

Transportation Analysis

Etowah River Tract DRI #1416 Cherokee County, Georgia

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EXECUTIVE SUMMARY

This report presents the analysis of the anticipated traffic impacts of a proposed 1,362-acre mixed-use development (Etowah River Tract) located north of the intersection of Highway 369 and Highway 372 in Cherokee County, Georgia. This report is being prepared as part of a submittal requesting a Land Disturbance Permit. Because the mixed-use 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) review. The Cherokee County Future Land Use Plan identifies the area as Residential Medium Density.

The proposed development is expected to consist of approximately 1,800 single-family residential units and 110,500 SF of retail space. The ultimate development program may include approximately 50 townhouse units, which would be included in the total number of 1,800 residential units within the development. In addition, amenity areas such as tennis courts and swimming pools are proposed, as well as a river park to connect to an existing County park. The development is scheduled to be completed in phases with ultimate build-out by the year 2015.

Based on the existing 2007 conditions, two of the study area intersections currently operate below the acceptable Level of Service standard (LOS D).

The results of the detailed intersection analysis for the 2015 No-Build and 2015 Build conditions identified improvements that will be necessary in order to maintain the Level of Service standard (LOS D or E) within the study network. These improvements are listed below:

2015 No-Build recommended improvements (includes background growth but does not include the Etowah River Tract DRI project traffic):

SR 372 (Ball Ground Road) @ SR 369 (Hightower Road) (Intersection #3)

- Install a traffic signal when warranted. (Note: Peak hour volumes indicate a signal is warranted in the 2015 No Build year during the AM and PM peak conditions.)
- Install an eastbound left-turn lane along SR 369 (Hightower Road).
- Install a westbound left-turn lane along SR 369 (Hightower Road).
- Install a northbound right-turn lane along SR 372 (Ball Ground Road).
- Install a southbound left-turn lane along SR 372 (Ball Ground Road).
- Install a northbound left-turn lane along SR 372 (Ball Ground Road).

Hightower Road (SR 369) @ Lower Creighton Road (Intersection #4)

- Install a traffic signal when warranted. (Note: Peak hour volumes indicate a signal is warranted in the 2015 No Build year during the PM peak conditions.)
- Install an eastbound right-turn lane along SR 369 (Hightower Road).
- Install a westbound left-turn lane along SR 369 (Hightower Road).
- Install a northbound right-turn lane along Lower Creighton Road.

SR 20 (Cumming Highway) @ SR 369 (Hightower Road) (Intersection #6)

- Install a traffic signal when warranted. (Note: Peak hour volumes indicate a signal is warranted in the 2015 No Build year during the AM and PM peak conditions.)
- Install a westbound right-turn lane along SR 20 (Cumming Highway).
- Provide additional storage length for the southbound left-turn lane along SR 369 (Hightower Road).

SR 20 (Cumming Highway) @ SR 372 (Ball Ground Road) (Intersection #7)

- Install a westbound right-turn lane along SR 20 (Cumming Highway).

2015 Build recommended improvements (2015 No-Build conditions plus the Etowah River Tract DRI project traffic): (Note: These improvements are in addition to the 2015 No-Build recommended improvements.)

SR 372 (Ball Ground Road) @ Hogan Pond Road (Intersection #1)

- Install a westbound right-turn lane along Hogan Pond Road (to make two approach lanes).
- Install a northbound right-turn lane along SR 372 (Ball Ground Road).
- Install a southbound left-turn lane along SR 372 (Ball Ground Road).

SR 20 (Cumming Highway) @ East Cherokee Drive (Intersection #5)

- Install a northbound right-turn lane along East Cherokee Drive.
- Install a southbound left-turn lane along East Cherokee Drive.

SR 20 (Cumming Highway) @ SR 369 (Hightower Road) (Intersection #6)

- Install a channelized free-flow southbound right-turn lane along SR 369 (Hightower Road) into a westbound acceleration lane along SR 20.

The following intersection geometry and improvements are recommended at the project site driveways and internal intersections (Note: The attached site plan includes these improvements):

SR 372 (Ball Ground Road) @ Street 26 (Entrance 2) – Intersection #8

- Install a traffic signal when warranted. (Note: Peak hour volumes indicate as signal is warranted prior to the 2015 build-out year during the AM and PM peak conditions.) A traffic signal is expected to be warranted prior to full build-out of the development.
- Install a southbound left-turn lane along SR 372 (Ball Ground Road).
- Install a northbound right-turn lane along SR 372 (Ball Ground Road).
- Install a westbound right-turn lane and a westbound left-turn lane along Street 26.

SR 369 (Hightower Road) @ Street 1 (Entrance 1) – Intersection #9

- Install a traffic signal when warranted. (Note: Peak hour volumes indicate as signal is warranted prior to the 2015 build-out year during the AM and PM peak conditions.) A traffic signal is expected to be warranted prior to full build-out of the development.
- Install an eastbound left-turn lane along SR 369 (Hightower Road).
- Install a westbound right-turn lane along SR 369 (Hightower Road).
- Install a southbound right-turn lane and a southbound left-turn lane along Street 1.

SR 372 (Ball Ground Road) @ Entrance 3 (E-3) – Intersection #10

- Install a right-in/right-out driveway; stop controlled.
- Install a northbound right-turn lane along SR 392.

SR 372 (Ball Ground Road) @ Entrance 4 (E-4) – Intersection #11

- Install a southbound left-turn lane along SR 372 (Ball Ground Road).
- Install a northbound right-turn lane along SR 372 (Ball Ground Road).
- Install a separate westbound left-turn lane and right-turn lane exiting at E-4; stop controlled.

Creighton Road @ Street 1 – Intersection #13

- Recommend Creighton Road eastbound and westbound approaches be stop-controlled.
- Install a separate northbound and southbound left-turn lane along Street 1/Proposed Parkway.

Street 1 @ Street 77 – Intersection #18

- A roundabout is proposed at this intersection.

Street 45 @ Street 1 – Intersection #19

- Install an eastbound shared left-turn / right-turn lane along Street 45; stop-controlled.
- Install a northbound left-turn lane along Street 1.

Street 26 / Street 37 @ Street 1 – Intersection #20

- Install all-way stop controlled intersection control.
- Install a southbound right-turn lane along Street 1.

Street 26 @ Street 24 / Street 30 – Intersection #21

- Install side-street (Street 24 & 30) stop-controlled approaches.

Street 26 @ West Retail Driveway – Intersection #22

- Install an eastbound left-turn lane and through lane along Street 26.
- Install a westbound through and right-turn lane along Street 26.
- Install a separate southbound left-turn lane and right-turn lane exiting the West Retail; stop controlled.

1.0 PROJECT DESCRIPTION

1.1 Introduction

This report presents the analysis of the anticipated traffic impacts of a proposed 1,362-acre mixed-use development (Etowah River Tract) located north of the intersection of Highway 369 and Highway 372 in Cherokee County, Georgia. This report is being prepared as part of a submittal requesting a Land Disturbance Permit. Because the mixed-use 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) review. The Cherokee County Future Land Use Plan identifies the area as Residential Medium Density.

The proposed development is expected to consist of approximately 1,800 single-family residential units and 110,500 SF of retail space. The ultimate development program may include approximately 50 townhouse units, which would be included in the total number of 1,800 residential units within the development. In addition, amenity areas such as tennis courts and swimming pools are proposed, as well as a river park to connect to an existing County park. The development is scheduled to be completed in phases with ultimate build-out by the year 2015.

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

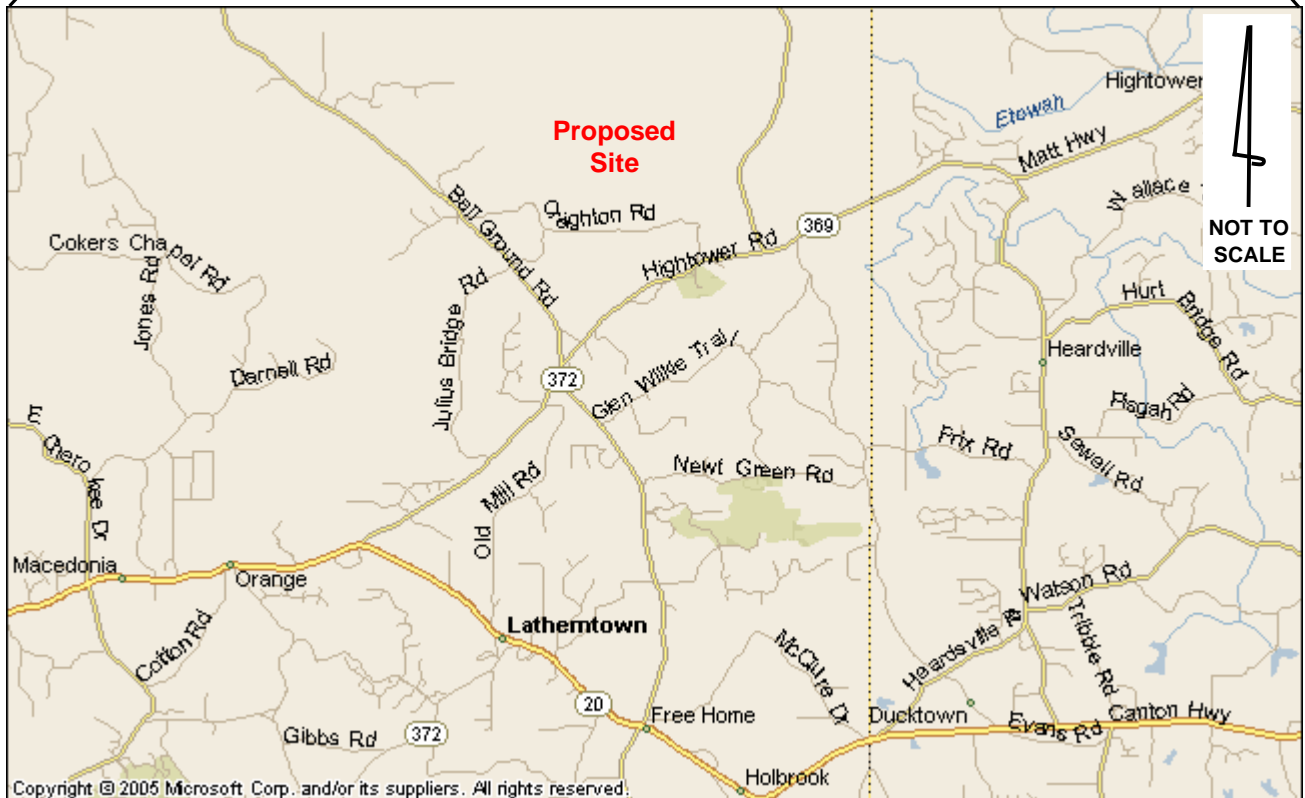
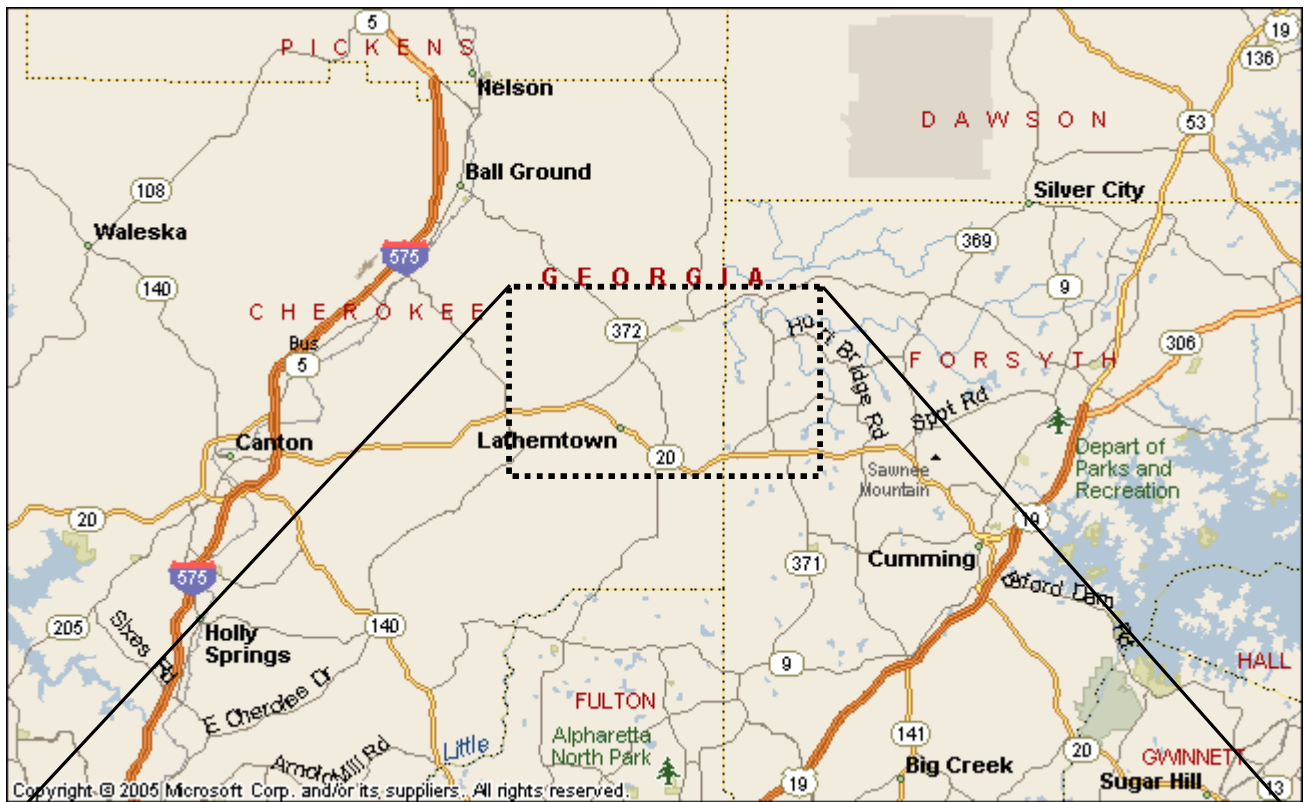
Table 1 Proposed Land Uses	
Single-Family Residential Homes	1,800 dwelling units
Commercial Space	110,500 square feet

