UNC HOSPITALS CLINICAL BUILDING

TRAFFIC IMPACT STUDY

EXECUTIVE SUMMARY

Prepared for:

The Town of Chapel Hill
Engineering Department

Prepared by:

HNTB North Carolina, PC

343 East Six Forks Road
Suite 200
Raleigh, NC 27609

June, 2006

NORTH CAROLINA PROFESSIONAL SEAL 026910 ENGINEER CRAIG R SCHEFFLER

6-1-06

EXECUTIVE SUMMARY

Project Overview

UNC Hospitals is proposing to construct a new clinical facility in Chapel Hill located on the southwest corner of N.C. Highway 54 (Raleigh Road) and Finley Golf Course Road. The development will consist of 30,000 square feet of medical/office facilities and provide 117 surface parking spaces. The development is to replace the existing Aurora Restaurant. **Figure ES-1** shows the general location of the site. The project is anticipated to be complete by late 2009. This report analyzes the full build-out scenario for the year 2010 (one year after full buildout), the no-build scenario for 2010, as well as 2006 existing year traffic conditions.

The proposed development plans show direct, full movement access to Finley Golf Course Road. An existing driveway along N.C. 54 is to be eliminated for this project. Most site-related traffic will use Finley Golf Course Road and N.C. 54 for access to locations external to the study area. **Figure ES-2** displays the preliminary site plans for the proposed UNC Hospitals Clinical Facility and nearby roadways.

Existing and Future Conditions

Study Area

This report analyzes and presents the transportation impacts that the UNC Hospitals site will have on the following intersections along N.C. 54 (Raleigh Road), west to east:

- N.C. 54 and S. Hamilton Road
- N.C. 54 and Burning Tree Drive/Finley Golf Course Road
- N.C. 54 and W. Barbee Chapel Road/Commercial Driveway

The study area also includes the future intersection of Finley Golf Course Road and UNC Hospitals Clinical Facility Site Driveway (Full Access) and the upstream intersection of Finley Golf Course Road and Prestwick Road.

The impacts of the proposed site at the study area intersections will be evaluated during the AM, noon, and PM peak hours of a typical weekday. The following study is based on background traffic for the existing year, 2006, and the year following the estimated site build out year of 2009, as well as the estimated site-generated traffic produced by the commercial development. There are no major transportation network changes planned for the project study area by NCDOT or the Town of Chapel Hill.

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 tripmaking were conducted for this study. Trip reductions of 5 % for transit were accounted for due to the proximity of the proposed site to multiple transit routes along N.C. 54 serving the downtown area and the UNC Campus.

Table ES-1
Vehicle Trip Generation Summary
Proposed UNC Hospitals Clinical Facility

Scenario	Development Density	Generation Rate (per 1000ft)	% Traffic Entering	% Traffic Exiting	TRIPS		Trips Generated
					IN	OUT	
Daily Traffic	30,000 sq ft	36.13	50%	50%	542	542	1084
AM Peak	30,000 sq ft	2.50	79%	21%	59	16	75
Noon Peak	30,000 sq ft	3.13*	48%	52%	45*	49*	94*
PM Peak	30,000 sq ft	3.73	27%	73%	30	82	112

* - No ITE data available, represents an estimate of the average of the AM and PM data

Background Traffic

There is one adjacent future development – University Village - that Town of Chapel Hill staff desired to include as an approved background traffic generator. This project is located immediately to the west of the UNC Hospitals site. There is a concurrent traffic impact study ongoing for University Village that data was taken from. It was conservatively assumed that the University Village site would be complete and fully operational by the 2010 analysis year, though its own estimated build out year is 2011. An ambient area-wide traffic growth percentage of two percent per year was applied to existing traffic volumes based on information from the NCDOT Traffic Surveys Unit and the Town of Chapel Hill Planning Department.

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 2010 background traffic volumes, no existing study area intersections will experience overall deficient traffic operations. Existing operational deficiencies occur for individual turning movements at the N.C. 54 and Burning Tree Lane/Finley Golf Course Road intersection, but will be mitigated by proposed improvements from the University Village development. 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** below.

