

**STARBUCKS AT EASTGATE
TRAFFIC IMPACT STUDY**

EXECUTIVE SUMMARY

THE TOWN OF CHAPEL HILL, NORTH CAROLINA



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EXECUTIVE SUMMARY

Project Overview

Redevelopment of the existing gas station located on the southeast corner of East Franklin Street and Eastgate Drive intersection is being proposed in Chapel Hill. The new development on this property will be a Starbucks coffee shop. **Figure ES-1** shows the general site location of the site. The project is anticipated to be complete by 2006. This report analyzes the full build-out scenario for the year 2007 (one year after full build out), the no-build scenario for 2007, as well as 2004 existing year traffic conditions.

The proposed site redevelopment will have direct, full movement access to East Franklin Street at an existing driveway and to Eastgate Drive via two existing driveways. One driveway will connect to an existing access point for the adjacent Bruegger's Bagel shop and is not expected to service the Starbucks site directly. **Figure ES-2** displays the preliminary site plan of the proposed Starbucks and nearby roadways. As part of the project, renovation of the existing on-site gas station building will occur, the underground fuel pumps/equipment will be removed and remediated, and the existing surface parking lot will be redelineated and is projected to contain 23 parking spaces.

Existing Conditions

Study Area

The site is located across from the existing Eastgate Shopping Center and is currently vacant. The study area is basically the immediate vicinity along Eastgate Drive from its termini with Franklin Street and US 15-501. Site traffic will use one of two driveways to access Eastgate Drive or East Franklin Street. Eastgate Drive is a collector street for this commercial area, and connects to US 15-501 and Franklin Street; two regional arterial facilities that provide connectivity with other areas of Chapel Hill and the Triangle. Eastgate Drive also connects to Ephesus Church Road, a minor arterial that provides linkage to commercial areas and neighborhoods in eastern Chapel Hill.

This report analyzes and presents the transportation impacts that the Starbucks at Eastgate site will have on the following intersections in the project study area:

- East Franklin Street and Eastgate Drive
- East Franklin Street and Existing Site Driveway
- Eastgate Drive and Existing Site Driveway
- US 15-501 Bypass and Ephesus Church Road/Eastgate Drive
- US 15-501 Frontage Road and Eastgate Drive

All of the analyzed intersections currently serve study area traffic. Eastgate Drive's intersections with East Franklin Street and US 15-501 are currently signalized. The US



15-501 Frontage Road intersection with Eastgate Drive is currently stop-controlled for Frontage Road traffic. The two driveway intersections are currently unsignalized with each experiencing the stop controlled condition.

Site Traffic Generation

With the addition of new peak hour trips during the AM, noon, and PM peak hours, there are potential site traffic impacts to the study area intersections. **Table ES-1** shows the site trip generation details, with generation rates taken from the *ITE Trip Generation Manual, Volume 7*. This site will likely generate a trip type known as "pass by" trips. These trips are not considered to be added to the design year traffic flow, but simply are a diverted trip that is analyzed at the driveway entrances and exits of the proposed site. It was assumed that about 25 percent of all trips will be of the pass-by type for this analysis.

Table ES-1
Weekday Vehicle Trip Generation Summary
Proposed Starbucks at Eastgate

Category	Area (sq ft)	Generation Rate	AM Peak (%)	Noon Peak (%)	AM Peak Trips	Noon Peak Trips	Total Trips
Daily Traffic	1,920 sq ft	496.12**	50%	50%	476 (357)	476 (357)	952 (714)
AM Peak	1,920 sq ft	73.03	51%	49%	71 (53)	69 (52)	140 (104)
Noon Peak	1,920 sq ft	50.91	51%	49%	50 (38)	48 (36)	98 (74)
PM Peak	1,920 sq ft	28.79	52%	48%	29 (22)	26 (20)	55 (42)

(##) New Trips = Total Trips – Pass-bys (25% of total trips)

** - Generation Rate for L.U. Code 934 – Fast Food Restaurant with Drive Through

Table ES-2, on the next page, shows original trip generation rates for the previous land use on the Starbucks site – a gasoline/service station with 8 pump islands. The number of pump islands is a usable trip generation variable for ITE Land Use Code 933. As **Table ES-2** shows, the former land use likely had higher trip generation rates for daily trips and PM peak trips. The Starbucks would likely generate more site-related traffic in the AM peak hour. No ITE noon peak data was available for gas stations, so an average of the AM and PM peak generation rate was used for estimation purposes.