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

1.2 Site Plan Review

The project site is located north of the intersection of Highway 369 and Highway 372. The proposed site is bounded by residential houses and undeveloped areas to the west and south, and the Etowah River to the north and east.

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.

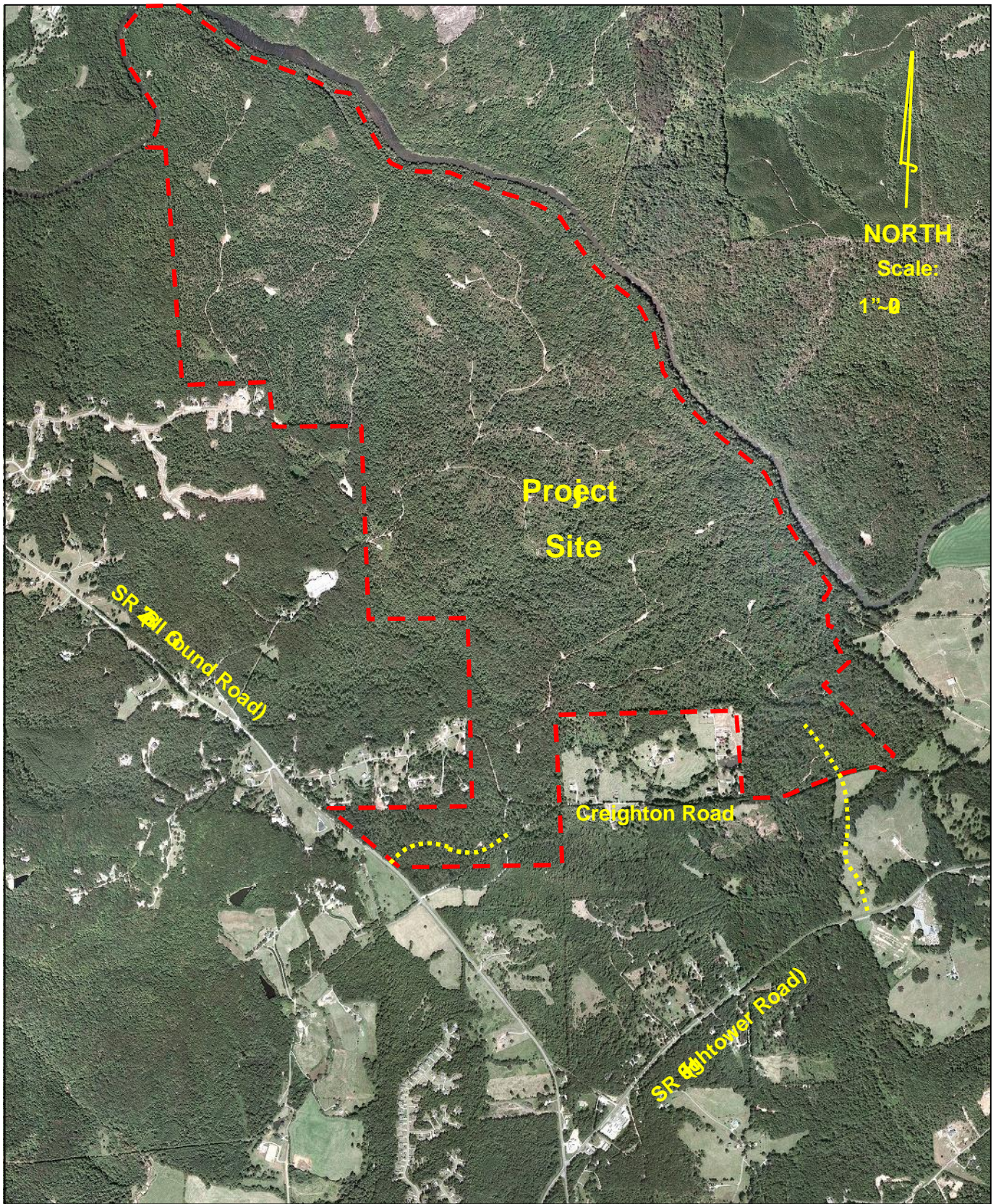


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Etowah River Tract DRI Transportation Analysis

Site Location

Figure
1



1.3 Site Access

Vehicular access to the development is proposed at two primary locations. Entrance 1 is a proposed parkway intersecting SR 369 along the south side of the development. Entrance 2 is a proposed driveway intersecting SR 372 along the west side of the development. These two entrances are proposed to be full-movement, signalized intersections.

There are additional development driveways that provide additional access to/from the development. Two driveways are proposed (Entrance 3 & 4) along SR 372 to provide access to the West Retail area. In the Town Center area, five driveways (Entrance 5-8) are located along the existing Creighton Road. Also in the Town Center area, the proposed parkway from SR 369 will intersect Creighton Road.

In addition to these proposed driveways, the development proposed two connections to Creighton Road (where Creighton Road currently passes through the site). The development also proposes a road connection to Hogan Pond Lane (Entrance 10).

1.4 Bicycle and Pedestrian Facilities

No sidewalks currently exist in the vicinity of the proposed development. The proposed development will provide sidewalks and trails for pedestrian and bicycle traffic. The retail and residential portions of the development are proposed to be connected by sidewalks to potentially reduce the amount of vehicular traffic internal to the site. An 8' sidewalk will be provided along one side of the street and a 5' sidewalk will be along the other side of the street. This will begin at which point S-1 (Entrance 1) intersects SR 369 (Hightower Road) and S-26 (Entrance 2) intersects SR 372 (Ball Ground Road). At which point the proposed 8' sidewalk will end at the intersection of S-1 and S-26. From that point leading into the development a 5' sidewalk will remain along one side of the street and the developer plans to include a natural trail that meanders along the other side of the street.

1.5 Transit Facilities

There is currently no fixed-transit service in the vicinity of this project. However, Cherokee County currently has the Cherokee Area Transportation System (CATS), which provides van pool service for commuters and rural transportation services for residents. Additionally, the GRTA Express Bus Route #490 provides service between Canton-Woodstock and Downtown-Midtown Atlanta.

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 3% per year along all roadways were agreed upon during the methodology meeting with GRTA staff.

2.2 *Traffic Data Collection*

2007 peak hour turning movement counts were conducted at nine intersections from 6:45-8:45 AM and 4:15-6:15 PM. The morning and afternoon peak hours varied between the nine intersections:

- SR 372 (Ball Ground Road) @ Hogan Pond Road (6:45-7:45 AM; 5:00-6:00 PM)
- SR 372 (Ball Ground Road) @ Creighton Road (6:45-7:45 AM; 5:00-6:00 PM)
- SR 372 (Ball Ground Road) @ SR 369 (Hightower Road) (7:30-8:30 AM; 4:30-5:30 PM)
- SR 369 (Hightower Road) @ Lower Creighton Road (7:30-8:30 AM; 4:30-5:30 PM)
- SR 20 (Cumming Highway) @ East Cherokee Drive (7:00-8:00 AM; 4:45-5:45 PM)
- SR 20 (Cumming Highway) @ SR 369 (Hightower Road) (7:30-8:30 AM; 4:15-5:15 PM)
- SR 20 (Cumming Highway) @ SR 372 (Ball Ground Road) (7:00-8:00 AM; 5:00-6:00 PM)

All raw count data is included in the Appendix.

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 and all-way stop-controlled unsignalized 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 1,800 single-family residential units and 127,000 SF of retail space. The development is scheduled to be completed in phases with ultimate build-out by the year 2015.

Traffic for these land uses was calculated using equations contained in the *Institute of Transportation Engineers' (ITE) Trip Generation Manual, Seventh Edition, 2003*. Gross trips generated are displayed below in **Table 2**.

Table 2 Etowah River Tract 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 2015)							
1,800 Single-Family Homes	210	7,426	7,426	317	952	910	535
110,500 SF Shopping Center	820	3,623	3,623	101	65	321	348
Total		11,049	11,049	418	1,017	1,231	883

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 Cherokee County staff at the Pre-Application 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 the 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 Pre-Application meeting, and includes the following intersections:

- SR 372 (Ball Ground Road) @ Hogan Pond Road (Unsignalized) – Intersection #1
- SR 372 (Ball Ground Road) @ Creighton Road (Unsignalized) – Intersection #2
- SR 372 (Ball Ground Road) @ SR 369 (Hightower Road) (Unsignalized) – Intersection #3

- SR 369 (Hightower Road) @ Lower Creighton Road (Unsignalized) – Intersection #4
- SR 20 (Cumming Highway) @ East Cherokee Drive (Signalized) – Intersection #5
- SR 20 (Cumming Highway) @ SR 369 (Hightower Road) (Unsignalized) – Intersection #6
- SR 20 (Cumming Highway) @ SR 372 (Ball Ground Road) (Signalized) – Intersection #7

All seven intersections were analyzed for the weekday AM and PM peak hour.

