

TRAFFIC IMPACT ANALYSIS SUMMARY

FOR THE

PROPOSED ORANGE UNITED METHODIST CHURCH EXPANSION



Prepared For
Town of Chapel Hill
Chapel Hill, North Carolina

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**TRAFFIC IMPACT ANALYSIS
PROPOSED ORANGE UNITED METHODIST CHURCH
CHAPEL HILL, NORTH CAROLINA**

A. SUMMARY

This document summarizes the results of the Traffic Impact Analysis (TIA) report performed for the Orange United Methodist Church in Chapel Hill, North Carolina.

1. Project Overview

The church expansion is proposed to be completed in three phases. Phase 1 of the expansion will be completed by 2010 and will consist of adding 660 seats to the existing sanctuary and 34 students to the existing daycare. Phase 2 of the expansion (which includes Phase 1) will be completed by 2014 and will consist of an Administration/Worship Support Building. Phase 3 of the expansion will be completed by 2018 and will consist of the Family Life Center. The purpose of this study is to determine the potential impact on the surrounding transportation system created by traffic generated by the proposed Orange United Methodist Church expansion as well as recommend improvements to mitigate the impacts. In order to accomplish this objective, this study analyzes existing (2006) traffic conditions, future (2019) traffic conditions without the proposed expansion but including adjacent development traffic, and future (2019) traffic conditions with adjacent development and the church expansion during the weekday AM, mid-day, and PM peak hours and the Sunday mid-day peak hours.

2. Study Area

Orange United Methodist Church is located at the intersection of NC 86 (Martin Luther King Jr. Boulevard) and Homestead Road in Chapel Hill, North Carolina. Refer to Figure S-1 for the site location map. The scope of this project was developed through coordination with the Town of Chapel Hill and consists of the following intersections:

- 1) NC 86 and Homestead Road (signalized)
- 2) NC 86 and the Church Exit Driveway (unsignalized)

3. Site Traffic Generation

Average weekday daily, AM peak hour, mid-day peak hour, PM peak hour, and Sunday mid-day peak hour trips for Phase 1 of the proposed expansion were calculated utilizing methodology contained within the ITE *Trip Generation Manual*, 7th Edition. Engineering judgment was used to determine that the Church (560) land use and the Daycare (565) land use would most accurately represent the trip generation of the proposed additions to the Orange United Methodist Church facility. A detailed breakdown of the trip generation results can be found in Table S-1.

**Table S-1
Trip Generation**

ITE Land Use (Code)	Density	Daily Trips (vpd)	Sunday Daily Trips (vpd)	AM Peak Hour (vph)		Mid-day Peak Hour (vph)		PM Peak Hour (vph)		Sunday Mid-day Peak Hour (vph)	
				Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
Church (560) Phase 1	660 Seats	0	1,010	0	0	0	0	0	0	218	198
Daycare (565) Phase 1	34 Students	152	0	14	13	14	14	13	15	0	0

The Administration/Worship Support Center that is proposed to be built in Phase 2 and the Family Life Center that is proposed to be built in Phase 3 traffic will be used primarily by the daycare students, the existing administrative staff, and the church congregants; thus engineering judgment was used to determine that the traffic generated by these improvements is accounted for in the traffic generated by the improvements in Phase 1. Also, the ITE Trip Generation manual does not provide mid-day peak hour traffic for the Church land use or the Daycare land use. For this study, mid-day trips were assumed to be equal to total PM peak hour trips, with 50% of the total entering and 50% exiting during the mid-day peak hour.

4. Access Analysis

Access to the site will be provided via one existing full access driveway and one existing exit only driveway on NC 86 (Martin Luther King Jr. Boulevard). These driveways are expected to provide adequate access for this expansion.

5. Intersection Analysis

A traffic signal exists at the intersection of the NC 86 and Homestead Road/Site Driveway. Analysis indicates that the intersection will operate at a LOS D or better in the weekday AM, and mid-day peak hours and the Sunday mid-day peak hour with and without the church expansion. In the weekday PM peak hour the intersection operates at a LOS F with and without the build out of the site. The expansion of the church facility will generate few trips at this intersection during the weekday PM peak hour and is not expected to have a significant impact on traffic operations in the study area.

Crash data were requested from NCDOT for the intersection of NC 86 and Homestead Road for a distance of 300 feet on each approach. According to accident data obtained from the NCDOT's Traffic Safety Systems Management Unit, a total of 27 crashes at the

intersection of NC 86 and Homestead Road between February 1, 2003 and January 31, 2006. No serious injuries were involved in any crashes.

