Development of Regional Impact Transportation Analysis

For

# Friendship Road Tract Mixed Use Development

City of Buford, Georgia

Prepared by:



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September 16, 2008

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#### PROJECT DESCRIPTION

The proposed Friendship Tract Mixed-Use Development will be located between Friendship Road (SR 347) and N. Bogan Road, as shown in Figure 1. This development comprises two separate and adjacent developments with one consisting of 578,000 s.f. of light industrial development, and 193,075 s.f. of retail space and the other consisting of 221 single family homes. Project characteristics are described in the following sections:

The Friendship Road Tract Mixed-Use development site is currently zoned a mix of AR –III and R-100 to be rezoned to M-1 and R-100 to accommodate the new development. The site will have multiple accesses onto Friendship Road (SR 347). A single full access driveway and two rightin/right-out accesses are planned on Friendship Road. All the accesses on Friendship Road will be serving the retail and the light-industrial portion of the development. The residential portion of the development will have two accesses onto N. Bogan Road south of Friendship Rd. This project will be studied as a single phase of development with build-out planned in 2012. The development has been categorized as a "Development of Regional Impact" (DRI) and was analyzed according to the guidelines set forth by the Georgia Regional Transportation Authority (GRTA), the Atlanta Regional Commission (ARC), Hall County, Gwinnett County and City of Buford.

Figure 1 is a map of the vicinity. Figure 2 is the site plan for the proposed development. A full size overall site plan is included in the appendix.

NORTH







# DEVELOPMENT SUMMARY - COMMERCIAL

TOTAL SITE AREA: ZONING:	27.2 ACRES COMMERCIAL (C-2)
TOTAL GROSS SQUARE FOOTAGE – ANCHOR A: No. PARKING SPACES PROVIDED: No. PARKING SPACES REQUIRED:	116,000± S.F. 603 (1 SPACE/192 S.F 580 (1 SPACE/200 S.F
TOTAL GROSS SQUARE FOOTAGE – SHOPS: No. PARKING SPACES PROVIDED: No. PARKING SPACES REQUIRED:	52,750± S.F. 266 (1 SPACE/198 S.F 264 (1 SPACE/200 S.F
TOTAL GROSS SQUARE FOOTAGE OUTPARCELS (RESTAURANT): No. PARKING SPACES REQUIRED:	24,325± S.F. 325 (1 SPACE/75 S.F.)
TOTAL PARCEL AREA FOR ANCHOR STORES AND SHOPS: TOTAL OUT-PARCEL AREA:	±21.8 ACRES ±5.4 ACRES

# DEVELOPMENT SUMMARY - INDUSTRIAL

TOTAL SITE AREA:	60.2 ACRES
ZONING:	INDUSTRIAL (M–1)
TOTAL GROSS SQUARE FOOTAGE – WAREHOUSE:	425,120± S.F.
No. PARKING SPACES PROVIDED:	346 (1 SPACE/1,229 S.F.)
No. PARKING SPACES REQUIRED:	213 (1 SPACE/2,000 S.F.)
TOTAL GROSS SQUARE FOOTAGE OFFICE/WAREHOUSE LOTS: No. PARKING SPACES REQUIRED:	152,880± S.F. 77 (1 SPACE/2,000 S.F.)
TOTAL AREA FOR OFFICE/WAREHOUSE LOTS:	±19.0 ACRES

N/F HUTCHINS (TAX PARCEL: 08156 002010 HALL COUNTY) ZONED AR-III

N/F JERRY LEE BROWN (TAX PARCEL: 08156 002004 HALL COUNTY) ZONED AR-III

174.4 ACRES SINGLE FAMILY RES (R-100) 221 LOTS 1.27 LOTS/ACRE  $\pm 5.4$  ACRES

Graphic Scale: 1" = 200'

400'

600'

200'

100**'** 0

Joseph							
BUFORD, GEORGIA 30518 (770) 271-2868 www.dpengr.com PREPARED FOR: YOST HOLDINGS AT FRIENDSHIP ROAD, LLC 883 ROGERS BRIDGE RD. SUITE 602 DULUTH, GA 30097 ONTACT: MR. RICK YOST (770) 622-5209 PROJECT NAME:							
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PROJECT INFORMATION: RIENDSHIP ROAD TRACT roject Name 8-015 roject Number RIENDSHIP ROAD AND I-985 roject Address 55, 156, and 171 and Lot No.(s) th							
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#### **Trip Generation**