Table ES-3 LOS and Delay Summary

Intersections	Time Period	2006 Existing		2010 No-Build		2010 Build		2010 Mitigated	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
N.C. 54 and S. Hamilton Road	AM	8.9	A	9.8	A	9.9	A	N/A	N/A
	NOON	8.5	A	9.7	A	9.7	A	N/A	N/A
	PM	10.4	B	13.9	B	13.8	B	N/A	N/A
N.C. 54 and Burning Tree Drive /Finley Golf Course Road	AM	16.6	B	22.8	B	23.4	B	N/A	N/A
	NOON	12.5	B	17.8	B	18.8	B	N/A	N/A
	PM	18.4	B	23.1	C	25.0	C	N/A	N/A
N.C. 54 and W. Barbee Chapel Road/ Commercial Driveway	AM	6.7	A	12.5	A	12.6	A	N/A	N/A
	NOON	5.7	A	8.9	A	9.0	A	N/A	N/A
	PM	7.0	B	13.4	B	13.6	B	N/A	N/A
Finley Golf Course Road and Site Driveway	AM	N/A	N/A	10.6	B	11.9	B	N/A	N/A
	NOON	N/A	N/A	10.5	B	12.5	B	N/A	N/A
	PM	N/A	N/A	11.4	B	14.9	B	N/A	N/A
Finley Golf Course Road and Prestwick Road	AM	9.3	A	10.6	B	10.7	B	N/A	N/A
	NOON	8.9	A	10.3	A	10.3	A	N/A	N/A
	PM	9.6	A	11.7	B	11.8	B	N/A	N/A

N/A – Not Applicable or No Improvements Necessary

Access Analysis

Vehicular site access is to be accommodated via one primary site driveway connecting to Finley Golf Course Road. The proposed driveway throat length, as shown on the proposed site development plans, is over 60 feet from the projected stop bar to internal parking stalls and aisles and should be adequate for the driveway access to Finley Golf Course Road for projected 2010 with site traffic conditions. On-site vehicle queuing will be able to be stored in the driveway throat, since the estimated AM, noon, and PM peak hour delays are not excessive for vehicles exiting the driveway.

Additional internal driveway connections to an existing office development to the south and the proposed University Village project to the west enhance local trip-making options and provide additional routes if, for instance, a crash were to block Finley Golf Course Road in the project vicinity. An existing right-turn in/right-turn out driveway access point along N.C. 54 is eliminated in the site plan. This is a positive improvement that would remove conflict points at this driveway from the busier N.C. 54 eastbound roadway.

Driveway distances from the signalized intersection at N.C. 54 and Finley Golf Course Road 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 2003 *Town of Chapel Hill Design Manual*. The Town Design Manual recommends 250 foot minimum spacing between an intersection and driveway along an arterial, not an issue with no direct access being proposed along N.C 54 and the proposed driveway located approximately 300 feet upstream of N.C. 54. In general, given the location of the site parking lot, the proposed access points should, from an operations and safety standpoint, work acceptably. Internal circulation is well designed on the site plan. The building is sited near the N.C. 54 frontage, leaving a large internal area to accommodate vehicular parking, loading operations and internal driveway circulation and connections.

Access for pedestrians and bicyclists is currently acceptable. There is good sidewalk connectivity, at least along N.C. 54 up to the site parcel itself. Bicycle access is possible to and from the site using N.C. 54 and any of the collector and 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)*. A warrant often satisfied from the MUTCD methodology is the Peak Hour Warrant, which would have comparable data collected from this study. Based on Figure 4C-4 from the *MUTCD 2003*, no study area intersection with the additional UNC Hospitals Clinical Facility 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 driveway would be minimal. Sight distance along N.C. 54 is adequate, with no horizontal and little vertical curvature present in the study area. Sight distances along Finley Golf Course Road are slightly reduced by the horizontal curvature of the road near the site driveway, although no major problems should ensue, particularly because traffic is slowing as it approaches the busy N.C. 54 intersection. No additional limitations or problems due to the site development or site traffic impacts on drivers' sight distance are expected at study area intersections.

