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## EXECUTIVE SUMMARY

### Project Overview

A new multi-family residential townhome development named Chapel Watch Village is being proposed for construction in Chapel Hill, NC along Eubanks Road near NC Highway 86 (Airport Road). **Figure ES-1** shows the general site location of the planned development. The proposed townhome units are located across from the Town of Chapel Hill Park and Ride Lot on Eubanks Road in the northern part of Chapel Hill. The proposed development is scheduled to be complete by 2008. This report analyzes the full build-out scenario for the year 2008, the no-build scenario for 2008, as well as 2005 existing year traffic conditions. The report details all applicable issues related to the impacts of the site development including: safety, access, bicycles and pedestrians, public transportation, traffic operations, and geometric features.

*This study is being conducted as an update to an original Town of Chapel Hill traffic impact study of the proposed Chapel Watch Village completed by HNTB North Carolina, PC in 2003. The development site plan has been changed by the applicant from 306 apartment units to 120 residential condominium/townhomes. This study will analyze the impacts of the 120 townhome units on the original study area, and update study area conditions from 2003 to 2005.*

### Existing Conditions

#### **Study Area**

The preliminary project site plan provided for this analysis is shown in **Figure ES-2**. The site is located on 35 acres of mostly undeveloped land. The parcel is zoned Residential 2 (R-2) by the Town of Chapel Hill. Site traffic will primarily use Eubanks Road as a connection to NC 86 (Airport Road); a regional arterial facility that will provide connectivity for site traffic with other areas of Chapel Hill and the Triangle.

This report analyzes and presents the transportation impacts that the Chapel Watch Village site will have on the following intersections along Eubanks Road (west to east):

- Eubanks Road and Mill House Road
- Eubanks Road and Future Chapel Watch Village West Site Driveway
- Eubanks Road and Park-and-Ride Lot Exit
- Eubanks Road and Park-and-Ride Lot Entrance / Future Maywood Drive Extension (Main Site Driveway)
- Eubanks Road and NC Highway 86 (Airport Road)

For the purposes of potential site traffic impacts in the future buildout analyses, the recently completed intersection of Homestead Road and Weaver Dairy Road Extension was also included in this study.



All of the analyzed intersections currently serve study area traffic, except for the future site driveways. The intersection of Eubanks Road and NC 86 is currently signalized. The other intersections are unsignalized or will be when constructed in 2008. NC 86 (Airport Road) serves Chapel Hill as a regional arterial facility. Eubanks Road is an important minor arterial facility for residential and commercial areas in north Chapel Hill. Mill House Road serves the study area as a collector street providing access rural residential areas in the nearby vicinity.

**Site Traffic Generation**

With the addition of new peak hour trips during the AM, Noon, and PM peak periods, there are potential site traffic impacts to the study area intersections. **Table ES-1**, on the next page shows the site trip generation details, with generation rates taken from the *ITE Trip Generation Manual, Volume 7*. Rates were calculated from the number of dwelling units as a trip generating variable. No trip reduction factor was used to account for transit service, pedestrian, and bicycle trips, although the proximity to transit service at the Eubanks Road Park-and-Ride, located across the road from the proposed site, would likely reduce overall travel by personal vehicle.

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**Background Traffic**

The Chapel Watch Village study area has three separate approved developments (either planned or under construction) that were analyzed as being fully built out by the 2008 design year. A list of these developments and the estimated amount of total trips they will generate is shown in **Table ES-2** below. Traffic from these sites was appropriately distributed on study area roadways for 2008 without site and with site capacity analyses.

