	1863	1583	91	1863	1615	671	1589		1490	1706	
Peak-hour factor, PHF	0.96	0.96	0.96	0.87	0.87	0.87	0.84	0.84	0.84	0.88	0.88	0.88
Adj. Flow (vph)	14	1168	312	221	413	15	244	6	308	30	14	30
RTOR Reduction (vph)	0	0	122	0	0	5	0	159	0	0	29	0
Lane Group Flow (vph)	14	1168	191	221	413	10	244	155	0	30	15	0
Heavy Vehicles (%)	0%	2%	2%	2%	2%	0%	2%	0%	2%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		
Actuated Green, G (s)	77.8	75.8	75.8	89.8	81.8	81.8	22.1	13.2		8.0	5.1	
Effective Green, g (s)	77.8	75.8	75.8	89.8	81.8	81.8	22.1	13.2		8.0	5.1	
Actuated g/C Ratio	0.63	0.61	0.61	0.72	0.66	0.66	0.18	0.11		0.06	0.04	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	629	1139	968	174	1229	1066	217	169		103	70	
v/s Ratio Prot	0.00	0.63		c0.08	0.22		c0.10	0.10		0.01	0.01	
v/s Ratio Perm	0.01		0.12	c0.84		0.01	c0.10			0.01		
v/c Ratio	0.02	1.03	0.20	1.27	0.34	0.01	1.12	0.92		0.29	0.22	
Uniform Delay, d1	8.6	24.1	10.6	44.1	9.2	7.2	49.2	54.8		55.1	57.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	33.3	0.1	158.8	0.7	0.0	98.6	50.2		1.6	1.6	
Delay (s)	8.7	57.4	10.7	202.9	9.9	7.2	147.8	105.0		56.7	59.0	
Level of Service	A	E	B	F	A	A	F	F		E	E	
Approach Delay (s)		47.2			75.6			123.7			58.1	
Approach LOS		D			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	69.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	123.9	Sum of lost time (s)	24.0
Intersection Capacity Utilization	106.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	12	4	1227	308	228	290	30	91	9
v/c Ratio	0.06	0.02	0.72	0.31	0.54	0.11	0.13	0.26	0.02
Control Delay	40.2	40.5	17.5	7.4	31.7	1.4	27.9	27.8	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	40.5	17.5	7.4	31.7	1.4	27.9	27.8	0.0
Queue Length 50th (ft)	4	1	137	43	63	0	7	23	0
Queue Length 95th (ft)	15	8	398	113	214	26	25	57	0
Internal Link Dist (ft)		1482		1776	5522			849	
Turn Bay Length (ft)	135		200			145	125		190
Base Capacity (vph)	258	255	2956	1621	918	2719	521	778	881
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.02	0.42	0.19	0.25	0.11	0.06	0.12	0.01