Intersection Crash Analysis
Data from the Town of Chapel Hill Police Department was provided for the period 3/1/2003 to 2/28/2006 for the study area intersections. Crash information for the N.C. 54 and Hamilton Road intersection exhibits an excessive trend for rear-end crashes along eastbound N.C. 54, potentially attributable to congested traffic operations and continued weaving from the U.S. 15-501/N.C. 54 interchange through two site driveway exits for commercial properties in the Glen Lennox Shopping Center. 61 total crashes that were recorded at the intersection between early 2003 and early 2006. There were 22 crashes at the Burning Tree Lane and Finley Golf Course Road intersection with N.C. 54 over the 3 year period, with most of these occurring in the through lanes of N.C. 54. There were 29 crashes at the intersection of West Barbee Chapel Road and N.C.

54 over the study period. Almost 2/3 of these collisions occurred as rear-end events along N.C. 54, where the speed limit is 45 miles per hour.

Overall, the number and severity of crashes at study area intersections are average compared to other intersections in the Town of Chapel Hill, except at Hamilton Road, where the three year data indicates that crashes are higher than the average for comparable intersections around town. Most of the crashes are rear-end, sideswipe, and angle collisions due to the high volume of traffic in the area, and the delays and congested conditions that may result from that traffic volume during the peak travel hours.

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** below, are germane to this study.

Table ES-4. Other Transportation-Related Analyses

Analysis	Comment
Generalized Peak Hour and/or Daily LOS Analysis	Planning-level corridor LOS Analyses indicate that N.C. 54 currently has adequate daily capacity in the section within the project study area. Future traffic growth on N.C. 54 (little of which is directly due to this site development) is expected to, by 2030 cause the roadway to operate over capacity.
Signal Phasing Analysis	Signal phasing for existing/future conditions produces adequate traffic operations at the signalized intersections under study.
Progression Analysis	Signals in the study area are part of the Town's signal system and coordination of these signals provides orderly traffic flow upstream and downstream of the proposed site. Signal timing plans are adjusted for each peak period under study.
Turn Lane Storage Requirements	Storage lengths for existing turning bays on N.C. 54 are currently adequate. However, increases in turning traffic due to the University Village necessitate lengthening storage bays for these movements to prevent queue spillback into the through travel lanes.
Appropriateness of Acceleration/ Deceleration Lanes	Given the proposed configuration of site driveway, the lane geometrics and traffic patterns and posted speeds on Finley Golf Course Road, no special acceleration or deceleration lanes are required due to the proposed UNC Hospitals development.
Pedestrian and Bicycle Analysis	Existing pedestrian access and connectivity is excellent through the study area, except immediately along site property. Exclusive ped/bike paths exist just to the east of the site location.
Public Transportation Analysis	Public transportation service to the site is excellent, with on-street bus stops within walking distance to the sites and multiple routes serving the study area.

Mitigation Measures/Recommendations

Planned Improvements

The Town of Chapel Hill and the North Carolina Department of Transportation are not expected to make any significant transportation improvements to the project study area within the design year time frame of 2006-2010.

Background Committed Improvements

No background improvements are committed by other area project developments already approved by the Town of Chapel Hill or currently under construction other than the University Village project improving the Prestwick Road cross section to the south and west of the UNC Hospitals site.

There are necessary improvements recommended in the concurrent University Village Traffic Impact Study that would lengthen left-turn storage bays on N.C. 54 at the Finley Golf Course Road intersection as well as provide painted crosswalks and pedestrian signal heads for all four approaches. In addition, the University Village study recommended widening Finley Golf Course Road to a three-lane cross section from N.C. 54 to Prestwick Road with a continuous center left-turn lane. This would allow the separation of left-turns into the UNC Hospitals site driveway and Prestwick Road for northbound traffic, and would permit an exclusive left-turn lane and shared through/right-turn lane at the northbound N.C. 54/Finley Golf Course Road intersection approach. These improvements were assumed to be complete for the analysis of the UNC Hospitals site. The proposed University Village background improvements are shown in **Figure ES-3**.