It is anticipated that the proposed development will reach full build-out by 2012. The trip generation for the proposed development was determined by applying the trip generation rates as per the Institute of Transportation Engineers (ITE), Trip Generation Manual (7<sup>th</sup> Edition). The list of proposed development and the weekday trip generation is shown in Table 1. The Saturday trip generation is shown on Table 2. Since there is no transit service within the study area, all trips are assumed to be made by private automobile or commercial vehicles.

TABLE 1: WEEKDAY TRIP GENERATION							
Land Use	Code	Description	Average Weekday	A.M. Peak Hour Trips		P.M. Peak	Hour Trips
			Trips (ADT)	Entering	Exiting	Entering	Exiting
Single Family	210	221 units	2,157	41	123	138	81
Retail	820	193,075 SF	10,415	142	91	464	503
- Pass By (20%)			-2,010	-27	-18	-90	-97
-Mixed Use (3.5%)			-364	-5	-3	-16	-17
Light Industrial	110	578,000 SF	3,615	326	72	102	385
-Mixed Use (3.5%)			-126	- 11	- 3	-15	-9
Gross Trips		16,187	509	286	704	969	
-Mixed use & Pass By		-2,500	-43	-24	-121	-123	
Net Trips		13,687	476	262	583	846	

TABLE 2: SATURDAY TRIP GENERATION						
Land Use	Code	Description	Average Weekday	Saturday Peak Hour Trips		
			Trips (ADT)	Entering	Exiting	
Single Family	210	221 units	2,218	112	96	
Retail	820	193,075 SF	13,985	690	637	
- Pass By (20%)			-2,699	-138	-128	
-Mixed Use (3.5%)			-489	-24	-22	
Light Industrial	110	578,000 SF	1,400	0	0	
-Mixed Use (3.5%)			-49	0	0	
Gross Trips		17,603	802	733		
-Mixed use & Pass By		-3,237	-162	-150		
Net Trips			14,366	528	583	

# Trip Distribution

The trip distribution for the proposed development has been determined based on the existing traffic flow patterns experienced in the area, the type of adjacent development and trip patterns typical for mixed use developments. Also, the census tract analysis was used to determine the distribution of productions and attractions to determine the expected trip distribution of each of the three land uses. Trip distribution for the project is shown in Figure 3.

# Trip Assignment

The site-generated traffic was assigned to the surrounding roadway network of Friendship Road, N. Bogan Road, I-985, E. Jones Dr, and their associated study intersections, according to the expected trip distribution as shown in Figure 3. Due to the proximity of the development of I-985 and the proposed widening planned for Friendship Rd, the majority of the trips are expected to enter and exit from the west. The trips were heavily assigned to Friendship Rd and I-985 also due to the planned improvements along Friendship Rd which will increase the capacity of Friendship Rd in the vicinity of this project.



#### Study Network Limits

The boundaries of the study network were defined based on net total traffic added to the surrounding roadways. Where the traffic generated by the project that is assigned to a roadway segment is greater than 7% of the service volume at the given level of service standard (LOS), that roadway segment should be included in the network.

GRTA mandated a LOS D for determining the service volume for each roadway segment. Also considered for each segment was facility type, number of signals per mile and number of lanes. Based on these criteria a maximum service volume was determined for each segment. Seven percent (7%) of the service volume was calculated and compared to the site traffic assigned to each roadway segment. The limits of the network include all segments where the traffic generated exceeds 7% of the service volume. All major intersections along these roadway segments are included in the analysis. The calculations to determine the study network are shown in the appendix.

