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ATTACHMENT 16

SOUTHERN COMMUNITY PARK

TRAFFIC IMPACT STUDY

EXECUTIVE SUMMARY

US 15-501 and DOGWOOD ACRES DRIVE
THE TOWN OF CHAPEL HILL, NORTH CAROLINA



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EXECUTIVE SUMMARY

Project Overview

A new community park for the Town of Chapel Hill is being proposed for construction near the southern boundary of the Town to the west of US 15-501 and just south of the Southern Village community. Southern Community Park plans consist of a large, multi-use complex that encompasses over 65 acres. The park will feature active athletic areas and courts for basketball, roller hockey, bocci ball, soccer and disc golf. There will be open space for picnics, playgrounds and outdoor performances. Much of the park will remain wooded, with nature trails that connect to a central park greenway trail. Public parking and multimodal access will also be included in the design. The proposed park facility is located immediately to the south of the Town of Chapel Hill Park and Ride Lot in Southern Village. The project report analyzes the full build-out scenario for the year 2007 (one year after full buildout), the no-build scenario for 2007, as well as 2004 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.

Existing Conditions

Study Area

The preliminary project site plan provided for this analysis is shown in **Figure ES-1**. The site is located on over 65 acres of undeveloped land. The parcel is zoned Residential 1 (R-1) by the Town of Chapel Hill. Site traffic will use Dogwood Acres Drive and a direct access driveway to connect to US 15-501; a regional arterial facility that provides connectivity for site traffic with other areas of Chapel Hill and the Triangle.

This report analyzes and presents the transportation impacts that the Southern Community Park site will have on the following intersections in the project study area:

- US 15-501 and Main Street
- US 15-501 and Future Site Driveway
- US 15-501 and Dogwood Acres Drive
- Smith Level Road and Dogwood Acres Drive

All of the analyzed intersections currently serve study area traffic, except for the future site driveway. The intersection of US 15-501 and Main Street is currently signalized. The other intersections are unsignalized or will be in the analysis year of 2007. US 15-501 serves Chapel Hill as a regional arterial facility. Smith Level Road is an important minor arterial facility for residential and commercial areas in southwest Chapel Hill and Carrboro. Dogwood Acres Drive serves the study area as a collector street, providing access low density 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*, and adjusted to meet the noon and Saturday peak time periods for each trip generation type. Two generation types were used – County Park (Land Use Code 412) and Soccer Complex (Land Use Code 488). Little relevant data was available for the City Park land use type. The cumulative effect of the organized recreation at the three proposed soccer fields in addition to the overall general park usage should provide an accurate estimation of total trip making yields. It is recognized that the proposed on-site recycling center could generate additional trips during peak periods. However, field observation of an existing recycling facility at Cedar Ridge Park in north Chapel Hill noted little recycling activity during the p.m. peak hour. It is anticipated that recycling trip-making will be dispersed throughout both average weekdays and weekends.

Background Traffic

The Southern Community Park study area has two separate developments that will be complete and operational by the 2007 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 2007 without site and with site capacity analyses.

Table ES-2
2007 Background Traffic Generators

Background Development	Year of Traffic Study	Site Information	Total External Trips Generated			
			AM Peak	Noon Peak	PM Peak	Daily
Southern Village	1996 (revision)	Large, mixed use neo-traditional development analyzed as fully built out by 2002 (changes have yet to occur)	114*	139*	164*	1158*
Chancellor's View	2002	23 single-family homes and 32 duplex units between US 15-501 and Mount Carmel Church Road	32	20	41	408

* - Values represent remaining Village Core area not completed as of February 2004



Table ES-1
Weekday Vehicle Trip Generation Summary
Southern Community Park – Proposed Town Recreation Area

ITE Land Use Codes 412 (County Park) & 488 (Soccer Complex)

Noon Peak Trip Summary

Independent Variable	% Traffic Entering	% Traffic Exiting	TOTAL TRIPS		Total Trips Generated
			IN	OUT	
Park Acreage (66 acres) & Soccer Fields (3)	50%	50%	23	23	46
<i>- 10% Transit/Pedestrian/Bike Reduction</i>			-2	-2	-4
Noon Peak Vehicle Trips			21	21	42

PM Peak Trip Summary

Independent Variable	% Traffic Entering	% Traffic Exiting	TOTAL TRIPS		Total Trips Generated
			IN	OUT	
Park Acreage (66 acres) & Soccer Fields (3)	35%	65%	32	60	92
<i>- 10% Transit/Pedestrian/Bike Reduction</i>			-3	-6	-9
PM Peak Vehicle Trips			29	54	83

