

**PUREFOY DRIVE SUBDIVISION  
TRAFFIC IMPACT STUDY  
EXECUTIVE SUMMARY**



**Prepared for:**

**The Town of Chapel Hill  
Engineering Department**

***Prepared by:***

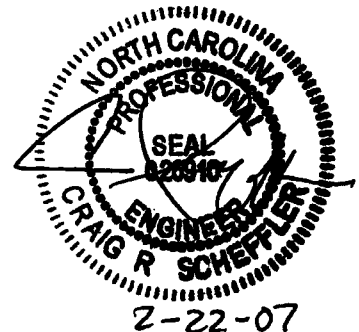
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**February, 2007**





## **EXECUTIVE SUMMARY**

### **Project Overview**

Development of a new residential subdivision located along Purefoy Drive to the east of Rogers Road is being proposed in Chapel Hill. **Figure ES-1** shows the general site location of the site. The project is anticipated to be complete by 2008. This report analyzes the full build-out scenario for the year 2009 (one year after full buildout), the no-build scenario for 2009, as well as 2007 existing year traffic conditions.

The proposed site development will have direct, full movement access to existing Purefoy Drive at one new local roadway access point and at an existing local roadway (Edgar Street). Purefoy Drive is a dead-end road that provides local access to other study area collector and arterial roadways (Rogers Road, Homestead Road, Eubanks Road). **Figure ES-2** displays the preliminary site plan of the proposed Purefoy Drive subdivision and nearby roadways.

### **Existing Conditions**

#### **Study Area**

The site is located in northwest Chapel Hill at the end of Purefoy Drive, just to the east of Rogers Road and currently contains three residential properties. The study area contains the length of Purefoy Drive and Rogers Road and the intersections of Homestead Road and Rogers Road to the south and Eubanks Road and Rogers Road to the north. All site traffic is expected use entrance and exit internal local streets within the subdivision to access Purefoy Drive and Rogers Road. Homestead Road is a minor suburban arterial connecting NC 86 in north Chapel Hill to Carrboro. Eubanks Road is a minor rural arterial serving areas north and west of Chapel Hill. Rogers Road is a suburban collector street. Purefoy Drive is a local roadway providing access to suburban residential development along its length.

This report analyzes and presents the transportation impacts that the Purefoy Drive subdivision will have on the following intersections in the project study area:

- Rogers Road and Eubanks Road
- Rogers Road and Purefoy Drive
- Rogers Road and Homestead Road

All three intersections are currently unsignalized "T" intersections. Rogers Road traffic experiences the stop-controlled condition at both intersections with Homestead Road and Eubanks Road. Purefoy Drive traffic experiences the stop-controlled condition at Rogers Road.



**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*. No trip reductions for "pass-by" type trips or for the effects of transit or non-motorized trip making was conducted for this study although some amount of vehicular trip reductions will occur from all of these sources.

**Table ES-1**  
**Weekday Vehicle Trip Generation Summary**  
**Proposed Purefoy Drive Subdivision (L.U. Code 210)**

Daily Traffic	48 net single-family homes	9.57	50%	50%	230	230	460
AM Peak		0.77	26%	74%	10	27	37
Noon Peak		0.89	45%*	55%*	19*	24*	43
PM Peak		1.00	63%	37%	30	18	48

\* Average Values between AM and PM peak data

**Background Traffic**

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

- Town of Chapel Hill Aquatics Center
- Orange County Senior Center
- Church Expansion (corner of Homestead Rd/NC 86)
- Town of Chapel Hill Operations Center

Background traffic methodologies and trip generation/distribution/assignment were made using information contained in previous traffic impact studies and existing traffic patterns. In general, most of the background trips from the planned developments are likely to be made along Homestead Road during the three peak periods under study. An ambient area-wide traffic growth percentage of three 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 2009 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, critical movement if stop-controlled) and the corresponding Level-of-Service (LOS) is shown in **Table ES-2** below.