The following intersections would be included in the study network based on this analysis:

- Friendship Road at N. Bogan Road,
- Friendship Road at I-985 Northbound Ramp
- Friendship Road at I-985 Southbound Ramp
- Friendship Road at E. Jones Drive
- N. Bogan Road at E. Jones Dr
- N. Bogan Road at Thomasville Road
- N. Bogan Road at Hamilton Road

#### Executive Summary

Friendship Road Tract is a mixed-use development that will include 578,000 s.f. of light industrial development, 193,075 s.f. of retail and is adjacent to a parcel containing 221 single family homes on 88.7 acres. The combined development is planned to be completed by the anticipated build out year is 2012.

The development is located on the south side of Friendship Road between N. Bogan Road and I-985 Ramps in Hall and Gwinnett Counties, GA. The required level of service (LOS) standard is assumed to be LOS D, based on the level of service standard in urban areas. In accordance with GRTA policy, this standard is reduced to LOS E at intersections that are operating below LOS D in the existing condition. The results of the analysis included in the following sections are summarized in Table 3.

TABLE 3: EXECUTIVE SUMMARY OF INTERSECTION OPERATIONS						
Intersection	Existing Base w/ Imp		sting Base w/ Imp		Futu In	re w/ າp
	AM	PM	AM	PM	AM	PM
Friendship Road at I-985 SB Ramp	В	С	С	В	С	С
Friendship Road at I-985 NB Ramp	В	С	С	С	С	D
Friendship Road at E. Jones Dr	С	F	Α	А	А	А
Friendship Road at N. Bogan Rd	F	D	В	А	В	В
N. Bogan Rd at E. Jones Dr	А	В	В	В	А	В
N. Bogan Rd at Thompson Mill Rd	С	F	Е	F	F	F
N. Bogan Rd at Hamilton Mill Rd	В	С	В	С	В	D

With the improvements planned for Friendship Rd and the development as proposed, six of the seven study intersections are expected to perform at acceptable levels of service in existing, base and future years during both morning and evening peak hour conditions. Also, the site accesses on Friendship Rd and on N Bogan Rd are also expected to operate well in the future with the conditions and configurations listed in the recommendations section of the analysis.

The intersection of N Bogan Rd and Thompson Mill Rd is expected to operate at an unacceptable level of service in the future with the development as proposed. Four alternatives were considered to improve the operations of the existing all-way stop controlled intersection. The installation of a roundabout was recommended, if approved by Gwinnett County Department of Transportation.

#### **Roadway Conditions**

#### Friendship Road (SR 347)

Friendship Road is a State Route that runs east-west from Thompson Mill Road to McEver Road where it changes name to Holiday Road in Hall County, Georgia. It has two lanes each direction in the study area; however, there is a planned GDOT project to widen Friendship Road from 2 lane to 6 lane from Thompson Mill Road to I-985 ramps. The speed limit on Friendship Road is 45 mph and the average annual daily traffic volume was measured by GDOT in the year 2007 on Friendship Road as 12, 270 vehicles per day.

#### N. Bogan Road

N. Bogan Road is an urban collector street that runs north-south from its intersection with Friendship Road (SR 347) in Hall County to its intersection with Hamilton Mill Rd in Gwinnett County. It has one lane in both directions and has a speed limit of 40 mph. The ADT collected on Bogan Road by GDOT in the year 2007 was 2,950 vehicles per day. The ADT collected on August 11<sup>th</sup>-13<sup>th</sup> showed an average of 3,671 vpd.

#### E. Jones Drive

E. Jones Drive is a local road that has a general orientation of north-south. It runs from its intersection with Friendship Road to its intersection with N. Bogan Road. It has one lane in both directions and has a speed limit of 35 mph. There are no GDOT count stations on E. Jones Drive. The estimated ADT is 2,200 vpd.

#### Thompson Mill Road

Thompson Mill Road has a general orientation of east-west. It runs from Old Winder Highway (SR 211) to its intersection with Buford Highway in Gwinnett County. It is classified as a urban local street from SR 211 to its intersection with N. Bogan Road and from there to Buford Highway it is classified as an urban collector street. It has one lane in both directions and has a speed limit of 45 mph.

#### Hamilton Mill Road

Hamilton Mill Road is an urban collector street that has a general orientation of east-west. It runs from its intersection with Braselton Highway to its intersection with Buford Highway. It has one lane in both directions for most part. The speed limit on Hamilton Mill Road is 45 mph. The average annual daily traffic volume was measured by GDOT in the year 2007 as 12,900 vehicles per day.