**Table ES-2  
2008 Background Traffic Generators**

Larkspur Subdivision	2001	85 single-family homes off of Weaver Dairy Road	64	N/A	86	813
Vineyard (The Homestead)	2000	194 residential town homes off of Homestead Road	87	N/A	106	1,144
Town of Chapel Hill Operations Center	2003*	Multi-Use Municipal Operations Facility	154	209	120	=2,000@

\* - Study being conducted concurrent to Chapel Watch Village

@ - Based on an average of the three peak periods and an assumed 8% of all daily traffic occurring in those periods



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**Table ES-1**  
**Weekday Vehicle Trip Generation Summary**  
**Chapel Watch Village – Proposed Town Homes**

*ITE Land Use Code 230 - (Condominium/Townhouse)*

**Daily Trip Summary**

120 Dwelling Units	50%	50%	352	352	704	0%	352	352
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**AM Peak Trip Summary**

120 Dwelling Units	16%	84%	8	44	52	0%	8	44
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**Noon Peak Trip Summary**

Average of AM and PM Vehicle Trip Generation Rates	45%	55%	25	31	56	0%	25	31
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**PM Peak Trip Summary**

120 Dwelling Units	67%	33%	42	20	62	0%	42	20
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**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 2008 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-3** on the next page.



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**Table ES-3 LOS and Delay Summary**

Chapel Watch Village Townhomes

Intersections	Time Period	2005 Existing		2008 No-Build		2008 Build		2008 Mitigated	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Eubanks Road and Airport Road	AM	21.1	C	22.2	C	25.4	C	N/A	N/A
	NOON	4.6	A	8.2	A	9.5	A	N/A	N/A
	PM	10.0	B	18.1	B	20.9	C	N/A	N/A
Eubanks Road and Maywood Road / Park and Ride In	AM	7.7	A	8.0	A	16.2	C	N/A	N/A
	NOON	7.6	A	8.0	A	13.4	B	N/A	N/A
	PM	8.2	A	8.4	A	15.3	C	N/A	N/A
Eubanks Road and Park and Ride Out	AM	12.5	B	15.9	C	16.1	C	N/A	N/A
	NOON	10.6	B	13.0	B	13.2	B	N/A	N/A
	PM	13.3	B	16.2	C	16.6	C	N/A	N/A
Eubanks Road and West Site Driveway	AM	N/A	N/A	N/A	N/A	11.6	B	N/A	N/A
	NOON	N/A	N/A	N/A	N/A	10.2	B	N/A	N/A
	PM	N/A	N/A	N/A	N/A	9.6	A	N/A	N/A
Eubanks Road and Mill House Road	AM	12.8	B	22.7	C	22.9	C	N/A	N/A
	NOON	10.0	A	13.8	B	13.9	B	N/A	N/A
	PM	12.3	B	17.1	C	17.4	C	N/A	N/A
Homestead Road and Weaver Dairy Road Extension	AM	N/A	N/A	45.9	E	47.2	E	N/A	N/A
	NOON	N/A	N/A	16.4	C	16.6	C	N/A	N/A
	PM	N/A	N/A	32.4	D	33.2	D	N/A	N/A

N/A - Not Applicable or No Improvements Necessary



**Access Analysis**

The provision of three driveway access points for this site serves to improve safety and distribute some of the site traffic. The extension of a public street (Maywood Drive) through the proposed complex will improve local connectivity. The provision of separate turning lanes at the Maywood Drive intersection with Eubanks Road will also improve operations. site-related traffic will primarily use Airport Road and Eubanks Road for local and regional connectivity. Both have adequate existing and design year capacity to handle increases in ambient, background and site related traffic. Internal pedestrian and bicycle access is well developed, however, Eubanks Road does not have an existing pavement cross-section conducive to bicycling, nor are sidewalks providing connectivity beyond the site present along this facility.

**Pedestrian and Bicycle Analysis**

The updated site plans still detail specific pedestrian facilities and bicycle amenities (bike racks). However, connectivity to other areas in Chapel Hill is an issue to the lack of adequate pavement width and sidewalks on existing Eubanks Road. The recently improved Airport Road facility in the study area has both four foot outside bike lanes and sidewalk provisions. A crosswalk is shown for Chapel Watch Village bus patrons across Eubanks Road (per recommendations from the original 2003 study).