**Table ES-2. LOS and Delay Summary**

Intersections	Time Period	2007 Existing		2009 No-Build		2009 Build		2009 Mitigated	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Rogers Road and Eubanks Road	AM	12.6	B	13.2	B	13.5	B	N/A	N/A
	NOON	9.3	A	9.3	A	9.5	A	N/A	N/A
	PM	10.7	B	10.9	B	11.3	B	N/A	N/A
Rogers Road and Purefoy Drive	AM	9.8	A	9.9	A	10.1	B	N/A	N/A
	NOON	9.1	A	9.1	A	9.4	A	N/A	N/A
	PM	9.5	A	9.6	A	10.2	B	N/A	N/A
Rogers Road and Homestead Road	AM	20.3	C	23.7	C	26.4	D	N/A	N/A
	NOON	11.5	B	12.1	B	12.4	B	N/A	N/A
	PM	15.4	C	17.3	C	17.0	C	N/A	N/A

N/A – Not Applicable or No Improvements Necessary

**Access Analysis**

Vehicular site access is to be initially accommodated by two residential streets that would connect to existing Purefoy Drive. One roadway, Edgar Street, currently exists and serves as a collection driveway for a few residences north of the proposed site. This roadway would connect to a new internal circulation street for the subdivision. This new local roadway is shown to reconnect with Purefoy Drive approximately 850 feet to the east of Edgar Street. Driveway and intersection spacing minimum distances are acceptable per Town of Chapel Hill 2005 Design Guidelines. An additional future local roadway connection is shown on the plans that would provide additional future local street access to the property to the east of the project.

Access for pedestrians and bicyclists is currently marginal in the project study area, though no prohibitions for access for local pedestrians/bicyclists is shown on the concept plan. Sidewalks should be included on at least one side of the future internal streets, per Town Design Guidelines for local streets.



### **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 Purefoy Drive Subdivision 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 proposed site would be minimal, considering the fact that Purefoy Drive and Edgar Street are tangent sections in the vicinity of the proposed project and vertical curvature is currently minimal.

### **Intersection Accident Analysis**

Data from the NCDOT Traffic Safety Unit was provided to HNTB for the period 10/31/2003 to 10/31/2006 for the study area intersections. Information included crash data for Eubanks Road, Rogers Road, Purefoy Drive, and Homestead Road in the project study area. Over the three-year period, there were four crashes in the vicinity of Eubanks Road/Rogers Road intersection. One crash (a pedestrian hit by a vehicle) occurred at the intersection of Purefoy Drive and Rogers Road. There were 11 crashes overall at the intersection of Rogers Road and Homestead Road – with left-turn angle crashes being the most predominate crash type (4 crashes). Overall, the crash rate for the three study area intersection is low, relative to other areas in Chapel Hill. The intersection of Homestead Road and Rogers Road should be monitored for increases in crash frequency due to increasingly congested conditions in the peak travel periods.

### **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-3** on the next page are germane to the scope of this study.



Table ES-3. Other Transportation-Related Analyses

Generalized Peak Hour and/or Daily LOS Analysis	Planning-level corridor LOS Analyses are not necessary for this study. The relative <u>daily</u> traffic impact over both short and long-term horizons along the major roadways (Eubanks Road, Homestead Road) in the study area is low.
Turn Lane Storage Requirements	The only storage bay in the existing study area network is a 100 foot delineated bay for eastbound traffic on Homestead Road. Field observation and analysis estimates from HCS indicate that this storage bay has adequate length to accommodate turning traffic in all conditions analyzed.
Appropriateness of Acceleration/Deceleration Lanes	Given the proposed configuration of the site and internal roadways, along with local study area speed limits and traffic volumes, no special acceleration or deceleration lanes are required due to the proposed Purefoy Drive subdivision development.
Pedestrian and Bicycle Analysis	Existing pedestrian and bicycle access and connectivity is poor through the study area. Little to no sidewalk exists on any study area roadway and no specific bicycle amenities are present. Roadway widths of Rogers Road and Eubanks Road are narrow for cycling.
Public Transportation Analysis	Public transportation service to the site present in the study area, though not proximate to the proposed site, which would be over ½ mile from the nearest transit line on Homestead Road.

#### 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 time frame of 2007-2009. NCDOT has a Transportation Improvement Program (TIP) project U-2805 that will widen Homestead Road in the study area to a consistent three-lane cross section between High School Road and N.C. 86. This project is currently unfunded and will likely be completed after the 2009 analysis year, so any impacts were not considered in this study.

##### B.) Background Committed Improvements

No background improvements affecting study area roadways or intersections 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.