Applicant Committed Improvements

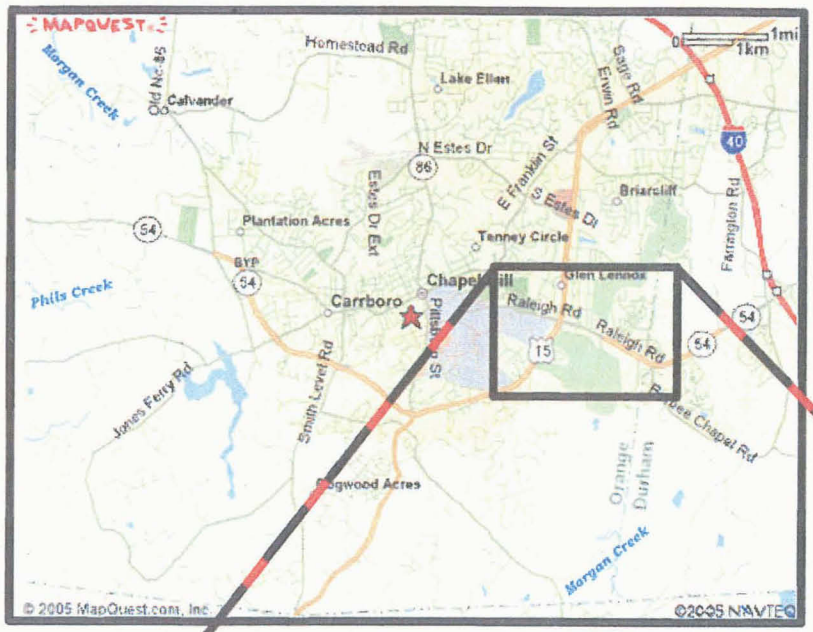
Based on the concept plan provided, there are no transportation-related improvements to be made external to the site property. The concept plan provided shows the driveway connection to Finley Golf Course Road, as well as internal driveway connections to office buildings to the south of the development and the proposed University Village project. Surface parking lot spaces and aisles are delineated and a bike rack is also shown. The driveway connection to Finley Golf Course Road has no pavement marking identifications, but appears to be of adequate width for one entering and one exit lane.

Necessary Improvements

No additional external roadway improvements for intersections in the project study area are necessary to due to the addition of ambient growth and/or site traffic impacts that are not part of the proposed background University Village improvements. However, the lack of existing sidewalk connectivity at the existing site should be addressed by provision for sidewalk along the N.C. 54 and Finley Golf Course Road site frontage. Sidewalk width and design should meet Town of Chapel Hill Engineering design standards. This improvement will provide a key link between the paved ped/bike paths in Meadowmont and existing sidewalk (with bus stop access) along the south side of N.C. 54. This improvement is shown in **Figure ES-3.**