**Public Transportation Analysis**

Chapel Watch Village has a proximate location to Chapel Hill Transit Service via the Eubanks Road Park-and-Ride Lot. With the land use type being analyzed and the fact that transit ridership and mode share in Chapel Hill is much higher than regional averages, a 10 percent trip generation reduction factor was originally applied to the site analysis in the 2003 study. For a more conservative estimate of total potential site trip yield, no such reduction was made for this 2005 study update.

Other transit services, such as Orange Public Transit and TTA have existing bus services around Chapel Hill and near the project study area. However, their impacts were not considered to be significant for this study.

**Special Analysis / Potential Traffic "Cut-Through" in Larkspur Subdivision**

One issue meriting special attention related to the proposed Chapel Watch development is the extension of Maywood Drive through the Chapel Watch complex. This roadway is proposed to become a town-maintained facility after the complex is built. A study of the preliminary design of the roadway shows that the facility is suited to function as a local street with no on-street parking. A special feature of the roadway will be a four-legged single-lane roundabout located at the heart of the development to be used as the primary traffic circulator. As designed, the roundabout will function as a traffic calming measure and is not designed to modern high-capacity roundabout standards. However, the capacity of this internal intersection would not require a high capacity design.

Another issue of concern to local residents in adjoining subdivisions to the south of Chapel Watch Village is the potential for neighborhood cut-through traffic. To analyze



these concerns for this 2005 reanalysis, HNTB conducted field travel time studies throughout the study area to calculate any perceived or actual travel time benefit that may lead to increased cut through traffic along the proposed Maywood Road Extension. The results of these travel time runs are documented in **Figure ES-3**.

Cut through traffic to Chapel Watch Village to/from points south would use Homestead Road to access Weaver Dairy Road and travel through the Larkspur Subdivision on Larkspur Lane/Maywood Drive. Travel time runs during AM peak conditions indicate that (using the Chapel Watch Village traffic circle as an origin) drive time to the Homestead Road/Airport Road intersection along Eubanks Road and Airport Road is 2 minutes 55 seconds. Estimated drive time from the traffic circle on site to the Homestead/Airport Road intersection via the cut-through route described above would be approximately 3 minutes 30 seconds. Drive time for vehicles desiring to head west on Homestead Road from Chapel Watch Village would be shorter using the cut through route than using Eubanks Road – Airport Road – Homestead Road. It should be noted that any trip heading west past the Homestead Road/Rogers Road intersection could be made quicker by simply accessing Eubanks Road westbound from Chapel Watch Village and heading south on Rogers Road to Homestead Road.

In any case, the total amount of overall site trip distribution to the Homestead Road area is expected to be small (10 percent), compared to site trips heading directly on Airport Road into Chapel Hill or onto I-40 to points beyond the study area. The amount of cut through traffic would be expected to be less than 10 vehicles total during a peak hour. The design of the roadway network within the Larkspur subdivision – narrow streets, with on-street parking, and low speed limits is not conducive to the perception that these roadways should be used as a cut-through route.

To help eliminate the perception that the Maywood Drive Extension should be regarded as a cut-through route, traffic calming measures should be implemented near the southern entrance to the Chapel Watch site. The site plan shows a crosswalk at the Maywood Drive Extension intersection with an internal driveway near a pod of townhomes in the southeast corner of the property. This pedestrian crosswalk could be designed as a raised concrete pedestrian table to slow vehicles at this crossing and provide additional pedestrian safety.



## Mitigation Measures/Recommendations

### **A. Planned Improvements**

The North Carolina Department of Transportation originally had one scheduled transportation improvement project (TIP) in the vicinity of the Chapel Watch Village Study area for the 2003 study. **NCDOT TIP Project U-2805** is a pavement rehabilitation and widening project that will provide an additional travel lane along Homestead Road in the southern portion of the study area from Airport Road to Seawell School Road. The project was scheduled for construction in 2005 and was assumed to be complete by the original 2006 analysis year. Recent changes in the NCDOT TIP schedule has pushed this project back beyond the current 2008 study design year, so it is not assumed to be complete for the purposes of this analysis.