Table ES-2
Weekday Vehicle Trip Generation Summary
Original Gas/Service Station (L.U. Code 933)

Daily Traffic	8 pumps	168.56	50%	50%	674 (337)	674 (337)	1348 (674)
AM Peak	8 pumps	12.07	50%	50%	48 (20)	48 (20)	96 (40)
Noon Peak	8 pumps	12.97	50%	50%	52 (26)	52 (26)	104 (52)
PM Peak	8 pumps	13.86	50%	50%	55 (32)	55 (32)	111 (64)

(##) New Trips = Total Trips - Pass-bys

Background Traffic

Two Town of Chapel Hill approved background traffic generators are located in the study area and are listed below:

- Franklin Grove Townhomes
- Village Plaza Theaters

Background traffic methodologies and trip generation/distribution/assignment were made using information contained in previous traffic impact studies and existing traffic patterns. In general, few background trips from the townhome development or the theaters are likely to be made during three peak periods under study. Franklin Grove will only add about 28 units in the next three years and the movie theater does not generate large amounts of traffic during a typical weekday that would significantly impact the study area intersections.

An ambient area-wide traffic growth percentage of two percent per year was applied to existing traffic volumes based on information from previous traffic impact studies in the area and information obtained from the NCDOT Traffic Survey Unit.

Impact Analysis

Peak Hour Intersection Level of Service

Even with the addition of AM, noon, and PM peak hour site-generated trips to the projected 2007 background traffic volumes, no study area intersections will experience overall deficient traffic operations. A summary of the traffic operations for each intersection, related to vehicular delays (intersection average as a whole if signalized,



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critical movement if stop-controlled) and the corresponding Level-of-Service (LOS) is shown in **Table ES-3** below.

Table ES-3 LOS and Delay Summary

Starbucks at Eastgate TIS

Intersections	Time Period	2005 Existing		2007 No-Build		2007 Build		2007 Mitigated	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Eastgate Drive and East Franklin Street	AM	8.3	A	8.6	A	8.7	A	N/A	N/A
	NOON	9.8	A	9.8	A	9.9	A	N/A	N/A
	PM	9.6	A	10.3	B	10.4	B	N/A	N/A
Eastgate Drive and US 15-501	AM	35.4	D	36.0	D	37.1	D	N/A	N/A
	NOON	38.4	D	39.5	D	40.7	D	N/A	N/A
	PM	48.7	D	49.8	D	51.8	D	N/A	N/A
Eastgate Drive and US 15-501 Frontage Road	AM	12.1	B	12.4	B	13.0	B	N/A	N/A
	NOON	12.8	B	13.2	B	13.5	B	N/A	N/A
	PM	12.1	B	12.3	B	12.5	B	N/A	N/A
East Franklin Street and Driveway #1	AM	N/A	N/A	N/A	N/A	19.7	C	N/A	N/A
	NOON	N/A	N/A	N/A	N/A	22.4	C	N/A	N/A
	PM	N/A	N/A	N/A	N/A	38.9	E	N/A	N/A
Eastgate Drive and Driveway #2	AM	N/A	N/A	N/A	N/A	11.3	B	N/A	N/A
	NOON	N/A	N/A	N/A	N/A	13.5	B	N/A	N/A
	PM	N/A	N/A	N/A	N/A	13.2	B	N/A	N/A

N/A – Not Applicable or No Improvements Necessary

Access Analysis

Vehicular site access is to be accommodated via the two site driveways connecting to Eastgate Drive and East Franklin Street, respectively. A third driveway shown on the preliminary site plan, internally connecting to Breugger's Bakery, was not specifically analyzed as site traffic access, but could be used for some site traffic when built out.

Driveway throat lengths as shown on the proposed site redevelopment plans are adequate for the driveway access to East Franklin Street for projected 2007 with site traffic conditions. Driveway distances from the signalized intersection at East Franklin Street and Eastgate drive are acceptable, based on recommendations of 100 foot minimum corner clearance as set forth in the 2003 *NCDOT Policy on Street and Driveway Access to North Carolina Highways* and the 1997 *Town of Chapel Hill Design Manual*. The Town Design Manual recommends 250 foot minimum spacing between



an intersection and driveway along an arterial. The existing driveway is only about 160 feet from the Eastgate Drive intersection with East Franklin Street. However, this is an existing driveway and the site has the other main access driveway available traffic on Eastgate Drive, so removing it, or prohibiting access based on estimated traffic operations is not likely to be necessary.

Access for pedestrians and bicyclists is currently acceptable. There is good sidewalk connectivity at least in the local study area. Bicycle access is possible to and from the site, although no specific bicycle amenities are provided on local roadways. The Lower Booker Creek Greenway provides some additional external connectivity for non-motorized transportation.