As indicated in the crash analysis report, 27 crashes occurred over a three-year period at the intersection of NC 86 and Homestead Road. It should be noted that this analysis includes crashes that occurred within 300 feet of the approaches along NC 86 and Homestead Road. Since this roadway segment is short and includes a major intersection, it would not be accurate to compare crash rates with statewide averages. Further, an analysis of the crash data does not indicate a significant safety problem exists at the intersection of NC 86 and Homestead Road in the study area.

6. Peak Hour Intersection Levels of Service

This study included three (3) separate analysis scenarios; existing (2006) traffic conditions, future (2019) traffic conditions without the proposed expansion but including adjacent development traffic, and future (2019) traffic conditions with adjacent development and the church expansion during the weekday AM, mid-day, PM peak hours and the Sunday mid-day peak hour. Based on information provided by the Town of Chapel Hill, several adjacent developments will impact study intersections. The following developments were included in the study: Rusch Road Subdivision, Avalon Park, Larkspur Subdivision, Northwoods V Phase 3, The Homestead Development, The Orange County Senior Center, and The Aquatics Center. All traffic generated by these adjacent developments was included in the future (2019) traffic conditions. Refer to Table S-2 for peak hour analysis results for existing (2006) traffic conditions, future (2019) traffic conditions without the proposed development, and future (2019) traffic conditions with the proposed development.

Analysis indicates that the intersection of NC 86 and Homestead Road will operate at LOS D or better in the weekday AM and mid-day peak hours, a LOS D in the Sunday mid-day peak hour, and a LOS F in the weekday PM peak hour. In addition, all approaches at this intersection are expected to operate at LOS D or better. The calculated 95th percentile queues for the eastbound left turning movement in the weekday AM peak hour will exceed the current left turn storage. The northbound left turning movement and the southbound left turning movement queues in the weekday PM peak hour will exceed the current storage as well.

Analysis indicates that the minor street approach at the intersections of NC 86 and the unsignalized driveway will operate at LOS F or better during the weekday AM, mid-day, and PM peak hours, and the Sunday mid-day peak hour under future (2019) conditions with expansion traffic. These levels of service are due to the high volumes of traffic on NC 86 and not site generated traffic.

7. Pedestrian and Bicycle Analysis

Based on observations in the field, sections of sidewalk exist on the north and south sides of Homestead Road, the west side of NC 86, and along the existing site frontage. No additional sidewalk is recommended.

Currently, bicycle lanes exist on the east and west sides of NC 86 north of Homestead Road within the vicinity of the site. No additional bicycle lanes are recommended as a result of this project.

8. Public Transportation Analysis

Based on information obtained during field reconnaissance by RKA, there are multiple bus stops located within the study area. Specifically, two bus stops are located along Homestead Road (one on the north side and one on the south side) and two bus stops are located along Airport Road (one on the east side and one on the west side) near the intersection of Homestead Road and Airport Road. Based on information received from the Town of Chapel Hill, the A Route, T Route, and N/S Express Route access one or more of these bus stops.

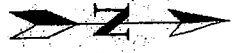
9. Special Analysis/Issues

As requested by the Town of Chapel Hill, a long-term link analysis was conducted for NC 86 and Homestead Road for the year 2025. Based Florida DOT guidelines, capacity for a four-lane undivided road in an "area transitioning into urbanized area" is 34,200 vpd. The estimated 2006 ADT based upon traffic counts completed for this study is approximately 35,000 vpd. Assuming a 3% compound annual growth rate, the year 2025 ADT will be approximately 61,300 vpd. The church expansion will add a minimal number of trips to the roadways and is not expected to have a significant on the long term operations of NC 86.

Based Florida DOT guidelines, capacity for a two-lane undivided road in an "area transitioning into urbanized area" is 13,600 vpd. The estimated 2006 ADT based upon traffic counts completed for this study is approximately 12,020 vpd. Assuming a 3% compound annual growth rate, the year 2025 ADT will be approximately 21,100 vpd. The church expansion will add a minimal number of trips to the roadways and is not expected to have a significant on the long term operations of Homestead Road.