Each of the above listed intersections was analyzed for the Existing 2007 Condition, the 2015 No-Build Condition, and the 2015 Build Condition. The 2015 No-Build condition represents the existing traffic volumes grown at 3% per year for eight years. The 2015 Build condition adds the project trips associated with the Etowah River Tract development to the 2015 No-Build condition. (NOTE: The additional proposed site access points and internal site intersections listed below were only analyzed for the 2015 Build Condition):

- SR 372 (Ball Ground Road) @ Street 26 (Entrance 2) – Intersection #8
- SR 369 (Hightower Road) @ Street 1 (Entrance 1) – Intersection #9
- SR 372 (Ball Ground Road) @ Entrance 3 – Intersection # 10
- SR 372 (Ball Ground Road) @ Entrance 4 – Intersection #11
- Creighton Road @ Entrance 5 – Intersection #12
- Creighton Road @ Street 1 – Intersection #13
- Creighton Road @ Entrance 6 – Intersection #14
- Creighton Road @ Entrance 7 – Intersection #15
- Creighton Road / Street 24 @ Entrance 8 – Intersection #16
- Street 1 @ Street 77 – Intersection #18 (Internal)
- Street 45 @ Street 1 – Intersection #19 (Internal)
- Street 26 @ Street 1 – Intersection #20 (Internal)
- Street 26 @ Street 30 – Intersection #21 (Internal)
- Street 26 (Entrance 2) @ West Retail Driveway – Intersection #22 (Internal)

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

3.5 Existing Facilities

SR 372 (Ball Ground Road) is a two-way, undivided, north-south oriented roadway that extends from Canton Highway (Bus 5, SR 372) to SR 20 (Cumming Highway) where the name changes to SR 372 (Freehome Highway). GDOT classifies this road as rural major collector. The 2006 ADT north of SR 369 was 6,392 vehicles per day (vpd) (three day average).

SR 369 (Hightower Road) is a two-way, undivided road. The roadway is considered to have an east-west orientation at its intersection with SR 372 (Ball Ground Road) and Lower Creighton Road. GDOT classifies this road as rural major collector. The 2006 ADT east of SR 372 was 9,910 vehicles per day (vpd) (three day average).

SR 20 (Cumming Highway) is a two-way undivided, east-west oriented roadway that extends from the city of Canton to the city of Cumming / GA 400. GDOT classifies this street as rural minor arterial.

Creighton Road is a two-way, undivided, east-west oriented roadway that extends from SR 372 (Ball Ground Road) to SR 369 (Hightower Road). GDOT classifies this road as a rural local road.

Lower Creighton Road is a two-way, undivided, north-south oriented roadway that extends from SR 369 (Hightower Road) to Franklin Goldmine Road. GDOT classifies this road as rural local road.

Hogan Pond Lane is a two-way, undivided, gravel, east-west oriented road that extends from SR 372 (Ball Ground Road) to the east. GDOT classifies this road as a rural local road.

East Cherokee Drive is predominantly north-south oriented roadway that extends from Canton Highway (Bus 5) to the city of Andersonville / Canton Highway (Old Highway 5). GDOT classifies this road as urban minor arterial at the intersection of Canton Highway (Bus 5) to just south of the intersection of Canton Highway (Bus 5) where it turns into a rural major collector until it reaches the intersection of Hickory Flat Highway (SR 140) and then turns back into an urban minor arterial at the intersection with Hickory Flay Highway (SR 140) to the intersection with Old Highway 5.

Roadway	Road Type	Number of Lanes	Posted Speed Limit (MPH)	GDOT Functional Classification
SR 372 (Ball Ground Road)	Two-Way	2	55	Rural Major Collector
SR 369 (Hightower Road)	Two-Way	2	55	Rural Major Collector
SR 20 (Cumming Highway)	Two-Way	2	45/55	Rural Minor Arterial
Creighton Road	Two-Way	2	35	Rural Local Road
Lower Creighton Road	Two-Way	2	35	Rural Local Road
Hogan Pond Lane	Two-Way	2	--	Rural Local Road
East Cherokee Drive	Two-Way	2	45	Rural Major Collector / Urban Minor Arterial

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 reductions were taken to account for internal trips between the residential and retail uses. Internal trips are anticipated to be 15% of the gross retail trips.

Pass-by reductions were taken according to the ITE Trip Generation Handbook, Second Edition, 2004 and GRTA guidelines. Based on a GRTA's "Limits Test", the total pass-by trips were limited to 10% of the adjacent roadway's existing traffic volumes. 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 Etowah River Tract DRI Net Trip Generation						
Land Use	Daily Traffic		AM Peak Hour		PM Peak Hour	
	Enter	Exit	Enter	Exit	Enter	Exit
Build-Out (Year 2015)						
Gross Trips	11,049	11,049	418	1,017	1,231	883
<i>Mixed-Use Reductions</i>	<i>-1,087</i>	<i>-1,087</i>	<i>-25</i>	<i>-25</i>	<i>-100</i>	<i>-100</i>
<i>Pass-by Reductions</i>	<i>-620</i>	<i>-620</i>	<i>-</i>	<i>-</i>	<i>-62</i>	<i>-62</i>
New Trips	9,342	9,342	393	992	1,069	721

5.0 TRIP DISTRIBUTION AND ASSIGNMENT

New trips were distributed onto the roadway network using the percentages agreed to during the Pre-Application meeting. **Figure 4 and Figure 5** displays the expected distribution percentages 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 6**.

LEGEND

Proposed Site Driveway

Turning Movement

Existing Traffic Signal

% Entering Trip Distribution

% Exiting Trip Distribution

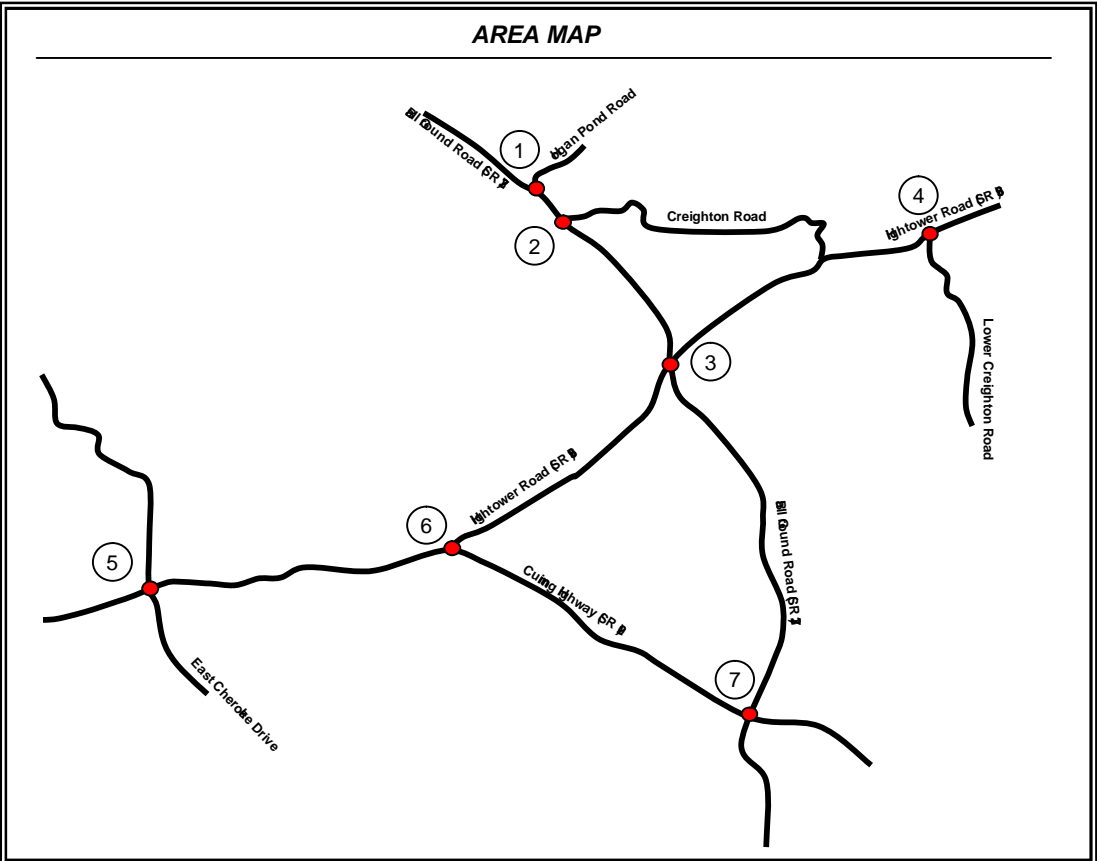
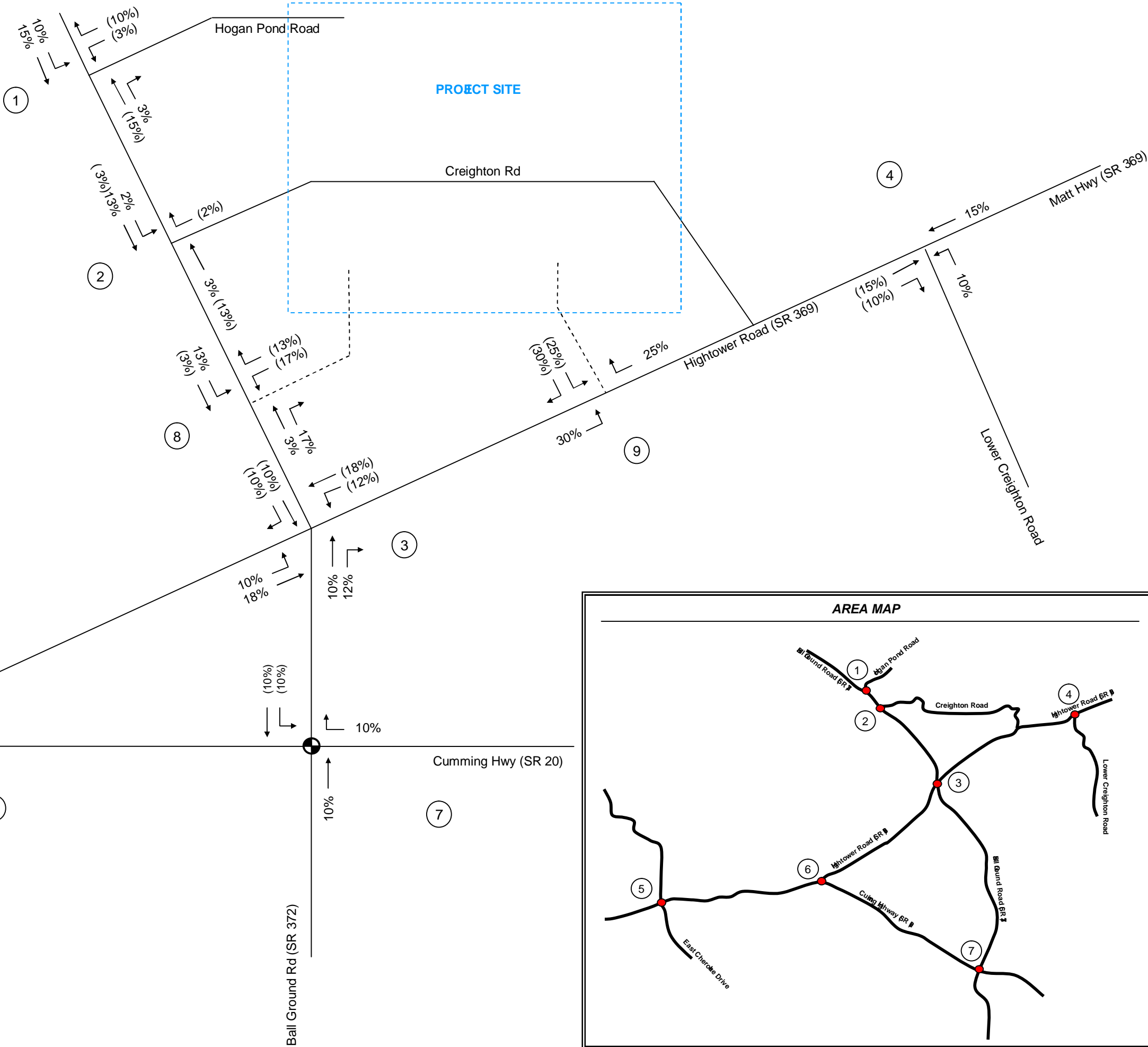


