Transportation Analysis

Satellite Business Center
DRI #1276
Gwinnett County, Georgia

Prepared for:
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019445000

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EXECUTIVE SUMMARY

This report presents the analysis of the anticipated traffic impacts of a proposed 85.31-acre mixed-use development (Satellite Business Center) located in Gwinnett County, Georgia. This report is being prepared as part of the application for the Gwinnett County MUR (Mixed-Use Redevelopment) Overlay District. The existing zoning is M-1 (Light Industrial) unconditional on the existing National Cash Register (NCR) campus area (38.49 acres) and RA-200 (Agricultural Residence District) on the remaining portion of the site (46.82 acres). Because the project will exceed 400,000 square feet, the proposed development is a Development of Regional Impact (DRI) and is subject to Georgia Regional Transportation Authority (GRTA) and Atlanta Regional Commission (ARC) review.

The proposed development is expected to consist of approximately 644 condominium units, a 9-hole golf course, 27,252 SF of office space (in addition to the existing 212,000 SF NCR office building), and 106,758 SF of retail. The development is scheduled to be completed in three phases by the year 2009. This analysis assumes a single-phase project, based upon build-out for the year 2009.

The existing 315,400 SF office building on the site is currently occupied by NCR. However, a portion of the existing building on site is empty and will be removed to make way for new uses. 103,400 SF of the existing facility will be demolished and 212,000 SF will remain on the site. The golf course is currently under construction, permitted under CDP# 2004-00013 (issued 08/18/05).

Access to the development is proposed at four locations. Driveways 1, 2, and 3 are located along Satellite Boulevard west of Boggs Road and east of Evergreen Boulevard. Proposed Driveway 1 is located along approximately 2,175’ west of Boggs Road, Existing Driveway 2 is located approximately 1,550’ west of Boggs Road, and Proposed Driveway 3 is located approximately 350’ west of Boggs Road. Existing Driveway 4 is located along Boggs Road approximately 400’ north of Satellite Boulevard.

Driveway 2 and Driveway 4 are existing access points for the existing NCR office space along Satellite Boulevard and Boggs Road, respectively. Proposed Driveway 1 will be constructed with the golf course (currently under construction) under CDP# 2004-00013 (issued 08/18/05). Proposed Driveway 3 is currently permitted under CDP# 2006-00235, and construction will begin in May 2007.

The results of the detailed intersection analysis for the 2009 No-Build conditions (excluding the Satellite Business Center development) and 2009 Build conditions (including the Satellite Business Center development) identified improvements that will be necessary in order to maintain the Level of Service standard (LOS D) within the study network. These improvements are listed on the following page.

2009 No-Build recommended improvements (includes background growth but does not include the Satellite Business Center DRI project traffic):

Satellite Boulevard at Old Norcross Road (East) (Intersection #1)

- Construct a third eastbound through lane along Satellite Boulevard.
- Construct a third northbound left-turn lane along Old Norcross Road (East).

Satellite Boulevard at Boggs Road (Intersection #2)

- Construct a southbound right-turn lane along Boggs Road.
- Construct a third eastbound through lane and a third westbound through lane along Satellite Boulevard.
- Extend northbound left-turn storage length back to I-85 South Ramp intersection.

Satellite Boulevard at Duluth Highway (Intersection #3)

- Construct a third northbound through lane and a third southbound through lane along Satellite Boulevard.
- Construct an additional southbound left-turn lane, creating dual southbound left-turn lanes.
- Construct an additional eastbound left-turn lane, creating dual eastbound left-turn lanes.
- Install right-turn overlap phasing for the northbound right-turn movement along Satellite Boulevard.

2009 Build recommended improvements (adds the Satellite Business Center DRI project traffic to the 2009 No-Build conditions):

NOTE: These improvements are in addition to the improvements listed above in the 2009 No-Build Conditions.

Satellite Boulevard at Driveway 1 (Intersection #5)

- Construct a westbound right-turn lane along Satellite Boulevard.
- The proposed driveway southbound approach should have one ingress lane and two egress lanes (separate left-turn and right-turn lanes).

Satellite Boulevard at Driveway 2 (Intersection #6)

- Install a traffic signal when warranted.
- The existing geometry at this intersection should remain.

Satellite Boulevard at Driveway 3 (Intersection #7)

- Construct a westbound right-turn lane along Satellite Boulevard.
- The proposed driveway southbound approach should have one ingress lane and one egress lane (shared left-turn/right-turn lane).

Satellite Boulevard at Driveway 4 (Intersection #8)

- Construct a southbound right-turn lane along Boggs Road.

1.0 PROJECT DESCRIPTION

1.1 Introduction

This report presents the analysis of the anticipated traffic impacts of a proposed 85.31-acre mixed-use development (Satellite Business Center) located in Gwinnett County, Georgia. This report is being prepared as part of the application for the Gwinnett County MUR (Mixed-Use Redevelopment) Overlay District. The existing zoning is M-1 (Light Industrial) unconditional on the existing National Cash Register (NCR) campus area (38.49 acres) and RA-200 (Agricultural Residence District) on the remaining portion of the site (46.82 acres). Because the project will exceed 400,000 square feet, the proposed development is a Development of Regional Impact (DRI) and is subject to Georgia Regional Transportation Authority (GRTA) and Atlanta Regional Commission (ARC) review.

