

The University of North Carolina at Chapel Hill

Development Plan Modification No.2

TRANSPORTATION IMPACT ANALYSIS

EXECUTIVE SUMMARY

(Updated May 3, 2004)

The University of North Carolina at Chapel Hill is requesting modifications to the Development Plan that was approved by the Town of Chapel Hill in 2001. As part of the approval process for the original Plan, a Transportation Impact Analysis (TIA) was submitted to the Town in July 2001 in accordance with the requirements of the Town's Office/Institutional-4 (OI-4) Zoning District regulations. Updates to the TIA, titled *Transportation Impact Analysis and Transportation Management Plan*, were subsequently submitted in January 2002 and January 2004.

The University was requested by the Town staff to submit a traffic assessment of the proposed modifications to the Development Plan (referred to as Modification #2). The primary change that affects transportation is the elimination of one planned parking deck that was in the Development Plan, and the relocation of this parking to another parking deck already in the Development Plan.

This report provides an analysis of the traffic changes associated with the modifications. There will be no overall increase in traffic, however, traffic patterns at some intersections will be altered. The parking demand and Main Campus parking shortfalls associated with the campus growth have not changed.

The parking changes consist of:

- Elimination of the proposed Science Complex Phase II (Venable Hall) parking deck (600 employee spaces) on the north side of South Road.
- Addition of 600 employee spaces to the planned Bell Tower parking deck on the south side of South Road (already included in the approved Development Plan), increasing the deck size from 1,000 to 1,600 spaces.

The following table summarizes the modifications to the Bell Tower and Venable Deck parking facilities by type of user, and also summarizes the net change in trips generated by these parking areas.

January 2004 Update - Trip Generation for Parking Facilities

Parking Facility	User Type	Spaces			Change in Trips				
		Existing	Future	Change	AM In	AM Out	PM In	PM Out	Daily
Venable Deck	Employee	0	600	600	218	41	79	181	2,161
Bell Tower Deck	Employee	459	1,000	541	196	37	71	163	1,948
Total		459	1,600	1,141	414	78	150	344	4,109

Modification No. 2 - Trip Generation for Parking Facilities

Parking Facility	User Type	Spaces			Change in Trips				
		Existing	Future	Change	AM In	AM Out	PM In	PM Out	Daily
Venable Deck	Employee	0	0	0	0	0	0	0	0
Bell Tower Deck	Employee	459	1,600	1,141	414	79	150	344	4,109
Total		459	1,600	1,141	414	79	150	344	4,109

The table below summarizes the total trips for the UNC-CH Development Plan Update dated January 2004, and Development Plan Modification No. 2. There is no change in the total number of trips.

Total Parking Space Modifications and Trip Generation

	Parking Totals (spaces)	AM In (trips)	AM Out (trips)	PM In (trips)	PM Out (trips)	Daily Trips (ADT)
Development Plan Totals	1,550	848	228	459	729	10,525
Modification Totals	1,550	848	228	459	729	10,525
Total Changes	0	0	0	0	0	0

Traffic Impacts

The traffic analysis was undertaken by applying the same techniques, model, and assumptions used in the January 2004 TIA Update. Only intersections on the Main Campus and Downtown were reanalyzed for these modifications. In addition to the 36 intersections on the Main Campus and Downtown Chapel Hill analyzed in the January 2004 Update, two more intersections were added because they could potentially be affected by the parking changes or recent traffic circulation changes on the Main Campus (for a total of 38 intersections).

Levels of service have changed at some study area intersections between the January 2004 Update report and the Modification No. 2 report. There were actually some changes in Existing and No-Build levels of service (unrelated to the modification), primarily a result of:

- A new traffic circulation pattern for UNC Hospitals on Manning Drive (West Drive is now a two-way road, and new signal has been installed at Old East Drive which has been converted from a one-way entrance to a one-way exit).
- New counts on Manning Drive which show a reduction in traffic around the Hospitals.
- Adding the signalized intersections at Old East Drive/Manning Drive and South Road/Bell Tower to the road network.

With these modifications to the network, and a re-optimization of signal offsets, some of the intersections experienced a slightly better or worse level of service compared to the 2004 Update. The following tables show intersections that experience a level of service change for the Existing and No-Build conditions, as well as Build conditions.