Figure 4

Residential Trip Distributions

Etowah River Tract DRI Transportation Analysis



LEGEND

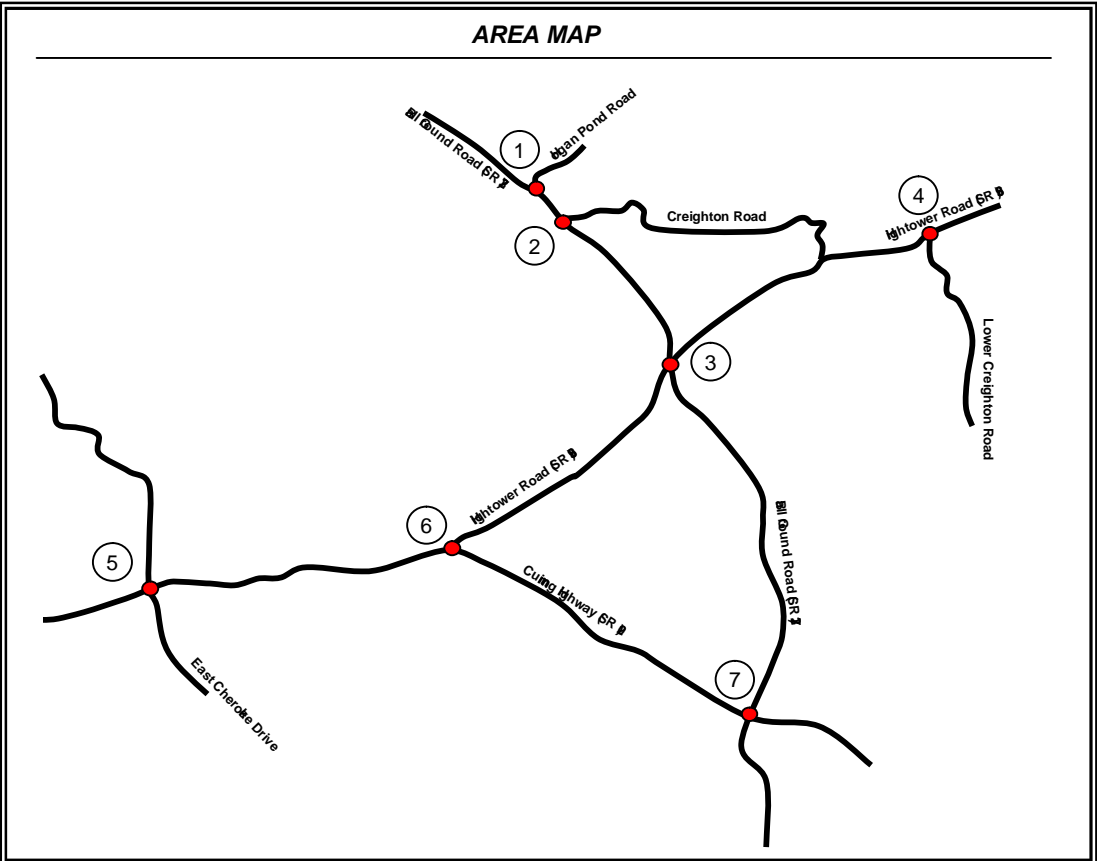
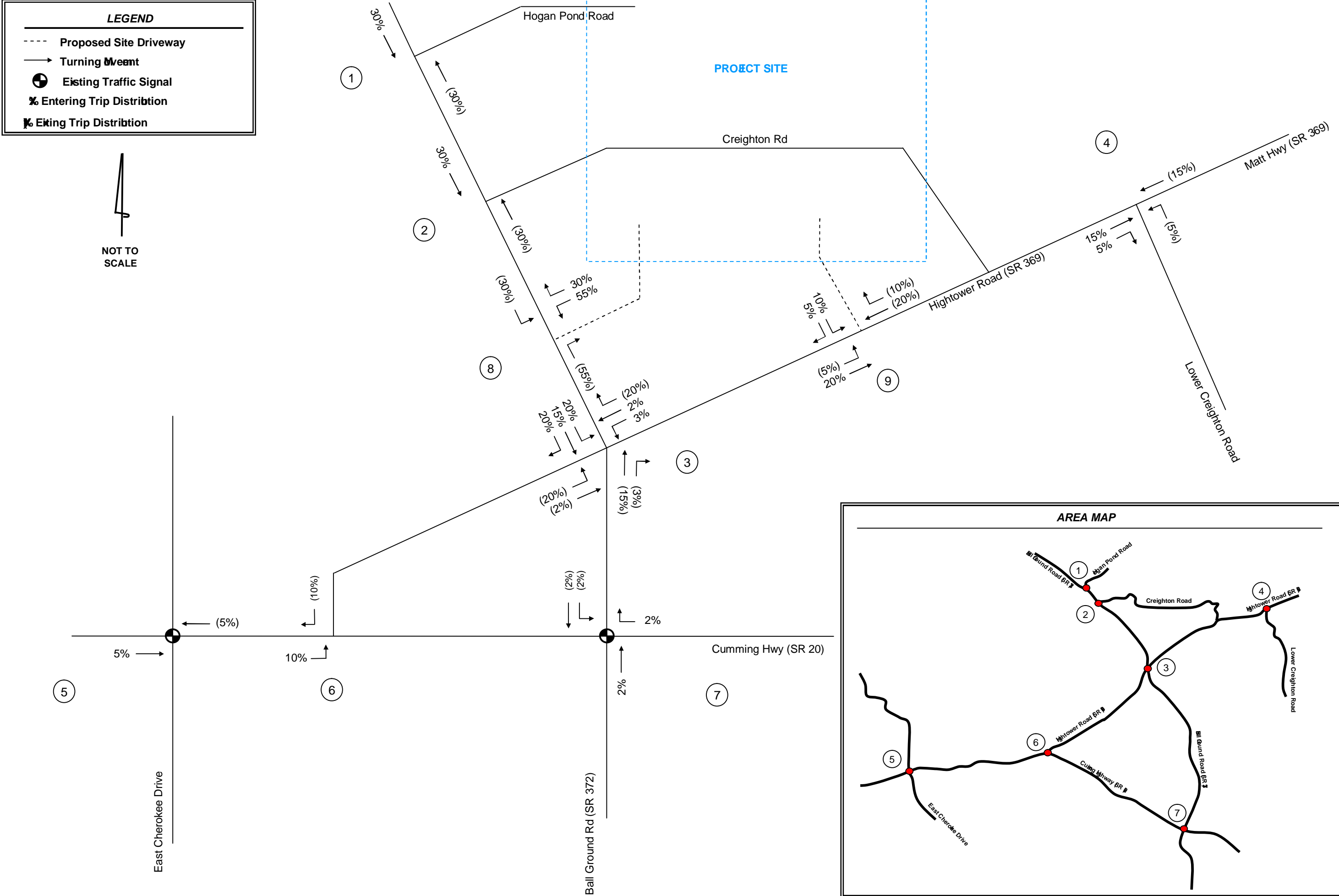
Proposed Site Driveway

Turning Movement

Existing Traffic Signal

Entering Trip Distribution

Exiting Trip Distribution



LEGEND

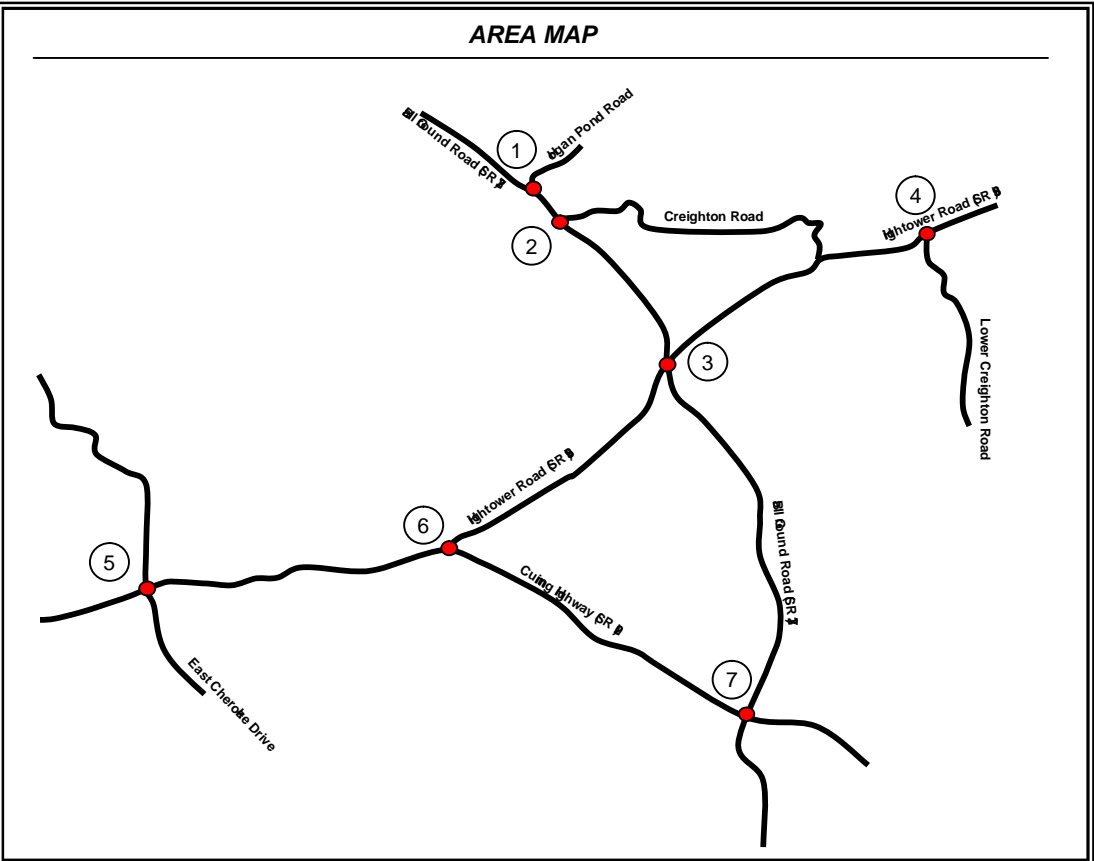
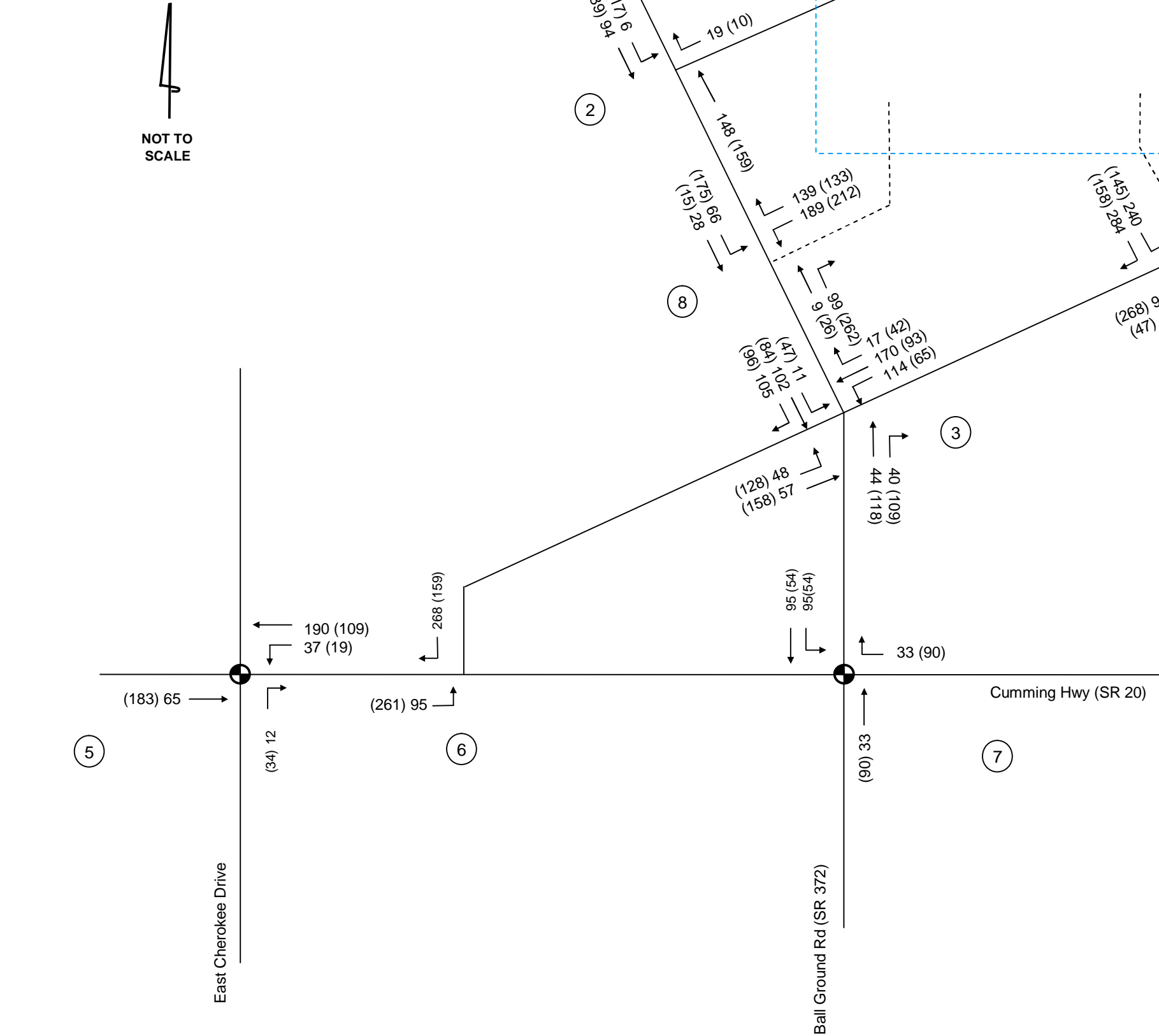
Proposed Site Driveway