The proposed development is expected to consist of approximately 644 condominium units, a 9-hole golf course, 27,252 SF of office space (in addition to the existing 212,000 SF NCR office building), and 106,758 SF of retail. The development is scheduled to be completed in three phases by the year 2009. This analysis assumes a single-phase project, based upon build-out for the year 2009.

A summary of the proposed land-uses and densities can be found below in **Table 1.**

Table 1
Satellite Business Center DRI
Proposed New Land Uses

Residential Condominium	644 dwelling units
Golf Course	9 holes
General Office	27,252 SF
Shopping Center	106,758 SF

Figure 1 and **Figure 2** provide a location map and an aerial photograph of the site.

1.2 Site Plan Review

The development plan incorporates a mix of residential, office, retail, and recreation uses. The proposed site is surrounded by Satellite Boulevard to the south, Boggs Road to the east, and industrial parks to the west and to the north.

The existing 315,400 SF office building on the site is currently occupied by NCR. However, a portion of the existing building on site is empty and will be removed to make way for new uses. 103,400 SF of the existing facility will be demolished and 212,000 SF will remain on the site. The golf course is currently under construction, permitted under CDP# 2004-00013 (issued 08/18/05).

Figure 3 is a small-scale copy of the site plan. A full-size site plan consistent with GRTA's Site Plan Guidelines is also being submitted as part of the Review Package.

1.3 Site Access

Access to the development is proposed at four locations. Driveways 1, 2, and 3 are located along Satellite Boulevard west of Boggs Road and east of Evergreen Boulevard. Proposed Driveway 1 is located along approximately 2,175' west of Boggs Road, Existing Driveway 2 is located approximately 1,550' west of Boggs Road, and Proposed Driveway 3 is located approximately 350' west of Boggs Road. Existing Driveway 4 is located along Boggs Road approximately 400' north of Satellite Boulevard.

Driveway 2 and Driveway 4 are existing access points for the existing NCR office space along Satellite Boulevard and Boggs Road, respectively. Proposed Driveway 1 will be constructed with the golf course (currently under construction) under CDP# 2004-00013 (issued 08/18/05). Proposed Driveway 3 is currently permitted under CDP# 2006-00235, and construction will begin in May 2007.

1.4 Bicycle and Pedestrian Facilities

There are no existing sidewalks directly adjacent to the site along the north side of Satellite Boulevard or the west side of Boggs Road. However, sidewalks do currently exist along the south side of Satellite Boulevard and the east side of Boggs Road. The sidewalk along the east side of Boggs Road extends northward from Satellite Boulevard and terminates approximately 425' north of Satellite Boulevard (just north of Driveway 4). The sidewalk along the south side of Satellite Boulevard extends westward from Boggs Road and terminates approximately 800' west of Boggs Road.

1.5 Transit Facilities

There is a Gwinnett County Transit bus stop located along Satellite Boulevard at Driveway 2 (the existing NCR driveway) for Gwinnett County Express Route 102A (see below). Gwinnett County Transit provides five (5) bus routes that run within 1.5 miles of the proposed development. These five bus routes all include a stop at the Gwinnett Transit Center near the Gwinnett Place Mall. Route 10 travels to the Doraville MARTA station, Route 20 travels to Jimmy Carter Boulevard/Buford Highway, Route 30 travels to Downtown Norcross, and Route 40 travels through Downtown Lawrenceville to the Gwinnett Transit O & M Facility. Route 102A travels from the Gwinnett Transit Center to six (6) MARTA stations in Atlanta: Arts Center, Midtown, North Avenue, Civic Center, Peachtree Center, and 5 Points.

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. Historical traffic count data from the Georgia DOT was reviewed for the area surrounding the proposed development, and growth rates of 4.0% per year along all roadways were agreed upon during the Pre-Application meeting with GRTA staff.

2.2 Traffic Data Collection

2006 peak hour turning movement counts were conducted at three (3) signalized intersections and two (2) unsignalized intersections between 7:00-9:00 AM and 4:00-6:00 PM. Traffic data for the sixth existing study intersection, Boggs Road at I-85 Southbound Ramps, was obtained from GDOT plans (see below paragraph). The morning and afternoon peak hours varied between the six (6) intersections:

1. Satellite Boulevard at Old Norcross Road (East) (AM Peak 7:30-8:30, PM Peak 4:45-5:45)
2. Satellite Boulevard at Boggs Road (AM Peak 7:15-8:15, PM Peak 4:45-5:45)
3. Satellite Boulevard at Duluth Highway (SR 120) (AM Peak 7:15-8:15, PM Peak 4:45-5:45)
4. Boggs Road at I-85 Southbound Ramps *** (AM Peak 7:15-8:15, PM Peak 4:45-5:45)
6. Satellite Boulevard at Driveway 2 (existing) (AM Peak 7:00-8:00, PM Peak 4:45-5:45)
8. Boggs Road at Driveway 4 (existing) (AM Peak 7:30-8:30, PM Peak 4:30-5:30)

All raw count data is included in the Appendix.

***NOTE: It should be noted that during the preparation of this DRI transportation analysis, construction was occurring on the I-85/SR 316 Interchange Improvements project. This road construction resulted in the closure of the ramp onto I-85 South from Boggs Road. GDOT plans show that this on-ramp will ultimately be re-opened upon completion of the roadway project. Because peak hour turning movement counts in November 2006 at the Boggs Road/I-85 Southbound Ramps intersection would not have included traffic associated with the ramp onto I-85 South, the GDOT projected 2005 AM and PM peak hour traffic volumes were used for the analysis. To obtain Existing 2006 volumes, these GDOT volumes were increased by 4.0% for 1 year.