LEGEND

- Existing Intersections
- Proposed Site Driveways
- SITE — UNC Site



UNC Hospitals Clinical Facility Traffic Impact Study

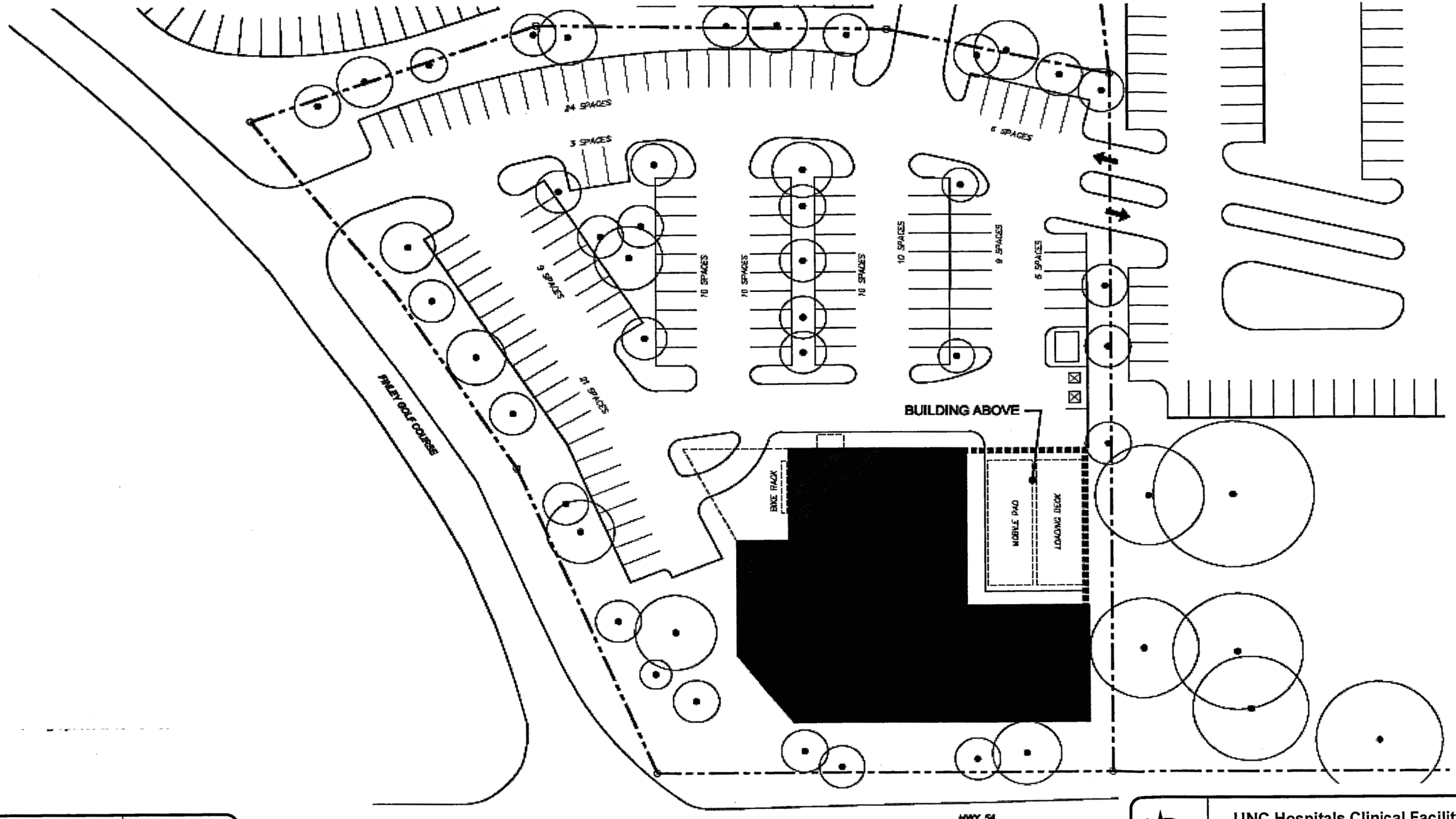
SITE LOCATION MAP

NOT TO SCALE

DATE: June, 2006

FIGURE ES-1

HNTB



HNTB

TOWN OF CHAPEL HILL

N

UNC Hospitals Clinical Facility Traffic Impact Study

PRELIMINARY SITE PLAN

DATE: June, 2006

NOT TO SCALE

FIGURE ES-2

LEGEND

Necessary Improvement

Background Improvement

Hamilton Road

Burning Tree Drive

W. Barbee Chapel Road

NC 54

Provide Crosswalk and Pedestrian Signal Heads at all 4 Intersection Approaches

Construct Continuous Sidewalk along Site Frontage

Lengthen Existing Left-Turn Bay to 250'

Lengthen Existing Left-Turn Bay to 250'

Widen Existing Roadway to 3-Lane Section

UNC Hospitals Clinical Facility

Site Driveway

STOP

Commercial Driveway

Prestwick Road

STOP

Finley Golf Course Road

N

NOT TO SCALE

UNC Hospitals Clinical Facility Traffic Impact Study

2010 Study Area Improvements

DATE: June, 2006

FIGURE ES-3