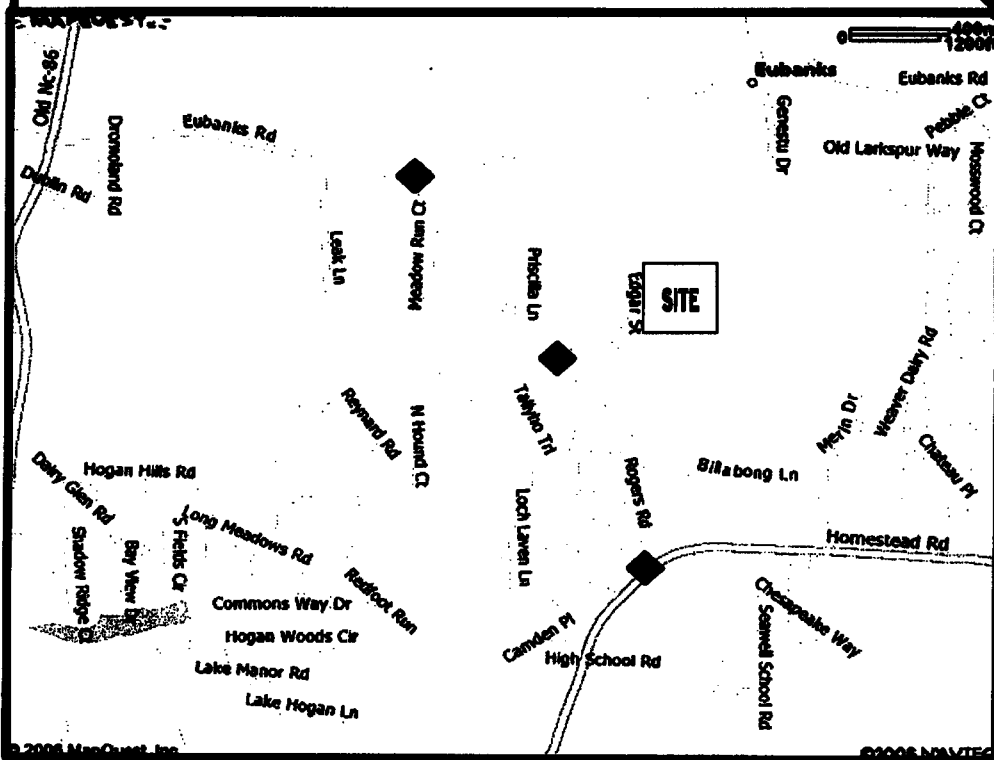
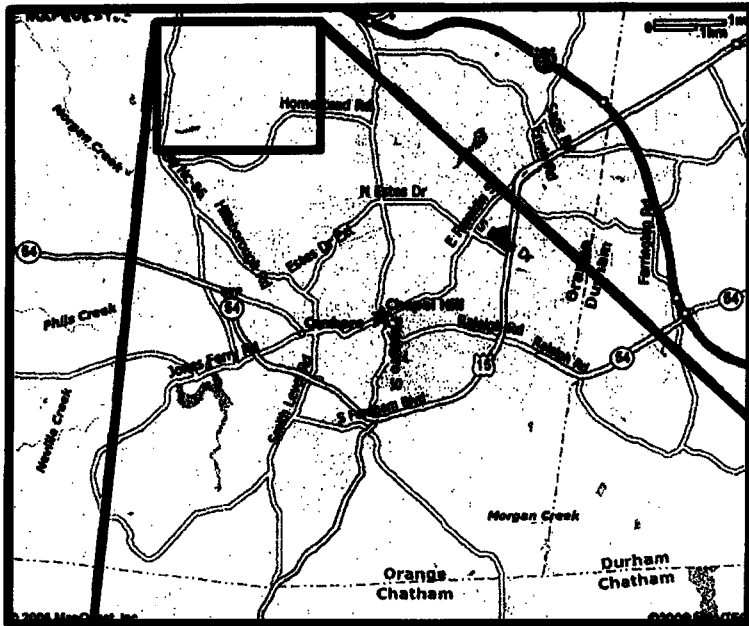
**D.) Necessary Improvements**

No additional external roadway improvements are necessary to due to the addition of ambient growth and/or site traffic impacts. The proposed local street improvements necessary for completion of the project should conform to all 2005 Town of Chapel Hill Design Guidelines for local streets.