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 6.0.

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

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

3.0 STUDY NETWORK

3.1 Gross Trip Generation

As stated earlier, the proposed development is expected to consist of approximately 644 condominium units, a 9-hole golf course, 27,252 SF of office space (in addition to the existing 212,000 SF NCR office building), and 106,758 SF of retail. This analysis assumes a single-phase project, based upon build-out for the year 2009.

Traffic for these land uses was calculated using equations contained in the *Institute of Transportation Engineers' (ITE) Trip Generation Manual, Seventh Edition, 2003*. Average rates were used only when equations were not provided. Gross trips generated are displayed below in **Table 2**.

Table 2
Satellite Business Center DRI
Gross Trip Generation

Land Use	ITE Code	Daily Traffic		AM Peak Hour		PM Peak Hour	
		Enter	Exit	Enter	Exit	Enter	Exit
Build-Out (Year 2011)							
644 Condominium Units	*230*	1,563	1,563	39	190	186	91
9-hole Golf Course	*430*	161	161	16	4	11	14
27,252 SF Office Space	*710*	245	245	58	8	19	90
106,758 SF Retail	*820*	3,543	3,543	99	64	314	340
Total		**5,512**	**5,512**	**212**	**266**	**530**	**535**

NOTE: The existing 212,000 SF office building on the site, currently occupied by NCR, will remain. However, a portion of the existing building is empty and will be removed to make way for new uses. This office space currently occupied by NCR was NOT included in the trip generation calculations. The traffic volumes associated with the existing NCR building are included in the existing traffic counts. The golf course is currently under construction, permitted under CDP# 2004-00013 (issued 08/18/05).

3.2 Trip Distribution

The directional distribution and assignment of new project trips was based on the project land uses, a review of land use densities in the area, combined with engineering judgment and discussions with GRTA and Gwinnett County staff at the methodology meeting.

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 GRTA's Letter of Understanding.

3.4 Study Network Determination

A general study area was determined using GRTA's "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) be considered for analysis. This general study area was refined during the methodology meeting, and includes the following signalized intersections:

1. Satellite Boulevard at Old Norcross Road (East)
2. Satellite Boulevard at Boggs Road
3. Satellite Boulevard at Duluth Highway (SR 120)
4. Boggs Road at I-85 Southbound Ramps

Each of the above listed intersections was analyzed for the Existing 2006 Condition, the 2009 No-Build Condition, and the 2009 Build Condition. The 2009 No-Build Condition represents the existing traffic volumes grown at 4.0% per year for three (3) years. The 2009 Build Condition adds the projected trips associated with the Satellite Business Center development to the 2009 No-Build Condition.

Additionally, the proposed site access points listed below were only analyzed for the 2009 Build Condition:

5. Satellite Boulevard at Proposed Driveway 1
6. Satellite Boulevard at Driveway 2 (existing NCR access driveway)
7. Satellite Boulevard at Proposed Driveway 3
8. Boggs Road at Driveway 4 (existing NCR access driveway)

These intersections were analyzed for the weekday AM and PM peak hour conditions.

3.5 Existing Facilities

Roads in the study network were inventoried to obtain geometric characteristics, posted speed limits, and the GDOT Functional Classifications.

Roadway	Number of Lanes	Posted Speed Limit (MPH)	GDOT Functional Classification
Interstate 85	10	65	Urban Interstate Principal Arterial
Duluth Highway (SR 120)	5 w/ TWLTL	45	Urban Minor Arterial
Old Norcross Road (East)	5 w/ TWLTL	45	Urban Minor Arterial
Boggs Road	5 w/ TWLTL	45	Urban Minor Arterial
Satellite Boulevard (west of Old Norcross Road)	5 w/ TWLTL	45	Urban Minor Arterial
Satellite Boulevard (east of Old Norcross Road)	5 w/ TWLTL	45	Urban Collector

* TWLTL – Two-Way Left-Turn Lane

Duluth Highway (SR 120) is an urban minor arterial that originates in Lawrenceville and travels westward through Duluth, Roswell, Alpharetta, Marietta, and westward towards Alabama. In the vicinity of the proposed site, Duluth Highway is a 5-lane roadway with a center two-way left-turn lane. The posted speed limit is 45 MPH.

Old Norcross Road (East) is an urban minor arterial that originates in Lawrenceville at SR 120 and travels westward until it intersects Satellite Boulevard. North of Gwinnett Place Mall, Old Norcross Road (East) begins again and eventually terminates at Buford Highway (US 23/SR 13) in Norcross. In the vicinity of the proposed site, Old Norcross Road (East) is a 5-lane roadway with a center two-way left-turn lane. The posted speed limit is 45 MPH.

Boggs Road is an urban minor arterial that originates at Duluth Highway (SR 120) and travels southward approximately 2 miles, crossing over I-85 and SR 316, until it terminates at Old Norcross Road (East). Adjacent to the proposed site, Boggs Road is a 5-lane roadway with a center two-way left-turn lane. The posted speed limit is 45 MPH.