Turning Movement

Existing Traffic Signal

Peak Hour Project Trips

Peak Hour Project Trips



6.0 TRAFFIC ANALYSIS

6.1 2007 Existing Traffic

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

Table 4 Etowah River Tract DRI 2007 Existing Intersection Levels of Service (delay in seconds)				
Intersection		Control	AM Peak Hour	PM Peak Hour
1	SR 372 (Ball Ground Road) @ Hogan Pond Road	WB STOP Controlled	WB – B	WB – B
2	SR 372 (Ball Ground Road) @ Creighton Road	WB STOP Controlled	WB – B	WB – B
3	SR 372 (Ball Ground Road) @ SR 369 (Hightower Road)	All-Way STOP Controlled	EB – C NB – C WB – D SB – D	EB – E NB – F WB – E SB – C
4	SR 369 (Hightower Road) @ Lower Creighton Road	NB STOP Controlled	NB – C	NB – C
5	SR 20 (Cumming Highway) @ East Cherokee Drive	Signalized	C (23.9)	C (22.5)
6	SR 20 (Cumming Highway) @ SR 369 (Hightower Road)	SB STOP Controlled	SB – D	SB – F
7	SR 20 (Cumming Highway) @ SR 372 (Ball Ground Road)	Signalized	C (22.5)	C (30.1)

As shown in the table, two of the intersections currently operate below the acceptable Level of Service standard (LOS D) during the PM peak hour.

6.2 2015 No-Build Traffic

The existing traffic volumes were grown at 3% per year 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. No future transportation projects were included in the No-Build analyses, in accordance with GRTA's Letter of Understanding guidelines. The results are displayed below in **Table 5**. The projected volumes for the year 2015 No-Build conditions are shown in **Figure 8**.

LEGEND

→ Existing Roadway Laneage

--- Proposed Site Driveway

⊕ Existing Traffic Signal

X All Peak Hour Traffic Values

⌵ All Peak Hour Traffic Values

NOT TO SCALE

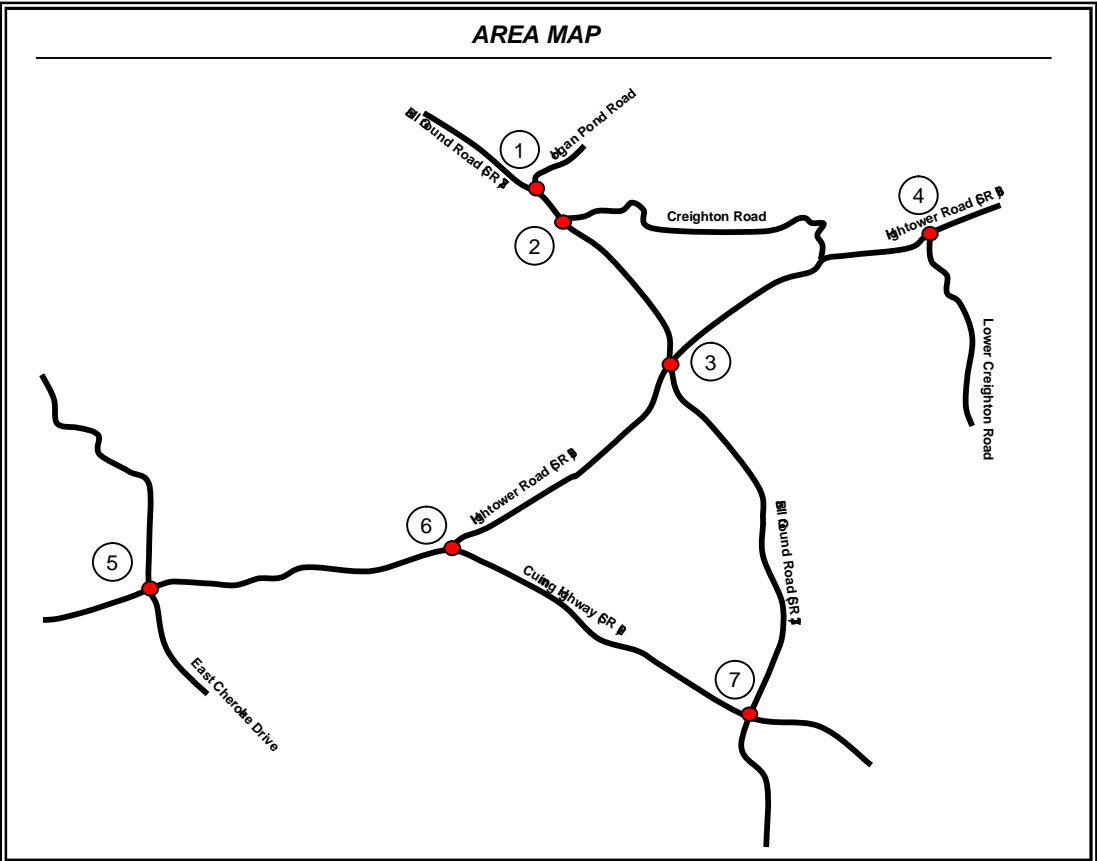
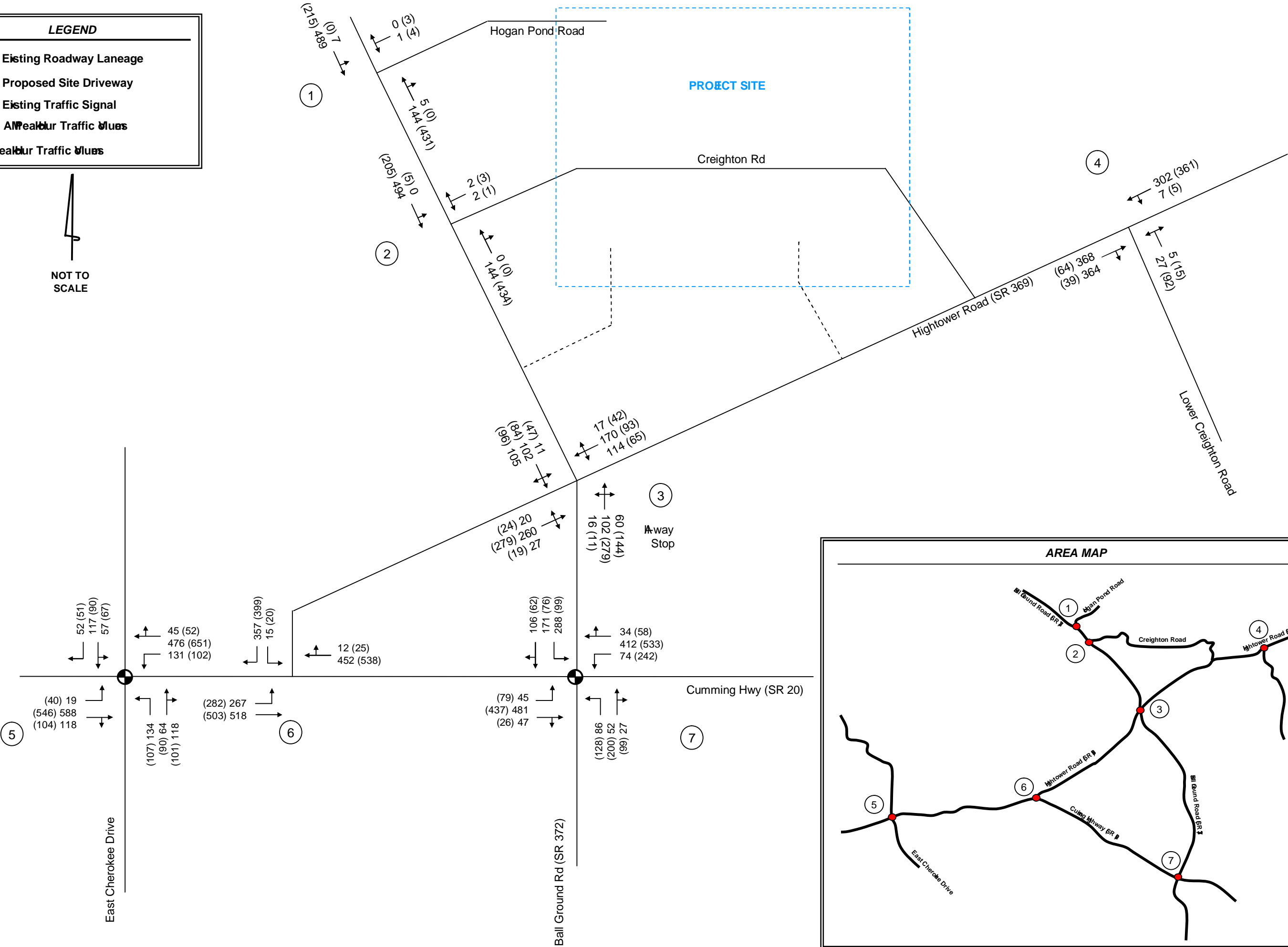


Figure 7

Existing Conditions

Etowah River Tract DRI
Transportation Analysis



LEGEND

→

Existing Roadway Laneage

→

No-Build Roadway Laneage

⬤

Existing Traffic Signal

⬤

No-Build Traffic Signal

X

Peak Hour Traffic Volumes

X

Peak Hour Traffic Volumes

NOT TO SCALE

The main map illustrates the project site and surrounding road network. Hogan Pond Road runs north-south, intersecting with Creighton Rd, Hightower Road (SR 369), and Lower Creighton Road. Creighton Rd runs east-west, intersecting with Hightower Road (SR 369) and Lower Creighton Road. Hightower Road (SR 369) runs north-south, intersecting with Cumming Hwy (SR 20) and Ball Ground Rd (SR 372). Lower Creighton Road runs east-west, intersecting with Cumming Hwy (SR 20) and Ball Ground Rd (SR 372). East Cherokee Drive runs north-south, intersecting with Cumming Hwy (SR 20) and Ball Ground Rd (SR 372). The project site is located on the east side of Hogan Pond Road, between Creighton Rd and Hightower Road (SR 369). Traffic signals are shown at the intersections of Hogan Pond Road with Creighton Rd, Hightower Road (SR 369), and Lower Creighton Road, and at the intersection of Cumming Hwy (SR 20) with Ball Ground Rd (SR 372). Peak hour traffic volumes are provided for each intersection. The map is divided into nine numbered areas (1-9).