**LEGEND**

-  Existing Intersections
-  Purefoy Subdivision



**Purefoy Drive Subdivision  
Traffic Impact Study**

**SITE LOCATION MAP**

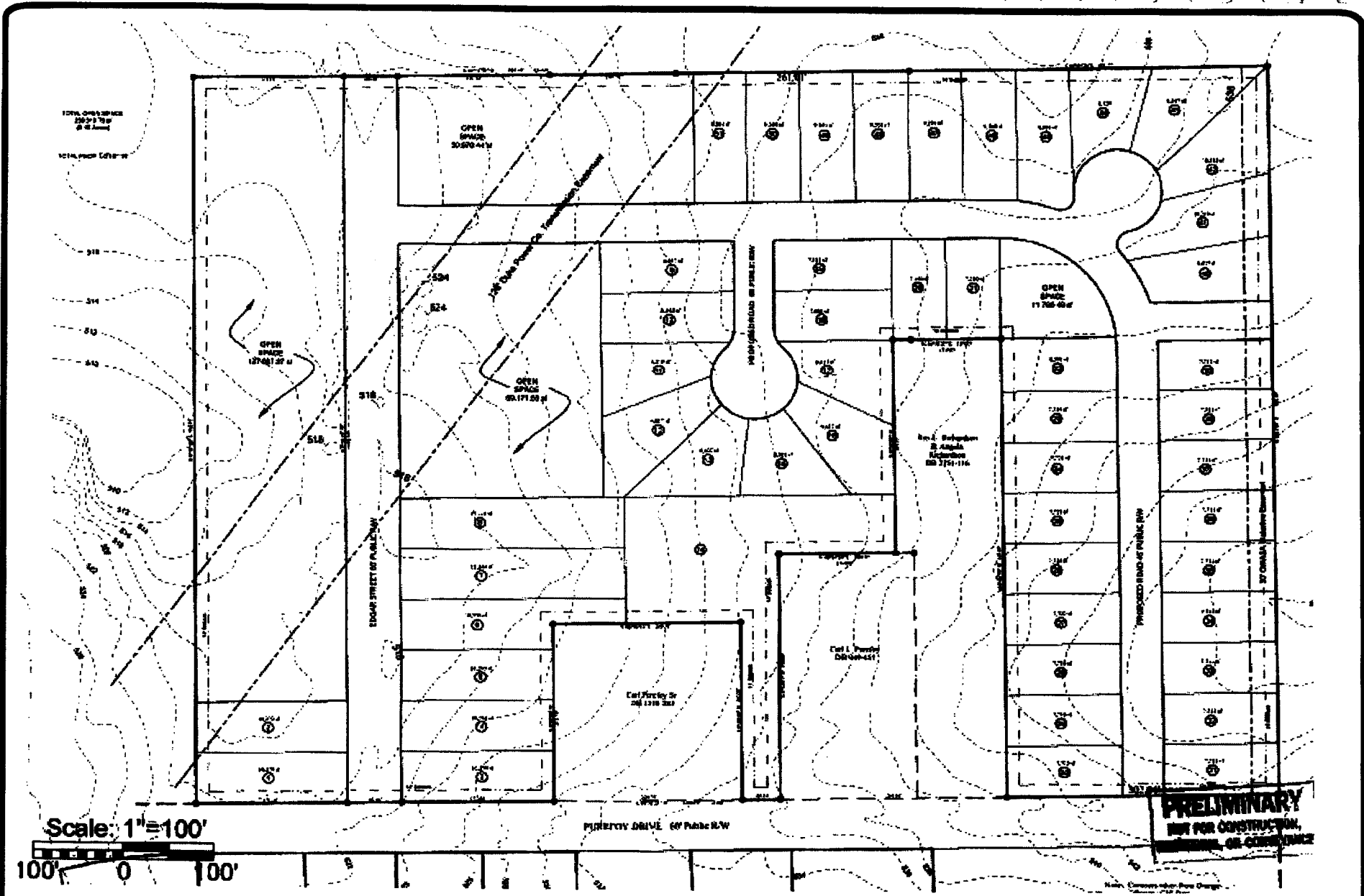
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**FIGURE ES-1**

**NOT  
TO  
SCALE**

**HNTB**





**HNTB**



**Purefoy Drive Subdivision  
Traffic Impact Study**

**PRELIMINARY SITE PLAN**



**NOT  
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**FIGURE ES-2**