Satellite Boulevard is mostly an urban minor arterial that runs parallel to I-85. Satellite Boulevard originates at Beaver Ruin Road (SR 378) and travels northeastward approximately 14 miles until it terminates at Buford Drive (SR 20) in Buford. Adjacent to the proposed site, Satellite Boulevard is a 5-lane roadway with a center two-way left-turn lane. The posted speed limit is 45 MPH.

4.0 TRIP GENERATION

As stated earlier, trips associated with the proposed development were estimated using the ITE *Trip Generation Manual*, Seventh Edition (2003), using equations where available.

Mixed-use and pass-by reductions were taken according to the *ITE Trip Generation Handbook, 2004* and GRTA guidelines. No alternate modes of transportation reductions were taken. The total trips generated and analyzed in the report are listed below in **Table 3**.

Table 3
Satellite Business Center DRI
Net Trip Generation

Land Use	Daily Traffic		AM Peak Hour		PM Peak Hour	
	Enter	Exit	Enter	Exit	Enter	Exit
Build-Out (Year 2009)						
Gross Trips	**5,512**	**5,512**	**212**	**266**	**530**	**535**
Internal Capture Reductions	*-805*	*-805*	*-0*	*-0*	*-83*	*-83*
Pass-By Reductions	*-1,347*	*-1,347*	*-0*	*-0*	*-124*	*-124*
New Trips	**3,360**	**3,360**	**212**	**266**	**323**	**328**

5.0 TRIP DISTRIBUTION AND ASSIGNMENT

New trips were distributed onto the roadway network using the percentages agreed to during the methodology meeting. **Figure 4A and Figure 4B** display the expected residential distribution for the development throughout the roadway network. **Figure 5A and Figure 5B** display the expected non-residential distribution for the development throughout the roadway network. These percentages were applied to the new trips generated by the development (see Table 3, above), and the volumes were assigned to the roadway network. The expected peak hour turning movements generated by the proposed development are shown in **Figure 6A and Figure 6B**.

6.0 TRAFFIC ANALYSIS

6.1 Existing Traffic

The existing traffic volumes are shown in **Figure 7A and Figure 7B**. These volumes were input in Synchro 6.0 and an Existing Conditions analysis was performed. The results are displayed below in **Table 4**.

Table 4
Satellite Business Center DRI
Existing 2006 Intersection Levels of Service
(delay in seconds)

	Intersection	Control	AM Peak Hour	PM Peak Hour
1	Satellite Blvd at Old Norcross Road (East)	Signal	F (87.3)	F (97.9)
2	Satellite Blvd at Boggs Road	Signal	E (76.4)	D (52.1)
3	Satellite Blvd at Duluth Hwy (SR 120)	Signal	D (47.5)	D (53.4)
4	Boggs Road at I-85 Southbound Ramps	Signal	C (28.4)	C (12.9)
6	Satellite Blvd at Driveway 2	Southbound stop-controlled	F*	E (38.0)
8	Boggs Road at Driveway 4	Eastbound stop-controlled	B (12.1)	C (15.4)

* = Greater than 100 seconds of delay

Three of the six intersections currently operate below the acceptable Level of Service standard (LOS D) during at least one of the peak hours. The LOS standard will become LOS E for the appropriate peak hours at these three intersections.

6.2 2009 No-Build Traffic

The existing traffic volumes were grown at 4.0% per year for 3 years along all roadway links within the study network. These volumes were input in Synchro 6.0 and analyses of the projected No-Build conditions were performed. The results of the analysis are displayed below in **Table 5.** The projected volumes for the 2009 No-Build conditions are shown in **Figure 8A and Figure 8B**.

Table 5
Satellite Business Center DRI
2009 No-Build Intersection Levels of Service
(delay in seconds)

	Intersection	Control	LOS Standard	AM Peak Hour	PM Peak Hour
1	Satellite Blvd at Old Norcross Road (East)	Signal	E	F*	F*
2	Satellite Blvd at Boggs Road	Signal	E	F*	E (73.8)
3	Satellite Blvd at Duluth Hwy (SR 120)	Signal	D	E (60.5)	E (72.8)
4	Boggs Road at I-85 Southbound Ramps	Signal	D	D (38.5)	D (39.0)
6	Satellite Blvd at Driveway 2	Southbound stop-controlled	E	F*	E (49.1)
8	Boggs Road at Driveway 4	Eastbound stop-controlled	D	B (12.7)	C (21.0)

* = Greater than 100 seconds of delay

Four of the six intersections failed to meet acceptable Level of Service standards for the year 2009 No-Build condition. Improvements were made to the 2009 No-Build Conditions at three (3) intersections to achieve the appropriate LOS Standard.

The 2009 No-Build conditions with Improvements analysis results are displayed below in **Table 6**. The 2009 No-Build conditions with improvements made to the intersections are shown in **Figure 8A and Figure 8B**, and are listed on the following page by intersection.

Table 6
Satellite Business Center DRI
2009 No-Build Intersection Levels of Service IMPROVED
(delay in seconds)

	Intersection	Control	LOS Standard	AM Peak Hour	PM Peak Hour
1	Satellite Blvd at Old Norcross Road (East)	Signal	E	E (74.9)	E (61.0)
2	Satellite Blvd at Boggs Road	Signal	E	D (48.8)	D (43.1)
3	Satellite Blvd at Duluth Hwy (SR 120)	Signal	D	D (45.1)	D (47.5)

Satellite Boulevard at Old Norcross Road (East) (Intersection #1)

- Construct a third eastbound through lane along Satellite Boulevard.
- Construct a third northbound left-turn lane along Old Norcross Road (East).