Intersection	Direction	Peak Hour Traffic Volume
Hogan Pond Rd / Creighton Rd	Northbound	0 (4)
	Southbound	1 (5)
	Eastbound	6 (0)
	Westbound	182 (546)
Hogan Pond Rd / Hightower Rd (SR 369)	Northbound	3 (4)
	Southbound	3 (1)
	Eastbound	0 (0)
	Westbound	182 (550)
Hogan Pond Rd / Lower Creighton Rd	Northbound	0 (4)
	Southbound	1 (5)
	Eastbound	6 (0)
	Westbound	182 (546)
Hightower Rd (SR 369) / Lower Creighton Rd	Northbound	383 (457)
	Southbound	9 (6)
	Eastbound	6 (19)
	Westbound	34 (117)
Cumming Hwy (SR 20) / Ball Ground Rd (SR 372)	Northbound	15 (32)
	Southbound	573 (682)
	Eastbound	134 (79)
	Westbound	217 (96)
Cumming Hwy (SR 20) / East Cherokee Drive	Northbound	57 (66)
	Southbound	603 (825)
	Eastbound	136 (170)
	Westbound	114 (81)
Cumming Hwy (SR 20) / Hightower Rd (SR 369)	Northbound	94 (307)
	Southbound	552 (675)
	Eastbound	109 (66)
	Westbound	162 (109)
Cumming Hwy (SR 20) / Lower Creighton Rd	Northbound	15 (32)
	Southbound	573 (682)
	Eastbound	134 (79)
	Westbound	217 (96)

The area map provides a regional context for the project. It shows the project site (indicated by a red dot) located on the east side of Hogan Pond Road, between Creighton Rd and Hightower Road (SR 369). The map includes labels for Hogan Pond Road, Creighton Rd, Hightower Road (SR 369), Lower Creighton Rd, Cumming Hwy (SR 20), Ball Ground Rd (SR 372), and East Cherokee Drive. The map is divided into nine numbered areas (1-9).

Figure 8

No-Build Conditions

Etowah River Tract DRI Transportation Analysis

Kimley-Horn and Associates, Inc.

Table 5
Etowah River Tract DRI
2015 No-Build Intersection Levels of Service
(delay in seconds)

Intersection		Control	LOS Standard	AM Peak Hour	PM Peak Hour
1	SR 372 (Ball Ground Road) @ Hogan Pond Road	WB STOP Controlled	D	WB – C	WB – C
2	SR 372 (Ball Ground Road) @ Creighton Road	WB STOP Controlled	D	WB – B	WB – B
3	SR 372 (Ball Ground Road) @ SR 369 (Hightower Road)	All-Way STOP Controlled	D – AM E – PM	EB – F NB – D WB – F SB – F	EB – F NB – F WB – F SB – E
4	SR 369 (Hightower Road) @ Lower Creighton Road	NB STOP Controlled	D	NB – C	NB – E
5	SR 20 (Cumming Highway) @ East Cherokee Drive	Signalized	D	D (45.8)	D (37.4)
6	SR 20 (Cumming Highway) @ SR 369 (Hightower Road)	SB STOP Controlled	D – AM E – PM	SB – F	SB – F
7	SR 20 (Cumming Highway) @ SR 372 (Ball Ground Road)	Signalized	D	C (34.6)	E (71.1)

Four of the intersections failed to meet acceptable Level of Service standards for the year 2015 No-Build condition. Per GRTA's Letter of Understanding guidelines, improvements were made to these four intersections until the Level of Service was elevated to the GRTA standard. The 2015 No-Build with Improvement intersection analysis Levels of Service are displayed in **Table 6**.

Table 6
Etowah River Tract DRI
2015 No-Build IMPROVED Intersection Levels of Service
(delay in seconds)

Intersection		Control	LOS Standard	AM Peak Hour	PM Peak Hour
3	SR 372 (Ball Ground Road) @ SR 369 (Hightower Road)	Signalized	D – AM E – PM	A (9.6)	A (9.0)
4	SR 369 (Hightower Road) @ Lower Creighton Road	Signalized	D	A (4.2)	A (7.0)
6	SR 20 (Cumming Highway) @ SR 369 (Hightower Road)	Signalized	D – AM E – PM	C (21.0)	C (30.3)
7	SR 20 (Cumming Highway) @ SR 372 (Ball Ground Road)	Signalized	D	C (30.5)	C (30.5)

The 2015 No-Build improvements made to the intersections are shown in Figure 8, and are listed below by intersection:

SR 372 (Ball Ground Road) @ SR 369 (Hightower Road) (Intersection #3)

- Install a traffic signal when warranted. (Note: Peak hour volumes indicate a signal is warranted in the 2015 No Build year during the AM and PM peak conditions.)
- Install an eastbound left-turn lane along SR 369 (Hightower Road).
- Install a westbound left-turn lane along SR 369 (Hightower Road).
- Install a northbound right-turn lane along SR 372 (Ball Ground Road).
- Install a southbound left-turn lane along SR 372 (Ball Ground Road).
- Install a northbound left-turn lane along SR 372 (Ball Ground Road).

Hightower Road (SR 369) @ Lower Creighton Road (Intersection #4)

- Install a traffic signal when warranted. (Note: Peak hour volumes indicate a signal is warranted in the 2015 No Build year during the PM peak conditions.)
- Install an eastbound right-turn lane along SR 369 (Hightower Road).
- Install a westbound left-turn lane along SR 369 (Hightower Road).
- Install a northbound right-turn lane along Lower Creighton Road.

SR 20 (Cumming Highway) @ SR 369 (Hightower Road) (Intersection #6)

- Install a traffic signal when warranted. (Note: Peak hour volumes indicate a signal is warranted in the 2015 No Build year during the AM and PM peak conditions.)
- Install a westbound right-turn lane along SR 20 (Cumming Highway).
- Provide additional storage length for the southbound left-turn lane along SR 369 (Hightower Road).

SR 20 (Cumming Highway) @ SR 372 (Ball Ground Road) (Intersection #7)

- Install a westbound right-turn lane along SR 20 (Cumming Highway).

6.3 2015 Build Traffic

The traffic associated with the proposed development (Etowah River Tract) was added to the 2015 No-Build volumes. These volumes were then input into the 2015 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 year 2015 Build conditions are shown in **Figure 9A**.

Table 7
Etowah River Tract DRI
2015 Build Intersection Levels of Service
(delay in seconds)

Intersection		Control	LOS Standard	AM Peak Hour	PM Peak Hour
1	SR 372 (Ball Ground Road) @ Hogan Pond Road	WB STOP Controlled	D	WB - F*	WB - F*
2	SR 372 (Ball Ground Road) @ Creighton Road	WB STOP Controlled	D	WB - B (13.5)	WB - C (15.8)
3	SR 372 (Ball Ground Road) @ SR 369 (Hightower Road)	Signalized	D – AM E – PM	C (21.8)	B (15.8)
4	SR 369 (Hightower Road) @ Lower Creighton Road	Signalized	D	A (5.5)	B (10.7)
5	SR 20 (Cumming Highway) @ East Cherokee Drive	Signalized	D	E (58.8)	E (70.7)
6	SR 20 (Cumming Highway) @ SR 369 (Hightower Road)	Signalized	D – AM E – PM	F*	F*
7	SR 20 (Cumming Highway) @ SR 372 (Ball Ground Road)	Signalized	D	D (48.4)	D (40.3)

* - Delays Expected

As shown in Table 7, three of the intersections failed to meet the acceptable Level of Service standard for the AM and/or PM Peak Hours. Per GRTA's Letter of Understanding guidelines, improvements were made to this intersection until the Level of Service was elevated to the GRTA standard. The 2015 Build with Improvement intersection analysis Levels of Service are displayed below in **Table 8**.

LEGEND

Existing Roadway Laneage

No-Build Roadway Laneage

Build Roadway Laneage

Existing Traffic Signal

No-Build Traffic Signal

Build Traffic Signal

Peak Hour Traffic Volume

Peak Hour Traffic Volume

NOT TO SCALE

The main map displays the intersection of Hogan Pond Road, Creighton Rd, Hightower Road (SR 369), Lower Creighton Road, Cumming Hwy (SR 20), and Ball Ground Rd (SR 372). It shows existing and proposed roadway laneage, traffic signals, and peak hour traffic volumes. The 'PROJECT SITE' is outlined in blue. Numbered locations 1 through 9 are marked. A note indicates 'Free-flow Right-turn lane into acceleration lane' at the intersection of Hogan Pond Road and Creighton Rd.

Location	Existing Roadway Laneage	No-Build Roadway Laneage	Build Roadway Laneage	Existing Traffic Signal	No-Build Traffic Signal	Build Traffic Signal	Peak Hour Traffic Volume
1	Left, Through, Right	Left, Through, Right	Left, Through, Right	None	None	None	15 (26), 340 (689), 94 (53), 29 (20)
2	Left, Through, Right	Left, Through, Right	Left, Through, Right	None	None	None	3 (4), 3 (1), 330 (709), 0 (0)
3	Left, Through, Right	Left, Through, Right	Left, Through, Right	None	None	None	139 (167), 189 (231), 47 (77), 412 (422), 277 (149), 116 (291), 173 (471), 20 (14)
4	Left, Through, Right	Left, Through, Right	Left, Through, Right	None	None	None	442 (618), 9 (6), 6 (19), 69 (214)
5	Left, Through, Right	Left, Through, Right	Left, Through, Right	None	None	None	51 (24), 875 (810), 132 (149), 136 (170), 114 (81), 162 (161)
6	Left, Through, Right	Left, Through, Right	Left, Through, Right	None	None	None	618 (433), 637 (656), 57 (66), 793 (934), 203 (148)
7	Left, Through, Right	Left, Through, Right	Left, Through, Right	None	None	None	100 (57), 554 (609), 33 (60), 134 (79), 217 (96), 365 (125)
8	Left, Through, Right	Left, Through, Right	Left, Through, Right	None	None	None	139 (167), 189 (231), 47 (77), 412 (422), 277 (149), 116 (291), 173 (471), 20 (14)
9	Left, Through, Right	Left, Through, Right	Left, Through, Right	None	None	None	86 (242), 502 (590), 148 (240), 164 (284), 270 (96), 695 (538)

The area map shows the project location relative to surrounding roads: Hogan Pond Road, Creighton Road, Hightower Road SR #, Cumming Hwy SR #, Ball Ground Road SR #, and East Cherokee Drive. The project site is highlighted in blue.

Figure 9

Build Conditions

Etowah River Tract DRI Transportation Analysis

Kimley-Horn and Associates, Inc.

Table 8
Etowah River Tract DRI
2015 Build IMPROVED Intersection Levels of Service
(delay in seconds)

<i>Intersection</i>		<i>Control</i>	<i>LOS Standard</i>	<i>AM Peak Hour</i>	<i>PM Peak Hour</i>
1	SR 372 (Ball Ground Road) @ Hogan Pond Road	WB STOP Controlled	D	WB – D (31.6)	WB – D (30.4)
5	SR 20 (Cumming Highway) @ East Cherokee Drive	Signalized	D	D (44.7)	C (31.9)
6	SR 20 (Cumming Highway) @ SR 369 (Hightower Road)	Signalized	D – AM E – PM	A (7.2)	C (24.1)

*Delays expected

The 2015 Build improvements made to the intersections are shown in Figure 9, and are listed below by intersection:

SR 372 (Ball Ground Road) @ Hogan Pond Road (Intersection #1)

- Install a westbound right-turn lane along Hogan Pond Road (to make two approach lanes).
- Install a northbound right-turn lane along SR 372 (Ball Ground Road).
- Install a southbound left-turn lane along SR 372 (Ball Ground Road).

SR 20 (Cumming Highway) @ East Cherokee Drive (Intersection #5)

- Install a northbound right-turn lane along East Cherokee Drive.
- Install a southbound left-turn lane along East Cherokee Drive.

SR 20 (Cumming Highway) @ SR 369 (Hightower Road) (Intersection #6)

- Install a channelized free-flow southbound right-turn lane along SR 369 (Hightower Road) into a westbound acceleration lane along SR 20.