### **B. Background Committed Improvements**

The Town of Chapel Hill approved site plans for the Vineyard Townhomes development in 2000. Per specifications in the plans, Weaver Dairy Road was being extended through the development and now connects to existing Homestead Road. No final cross-section details were available for this study, but it is assumed that the Weaver Dairy Road facility will be consistent with the existing cross-section of four travel lanes with a median found in this area. Traffic analyses completed for the Vineyard development indicated that Weaver Dairy Road would feature exclusive left-turn and right-turn lanes at its terminus with Homestead Road, as is currently the case.

The Town of Chapel Hill Operations Center, located on Mill House Road, will require improvements on Mill House Road and at the intersection of Eubanks Road and Mill House Road to improve safe operations for the high percentage of buses and trucks using that site. Mill House Road is to be repaved and widened to meet Town standards for a collector facility. A sidewalk is to be added along the east side of the road. At the intersection of Mill House Road and Eubanks Road, an exclusive westbound right-turn lane is to be added to separate decelerating right-turn vehicles from the Eubanks Road traffic stream. Southbound laneage will be improved to add an exclusive right-turn bay near the intersection. A traffic signal is also to be installed at the intersection to facilitate safe operations for large vehicles (Town trucks, buses) at the intersection. These improvements were not analyzed for the capacity analysis in this study. The analysis showed that this intersection would still provide adequate operations without these geometric improvements and traffic control improvements.

### **C. Applicant Committed Improvements**

To facilitate the circulation of site-generated trips, the site plan of Chapel Watch Village currently shows three designated points of access to the complex. Two driveways are located along Eubanks Road, one of which is to be located opposite the Eubanks Park and Ride Entrance. This driveway will serve as the main access point for site-related traffic, due to its proximity to most trips made from Airport Road, and because it is a centrally located north-south roadway in the complex. This roadway will also connect with Maywood Road on the southern property boundary of the complex.



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The Applicant has provided approximately 100 feet of exclusive left-turn storage at the Maywood Road Extension intersection with Eubanks Road. This lane is to be striped to designate left and through movements. The other lane will be for right-turning vehicles only. The Applicant has also provided a 24 foot wide, two-lane design for the lesser used West Site Driveway. No off-site improvements to existing facilities were noted on the site plan.

The site plan shows the presence of multiple connecting sidewalks throughout the complex. A proposed sidewalk will extend the entire length of the development along Eubanks Road. Sidewalks will also flank thg entire length of the Maywood Road Extension through the complex and connect to proposed sidewalk terminating at the end of the Larkspur Subdivision.

#### **D. Necessary Improvements**

The results of the short-term design year intersection capacity analyses show that no improvements are required to maintain adequate LOS and vehicular delay for any of the Peak periods. However, there are some safety considerations and operational efficiency considerations that were recommended in the original 2003 study due to the development impact of Chapel Watch Village. These are listed below, with commentary regarding the updated land use and site plan for 2005.

- *"The potential presence of pedestrians crossing Eubanks Road from the proposed site to the bus stops at the Park and Ride necessitates pedestrian amenities to allow for safe crossing of the existing roadway. Sidewalks, as shown on the site plan, need to be realigned at the Maywood Road entrance to allow for a striped cross walk on the western side of the intersection. This cross walk should then connect with existing sidewalk on the Park-and-Ride Lot side of the road. Adequate upstream warning signing needs to be installed to alert motorists to the presence of pedestrians crossing at this location. Also, adequate street lighting in the vicinity of this intersection needs to be installed for pedestrian safety in low-light conditions."*

Comment: This recommendation would still be necessary for the updated land uses and the updated site plan does indicate the presence of a sidewalk across Eubanks Road on the west side of the Maywood Road Extension intersection. Appropriate warning signage and lighting improvements would still apply.