Satellite Boulevard at Boggs Road (Intersection #2)

- Construct a southbound right-turn lane along Boggs Road.
- Construct a third eastbound through lane and a third westbound through lane along Satellite Boulevard.
- Extend northbound left-turn storage length back to I-85 South Ramp intersection.

Satellite Boulevard at Duluth Highway (Intersection #3)

- Construct a third northbound through lane and a third southbound through lane along Satellite Boulevard.
- Construct an additional southbound left-turn lane, creating dual southbound left-turn lanes.
- Construct an additional eastbound left-turn lane, creating dual eastbound left-turn lanes.
- Install right-turn overlap phasing for the northbound right-turn movement along Satellite Boulevard.

The southbound approach of Driveway 2 (existing NCR driveway) (Intersection #6) at its intersection with Satellite Boulevard is projected to operate at LOS F during both the AM and PM peak hour. It is important to note that side street delay is not uncommon for traffic turning onto a major roadway. Additionally, the traffic signal along Satellite Boulevard at Boggs Road should provide some gaps in through traffic. The presence of a two-way left-turn lane along Satellite Boulevard additionally provides for two-stage gap operation. A traffic signal was not considered in the No-Build analysis because the side street approach volumes are not expected to meet traffic signal warrants.

6.3 2009 Build Traffic

The traffic associated with the proposed development (Satellite Business Center) was added to the 2009 No-Build volumes. These volumes were then input into the 2009 "No-Build" with Improvements roadway network and analyzed with Synchro 6.0. The results of the analyses are displayed in **Table 7**. The projected volumes for the 2009 Build conditions are shown in **Figure 9A and Figure 9B**.

Table 7
Satellite Business Center DRI
2009 Build Intersection Levels of Service
(delay in seconds)

	Intersection	Control	LOS Standard	AM Peak Hour	PM Peak Hour
1	Satellite Blvd at Old Norcross Road (East)	Signal	E	E (72.6)	D (64.7)
2	Satellite Blvd at Boggs Road	Signal	E	E (51.2	D (47.9)
3	Satellite Blvd at Duluth Hwy (SR 120)	Signal	D	D (46.1)	D (53.3)
4	Boggs Road at I-85 Southbound Ramps	Signal	D	D (40.4)	D (37.0)
5	Satellite Blvd at Driveway 1	Southbound stop-controlled	D	F (65.3)	E (39.1)
6	Satellite Blvd at Driveway 2	Southbound stop-controlled	E	F*	F*
7	Satellite Blvd at Driveway 3	Southbound stop-controlled	D	F*	F*
8	Boggs Road at Driveway 4	Eastbound stop-controlled	D	C (15.1)	D (28.7)

* = Delay is greater than 100 seconds

Three of the eight intersections failed to meet the acceptable Level of Service standard for the AM and PM peak hours. The three intersections were project driveways. Improvements were made at all four project driveways based on driveway volumes to improve traffic operations. Improvements were made to the 2009 Build Conditions to obtain the appropriate LOS Standard.

The 2009 Build conditions with Improvements analysis results are displayed below in **Table 8**. The 2009 Build conditions with improvements made to the intersections are shown in **Figure 9A and Figure 9B**, and are listed on the following page by intersection.

Table 8
Satellite Business Center DRI
2009 Build Intersection Levels of Service IMPROVED
(delay in seconds)

	Intersection	Control	LOS Standard	AM Peak Hour	PM Peak Hour
6	Satellite Blvd at Driveway 2	Signal *	E	C (32.2)	D (36.4)
8	Boggs Road at Driveway 4	Eastbound stop-controlled	D	B (14.3)	D (28.5)

* Install new traffic signal.

Satellite Boulevard at Driveway 1 (Intersection #5)

- Construct a westbound right-turn lane along Satellite Boulevard.
- The proposed driveway southbound approach should have one ingress lane and two egress lanes (separate left-turn and right-turn lanes).

Satellite Boulevard at Driveway 2 (Intersection #6)

- Install a traffic signal when warranted. (Note: Adequate signal spacing is provided as the existing traffic signal at Boggs Road is approximately 1,500 feet to the east and the existing traffic signal at Evergreen Boulevard is approximately 1,900 feet to the west.)

Satellite Boulevard at Driveway 3 (Intersection #7)

- Construct a westbound right-turn lane along Satellite Boulevard.
- The proposed driveway southbound approach should have one ingress lane and two egress lanes (separate left-turn and right-turn lanes).

Satellite Boulevard at Driveway 4 (Intersection #8)

- Construct a southbound right-turn lane along Boggs Road.

The southbound approaches at the unsignalized Driveways 1 and 3 along Satellite Boulevard are projected to operate at LOS F during both the AM and PM peak hour. It is important to note that side street delay is not uncommon for traffic turning onto a major roadway. Additionally, the existing and proposed traffic signals along Satellite Boulevard should provide some gaps in through traffic to make a southbound left-turn movement from the Satellite Business Center onto Satellite Boulevard.

7.0 IDENTIFICATION OF PROGRAMMED PROJECTS

The *TIP, STIP, RTP, GDOT's Construction Work Program, and the Gwinnett County SPLOST* were searched for currently programmed transportation projects within the vicinity of the proposed development. Several projects are programmed for the area surrounding the study network. Information on the projects is included in the Appendix. **Figure 10** shows a map of the programmed projects listed below.