10. Mitigation Measures/Recommendations

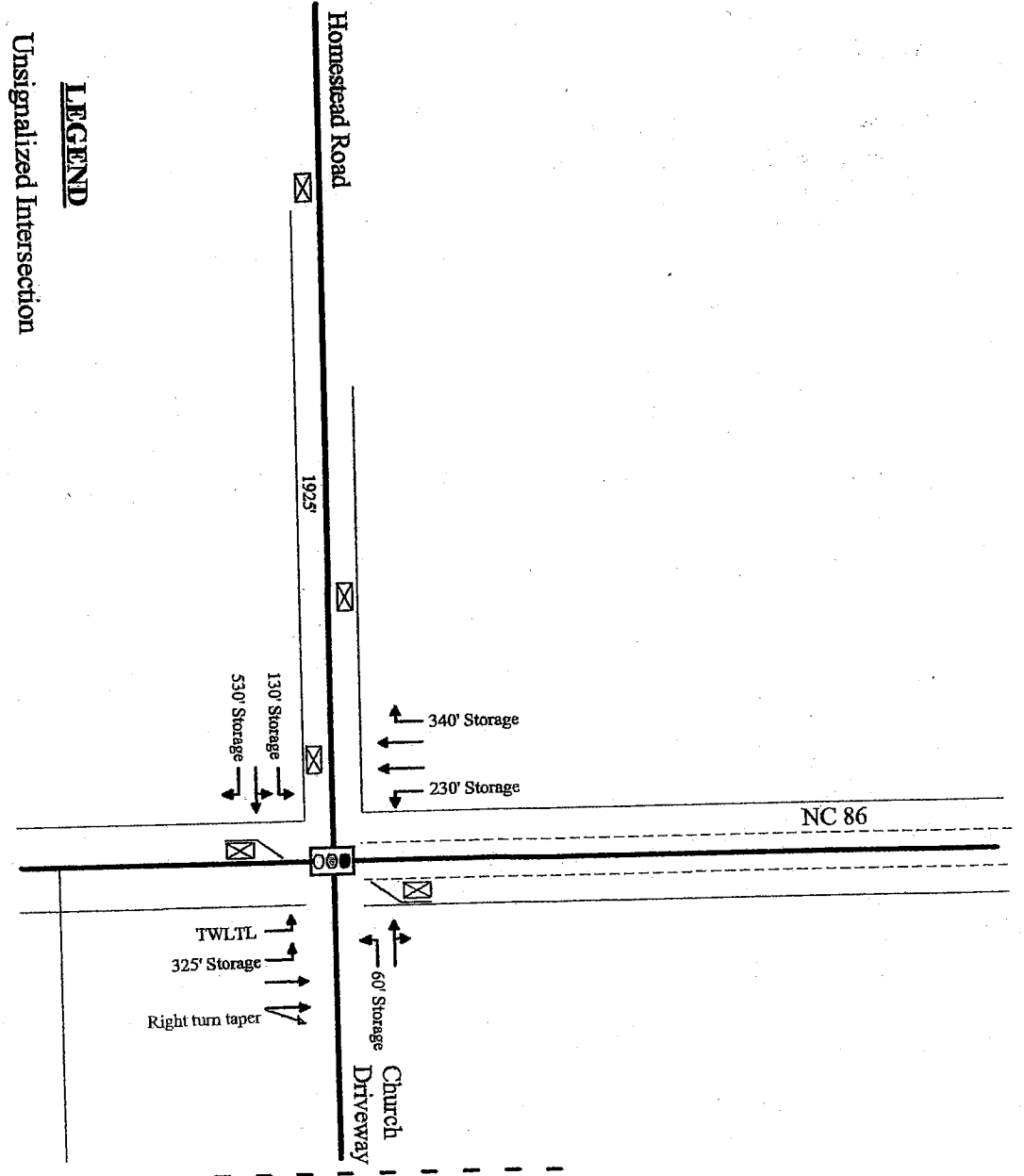
Refer to Figure S-3 for an illustration of improvements. Since traffic volumes are expected to continue to increase in the future, it would be beneficial to provide a right turn taper on the northbound approach of NC 86 at the signalized Main Church Driveway to remove right turning vehicles from the through lanes. A long right turn lane is not necessary since the right turn volume is relatively low and northbound through queues at the intersection would extend beyond the storage for the right turn lane. The taper would be beneficial during green times for the northbound through lanes and would prevent delays for northbound through vehicles.



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- Unsignalized Intersection
- ⊞ Signalized Intersection
- Existing Lane Configuration
- ⇄ Recommended Improvement
- Side Walk
- - - Bike Lane
- ⊞ Bus Stop