Intersection Summary

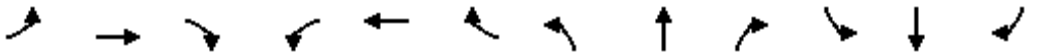


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	2	0	1166	191	102	1	207	264	17	51	5
Future Volume (vph)	6	2	0	1166	191	102	1	207	264	17	51	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0			6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00		0.97	1.00			1.00	0.88	1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.95			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1863		3433	1760			1727	2787	1687	1462	1583
Flt Permitted	1.00	1.00		0.95	1.00			1.00	1.00	0.55	1.00	1.00
Satd. Flow (perm)	1881	1863		3433	1760			1726	2787	980	1462	1583
Peak-hour factor, PHF	0.50	0.50	0.50	0.95	0.95	0.95	0.91	0.91	0.91	0.56	0.56	0.56
Adj. Flow (vph)	12	4	0	1227	201	107	1	227	290	30	91	9
RTOR Reduction (vph)	0	0	0	0	18	0	0	0	0	0	0	7
Lane Group Flow (vph)	12	4	0	1227	290	0	0	228	290	30	91	2
Heavy Vehicles (%)	1%	2%	0%	2%	2%	3%	2%	10%	2%	7%	30%	2%
Turn Type	Perm	NA	Perm	Prot	NA		Perm	NA	pt+ov	Perm	NA	Perm
Protected Phases		6		5	2			4	4 5		8	
Permitted Phases	6		6				4			8		8
Actuated Green, G (s)	2.1	2.1		33.1	41.2			16.4	55.5	16.4	16.4	16.4
Effective Green, g (s)	2.1	2.1		33.1	41.2			16.4	55.5	16.4	16.4	16.4
Actuated g/C Ratio	0.03	0.03		0.48	0.59			0.24	0.80	0.24	0.24	0.24
Clearance Time (s)	6.0	6.0		6.0	6.0			6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	56	56		1632	1041			406	2222	230	344	373
v/s Ratio Prot		0.00		c0.36	c0.16				0.10		0.06	
v/s Ratio Perm	0.01							c0.13		0.03		0.00
v/c Ratio	0.21	0.07		0.75	0.28			0.56	0.13	0.13	0.26	0.01
Uniform Delay, d1	32.9	32.8		14.9	6.9			23.4	1.6	21.0	21.7	20.4
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.5		2.0	0.1			1.8	0.0	0.3	0.4	0.0
Delay (s)	34.9	33.3		16.9	7.1			25.2	1.6	21.2	22.1	20.4
Level of Service	C	C		B	A			C	A	C	C	C
Approach Delay (s)		34.5			14.9			12.0			21.8	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	69.6	Sum of lost time (s)	18.0
Intersection Capacity Utilization	64.1%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

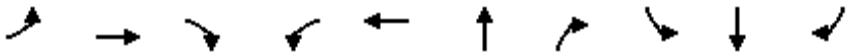
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	533	780	161	85	905	114	77	185	35	47	582	474
Future Volume (vph)	533	780	161	85	905	114	77	185	35	47	582	474
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3335	3448		1770	3539	1568	1736	3539	1568	1736	3539	1538
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.16	1.00	1.00	0.62	1.00	1.00
Satd. Flow (perm)	3335	3448		1770	3539	1568	297	3539	1568	1135	3539	1538
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.89	0.89	0.89	0.93	0.93	0.93
Adj. Flow (vph)	599	876	181	93	995	125	87	208	39	51	626	510
RTOR Reduction (vph)	0	14	0	0	0	82	0	0	30	0	0	314
Lane Group Flow (vph)	599	1043	0	93	995	43	87	208	9	51	626	196
Heavy Vehicles (%)	5%	2%	2%	2%	2%	3%	4%	2%	3%	4%	2%	5%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases						2	4		4	8		8
Actuated Green, G (s)	24.0	54.6		10.4	41.0	41.0	31.6	26.6	26.6	29.4	25.5	25.5
Effective Green, g (s)	24.0	54.6		10.4	41.0	41.0	31.6	26.6	26.6	29.4	25.5	25.5
Actuated g/C Ratio	0.20	0.46		0.09	0.34	0.34	0.26	0.22	0.22	0.25	0.21	0.21
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	669	1575		154	1214	537	138	787	349	298	755	328
v/s Ratio Prot	c0.18	0.30		0.05	c0.28		c0.03	0.06		0.01	c0.18	
v/s Ratio Perm						0.03	0.14		0.01	0.04		0.13
v/c Ratio	0.90	0.66		0.60	0.82	0.08	0.63	0.26	0.02	0.17	0.83	0.60
Uniform Delay, d1	46.5	25.3		52.6	35.9	26.5	35.3	38.4	36.3	35.0	44.9	42.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.5	1.1		6.5	6.3	0.3	9.0	0.2	0.0	0.3	7.5	2.9
Delay (s)	61.0	26.3		59.1	42.1	26.8	44.3	38.5	36.3	35.3	52.4	45.3
Level of Service	E	C		E	D	C	D	D	D	D	D	D
Approach Delay (s)		38.9			41.8			39.8			48.6	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	42.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	119.5	Sum of lost time (s)	24.0
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