1. AR-905A and AR-905B	Long-range project to install I-85 North Business Rapid Transit (BRT) from Doraville MARTA station to Sugarloaf Parkway. Completion Date: 2025
2. AR-H-100 GDOT #0003164	Addition of 1 HOV lane in both directions for 14 miles along I-85 from SR 316 to Hamilton Mill Road. Dedicated HOV-only ramps will be provided but have not been determined at this time. The HOV lanes will be barrier-separated with median breaks in certain locations to allow for ingress and egress from the HOV lanes as well as emergency vehicle access. Completion Date: 2012
3. GW-322 GDOT #0005825	The Old Norcross Road ITS project will consist of installing fiber optic cable and closed circuit TV cameras from Breckinridge Boulevard to SR 120. This project will enhance the County's Advance Transportation Management system and provide gap closures in the existing system. Completion Date: 2008
4. AR-H-500 GDOT #0003168	Addition of 1 HOV lane in both directions for 14 miles along SR 316 from I-85 to SR 20. Dedicated HOV-only ramps will be provided but have not been determined at this time. The HOV lanes will be barrier-separated with median breaks in certain locations to allow for ingress and egress from the HOV lanes as well as emergency vehicle access. Completion Date: 2012
5. GW-303 GDOT #0006828	Installation of Gwinnett County's ITS/ATMS infrastructure along Satellite Boulevard from SR 378 (Beaver Ruin Road) to SR 317 (Lawrenceville Suwanee Road). Completion Date: 2009

8.0 INGRESS/EGRESS ANALYSIS

Access to the development is proposed at four locations. Driveways 1, 2, and 3 are located along Satellite Boulevard west of Boggs Road and east of Evergreen Boulevard. Proposed Driveway 1 is located along approximately 2,175' west of Boggs Road, Existing Driveway 2 is located approximately 1,550' west of Boggs Road, and Proposed Driveway 3 is located approximately 350' west of Boggs Road. Existing Driveway 4 is located along Boggs Road approximately 400' north of Satellite Boulevard.

Driveway 2 and Driveway 4 are existing access points for the existing NCR office space along Satellite Boulevard and Boggs Road, respectively. Proposed Driveway 1 will be constructed with the golf course (currently under construction) under CDP# 2004-00013 (issued 08/18/05). Proposed Driveway 3 is currently permitted under CDP# 2006-00235, and construction will begin in May 2007.

9.0 INTERNAL CIRCULATION ANALYSIS

The proposed development will generate trips between the residential and non-residential uses. The internal roadway network connects the residential condominium units, office space, retail space, and recreation use. Using the *ITE Trip Generation Handbook, 2004* as a reference, approximately 15.04% of the gross daily trips will be internal and approximately 15.96% of the gross PM peak hour trips will be internal.

10.0 COMPLIANCE WITH COMPREHENSIVE PLAN ANALYSIS

The Gwinnett County 2020 Land Use Plan Map identifies this area as Light Industrial.

11.0 NON-EXPEDITED CRITERIA

11.1 Quality, Character, Convenience, and Flexibility of Transportation Options

The proposed DRI is located within walking distance to a bus stop serving the Gwinnett County Express Route 102A (see below). This bus stop is located along Satellite Boulevard at Driveway 2 (the existing NCR driveway). Additionally, the proposed Satellite Business Center is located within 1.5 miles of the Gwinnett Transit Center near the Gwinnett Place Mall. This transit center serves as the origin/destination for four (4) local bus routes and one (1) express route provided by the Gwinnett County Transit. Route 10 travels to the Doraville MARTA station, Route 20 travels to Jimmy Carter Boulevard/Buford Highway, Route 30 travels to Downtown Norcross, and Route 40 travels through Downtown Lawrenceville to the Gwinnett Transit O & M Facility.

A fifth route (express route) travels between the Gwinnett Transit Center and Downtown Atlanta. Route 102A travels from the Gwinnett Transit Center to six (6) MARTA stations in Atlanta: Arts Center, Midtown, North Avenue, Civic Center, Peachtree Center, and 5 Points.

11.2 Vehicle Miles Traveled

The following table displays the reduction in traffic generation due to internal capture and pass-by trips.

	Build-out Total
Daily Gross Trip Generation:	11,024
(-)Mixed-use reductions (internal capture)	-1,610
(-)Pass-by trips	-2,693
(-)Alternative modes	-0
Net Trips:	**6,721**

11.3 Relationship Between Location of Proposed DRI and Regional Mobility

The proposed development is located within an activity center bounded by the Gwinnett Civic & Cultural Center, the Discover Mills Outlet Center, and Gwinnett Place Mall. This area is comprised of many types of land uses including commercial and retail services, industrial employment centers, civic and public buildings, and single-family and multi-family housing. The Gwinnett Livable Center Initiative (LCI) project identified many factors that may influence the way the area grows and develops.

The proposed development is located along Satellite Boulevard, a major county arterial, and near I-85 and State Route 316.

The proposed development is not located within an urban core or a town center. Additionally, it is not part of an infill initiative.