Comparison of 2004 Update and Modification No. 2 Existing Levels of Service

ID #	Intersection	Control	Existing (2004) 2004 Update		Existing (2004) Mod #2	
			AM Peak	PM Peak	AM Peak	PM Peak
4	Merritt Mill Road/Cameron Avenue	Signalized	B (WB-D)	C (WB-C)	B (WB-E)	B (WB-C)
5	Cameron Avenue/Pittsboro Street	Signalized	A (EB-B)	B (EB-B)	B (EB-B)	B (WB-B)
9	Columbia Street/South Road	Signalized	C (WB-E)	C (WB-E)	C (WB-C)	D (WB-D)
12	Columbia Street/Manning Drive	Signalized	B (WB-D)	C (WB-D)	B (WB-C)	B (EB-C)
13	Manning Drive/West Drive	Signalized	A (SB-D)	B (SB-E)	A (SB-D)	A (SB-D)
14	Manning Drive/East Drive	Signalized	B (NB-C)	C (NB-D)	B (NB-C)	B (NB-D)
27	Franklin Street/Boundary Street	Signalized	B (SB-C)	C (SB-C)	B (SB-C)	B (SB-C)

Legend: X = Overall intersection level of service; (X) = worst movement level of service.

Comparison of 2004 Update and Modification No. 2 No-Build Levels of Service

ID #	Intersection	Control	No-Build (2010) 2004 Update		No-Build (2010) Mod #2	
			AM Peak	PM Peak	AM Peak	PM Peak
1	Columbia Street/Rosemary Street	Signalized	B (WB-D)	D (WB-F)	C (WB-D)	D (WB-F)
2	Columbia Street/Franklin Street	Signalized	C (WB-E)	D (EB-D)	D (EB-D)	D (SB-E)
4	Merritt Mill Road/Cameron Avenue	Signalized	B (WB-E)	D (WB-E)	B (WB-D)	C (WB-D)
5	Cameron Avenue/Pittsboro Street	Signalized	A (EB-B)	A (EB-B)	B (EB-B)	B (WB-B)
6	Cameron Avenue/Columbia Street	Signalized	C (WB-D)	E (SB-F)	C (WB-D)	F (WB-F)
8	Pittsboro Street/McCauley Street	Signalized	B (EB-C)	B (WB-B)	B (EB-C)	C (SB-D)
9	Columbia Street/South Road	Signalized	C (WB-C)	D (NB-D)	B (EB-C)	D (WB-E)
10	Raleigh Street/South Road	Signalized	A (SB-C)	A (SB-C)	B (SB-C)	B (SB-D)
23	Columbia St/Fordham Blvd (S. ramp)	Signalized	D (EB-F)	C (EB-D)	C (EB-D)	C (EB-E)
27	Franklin Street/Boundary Street	Signalized	B (SB-C)	C (SB-C)	B (SB-C)	B (SB-C)
33	Manning Drive/Craige Drive	Signalized	A (NB-D)	B (NB-E)	A (NB-D)	C (NB-E)

Legend: X = Overall intersection level of service; (X) = worst movement level of service.

Comparison of 2004 Update and Modification No. 2 Build Levels of Service

ID #	Intersection	Control	Build (2010) 2004 Update		Build (2010) Mod #2	
			AM Peak	PM Peak	AM Peak	PM Peak
1	Columbia Street/Rosemary Street	Signalized	B (WB-D)	D (WB-F)	C (WB-D)	D (WB-F)
3	Franklin Street/Raleigh Street	Signalized	B (EB-C)	D (NB-F)	C (EB-D)	C (NB-F)
5	Cameron Avenue/Pittsboro Street	Signalized	B (EB-B)	B (EB-C)	C (WB-C)	B (WB-B)
6	Cameron Avenue/Columbia Street	Signalized	D (SB-E)	F (SB-F)	E (SB-E)	F (SB-F)
7	Cameron Avenue/Raleigh Street	Signalized	D (EB-E)	E (EB-F)	C (WB-D)	D (EB-E)
8	Pittsboro Street/McCauley Street	Signalized	B (EB-B)	C (SB-C)	C (SB-C)	C (SB-D)
9	Columbia Street/South Road	Signalized	B (EB-D)	E (WB-F)	D (NB-D)	E (NB-F)
10	Raleigh Street/South Road	Signalized	A (SB-C)	B (SB-C)	C (SB-E)	B (SB-E)
12	Columbia Street/Manning Drive	Signalized	C (WB-E)	E (WB-F)	D (WB-F)	E (WB-F)
27	Franklin Street/Boundary Street	Signalized	B (SB-C)	B (SB-C)	B (SB-C)	C (SB-C)

Legend: X = Overall intersection level of service; (X) = worst movement level of service.