The proposed project driveways and five internal intersections were analyzed for the 2015 Build conditions. The results of the analyses are presented in **Table 9**. The projected volumes and recommended intersection geometry are shown in **Figure 9B**.

Table 9
Etowah River Tract DRI
2015 Build Levels of Service for Proposed Project Driveways and Internal Site Intersections
(delay in seconds)

Intersection		Control	LOS Standard	AM Peak Hour	PM Peak Hour
8	SR 372 (Ball Ground Road) @ Street 26 (E-2)	Signalized	D	A (9.0)	B (13.7)
9	SR 369 (Hightower Road) @ Street 1 (E-1)	Signalized	D – AM E – PM	B (10.0)	B (11.4)
10	SR 372 (Ball Ground Road) @ E-3	WB STOP Controlled	D	WB: B (10.2)	WB: C (16.3)
11	SR 372 (Ball Ground Road) @ E-4	WB STOP Controlled	D	WB: B (13.4)	WB: D (31.0)
12	Creighton Road @ E-5	SB STOP Controlled	D	SB: A (8.3)	SB: A (8.3)
13	Creighton Road @ Street 1	EB STOP Controlled WB STOP Controlled	D	EB: B (12.5) WB: C (17.9)	EB: B (12.3) WB: C (21.0)
14	Creighton Road @ E-6	SB STOP Controlled	D	SB: A (8.7)	SB: A (8.7)
15	Creighton Road @ E-7	SB STOP Controlled	D	SB: A (8.4)	SB: A (8.4)
16	Creighton Road @ E-8	SB STOP Controlled	D	SB: A (8.6)	SB: A (8.7)
18	Street 1 @ Street 77	Roundabout	D	A	A
19	Street 45 @ Street 1	EB STOP Controlled	D	B (14.3)	EB: B (12.7)
20	Street 26 / Street 37 @ Street 1	All Way Stop Controlled	D	B (10.2)	B (11.9)
21	Street 26 @ Street 24 / Street 30	NB STOP Controlled SB STOP Controlled	D	NB: B (10.2)	NB: A (10.8)
22	Street 26 @ West Retail Driveway	SB STOP Controlled	D	SB: B (10.6)	SB: B (11.4)

The following intersection geometry and improvements are recommended at the project site driveways and internal intersections (Note: The attached site plan includes these improvements):

SR 372 (Ball Ground Road) @ Street 26 (Entrance 2) – Intersection #8

- Install a traffic signal when warranted. (Note: Peak hour volumes indicate as signal is warranted prior to the 2015 build-out year during the AM and PM peak conditions.) A traffic signal is expected to be warranted prior to full build-out of the development.
- Install a southbound left-turn lane along SR 372 (Ball Ground Road).
- Install a northbound right-turn lane along SR 372 (Ball Ground Road).
- Install a westbound right-turn lane and a westbound left-turn lane along Street 26.

SR 369 (Hightower Road) @ Street 1 (Entrance 1) – Intersection #9

- Install a traffic signal when warranted. (Note: Peak hour volumes indicate as signal is warranted prior to the 2015 build-out year during the AM and PM peak conditions.) A traffic signal is expected to be warranted prior to full build-out of the development.
- Install an eastbound left-turn lane along SR 369 (Hightower Road).
- Install a westbound right-turn lane along SR 369 (Hightower Road).
- Install a southbound right-turn lane and a southbound left-turn lane along Street 1.

SR 372 (Ball Ground Road) @ Entrance 3 (E-3) – Intersection #10

- Install a right-in/right-out driveway; stop controlled.
- Install a northbound right-turn lane along SR 392.

SR 372 (Ball Ground Road) @ Entrance 4 (E-4) – Intersection #11

- Install a southbound left-turn lane along SR 372 (Ball Ground Road).
- Install a northbound right-turn lane along SR 372 (Ball Ground Road).
- Install a separate westbound left-turn lane and right-turn lane exiting at E-4; stop controlled.

Creighton Road @ Street 1 – Intersection #13

- Recommend Creighton Road eastbound and westbound approaches be stop-controlled.
- Install a separate northbound and southbound left-turn lane along Street 1/Proposed Parkway.

Street 1 @ Street 77 – Intersection #18

- A roundabout is proposed at this intersection.

Street 45 @ Street 1 – Intersection #19

- Install an eastbound shared left-turn / right-turn lane along Street 45; stop-controlled.
- Install a northbound left-turn lane along Street 1.

Street 26 / Street 37 @ Street 1 – Intersection #20

- Install all-way stop controlled intersection control.
- Install a southbound right-turn lane along Street 1.

Street 26 @ Street 24 / Street 30 – Intersection #21

- Install side-street (Street 24 & 30) stop-controlled approaches.

Street 26 @ West Retail Driveway – Intersection #22

- Install an eastbound left-turn lane and through lane along Street 26.
- Install a westbound through and right-turn lane along Street 26.
- Install a separate southbound left-turn lane and right-turn lane exiting the West Retail; stop controlled.

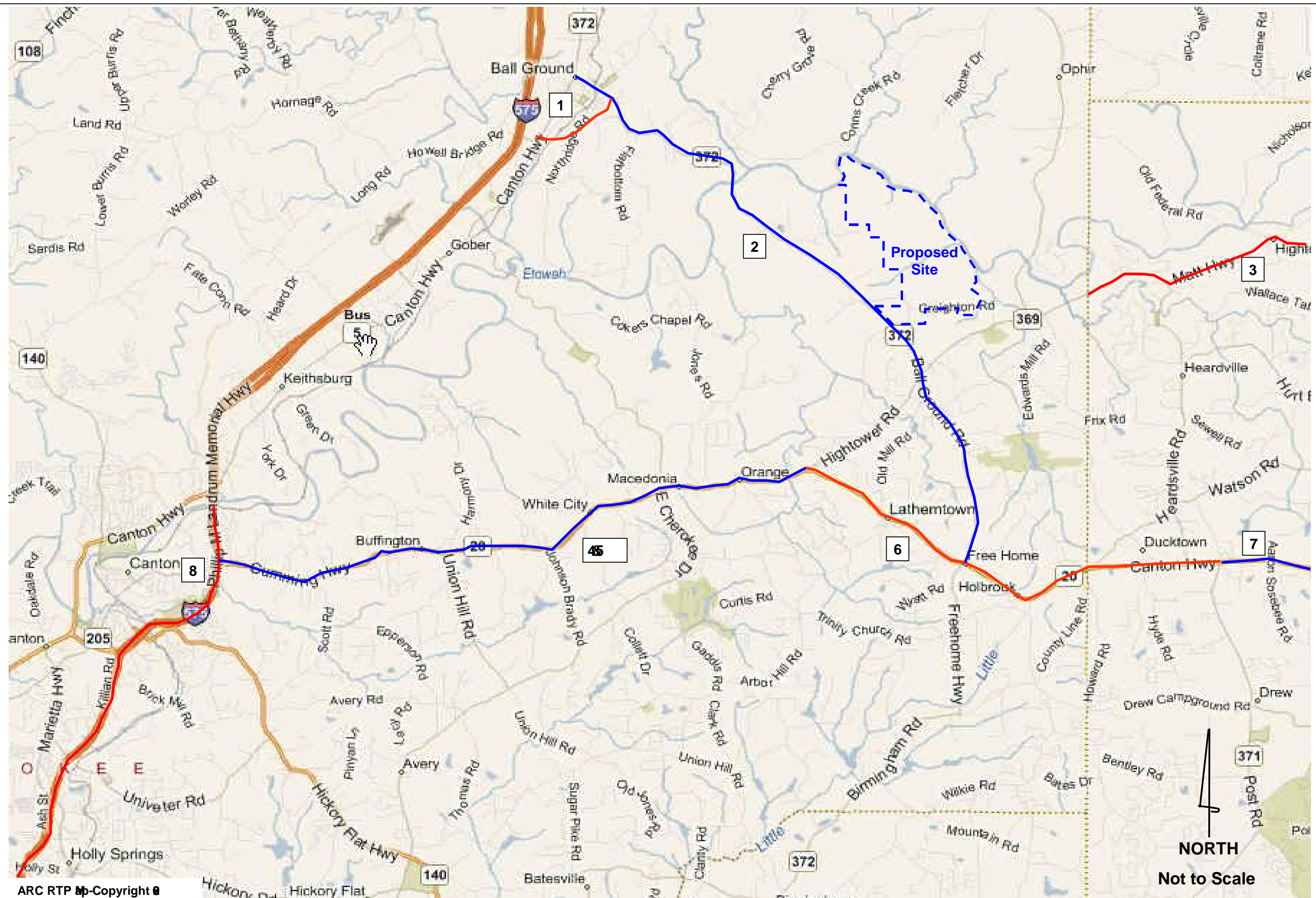


Figure 10

Future and
Program
Projects

Etowah River Tract DRI
Transportation Analysis

Kimley-Horn
and Associates, Inc.



7.0 IDENTIFICATION OF PROGRAMMED PROJECTS

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

1. ARC CH-180, GDOT #0002525 ARC RTP	SR 372 SPUR (Ball Ground Bypass) from SR 5 Business (Intersection of Canton Highway and Howell Bridge Road) to SR 372 (Ball Ground Road) South of Ball Ground Completion Date: 2030
2. ARC CH-165, GDOT #0005970 ARC RTP	SR 372 (Ball Ground Road) From SR 5 Business (Canton Highway) to SR 20 (Cumming Highway) - This project will reconstruct/ rehabilitate the roadway for 9.88 miles including installation of shoulders and turn lanes at various intersections Completion Date: 2016
3. ARC FT-086, GDOT #0000292 ARC RTP	SR 369 From Cherokee County line to Hightower Circle (Western Intersection) – This project will construct passing lanes on SR 369. Completion Date: 2011
4. ARC 020A1 GDOT #632790- ARC RTP	SR 20 Truck climbing lanes/ intersection improvements from I-575 to CR 238 (Old Orange Mill Road) [See also other CH-020 Series Line Items] – Construction of truck climbing lanes on SR 20 from I-575 to Old Orange Mill Road as well as intersection improvements along that corridor. This project is classified as a safety improvement. Completion Date: 2010
5. ARC CH-020B, GDOT #0003681 ARC RTP	SR 20 (Cumming Highway): Segment 2 From I-575 to SR 369 (Hightower Road) [See also CH-020A] – This project widens this critical East-West Corridor linking Canton to Forsyth County and Cumming from 2 to 4 lanes. This corridor is forecast to be over capacity in 2030 and is part of the cross-regional grid network. Completion Date: 2024
6. ARC FT-061A, GDOT #0002862 ARC RTP	SR 20 (Canton Highway / Cumming Highway): Segment 1 from SR 369 (Hightower Road) in Cherokee County to SR 371 (Post Road) in Forsyth County [See also FT-061B, FT-001D, FT-061C and FT-061D] Completion Date: 2030
7. ARC AR-920, GDOT #0003682 ARC RTP	SR 20 from SR 371 to SR 400 [ROW Funding covers FY 2010-2016] – This project widens SR 20 in Forsyth County from SR 371 to SR 400. This will provide better mobility in the critical east-west corridor. Completion Date: 2016
8. ARC AR-917, GDOT #611150- ARC RTP	I-575 from I-75 North to SR 5 Business in Cherokee county Completion Date: 2025

8.0 INGRESS/EGRESS ANALYSIS

Vehicular access to the development is proposed at two primary locations. Entrance 1 is a proposed parkway intersecting SR 369 along the south side of the development. Entrance 2 is a proposed driveway intersecting SR 372 along the west side of the development. These two entrances are proposed to be full-movement, signalized intersections.

There are additional development driveways that provide additional access to/from the development. Two driveways are proposed (Entrance 3 & 4) along SR 372 to provide access to the West Retail area. In the Town Center area, five driveways (Entrance 5-8) are located along the existing Creighton Road. Also in the Town Center area, the proposed parkway from SR 369 will intersect Creighton Road.