11.4 Relationship Between Proposed DRI and Existing or Planned Transit Facilities

The proposed DRI is located within walking distance to a bus stop serving the Gwinnett County Express Route 102A (see below). This bus stop is located along Satellite Boulevard at Driveway 2 (the existing NCR driveway). Additionally, the proposed Satellite Business Center is located within 1.5 miles of the Gwinnett Transit Center near the Gwinnett Place Mall. This transit center serves as the origin/destination for four (4) local bus routes and one (1) express route provided by the Gwinnett County Transit. Route 10 travels to the Doraville MARTA station, Route 20 travels to Jimmy Carter Boulevard/Buford Highway, Route 30 travels to Downtown Norcross, and Route 40 travels through Downtown Lawrenceville to the Gwinnett Transit O & M Facility.

A fifth route (express route) travels between the Gwinnett Transit Center and Downtown Atlanta. Route 102A travels from the Gwinnett Transit Center to six (6) MARTA stations in Atlanta: Arts Center, Midtown, North Avenue, Civic Center, Peachtree Center, and 5 Points.

11.5 Transportation Management Area Designation

The proposed development is not located within an established TMA.

11.6 Offsite Trip Reduction and Trip Reduction Techniques

Mixed-use and pass-by trip reductions were taken according to the *ITE Trip Generation Handbook, 2004*. Approximately 15.04% of the gross daily trips will be internal and approximately 15.96% of the gross PM peak hour trips will be internal. A 38% pass-by trip reduction was used for the PM peak hour when determining the net new trips for the retail use. Using the ITE fitted curve equation to determine the pass-by trip reduction produced a value that was less than 10% of the adjacent street traffic (Satellite Boulevard).

11.7 Balance of Land Uses – Jobs/Housing Balance

Please refer to the Area of Influence Analysis, located in Section 12.0 of the report.

11.8 Relationship Between Proposed DRI and Existing Development and Infrastructure

The development is located in an area where the existing infrastructure is expected to be adequate to serve the needs of the development upon build-out (2009).

12.0 AREA OF INFLUENCE

This section will describe the Area of Influence (AOI) demographics, AOI average wage levels, expected DRI housing costs, and the availability of jobs within the AOI that would reasonably position employees to purchase housing within the proposed DRI.

12.1 Criteria

As part of the non-expedited review process for a DRI, an Area of Influence Analysis must be performed to determine the impact of the proposed development on the balance of housing and jobs within the immediate area surrounding the proposed development. For this proposed development expansion, the non-expedited review criterion is as follows:

This section is included to satisfy the following GRTA Non-expedited review criteria:

7. The proposed DRI:
   (c) Is located in an area of influence with employment opportunities which are such that at least twenty-five percent (25%) of the persons that are reasonably anticipated to live in the proposed DRI and are reasonably expected to be employed will have an opportunity to find employment appropriate to such persons' qualifications and experience within the Area of Influence;

The Area of Influence is comprised of the area within six road-miles of the proposed development. To determine the AOI, *TransCAD* was used to measure six road miles from the nearest intersection to the project (Satellite Boulevard at Boggs Road). The population and housing statistics for the AOI were determined by taking the area outlined in *TransCAD*, creating a boundary in GIS format, and overlaying the boundary with a GIS layer containing census tract information. The Area of Influence (located within Gwinnett County) can be seen in **Figure 11**. Information obtained from the census tracts can be seen in **Table 9.**

Table 9
Census Tract Information

Total Households	54,428
Population in Households	151,416
Average household size	2.78
Total Workers	82,724
Workers per Household	1.52
Owner Occupied	65.33%
Rental Occupied	34.67%

As can be seen from the table above, the total population within the Area of Influence is 151,416, residing within 54,428 households (an average of 2.78 people per household). The AOI area totals 45,734 acres.

Using the above calculated average of 2.78 persons per household, it can be anticipated that the proposed DRI will house approximately 1,790 people (644 proposed dwelling units multiplied by 2.78). Based on information obtained from the Census Tracts, it is estimated that approximately 978 of these expected 1,790 residents would be workers. The remainder of this section will demonstrate the availability of jobs for these expected workers within the development at or above the necessary income level to afford housing within the DRI.

The Atlanta Journal-Constitution website was researched to find current listings of houses for sale in the vicinity of the proposed development (30096 Zip Code). At the time of this report, 250 homes were listed for sale in the area, ranging in price from $114,500 to $1,150,000.

12.3 Development Housing Analysis

The development plan provides for houses for sale in two different price ranges within the proposed development. **Table 10**, below, displays the number of units for sale, the average sale price for those units, and the number of workers expected to reside in homes at each price range.

Table 10
Estimated Workers per Household

	Number of Units	Average Price	Number of Workers
A	322 Residential Condo Units	$225,000	489
B	322 Residential Condo Units	$275,000	489
	644 total units	**-**	**978 total workers**

In order to determine the number of jobs available within the AOI that would provide adequate income, information about the types of jobs within the AOI and the average salaries for these positions was collected first. Information about the types of jobs available within the AOI was obtained from Claritas, a data solutions company. A map with the boundary of the AOI was sent to Claritas, and a report containing the types of employment opportunities and number of each type of job was compiled. The Claritas report is included in the Appendix of this report. Next, the Georgia Department of Labor website was researched to obtain average salary information for the positions available within the AOI. Average salary information for jobs in Gwinnett County was matched to the jobs existing within the AOI. This information (also available in the Appendix), along with the information provided by Claritas, is included in the **Table 11**, on the following page.