#### EXISTING CONDITIONS – Study Network

#### Intersection Geometry

#### Friendship Road (SR 347) at I-985 Southbound Ramps

At the signalized intersection of Friendship Road at I-985 Southbound ramps, Friendship Road is oriented east-west. Friendship Road, at the intersection has two through lanes and two exclusive left-turn lanes on the westbound approach and exclusive right-turn lane and two through lanes on the eastbound approach. I-985 southbound ramp at the intersection has exclusive left and right turn lanes.

#### Friendship Road (SR 347) at I-985 Northbound Ramps

At the signalized intersection of Friendship Road at I-985 Northbound ramps, Friendship Road is oriented east-west. Friendship Road, at the intersection has two through lanes on the westbound approach and exclusive left-turn lane and two through lanes on the eastbound approach. I-985 northbound ramp at the intersection has two exclusive left turn lanes and a right turn lane.

#### Friendship Road (SR 347) at E. Jones Drive

The intersection of Friendship Road and E. Jones Drive is an unsignalized three legged intersection with single lanes on all approaches. E. Jones Drive at the intersection is stop controlled.

#### Friendship Road (SR 347) at N. Bogan Road

At the three-way unsignalized intersection of Friendship Road and N. Bogan Road N. Bogan Road is stop controlled. All the approaches have single lane and have no exclusive turn lanes.

#### N. Bogan Road at E. Jones Drive

The intersection of N. Bogan Road and E. Jones Drive is an unsignalized three legged intersection with single lanes on all approaches. E. Jones Drive at the intersection is stop controlled.

#### N. Bogan Road at Thompson Mill Road

The intersection of N. Bogan road at Thompson Mill Road is an all-way stop controlled intersection. All the legs of the intersection have single lane on all directions.

#### N. Bogan Road at Hamilton Mill Road

The intersection of N. Bogan Road at Hamilton Mill Road is a signalized intersection where N. Bogan road runs north-south and Hamilton Mill Road runs east-west. The intersection has exclusive left-turn lanes on all the legs and an exclusive right-turn lane on the eastbound approach. It has right-turn flares on both north and southbound approaches. N. Bogan Road has single though lane on both approaches and Hamilton Mill Road has 2 through lanes in the westbound direction and a single through lane in the eastbound direction at the intersection.

# Traffic Volumes

The turning movement traffic counts and intersection inventories were performed during the am and pm peak hours on Wednesday and Thursday August 13<sup>th</sup> and 14<sup>th</sup>. Also, Saturday daily and peak hour volumes were collected on N. Bogan Road and at the intersection of N Bogan Rd and Friendship Rd in the vicinity of the proposed site access.

- Friendship Road at N. Bogan Road,
- Friendship Road at I-985 Northbound Ramp
- Friendship Road at I-985 Southbound Ramp
- Friendship Road at E. Jones Drive
- N. Bogan Road at E. Jones Drive
- N. Bogan Road at Thomasville Road
- N. Bogan Road at Hamilton Road

These volumes were used to evaluate existing traffic conditions in the study area. Results of these analyses are presented in Table 4. Figures 4 shows the existing am and pm peak hour traffic volume at the study intersections. The intersection geometry for the above intersections and the site access are shown in Figure 5.

TABLE 4: EXISTING LEVEL OF SERVICE – YEAR 2008						
Intersection	AM Peak Hour	PM Peak Hour				
	LOS	LOS				
Friendship Road at I-985 SB Ramp	В	С				
Friendship Road at I-985 NB Ramp	В	С				
Friendship Road at E. Jones Dr	С	F				
Friendship Road at N. Bogan Rd	F	D				
N. Bogan Rd at E. Jones Dr	А	В				
N. Bogan Rd at Thompson Mill Rd	С	F				
N. Bogan Rd at Hamilton Mill Rd	В	С				

All the intersections on Friendship Rd perform at acceptable levels of service, LOS E or better during the am and pm peak hours. Two of the three intersections on N Bogan Rd are also currently performing at acceptable levels of service. The intersection of N Bogan Rd and Thompson Mill Rd is currently operating at an unacceptable level of service, LOS F, during the am peak hour.