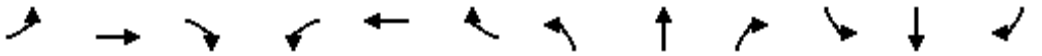
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	204	96	157	1023	1	364	1	167	1	0	1
Future Volume (vph)	1	204	96	157	1023	1	364	1	167	1	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1863	1583	1770	1863	1615	1770	1585		1805	1615	
Flt Permitted	0.07	1.00	1.00	0.56	1.00	1.00	0.58	1.00		1.00	1.00	
Satd. Flow (perm)	126	1863	1583	1046	1863	1615	1080	1585		1900	1615	
Peak-hour factor, PHF	0.89	0.89	0.89	0.96	0.96	0.96	0.82	0.82	0.82	0.88	0.88	0.88
Adj. Flow (vph)	1	229	108	164	1066	1	444	1	204	1	0	1
RTOR Reduction (vph)	0	0	50	0	0	0	0	164	0	0	1	0
Lane Group Flow (vph)	1	229	58	164	1066	1	444	41	0	1	0	0
Heavy Vehicles (%)	0%	2%	2%	2%	2%	0%	2%	0%	2%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		
Actuated Green, G (s)	61.2	60.3	60.3	69.4	64.4	64.4	29.0	22.1		1.8	0.9	
Effective Green, g (s)	61.2	60.3	60.3	69.4	64.4	64.4	29.0	22.1		1.8	0.9	
Actuated g/C Ratio	0.54	0.54	0.54	0.62	0.57	0.57	0.26	0.20		0.02	0.01	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	82	1000	849	678	1068	926	414	311		29	12	
v/s Ratio Prot	0.00	0.12		c0.01	c0.57		c0.21	0.03		0.00	0.00	
v/s Ratio Perm	0.01		0.04	0.14		0.00	c0.07			0.00		
v/c Ratio	0.01	0.23	0.07	0.24	1.00	0.00	1.07	0.13		0.03	0.00	
Uniform Delay, d1	25.8	13.7	12.5	9.2	23.9	10.2	40.7	37.2		54.4	55.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.1	0.0	0.2	27.1	0.0	64.9	0.9		0.5	0.0	
Delay (s)	25.8	13.8	12.5	9.4	51.0	10.2	105.7	38.1		54.9	55.3	
Level of Service	C	B	B	A	D	B	F	D		D	E	
Approach Delay (s)		13.5			45.4			84.3			55.1	
Approach LOS		B			D			F			E	

Intersection Summary			
HCM 2000 Control Delay	51.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	112.3	Sum of lost time (s)	24.0
Intersection Capacity Utilization	99.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			



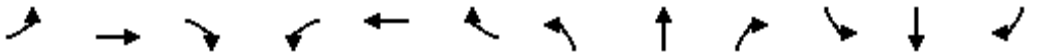
Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	5	237	8	506	159	86	1232	204	378	72
v/c Ratio	0.02	0.64	0.02	0.56	0.16	0.19	0.62	0.51	0.73	0.13
Control Delay	32.5	41.8	0.1	31.9	10.9	24.1	5.8	30.2	36.0	5.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.5	41.8	0.1	31.9	10.9	24.1	5.8	30.2	36.0	5.1
Queue Length 50th (ft)	2	114	0	115	36	32	84	86	173	0
Queue Length 95th (ft)	13	219	0	224	90	80	189	89	155	0
Internal Link Dist (ft)		1482			1776	5522			849	
Turn Bay Length (ft)	135		150	200			145	125		190
Base Capacity (vph)	466	703	649	1210	1410	804	2190	709	923	913
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.34	0.01	0.42	0.11	0.11	0.56	0.29	0.41	0.08