Since the only change in parking in Modification No. 2 is minor, basically involving moving 600 parking spaces across South Road, there is little change in level of service when compared to the January 2004 TIA Update. There were some minor fluctuations in traffic volumes along some campus streets, with percent changes ranging between minus five percent and plus three percent. Impacts and mitigation measures, where appropriate, are summarized below:

South Road/Bell Tower Drive

The level of service at this intersection dropped from LOS B to LOS C in the P.M. peak hour from Existing conditions to Build conditions. No geometric improvements are required at this location as a result of Modification No.2. Signal timing will be adjusted to accommodate the increase in vehicle trips entering and exiting the Bell Tower Drive.

Manning Drive/Craig Deck Drive

The level of service remains acceptable at this intersection and does not change under Build conditions for either the A.M. or P.M. peak hours from the January 2004 Update. No geometric improvements are required at this location as a result of Modification No.2. Signal timing will be adjusted to accommodate the increase in vehicle trips entering and exiting the Craig Deck Drive.

Cameron Avenue/S. Columbia Street

The level of service dropped from LOS D to LOS E in the A.M. peak hour and remains unchanged at F for the P.M. peak hour under Build conditions. However, due to physical constraints and the character of the area, geometric improvements are not recommended at this location.

South Road/S. Columbia Street

The level of service at this intersection is borderline LOS D/E in the P.M. peak hour under Build conditions. There is a slight increase in intersection delay of less than two seconds between the Modification No. 2 and January 2004 Update results. The same geometric improvements recommended in the January 2004 Update are recommended

for the Modification No. 2. These include the removal of the northbound right-turn slip lane, and re-striping the McCauley Street approach to accommodate an additional eastbound left-turn lane.

Mason Farm/New East Drive Intersection

Although this intersection continues to not warrant signalization and level of service is unchanged from the 2004 Update, the Town of Chapel Hill requested a comparison of level of service and intersection delay at Mason Farm Drive/New East Drive for all-way stop and signalized conditions. The table below summarizes the findings. The intersection continues to operate at an acceptable level of service under both types of traffic control.

Traffic Control Type	A.M. Peak Hour		P.M. Peak Hour	
	Level of Service	Control Delay	Level of Service	Control Delay
All-Way Stop	C	15.9 seconds	C	21.5 seconds
Signalized	B	13.7 seconds	A	5.8 seconds

Trip Reduction Strategies

The trip reduction strategies proposed to address the needs of University commuters, as described in the January 2004 TIA Update, have not changed as a result of the modifications. As reported in the January 2004 TIA Update, the trip reduction strategies implemented by the University thus far have been very effective in reducing traffic and diverting commuters to alternative modes of travel. The campus-wide traffic counts undertaken in fall 2003 (as reported in the January 2004 TIA Update) revealed that overall traffic volumes throughout the campus have decreased since the fall 2001 counts (published in the January 2002 update).

Some key trip reduction strategies that have been implemented in the last two years, many in conjunction with the Town, include:

- Introducing a fare-free system for Chapel Hill Transit, with significant financial support from the University. Transit ridership has significantly increased as a result. The total daily boardings in fall 2003 were approximately 23,500, a large increase over 2001.
- Other transit improvements, including:
 - More express service to the Friday Center/Hedrick Building area, the Airport Road complex (which includes the P and PR park-and-ride lots), and the Southern Village park-and-ride lot.
 - Extended hours of service to all park-and-ride lots until at least 8:00 P.M., and 10:00 P.M. at the Friday Center, NC 54, P and PR lots.
 - Increased evening service on weekdays and on weekends on the NU Route.

- Operating the U Route to later hours on weekends.
 - Increased midday service on the HU Route to 10-minute frequency.
 - Increased midday service on the S Route to 10-minute frequency.
 - Increased evening service on the CM Route (previously the C Route).
 - Service to the new Jones Ferry Road lot.
 - Service to the S11 Manning Drive lot for evening park-and-ride.
- The addition of over 1,300 park-and-ride spaces, and plans for another approximately 650 spaces in two lots over the next year or so. The total permanent need for the Development Plan has been largely met with construction of the 871-space Friday Center lot and the 435-space Jones Ferry Road lot. In addition, a 300-350 space lot is in design for the US 15-501 south corridor, and a 300-space lot is planned near the Hedrick Building (at the rear of the Friday Center complex).
 - Since 2002 there has been a 60 percent increase in the use of park-and-ride (over 1,000 spaces). In the NC 54 corridor from the east, the 871-space Friday Center lot which has been open for only a year is typically full at peak times (in addition to the original NC 54 lot which continues to fill).
 - The hiring of a full-time Transportation Demand Management (TDM) coordinator. The role of this person is to promote and assist employees in learning about and using alternative modes, as well as managing the Commuter Alternatives Program (CAP) which is a new incentive program designed to encourage University and Hospital employees and commuter students to use alternative transportation modes.
 - The introduction of four “Zipcars” in January 2004. These are cars that can be rented by the hour and are available 24/7 to staff and students who are at least 21, have good driving records, and need to run errands or make day trips. The purpose of the cars is to enhance the services provided to commuters not driving alone, and to make it feasible for people who have converted to alternative modes to make business or personal trips by car during the day. Zipcars are a new feature of the UNC Commuter Alternatives Program, which is designed to get people to leave their cars at home to reduce traffic and air pollution.