The Saturday traffic volumes were found to be lower both in the peak hour and total daily volume than the weekday peak hour and daily traffic volumes collected on Friendship Rd and on N Bogan Rd. However, the Saturday peak hour was evaluated for the intersection of N Bogan Rd and Friendship Rd and the all proposed site access points on Friendship Rd and N Bogan Rd.



NORTH

NTS

EXISTING INTERSECTION PEAK HOUR TRAFFIC VOLUMES FIGURE 4 SOUTHEASTERN ENGINEERING, INC.



#### FUTURE YEAR 2012 BACKGROUND TRAFFIC

Base traffic operations are those that would exist in the build-out year (2012) without traffic generated by the proposed development. To project base conditions, a review of planned transportation improvement projects was performed and background growth was projected.

To estimate the volumes that will exist in the vicinity of the proposed mixed-use development during the anticipated full build out year of 2012, current traffic trends were evaluated. Based on the historical data and current build out in the area and continued development along Friendship Road and N. Bogan Road in the vicinity of the site, the future growth rate, assumed for the purposes of this study, is 3.0% per year. The future background traffic volumes (2012) were determined by increasing the existing traffic volumes by the assumed growth factor for a period of 4 years. Traffic volumes for all the intersections along Friendship Road were obtained from GDOT, since traffic studies were already being performed by GDOT on Friendship Road as a part of the Friendship Road widening project.

Projected base traffic volumes are shown in Figures 6. These volumes were used to analyze base intersection operations. Results of this analysis are presented in Table 5.

#### Planned and Programmed Improvements in the Study Area

The TIS, STIP, RTP and GDOT's construction work program were searched for currently programmed transportation projects within the vicinity of the proposed development. Pertinent roadway improvements include:

#### Project ID 162430 – Hall Friendship Road (SR 347) from I-985 to SR 211

Widen and relocate SR 347/Friendship/Thompson Mill Road from existing rural 2-lane to 6-lane with 20' raised median and urban shoulders from I-985 east to SR 211 for a length of 8.4 miles.

#### <u>GW-099C – US 23 (Buford Highway</u>)

Widening of Buford Highway from 2 lane to 4 lane roadway from Thompson Mill Road in Gwinnett County to Friendship Road (SR 347) in Hall County.



NORTH FUTURE BACKGROUND PEAK HOUR TRAFFIC VOLUMES FIGURE 6 NTS SOUTHEASTERN ENGINEERING, INC.

#### Future Background Intersection Planned and Programmed Improvements

The future background volumes were used to analyze the future conditions in year 2012 without the development and are shown below.

TABLE 5: FUTURE BACKGROUND LEVEL OF SERVICE – YEAR 2012   WITH PLANNED AND PROGRAMMED IMPROVEMENTS					
Intersection	AM Peak Hour	PM Peak Hour			
	LOS	LOS			
Friendship Road at I-985 SB Ramp	С	В			
Friendship Road at I-985 NB Ramp	С	С			
Friendship Road at E. Jones Dr	В	A			
Friendship Road at N. Bogan Rd	В	A			
N. Bogan Rd at E. Jones Dr	В	В			
N. Bogan Rd at Thompson Mill Rd	E	F			
N. Bogan Rd at Hamilton Mill Rd	В	C			
Friendship Rd at Future Site Access (Unsig.)	A	A			

All the intersections on Friendship Rd perform at acceptable levels of service, LOS E or better during the am, pm and Saturday peak hours. Two of the three intersections on N Bogan Rd are also currently performing at acceptable levels of service. The intersection of N Bogan Rd and Thompson Mill Rd is currently operating at an unacceptable level of service, LOS F, during the pm peak hour.

### FUTURE YEAR 2012 TOTAL TRAFFIC

The Future Year 2012 Future Traffic Volumes are composed the traffic projected to be generated by the development added to the future background traffic volumes estimated previously. The site generated traffic volumes for full build out in the year 2012 are shown in Figure 7. The future traffic volumes are shown in Figure 8. These volumes were used to analyze future conditions at full build-out of the Friendship Rd Development and the results of these analyses are presented in Table 6.