Intersection Summary



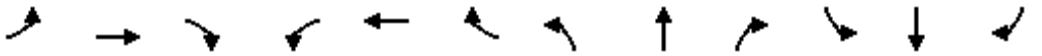
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	199	7	450	120	21	16	66	1183	102	189	36
Future Volume (vph)	4	199	7	450	120	21	16	66	1183	102	189	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0			6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00			1.00	0.88	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.98			1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.99	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1787	1863	1583	3433	1810			1605	2787	1736	1667	1583
Flt Permitted	0.66	1.00	1.00	0.95	1.00			0.90	1.00	0.70	1.00	1.00
Satd. Flow (perm)	1234	1863	1583	3433	1810			1453	2787	1281	1667	1583
Peak-hour factor, PHF	0.84	0.84	0.84	0.89	0.89	0.89	0.96	0.96	0.96	0.50	0.50	0.50
Adj. Flow (vph)	5	237	8	506	135	24	17	69	1232	204	378	72
RTOR Reduction (vph)	0	0	6	0	5	0	0	0	196	0	0	49
Lane Group Flow (vph)	5	237	2	506	154	0	0	86	1036	204	378	23
Heavy Vehicles (%)	1%	2%	2%	2%	2%	6%	2%	21%	2%	4%	14%	2%
Turn Type	Perm	NA	Perm	Prot	NA		Perm	NA	pt+ov	Perm	NA	Perm
Protected Phases		6		5	2			4	4 5		8	
Permitted Phases	6		6				4			8		8
Actuated Green, G (s)	17.3	17.3	17.3	22.1	45.4			26.3	54.4	26.3	26.3	26.3
Effective Green, g (s)	17.3	17.3	17.3	22.1	45.4			26.3	54.4	26.3	26.3	26.3
Actuated g/C Ratio	0.21	0.21	0.21	0.26	0.54			0.31	0.65	0.31	0.31	0.31
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0			6.0		6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0			3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	255	385	327	906	981			456	1811	402	523	497
v/s Ratio Prot		c0.13		0.15	0.09				c0.37		c0.23	
v/s Ratio Perm	0.00		0.00					0.06		0.16		0.01
v/c Ratio	0.02	0.62	0.01	0.56	0.16			0.19	0.57	0.51	0.72	0.05
Uniform Delay, d1	26.4	30.2	26.4	26.6	9.6			20.9	8.2	23.4	25.5	20.0
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.0	2.9	0.0	0.8	0.1			0.2	0.4	1.0	4.9	0.0
Delay (s)	26.5	33.1	26.4	27.3	9.7			21.1	8.6	24.4	30.4	20.0
Level of Service	C	C	C	C	A			C	A	C	C	C
Approach Delay (s)		32.7			23.1			9.4			27.4	
Approach LOS		C			C			A			C	