- *"The intersection of Maywood Road and Eubanks Road also needs some minor geometric improvements from what is shown on the preliminary site plans. As shown in Figure 12 [of the 2003 study], the main site driveway exit stop bar should be moved closer to the Eubanks roadway, for sight distance reasons. This will force the sidewalk to be moved closer to the edge of the roadway, also. Operations analyses show that a separate left-turn bay for westbound traffic turning into the property is not necessary to maintain adequate levels of service. However, a separate turn bay with at least 100 feet of storage (not including taper) should be developed at this location. There is existing pavement not being used for this maneuver that opposes the eastbound left-turn bay into the Park-and-Ride."*





*Separation of the significant site-related left-turn traffic at this location will improve overall traffic flow and safety on Eubanks Road, especially considering the current 45 mph speed limit."*

Comment: Roadway improvements to Eubanks Road are not clearly indicated on the site plan reviewed by HNTB for the 2005 update. These recommendations still apply to the new development mix, regardless of reduction in traffic impact due to reduction in overall trip generation. Separation of turning traffic would yield more safety benefits in this vicinity than capacity benefits.

- *"2006 traffic analyses indicate that site traffic will have a negative impact on operations at the signalized intersection of Eubanks Road and NC 86. Delay and LOS estimates do not account for upstream blockages caused by an inadequate left-turn bay length on Eubanks Road. It is recommended that the storage of this left-turn bay be lengthened to 300 feet, to accommodate both background and site traffic impact. The existing pavement cross-section on Eubanks Road needs to be upgraded also. It is recommended that the roadway be widened to at least 12 foot travel lanes for the left-turn bay extension, and existing through travel lanes. In addition, a paved flare area needs to be created for southbound right-turn movements on Airport Road. Heavy vehicle turning radii currently force trailers off the pavement in this location and cause significant rutting problems along the shoulder. This improvement is necessary to improve existing traffic conditions, but will be more apparent with the addition of background traffic from the Town Operations Center site and Chapel Watch Village site traffic. It would be equitable, since both proposed developments add considerable amounts of traffic at this approach, to assign the responsibility of this necessary improvement to both Applicants.*

*It is important to note that the improvements listed above will improve traffic operations in terms of delay and LOS at the individual intersections that are involved in each improvement. Because no intersection or critical movement is projected to create excessive delay in the 2008 Condition 3 - With Site Traffic scenario, no capacity analysis was completed to analyze specific implications of these improvements. The additional storage capacity needed at Eubanks Road and Airport Road was calculated from statistics produced by the Synchro software. Required storage can obviously change if more green time in a signal cycle is assigned to the minor street approach."*

Comment: Updated 2005 existing year and 2008 design year analyses show that the turn bay length for Eubanks Road would still need to be extended, regardless of changes due to new site plans at Chapel Watch Village. The amount of traffic and resultant impact to queue lengths at this intersection will be reduced, due to an overall reduction in site generated trips. Improvements, **as** described above, are partially necessitated by traffic impacts associated with the site development. The relative amount of impact, though, has lessened from the original 2003 study.



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In addition to these improvements noted previously in the 2003 study, public concern for a reduction in the possibility of site-related cut-through traffic necessitates the improvement suggested in the Special Analyses section of this report. The site plan shows a crosswalk at the internal Maywood Road Extension intersection with the driveway serving a pod of townhomes in the southeast corner of the property. This pedestrian crosswalk could be designed as a raised concrete pedestrian table to slow vehicles at this crossing and provide additional pedestrian safety. This improvement would add incentive for vehicles to use the main entrances/exits off of Eubanks Road as a primary means of access.