TABLE 6: FUTURE YEAR LEVEL OF SERVICE – YEAR 2012					
	AM Peak	PM Peak	Sat. Peak		
Intersection	Hour	Hour	Hour		
	LOS	LOS	LOS		
Friendship Road at I-985 SB Ramp	С	С	N/A		
Friendship Road at I-985 NB Ramp	С	D	N/A		
Friendship Road at E. Jones Dr	А	А	N/A		
Friendship Road at N. Bogan Rd	В	В	В		
N. Bogan Rd at E. Jones Dr	А	В	N/A		
N. Bogan Rd at Thompson Mill Rd	F	F	N/A		
N. Bogan Rd at Hamilton Mill Rd	В	D	N/A		

Six of the seven intersections evaluated in the study are expected to operate at acceptable levels of service in the future with the development as proposed, except for N Bogan Rd and Thompson Mill Rd. N Bogan Rd and Thompson Mill Rd is expected to continue to operate at an unacceptable level of service in the future with or without the development. The intersection is currently operating as an all way stop controlled intersection. The four alternatives to improve this type of intersection were considered. The four alternatives and the results are as follows:







### FACILITY NEEDS ANALYSIS

An analysis of the future background condition with the planned and programmed improvements on Friendship Rd identifies only one intersection is expected to operate at an unacceptable level of service, LOS F. The intersection of N Bogan Rd and Thompson Mill Rd was evaluated under four alternative improvement scenario's to determine which alternative would restore the level of service to current standards.

- 1. **Capacity Improvements**-Right turn lanes were considered on any and all approaches. It was determined that the level of service would not increase significantly with any or all of these improvements. Left turn lanes are not recommended at this type of intersection.
- 2. **Signalization**-A preliminary signal warrant analysis was performed based on the peak hour volumes collected for the study. A signal is not likely warranted and not recommended at this intersection in the future with or without the development.
- 3. **Roundabout-**The volume to capacity ratio is lower with the removal of the stop signs and the installation of a roundabout for the future condition with or without the development. The v/c ratio is reduced by half on the critical approach from 1.68 to .69. Based on a preliminary survey of this intersection, the construction of a roundabout at this location is feasible and should be considered.
- 4. **Two Way Stop Control** The level of service would improve significantly with the removal of the stop signs on N Bogan Rd. However, removing the stop signs is not recommended.

Three of the four alternatives are not recommended due to constraints of an all-way stop controlled intersection. The most feasible alternative is the installation of a roundabout. The expected degree of saturation is 63% which is well below the maximum of 85%. The level of service is expected to be LOS D or better.

#### Site access analysis

The streets planned to route through the development will be a single lane roadway with sidewalks throughout. The mixed-use development will have five site accesses with one full access and two right-in/right out accesses on Friendship Road (SR 347) and two full accesses on N Bogan Rd. Table 7 outlines the future level of service expected at these site accesses.

TABLE 7: FUTURE LEVEL OF SERVICE – SITE ACCESS INTERSECTIONS						
Intersection	Intersection					
	AM	PM	Sat	Control		
Friendship Road Site Access -1	А	С	В	Signalized		
Friendship Road Right-in-Right-out	А	А	А	Unsignalized		
N. Bogan Road Site Access -1	В	В	А	Unsignalized		
N. Bogan Road Site Access -2	A	В	A	Unsignalized		

#### Other pertinent information

At this time no other pertinent information is available with regards to this development. All significant characteristics of the proposed development are fully discussed within this report. Additionally, a discussion on area of influence discussion has been prepared and submitted as requested by ARC.

# Significant Impact Analysis

The proposed development along with the installation of the recommended improvements will not have a significant impact on the surrounding roadway network. With the recommended improvements the traffic will continue to operate satisfactorily at all the intersections with the full buildout and operations of the development.

#### Consistency with Adopted Comprehensive County Plan

The Friendship Road Mixed-Use development site is currently zoned a mix of R-100 and AR –III and is proposed to be rezoned to R-100 and M to accommodate the new development. The proposed zoning is consistent with the intent of the overall development and has been annexed and rezoned by the City of Buford. The current Hall County's land use plan and future zoning plan show the area as low density residential (suburban) which will be consistent with the development. The Future Land Use plan for Hall and Gwinnett Counties are attached in the appendix.