Signal Warrant Analysis

Based on projected traffic volumes, none of the unsignalized intersections in the project study area would warrant the installation of a traffic signal based on the methodology found in the *2003 Manual on Uniform Traffic Control Devices (MUTCD 2003)*. A warrant often satisfied from the MUTCD methodology is the Peak Hour Warrant, which would have comparable data collected from this study. Based on Figures 4C-3 and 4C-4 from the *MUTCD 2003*, no study area intersection with the additional Starbucks site trips added would warrant the installation of a signal based on the Peak Hour thresholds.

Sight Distance Analysis

In general sight distance issues entering and exiting the driveways are minimal, except at the intersections of US 15-501 Frontage Road and US 15-501 with Eastgate Drive. Sight distance problems at these intersections are related to potential vehicular congestion in and around the actual crossing of the Frontage Road and Eastgate Drive. Vehicles may become trapped in the middle of this intersection when the eastbound approaches experience a red signal indication. Traffic moving southbound and northbound on the Frontage Road may or may not be able to safely negotiate through the intersection with moderate to high amounts of turning and through traffic entering the shopping center from US 15-501 and Ephesus Church Road. No simple remedy (short of limiting, or eliminating through and left-turn access to and from the Frontage Road) exists for this condition, and the addition of site-related traffic will cause little or no additional impact to the existing conditions. Sight distance at the existing site driveways is acceptable. Franklin Street has generally little horizontal or vertical curvature in this area.

Intersection Accident Analysis

Crash information for the US 15-501 and Ephesus Church Road/Eastgate Drive intersection exhibit a high number of rear-end accidents commonly associated with congested conditions on high volume arterial roadways. There were a number of other accidents types (angle crashes, sideswipes, ran off road) found at this intersection, but no major discernable patterns. 27 accidents were reported at this intersection over the 3 year period. Data from the Town of Chapel Hill indicated that, over the 2001-2003



analysis period, this intersection had the 7th highest total number of accidents of any intersection in the Town.

There were 10 accidents at East Franklin Street and Eastgate Drive over the 3 year period, with no discernable particular accident patterns noted. There were only two reported accidents at the US 15-501 Frontage Road and Eastgate Drive in the last 3 years.

Other Transportation-Related Analyses

Other transportation-related analyses relevant to the 2001 Town of Chapel Hill Guidelines for the preparation of Traffic Impact Studies were completed as appropriate. The following topics listed in **Table ES-4** are germane to the scope of this study.

Table ES-4. Other Transportation-Related Analyses

Analysis	Conclusion
Generalized Peak Hour and/or Daily LOS Analysis	Planning-level corridor LOS Analyses are not necessary for this study. The size of the study area does not encompass any significant length of arterial corridors.
Signal Phasing Analysis	Signal phasing for existing and future conditions produces adequate traffic operations at the signalized intersections under study. The use of lagging left-turn phases and split signal phases at the US 15-501/Ephesus Church signal is necessary for optimal coordination along US 15-501 and safe movements at the side street approaches.
Progression Analysis	The existing Franklin Street/Eastgate signal does not need to be integrated into a coordinated signal system at this time. The signal at US 15-501 and Ephesus Church Road is in a coordinated system along US 15-501, but no other signal in this system was analyzed for this study, since they are located outside the study area.
Turn Lane Storage Requirements	Most storage lanes adequately meet the traffic demands for existing and future traffic. Storage for queues at the US 15-501/Ephesus Church Road intersection may pose an issue, as the intersection is near capacity in the PM peak in existing and future analysis years. Signal timing plans need to be monitored, regardless of site traffic impact to avoid queue spillbacks.
Appropriateness of Acceleration/ Deceleration Lanes	Given the proposed configuration of site driveways, the lane geometrics and traffic patterns and posted speeds on Franklin Street and Eastgate Drive, no special acceleration or deceleration lanes are required due to the proposed Starbucks at Eastgate development.
Pedestrian and Bicycle Analysis	Existing pedestrian analysis and connectivity is acceptable through the study area, except along US 15-501. Besides the adjacent Booker Creek Greenway, no roadways with bicycle amenities exist in the study area.
Public Transportation Analysis	Public transportation service to the site is excellent, with on-street bus stops immediately adjacent to the site.



IV. MITIGATION MEASURES/RECOMMENDATIONS

A.) Planned Improvements

Neither the Town of Chapel Hill nor the North Carolina Department of Transportation are expected to make any significant planned improvement projects for study area facilities studied within the design year timeframe of 2005-2007.

B.) Background Committed Improvements

No background improvements are committed by other area project developments.