Table 11
AOI Jobs and Average Salaries

Industry / Business Type	# Businesses	# Employees	Average Salary
Retail Trade	1,808	300,117	$55,154
Building Materials and Garden Supply	97	2,848	-
General Merchandise Stores	68	3,392	-
Food Stores	140	2,442	-
Auto Dealers and Gas Stations	167	3,555	-
Apparel and Accessory Stores	174	1,366	-
Home Furniture, Furnishings, and Equipment	295	4,226	-
Eating and Drinking Places	431	8,866	-
Miscellaneous Retail Stores	435	3,421	-
Finance	812	10,441	$117,067
Banks, Savings and Lending Institutions	259	3,058	-
Securities and Commodity Brokers	65	2,015	-
Insurance Carriers and Agencies	180	2,596	-
Real Estate Trusts, Holdings, and Other Investments	307	2,772	-
Services	3,110	46,424	-
Hotels and Other Lodging	33	789	$31,344
Personal Services	686	9,108	-
Business Services	883	10,653	$133,881
Motion Picture and Amusement	172	1,656	$94,680
Health Services	494	13,335	$80,105
Legal Services	128	574	$133,881
Education Services	100	4,879	$65,639
Social Services	111	1,614	$80,105
Miscellaneous, Membership Organizations and Nonclassified	503	3,817	-
Agriculture	111	1,180	$18,309
Mining	4	33	$32,334
Construction	565	6,112	$91,629
Manufacturing	388	13,091	$108,148
Transportation, Communication/Public Utilities	283	6,086	$149,406
Wholesale Trade	532	10,447	$121,600
Public Administration	31	585	$84,920
Total	7,644	394,516	-

12.4 Affordable Housing Analysis

The Government National Mortgage Association website makes available several online calculators to aid in determining affordable housing based on given incomes and income ranges. These calculators were used to determine the minimum income necessary to afford housing within the proposed Satellite Business Center development. It was assumed that no more than one third of an individual's income would be used for mortgage costs, that a 7.0% interest rate on a 30-year conventional loan could be obtained, and that a 10% down payment would be made. The incomes required to purchase a home at the midpoint of each price range were calculated and are displayed in **Table 12**. Because there is an average of 1.52 workers expected per household, the required income for each range was divided by 1.52 to determine the average salary each worker within the development would be expected to earn in order to provide their "fair share" of the housing costs. This methodology assumes an equal burden on all workers within the development, and is considered to be a conservative approach since it eliminates the lower paying positions within the AOI from consideration in the analysis. **Table 12** also displays the number of workers expected in each price range, as well as the number of jobs available at the necessary average income level to afford housing within that price range. As can be seen in the table, there are enough positions available within the AOI for all of the expected workers within the proposed development to find employment, thus satisfying the GRTA requirement of 25%.

Table 12
Expected Workers

	Average Sale Price	Necessary Income per Expected Worker	Expected Worker per Price Range	Jobs at or above Necessary Income
A	$225,000	$31,900	489	379,623
B	$275,000	$39,000	489	379,590
Percent of expected workers likely to find necessary employment within the AOI				**100%**

13.0 ARC'S AIR QUALITY BENCHMARK

The development is expected to consist of approximately 644 condominium units, a 9-hole golf course, 27,252 SF of office space (in addition to the 212,000 SF NCR office building), and 106,758 SF of retail space on approximately 85.31 acres. Residential is the dominant use and the dwelling units per acre ratio is approximately 7.55.

For projects where Residential is the dominant use, a development can receive VMT credits if at least 10% of the floor area is office or retail space. Assuming each residential unit is 1,800 SF (1,159,200 SF residential) and the total office floor area is 239,252 SF (existing NCR plus proposed addition), the office use accounts for approximately 16% of the gross floor area. Thus, the ARC criteria for a 4% VMT reduction are met.

The retail space (106,758 SF) is approximately 7% of the gross floor area. This does not meet the 10% threshold, but a partial 2% VMT reduction may be received.

The proposed DRI is located within walking distance to a bus stop serving the Gwinnett County Express Route 102A. This bus stop is located along Satellite Boulevard at Driveway 2 (the existing NCR driveway). Therefore, the proposed development may receive a 3% VMT reduction.

The proposed development will provide pedestrian connections between the residential and non-residential uses within the site. Additionally, the proposed development will connect with adjoining sidewalks along Satellite Boulevard and Boggs Road. Because the site also meets a Mixed Use 'target' as described above, the proposed site may receive a 5% VMT reduction.

The proposed development meets the ARC criteria for a total 14% VMT reduction. These reductions are displayed below in **Table 13**.

Table 13
ARC VMT Reductions

Mixed-Use Projects where Residential is the dominant use	
Mixed Use 'target' – 16% of floor area is office	- 4%
Mixed Use 'target' – 7% of floor area is retail	- 2%
Project is located within ¼ mile of a bus stop (Gwinnett County Transit)	- 3%
Bike/pedestrian networks in developments that meet one Mixed Use 'target' and connect to adjoining uses	- 5%
Total Reductions	**- 14%**

Appendix

Site Photos

Future Roadway/Intersection Projects

Transit Information

Trip Generation and Volume Worksheets

Peak Hour Turning Movement Counts

GDOT Projected 2005 Volumes

From Interstate 85/SR 316 Interchange Improvements

Capacity Analyses – Existing 2006 Conditions

Capacity Analyses – 2009 No-Build Conditions

Capacity Analyses – 2009 No-Build Conditions

IMPROVED

Capacity Analyses – 2009 Build Conditions

Capacity Analyses – 2009 Build Conditions

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