Intersection Summary			
HCM 2000 Control Delay	18.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	83.7	Sum of lost time (s)	18.0
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	630	928	82	96	776	66	273	747	52	157	323	476
Future Volume (vph)	630	928	82	96	776	66	273	747	52	157	323	476
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	0.97	0.95		1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3367	3496		1770	3539	1509	1770	3539	1524	1752	3505	1538
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.36	1.00	1.00	0.16	1.00	1.00
Satd. Flow (perm)	3367	3496		1770	3539	1509	670	3539	1524	298	3505	1538
Peak-hour factor, PHF	0.92	0.92	0.92	0.95	0.95	0.95	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	685	1009	89	101	817	69	300	821	57	173	355	523
RTOR Reduction (vph)	0	6	0	0	0	51	0	0	43	0	0	376
Lane Group Flow (vph)	685	1092	0	101	817	18	300	821	14	173	355	147
Heavy Vehicles (%)	4%	2%	2%	2%	2%	7%	2%	2%	6%	3%	3%	5%
Turn Type	Prot	NA		Prot	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases						2	4		4	8		8
Actuated Green, G (s)	24.0	46.4		9.6	32.0	32.0	44.6	29.7	29.7	34.8	24.8	24.8
Effective Green, g (s)	24.0	46.4		9.6	32.0	32.0	44.6	29.7	29.7	34.8	24.8	24.8
Actuated g/C Ratio	0.20	0.39		0.08	0.27	0.27	0.37	0.25	0.25	0.29	0.21	0.21
Clearance Time (s)	6.0	6.0		6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	675	1355		141	946	403	386	878	378	208	726	318
v/s Ratio Prot	c0.20	0.31		0.06	c0.23		c0.10	c0.23		0.07	0.10	
v/s Ratio Perm						0.01	0.19		0.01	0.17		0.10
v/c Ratio	1.01	0.81		0.72	0.86	0.05	0.78	0.94	0.04	0.83	0.49	0.46
Uniform Delay, d1	47.9	32.6		53.7	41.8	32.5	29.2	44.1	34.2	35.0	41.9	41.6
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	38.4	3.6		15.9	10.3	0.2	9.5	16.7	0.0	23.7	0.5	1.1
Delay (s)	86.2	36.3		69.6	52.1	32.7	38.7	60.7	34.2	58.7	42.4	42.7
Level of Service	F	D		E	D	C	D	E	C	E	D	D
Approach Delay (s)		55.5			52.5			53.8			45.2	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM 2000 Control Delay	52.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	119.7	Sum of lost time (s)	24.0
Intersection Capacity Utilization	88.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	1121	300	192	359	13	205	5	259	26	12	26
Future Volume (vph)	13	1121	300	192	359	13	205	5	259	26	12	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85		1.00	0.90	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1863	1583	1770	1863	1615	1770	1589		1805	1706	
Flt Permitted	0.52	1.00	1.00	0.05	1.00	1.00	0.36	1.00		0.78	1.00	
Satd. Flow (perm)	981	1863	1583	91	1863	1615	671	1589		1490	1706	
Peak-hour factor, PHF	0.96	0.96	0.96	0.87	0.87	0.87	0.84	0.84	0.84	0.88	0.88	0.88
Adj. Flow (vph)	14	1168	312	221	413	15	244	6	308	30	14	30
RTOR Reduction (vph)	0	0	122	0	0	5	0	159	0	0	29	0
Lane Group Flow (vph)	14	1168	191	221	413	10	244	155	0	30	15	0
Heavy Vehicles (%)	0%	2%	2%	2%	2%	0%	2%	0%	2%	0%	0%	0%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		7	4		3	8	
Permitted Phases	6		6	2		2	4			8		
Actuated Green, G (s)	77.8	75.8	75.8	89.8	81.8	81.8	22.1	13.2		8.0	5.1	
Effective Green, g (s)	77.8	75.8	75.8	89.8	81.8	81.8	22.1	13.2		8.0	5.1	
Actuated g/C Ratio	0.63	0.61	0.61	0.72	0.66	0.66	0.18	0.11		0.06	0.04	
Clearance Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		6.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	629	1139	968	174	1229	1066	217	169		103	70	
v/s Ratio Prot	0.00	0.63		c0.08	0.22		c0.10	0.10		0.01	0.01	
v/s Ratio Perm	0.01		0.12	c0.84		0.01	c0.10			0.01		
v/c Ratio	0.02	1.03	0.20	1.27	0.34	0.01	1.12	0.92		0.29	0.22	
Uniform Delay, d1	8.6	24.1	10.6	44.1	9.2	7.2	49.2	54.8		55.1	57.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	33.3	0.1	158.8	0.7	0.0	98.6	50.2		1.6	1.6	
Delay (s)	8.7	57.4	10.7	202.9	9.9	7.2	147.8	105.0		56.7	59.0	
Level of Service	A	E	B	F	A	A	F	F		E	E	
Approach Delay (s)		47.2			75.6			123.7			58.1	
Approach LOS		D			E			F			E	

Intersection Summary			
HCM 2000 Control Delay	69.5	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.32		
Actuated Cycle Length (s)	123.9	Sum of lost time (s)	24.0
Intersection Capacity Utilization	106.2%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			