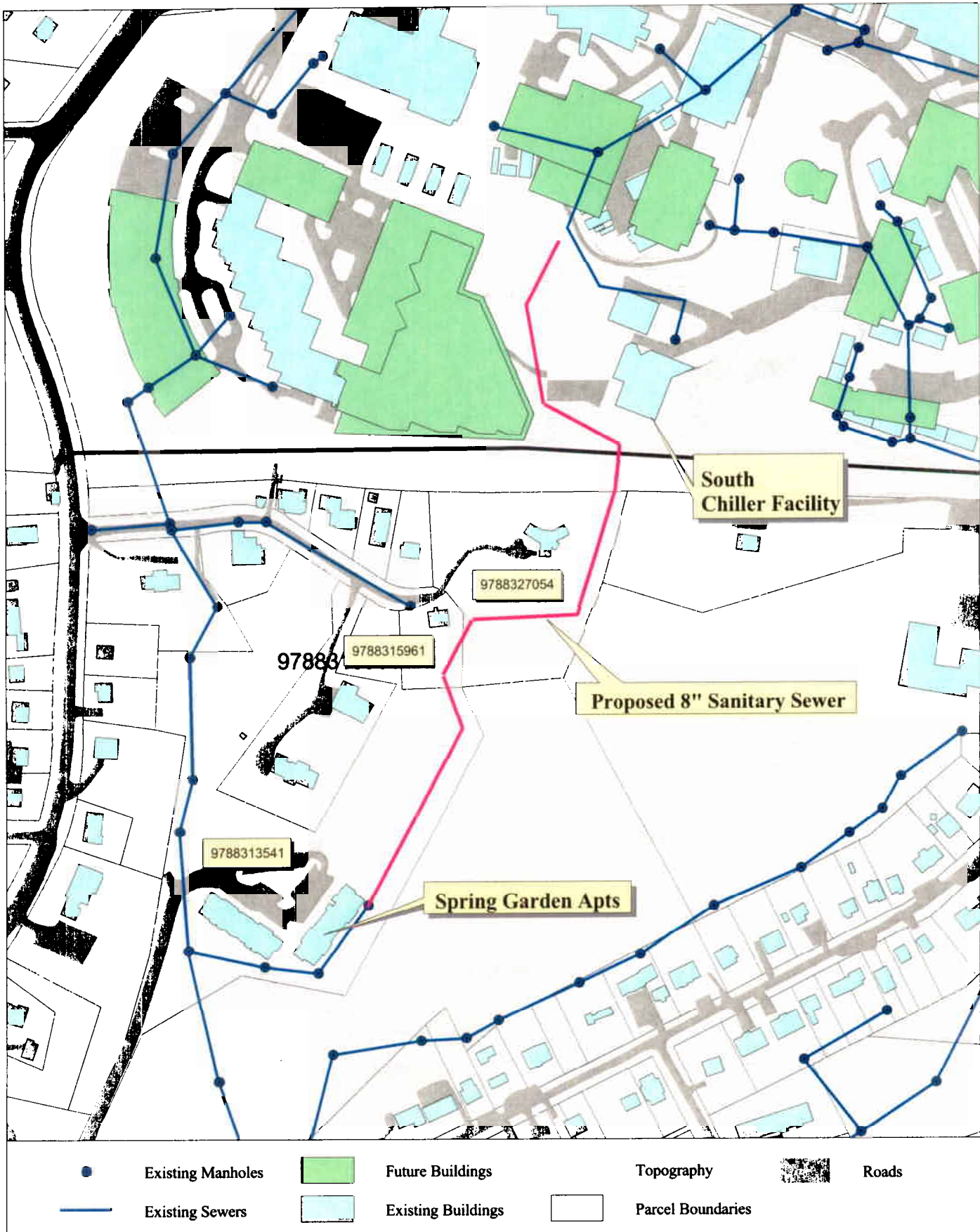


Figure 2. Recommended Route for South Campus Sanitary Sewer