Weekend Peak Trip Summary

Independent Variable	% Traffic Entering	% Traffic Exiting	TOTAL TRIPS		Total Trips Generated
			IN	OUT	
Park Acreage (66 acres) & Soccer Fields (3)	48%	52%	91	99	190
<i>- 10% Transit/Pedestrian/Bike Reduction</i>			-9	-10	-19
Weekend Peak Vehicle Trips			82	89	171

Daily Trip Summary

Independent Variable	% Traffic Entering	% Traffic Exiting	TOTAL TRIPS		Total Trips Generated
			IN	OUT	
Park Acreage (66 acres)	50%	50%	75	75	150
Soccer Fields (3)	50%	50%	107	107	214
<i>- 10% Transit/Pedestrian/Bike Reduction</i>			-18	-18	-36
Daily Total Vehicle Trips			164	164	328



Impact Analysis

Peak Hour Intersection Level of Service

Even with the addition of Noon, PM, and weekend peak hour site-generated trips to the projected 2007 background traffic volumes, no study area intersections will experience peak period 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** below.

Table ES-3 LOS and Delay Summary

Southern Community Park

Intersections	Time Period	2003 Existing		2007 No-Build		2007 Build		2007 Mitigated	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
US 15-501 and Main Street	NOON	7.9	A	8.2	A	8.3	A	N/A	N/A
	PM	19.8	B	15.5	B	15.9	B	N/A	N/A
	WEEKEND	8.3	A	7.6	A	8.7	A	N/A	N/A
US 15-501 and Site Driveway	NOON	N/A	N/A	N/A	N/A	10.1	B	N/A	N/A
	PM	N/A	N/A	N/A	N/A	12.6	B	N/A	N/A
	WEEKEND	N/A	N/A	N/A	N/A	10.5	B	N/A	N/A
US 15-501 and Dogwood Acres Drive	NOON	24.8	C	14.7	B	14.7	B	N/A	N/A
	PM	32.8	D	22.6	C	23.5	C	N/A	N/A
	WEEKEND	17.9	C	13.9	B	14.3	B	N/A	N/A
Smith Level Road and Dogwood Acres Drive	NOON	11.1	B	11.5	B	11.5	B	N/A	N/A
	PM	10.8	B	11.1	B	11.1	B	N/A	N/A
	WEEKEND	10.5	B	10.8	B	10.8	B	N/A	N/A

N/A – Not Applicable or No Improvements Necessary

Access Analysis

Vehicular site access is to be accommodated through three entry/exit points. The site will have a right-turn in/right-turn out driveway connecting to US 15-501, a full access connection to Main Street in Southern Village via the Town Park and Ride Lot, and a third full access driveway to Dogwood Acres Drive. The main on-site parking lot is



currently shown to have 111 parking spaces and a proposed connection to a recycling center. A smaller, 40 space parking lot is shown on park property just south of Dogwood Acres. Potential overflow parking can be accommodated in the Town Park and Ride Lot. Field observations indicate that the Lot is 60-70 percent full during the p.m. peak period. With a capacity of 415 vehicles, this would leave over 100 additional spaces for park users, if needed.

Current concept plans provide more than adequate width for two lanes of vehicular movement on the internal circulation roadway. Driveway access points for the proposed site parking lot and recycling center feature acceptable spacing from adjacent roadways and driveways (100 feet minimum).

Pedestrian and Bicycle Analysis

External access for pedestrians is currently limited, especially along US 15-501, due to no dedicated pedestrian facilities and on-going road construction. The pedestrian greenway through Southern Village and internal sidewalks through the community provide excellent local access for those living/working in this development. Dogwood Acres Drive has no exclusive pedestrian facilities. Site plans show comprehensive internal connectivity for sidewalks and footpaths on park property. External access to existing greenway and sidewalk connections is also indicated, along with a hierarchy of path designations.

Access for bicycles is similar to pedestrians. No bicycle lanes or amenities are specifically provided on existing study area roadways. Roadways in Southern Village are amenable to bicycling and Dogwood Acres Drive, due to low traffic volumes offers local bicycling opportunity. The Southern Village greenway and its extension into the proposed park will offer excellent bicycle access to park amenities. Even with improvements to US 15-501, traffic speeds and volumes would not likely make the new roadway a safe route for bicyclists.

Public Transportation Analysis

Transit service currently exists to serve the Southern Community Park. The nearest transit service area is the Park-and-Ride facility in Southern Village, which is a short walk from the proposed site. Existing observations of transit-related use at the current site indicate that the Park-and-Ride is well used for transit service to and from Chapel Hill. Bus service is provided by Chapel Hill Transit on a consistent basis for the peak park usage periods of noon and late afternoon on weekdays and Saturday early afternoons. Due to the close proximity of bus service, it was included in the overall vehicular site trip reduction calculations.