C.) Applicant Committed Improvements

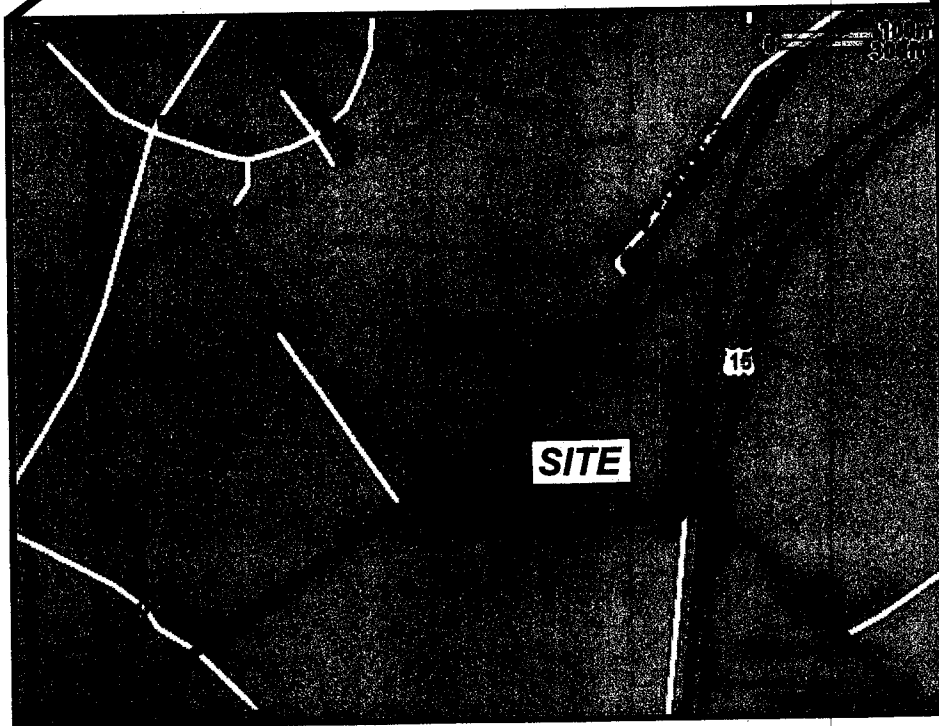
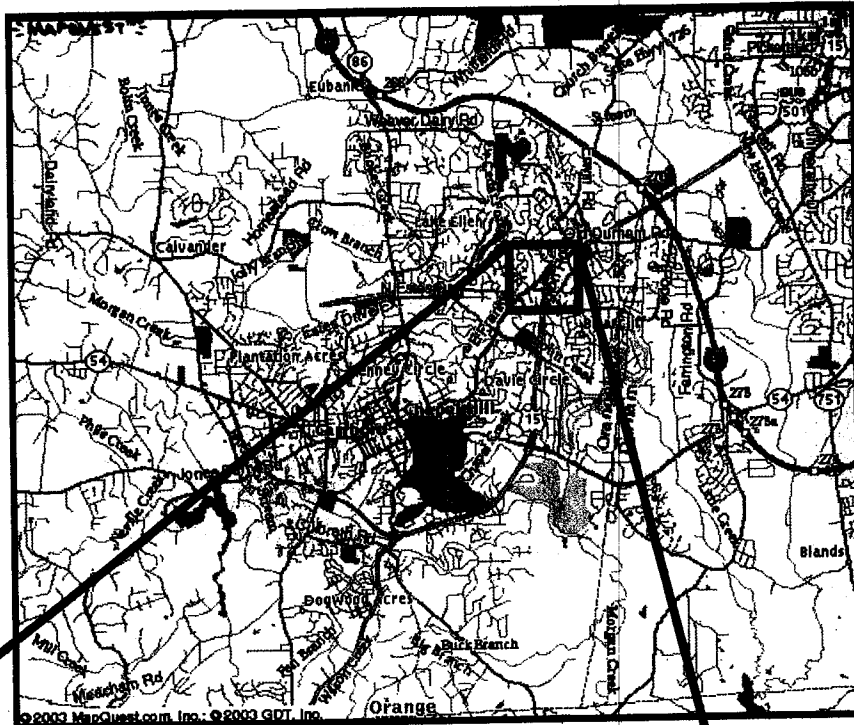
Based on the concept plan provided, there are no transportation-related improvements to be made external to the site property. The concept plan shows that the development will make use of the two existing driveways and will keep the existing sidewalk along Eastgate Drive.

D.) Necessary Improvements

No additional external roadway improvements are necessary to due to the addition of ambient growth and/or site traffic impacts.



Not to Scale



Note:

- ◆ Site Driveways = Included in Study
- ◆ Other Intersections = Included in Study

Site Location Map

Figure ES-1	Starbucks at Eastgate Traffic Impact Study
HNTB	