In addition to these proposed driveways, the development proposed two connections to Creighton Road (where Creighton Road currently passes through the site). The development also proposes a road connection to Hogan Pond Lane (Entrance 10).

9.0 INTERNAL CIRCULATION ANALYSIS

The proposed development will generate internal trips between the residential and retail uses. Internal trips are anticipated to be 15% of the gross retail trips. These internal trips were assigned to internal project intersections. Per GRTA's Letter of Understanding, five internal intersections were analyzed.

10.0 COMPLIANCE WITH COMPREHENSIVE PLAN ANALYSIS

The Cherokee County Existing Land Use for the site is PUD (Planned Use Development). The Cherokee County future land use map identifies the property as Agriculture/Forestry/Undeveloped land. The draft Cherokee County Future Land Use Plan Map identifies this area as Residential Medium Density. The ARC Envision6 'Atlanta Region Unified Growth Policy Map' identifies the project site as a 'Rural Area'.

11.0 NON-EXPEDITED CRITERIA

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

There is currently no fixed-transit service in the vicinity of this project. However, Cherokee County currently has the Cherokee Area Transportation System (CATS), which provides van pool service for commuters and rural transportation services for residents. Additionally, the GRTA Express Bus Route #490 provides service between Canton-Woodstock and Downtown-Midtown Atlanta.

11.2 *Vehicle Miles Traveled*

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

Weekday	Build-out Total
Daily Gross Trip Generation:	22,784
(-)Internal Capture	-2,174
(-)Pass-by trips	-1,240
Net Trips:	18,684

11.3 Relationship Between Location of Proposed DRI and Regional Mobility

The proposed development is not located within an urban core, activity center or town center; it is not within walking distance to a rail station or transit facility; and it is not part of an infill initiative. The development provides access to two state roadways which provide mobility to the north, south, east, and west.

11.4 Relationship Between Proposed DRI and Existing or Planned Transit Facilities

The proposed DRI is not located near any existing or planned transit facilities or bus stops.

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

Pass-by trip reductions were taken according to the *ITE Trip Generation Handbook, 1998*, however, according the GRTA's 10% limit test, pass-by trips were limited to 10% of the adjacent roadway volumes.

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 (2015).

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.

12.2 Study Area Determination and Characteristics

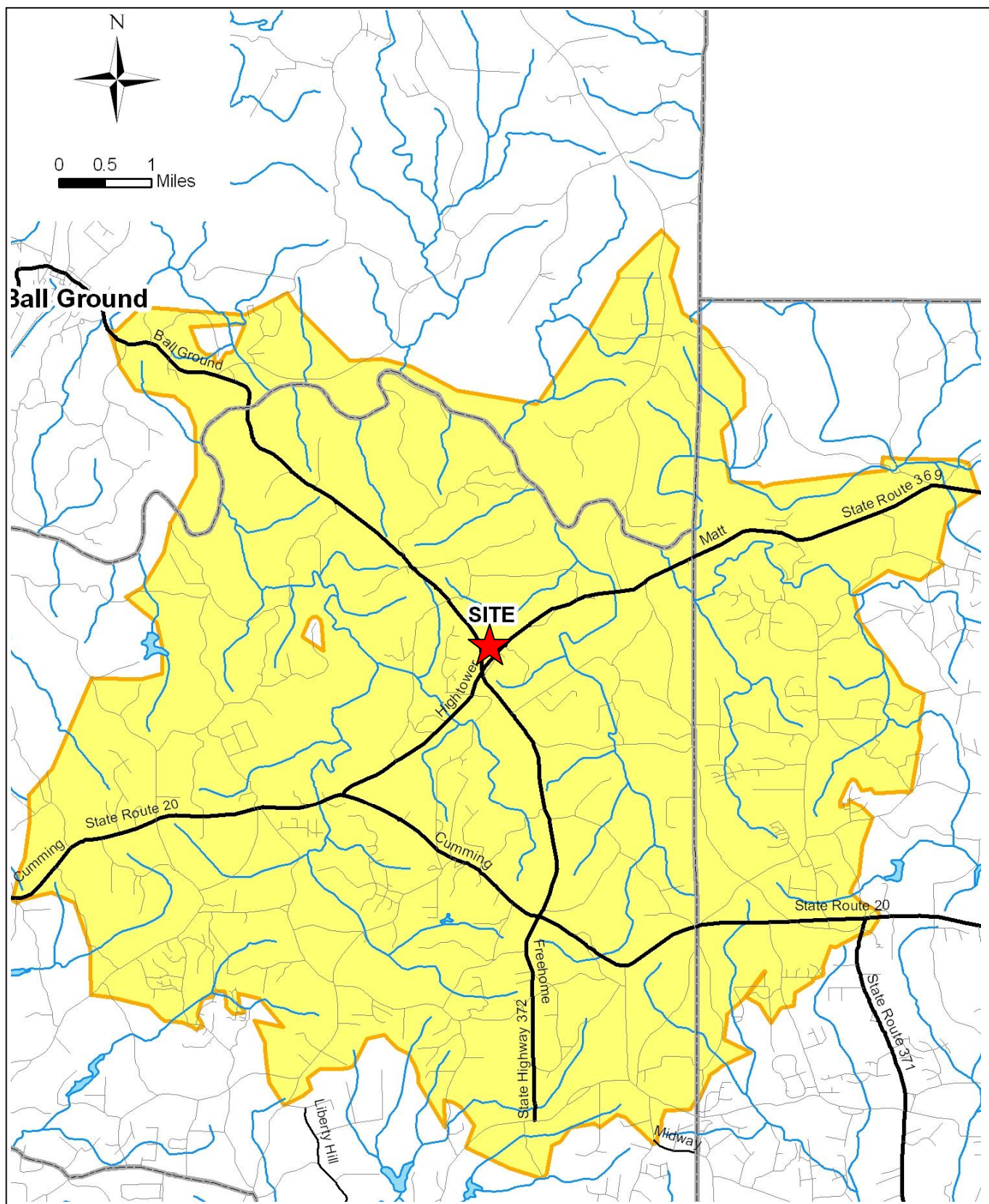
The Area of Influence is comprised of the area within six road-miles of the proposed development. To determine the AOI, *TransCAD* was used to measure six road miles from the nearest intersection to the project (SR 372 at SR 369). The population and housing statistics for the AOI were determined by taking 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 Forsyth and Cherokee Counties) can be seen in **Figure 11**. Information obtained from the census tracts can be seen in **Table 10**.

Table 10 Census Tract Information	
Total Households	4,013
Population in Households	11,201
Average household size	2.79
Total Workers	5,871
Workers per Household	1.46
Owner Occupied	89.18%
Rental Occupied	10.82%

As can be seen from the table above, the total population within the Area of Influence is 11,201, residing within 4,013 households (an average of 2.79 people per household). The AOI area totals 40,657 acres.

Using the above calculated average of 1.46 persons per household, it can be anticipated that the proposed DRI will house approximately 5,022 people (1,800 proposed dwelling units multiplied by 2.79). Based on information obtained from the Census Tracts, it is estimated that approximately 2,628 of these expected 5,022 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 (30107 Zip Code). At the time of this report, about 83 homes were listed for sale in the area, ranging in price from \$140,000 to \$750,000.



12.3 Development Housing Analysis

The development plan provides for houses for sale in nine price ranges within the proposed development. **Table 11**, below, displays the number of units for sale, the average sale price for those units, and the number of workers expected to reside in the homes.

Table 11 Estimated Workers per Household				
Tier	Description	Number of Units	Average Price	Number of Workers
1	Townhomes	50	\$235,000	73
2	Single Family Homes	72	\$230,000	105
3	Single Family Homes	409	\$265,000	597
4	Single Family Homes	48	\$285,000	70
5	Single Family Homes	498	\$315,000	727
6	Single Family Homes	16	\$305,000	23
7	Single Family Homes	431	\$365,000	629
8	Single Family Homes	226	\$435,000	330
9	Single Family Homes	50	\$600,000	73

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 Forsyth and Cherokee counties 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 12**, on the following page.

Table 12
AOI Jobs and Average Salaries

Industry / Business Type	# Businesses	# Employees	Average Salary
Retail Trade	72	662	\$23,421
Building Materials and Garden Supply	11	77	-
General Merchandise Stores	2	10	-
Food Stores	11	243	-
Auto Dealers and Gas Stations	8	28	-
Apparel and Accessory Stores	2	2	-
Home Furniture, Furnishings, and Equipment	12	71	-
Eating and Drinking Places	13	179	-
Miscellaneous Retail Stores	14	52	-
Finance	25	141	\$45,479
Banks, Savings and Lending Institutions	4	61	-
Securities and Commodity Brokers	2	15	-
Insurance Carriers and Agencies	5	10	-
Real Estate	13	54	-
Trusts, Holdings, and Other Investments			
Services	118	762	-
Hotels and Other Lodging	0	4	\$11,700
Personal Services	35	125	-
Business Services	32	157	\$47,341
Motion Picture and Amusement	16	176	\$16,442
Health Services	3	12	\$33,103
Legal Services	0	0	\$47,341
Education Services	4	177	\$27,050
Social Services	2	18	\$33,103
Miscellaneous, Membership	24	93	-
Organizations and Nonclassified			
Agriculture	22	147	\$6,604
Mining	0	1	\$11,939
Construction	55	423	\$37,856
Manufacturing	15	167	\$34,632
Transportation, Communication/Public Utilities	12	83	\$40,830
Wholesale Trade	18	252	\$47,414
Public Administration	2	36	\$34,122
Total	339	2,674	-

12.4 Affordable Housing Analysis

Various mortgage calculators are available online 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 Etowah River Tract development. It was assumed that no more than one third of an individual's income would be used for mortgage costs (principal + interest), that a 6.37% interest rate on a 30-year conventional loan could be obtained, and that a 10% down payment would be made. The income required to purchase a home at the approximate price range was calculated and is displayed in **Table 13**. Because there is an average of 1.46 workers expected per household, the required income was divided by 1.46 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, it is expected that 54% of the workers living within the DRI would be able to find employment within the AOI, thus satisfying the GRTA requirement of 25%.

Table 13 Expected Workers				
	Average Sale Price	Necessary Income per Expected Worker	Expected Worker per Price Range	Jobs at or above Necessary Income
1	\$235,000	\$32,518	73	1289
2	\$230,000	\$31,826	105	1289
3	\$265,000	\$36,669	597	1056
4	\$285,000	\$39,437	70	633
5	\$315,000	\$43,588	727	550
6	\$305,000	\$42,204	23	550
7	\$365,000	\$50,507	629	0
8	\$435,000	\$60,193	330	0
9	\$600,000	\$83,025	73	0
Percent of expected workers likely to find necessary employment within the AOI				54%

13.0 ARC'S AIR QUALITY BENCHMARK

The development is a mixed-use development, containing 1,800 single-family residential units and 110,500 SF of retail on approximately 1,362 acres. The project's residential component is the dominant use with 1.3 dwelling units per acre. The retail gross floor area is approximately 3.3% of the total. Therefore, the development does not warrant a 4% vehicle miles traveled (VMT) reduction for a 'mix' of uses.

The primarily residential development contains neighborhood retail uses and will provide sidewalk connections between the residential and retail portions of the development. The development meets the ARC criteria for a 15% VMT reduction because the project is primarily 'SF detached dwelling', contains a neighborhood retail center, and contains sidewalk/bike/ped facilities which will provide connections within the site.

Additionally, the development will provide bicycle/ pedestrian facilities within the site, thereby meeting the ARC criteria for a 2% VMT reduction.

The proposed development meets the ARC criteria for a total 17% VMT reduction. These reductions are displayed below in **Table 14**.

Table 14 ARC VMT Reductions	
Mixed-Use Projects where Residential is the dominant use	
Traditionally single-use residential development which contains neighborhood retail and sidewalk connections	-15%
Bike/ped networks providing connections to uses within the site	-2%
Total Reductions	17%