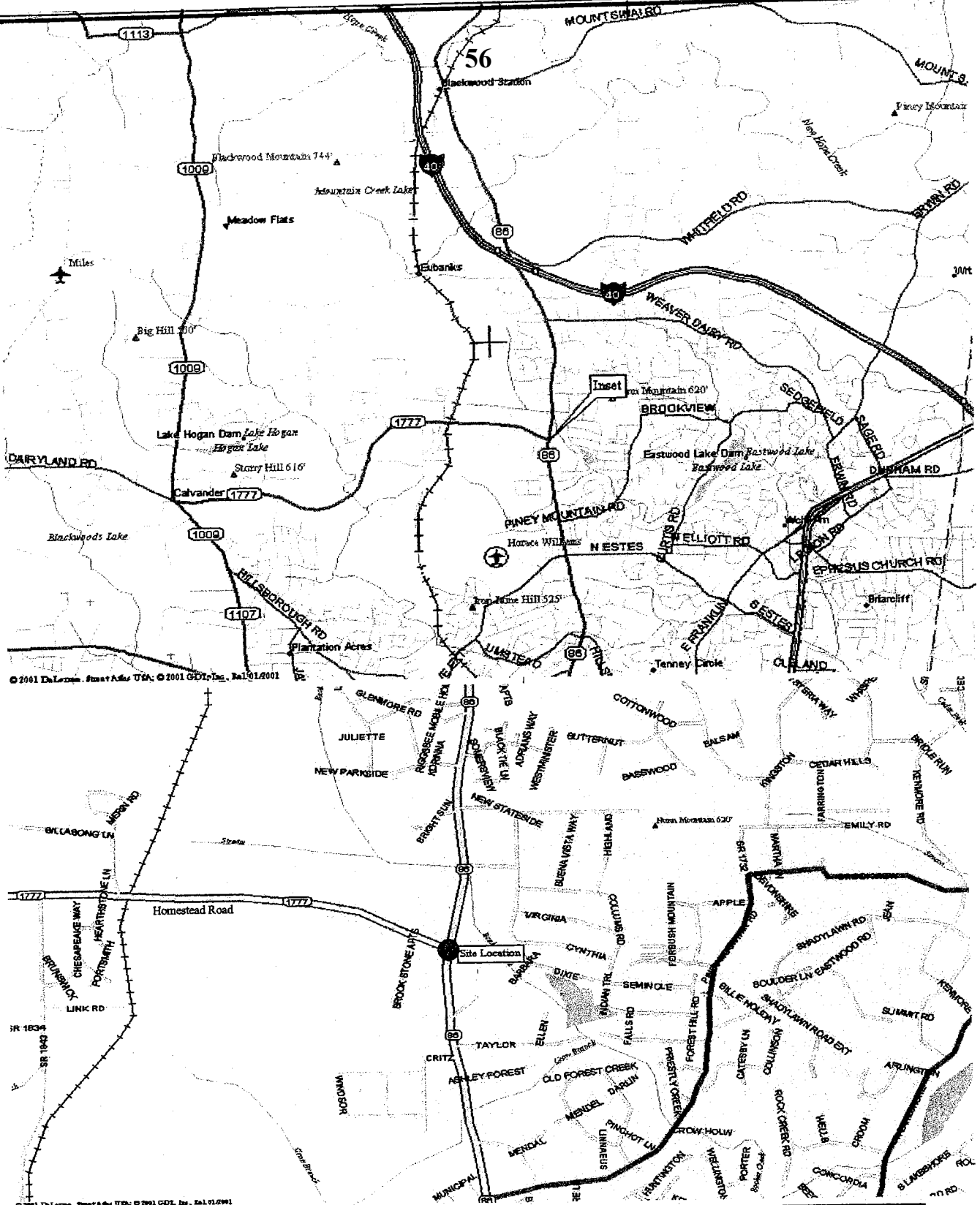
LEGEND



S I T E

PROPOSED CHURCH EXPANSION
CHAPEL HILL, NORTH CAROLINA
RECOMMENDED LANE CONFIGURATIONS

SCALE: Not to Scale	Figure S-3
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**PROPOSED CHURCH EXPANSION
CHAPEL HILL, NORTH CAROLINA**

Site Location Map

SCALE: Not to Scale	Figure 1
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LEGEND

- Off-site Study Intersections

average weekday, this site is not expected to have a significant on the long term outlook of NC 86.

Based Florida DOT guidelines, capacity for a two-lane undivided road in an "area transitioning into urbanized area" is 13,600 vpd. The estimated 2006 ADT based upon traffic counts completed for this study is approximately 12,020 vpd. Assuming a 3% compound annual growth rate, the year 2025 ADT will be approximately 21,100 vpd. With the only approximately 10 site trips utilizing Homestead Road on an average weekday, this site is not expected to have a significant on the long term outlook of Homestead Road.

8. RECOMMENDATIONS

Based on the findings of this study, the following improvements are recommended at study intersections to achieve a desirable level of operation. Refer to Figure 17 for an illustration of improvements.

NC 86 and Church Main Driveway

- Construct a northbound right-turn taper along NC 86.