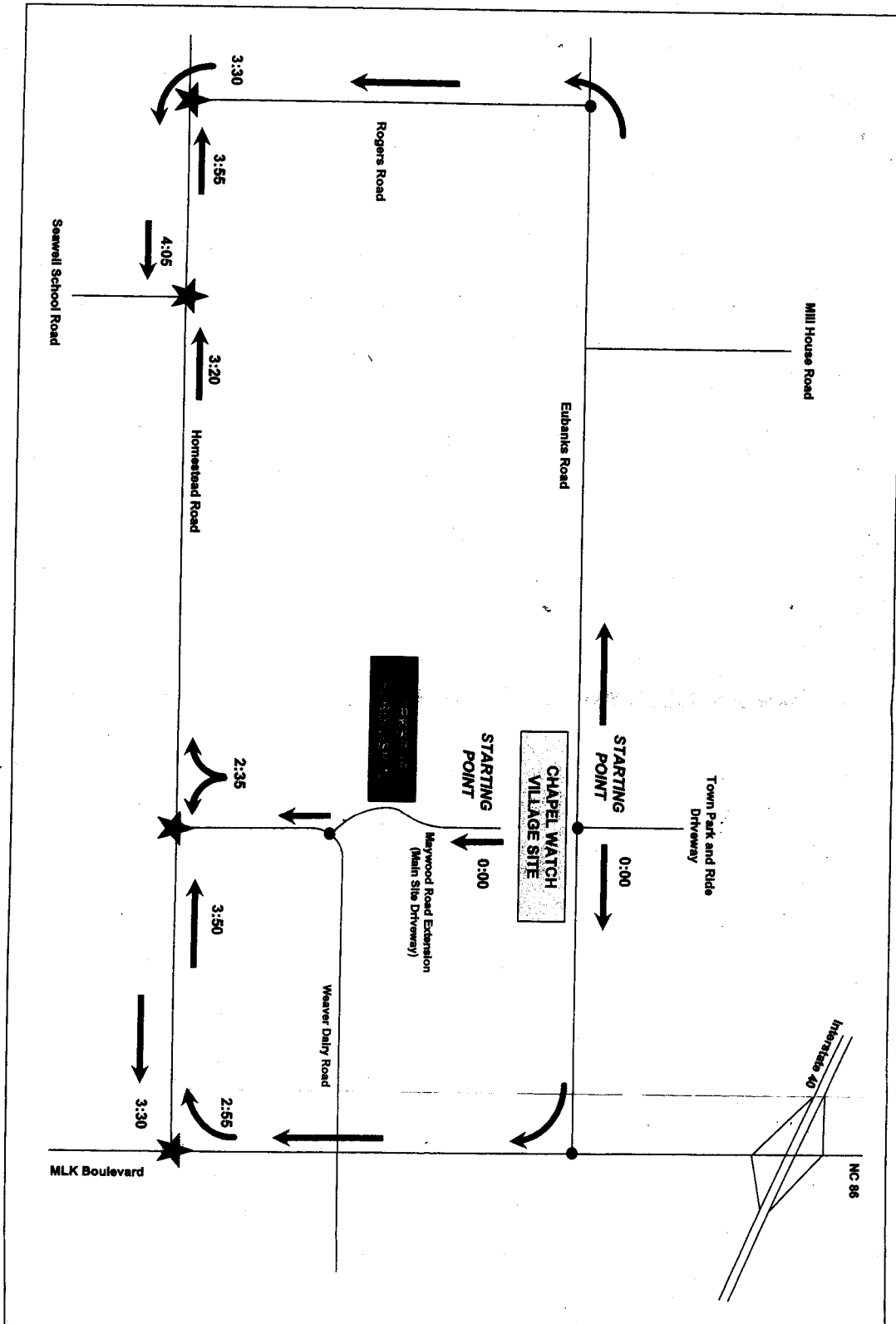


Figure ES-3  
**HNTB**

Chapel Watch Village  
Cut-Through Traffic Analysis  
AM Peak Travel Time Data

CHAPEL WATCH VILLAGE  
Traffic Impact Study Reanalysis

Not to Scale