Because of its proximity and integration as part of an overall community, the rezoning has been categorized as a "Development of Regional Impact", DRI, and was analyzed according to the guidelines set forth by the Georgia Regional Transportation Authority (GRTA), the Atlanta Regional Commission (ARC) and Gwinnett County.

#### NON-EXPEDITED CRITERIA Regional Mobility and Location

#### 1. Quality Character, Convenience, and Flexibility of transportation option

The increasing density of Hall County and the proximity of the proposed development to the City of Atlanta make this area a good location for proposing future transit facility and other alternative mode programs. There is current Gwinnett Transit service that runs to the Mall of Georgia south of the proposed development.

#### 2. Vehicle Miles Traveled

The proposed DRI will mainly provide much needed housing opportunities in close proximity to employment opportunities in the nearby area, thereby providing the potential for reducing vehicle miles traveled. The commercial and industrial are connected internally and share access which allows for internal trip capture between the two developments. Also, sidewalk is proposed along N Bogan Rd and E Jones Rd to facilitate pedestrian traffic.

#### 3. Relationship between Location of Proposed DRI and Regional Mobility

The proposed DRI will improve connections to the local area by providing access to adjacent developments in the future through new roadway connections.

#### 4. Relationship between Proposed DRI and Existing or Planned Transit Facilities

The proposed development has some existing transit facilities in close proximity. However, there are no transit or shuttles services routes on Friendship Road. Increasing density of the City of Buford, Hall County and Gwinnett County makes it a good candidate for future transit facility planning.

#### 5. Transportation Management Area Designation

The proposed project location comes under Gwinnett and Hall transportation management area which encourages alternative modes of transportation.

#### 6. Offsite Trip Reduction and Trip Reduction Techniques

A 20% pass-by reduction was applied to the retail portion of the development. These pass-bys were applied at the intersection of Friendship Road at site access 1 which is a signalized intersection. Also, a 3.5% internal capture reduction was applied between the retail and industrial land uses.

#### 7. Balance of Land Uses – Jobs/ Housing Balance

Please refer to the AOI discussion submitted with the detailed traffic study.

#### 8. Relationships between Proposed DRI and Existing Development

The proposed DRI is located in an area where adequate public facilities will be available to serve the proposed development. City of Buford Water and Sewer Authority will provide wastewater facilities for the development. Regarding transportation, the traffic study has identified transportation improvements required in the surrounding roadway network, which will allow traffic in the area to operate at the LOS standard.

#### Alternative Modes of Transportation

The proposed project includes sidewalks on all internal roadways and adjacent roadway property frontages. The network of internal and external sidewalks will provide adequate pedestrian access. No pedestrian actuated devices are required at the site's unsignalized vehicular access points, however, other pedestrian facilities such as handicap ramps and crosswalks parallel to the main road will be provided to offer safe pedestrian movement relative to the parallel roadway. No bicycle facilities are provided in or around the development. There are existing transit facilities by Gwinnett Transit on Buford Drive and the Mall of Georgia area in the vicinity of the site. There is no transit facility on Friendship Road near the proposed development.

A trail and/or pedestrian connection between the residential and commercial land uses would require access through the industrial portion of the site and would result in undesirable pedestrian activity in the industrial area of the development. A connection is not recommended based on the communities concerns.

Internal roadways will provide adequate circulation of vehicular traffic as designed in the site plan. Vehicles exiting the site will be able to move internally to the exit desired without experiencing excessive delays.

# APPENDIX A

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# APPENDIX C

# SUPPORTING DATA

- TRIP GENERATION
- MIXED USE REDUCTION WORK SHEETS
- SITE GENERATED TRAFFIC BY LAND USE
- TRIP DISTRIBUTION BY LAND USE
- STUDY NETWORK DETERMINATION
- TRAFFIC COUNTS
- TRAFFIC VOLUME WORKSHEETS
- SYNCHRO ANALYSIS