Special Analysis/Issues

An issue discussed by Town Engineering and Parks and Recreation staff was the need to investigate any transportation impacts along Dogwood Acres Drive – especially



vehicular conflicts with pedestrians and bicyclists. The Necessary Improvements section in the main document outlines some general actions that will provide adequate traffic flow, access, and safety to this area for both external traffic and park patrons.

Additionally, Town Parks and Recreation staff and the project architect desired an analysis of the internal circulation of the main driveway connecting the Park and Ride Lot and US 15-501. Two potential improvements for the internal driveway layout would be either to:

- Construct a four approach, single lane roundabout along the internal access roadway that would provide single point connectivity to the main parking lot and the recycling center, as well as slowing any through vehicles down in this area, or;
- Eliminate the single access driveway for the main parking facility and provide two access driveways at each end of the lot which would directly align with the two driveways for the recycling center currently shown on the plan. All movements should have full access onto the internal roadway. This would improve overall traffic flows by aligning all turning movements onto the internal road.

The need for this improvement is not directly related to capacity, but either improvement will improve overall traffic flow and vehicular safety along the internal access road.



Mitigation Measures/Recommendations

Existing and future design year capacity analyses do not indicate a need for additional improvements to maintain adequate traffic operations on study area facilities. However, there are some improvements to study area intersections that are recommended to improve operations and safety in the 2007 design year. **Figure ES-3** shows improvements to the local external transportation system by 2007.

Planned Improvements

The North Carolina Department of Transportation is in the process of upgrading US 15-501 in the study area for additional travel lanes, turn lanes, and a median. This project, TIP R-942, is scheduled to be completed in the study area by 2005. All future design year 2007 analyses were completed using laneage and traffic signal design improvements provided by NCDOT. R-942 plans do not show any improvements to laneage for the connecting Main Street and Dogwood Acres Drive roadways. No improvement projects by the Town of Chapel Hill or private developers are anticipated or analyzed in this analysis.

Background Committed Improvements

Neither background traffic study – *Chancellor's View Subdivision* or *Southern Village* contain any improvements that affect study area intersections for the 2007 design year. Southern Village's road network has essentially been completed and the Village Commercial Core is in the process of completing construction of commercial building parcels. Chancellor's View subdivision will add a minor amount of traffic along US 15-501 for the 2007 analyses, but no improvements to the intersections at Main Street or Dogwood Acres Drive were necessary.

Applicant Committed Improvements

The preliminary site plan analyzed for this study shows driveway connections and internal roadway between the Town Park and Ride Lot at Southern Village and US 15-501. It is assumed that the driveway at US 15-501 will be a right-turn only facility and that the internal roadway connection will connect with the main internal circulation lane in the Park and Ride Lot. The Southern Park concept plan also shows a parking lot located along Dogwood Acres Drive as it traverses through the park. No widening or improvements are noted for Dogwood Acres Drive. A park nature trail and greenway trail are shown to cross Dogwood Acres to the west of the proposed parking lot.

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

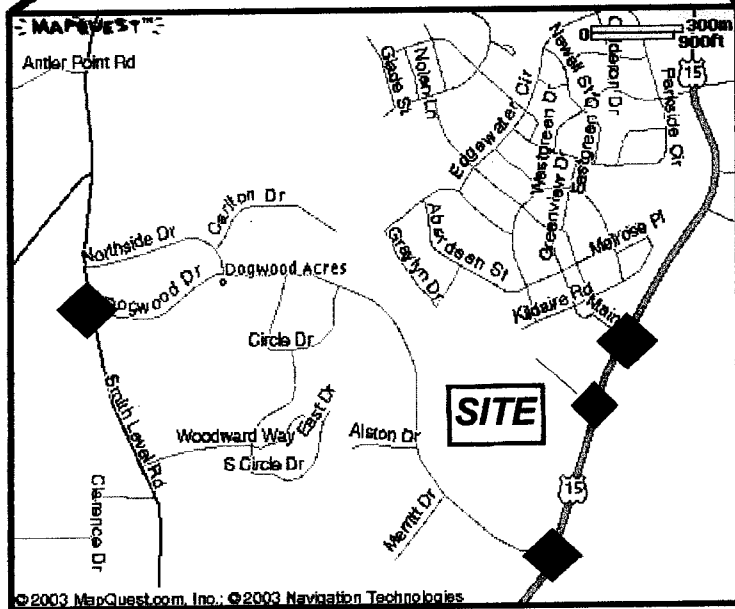
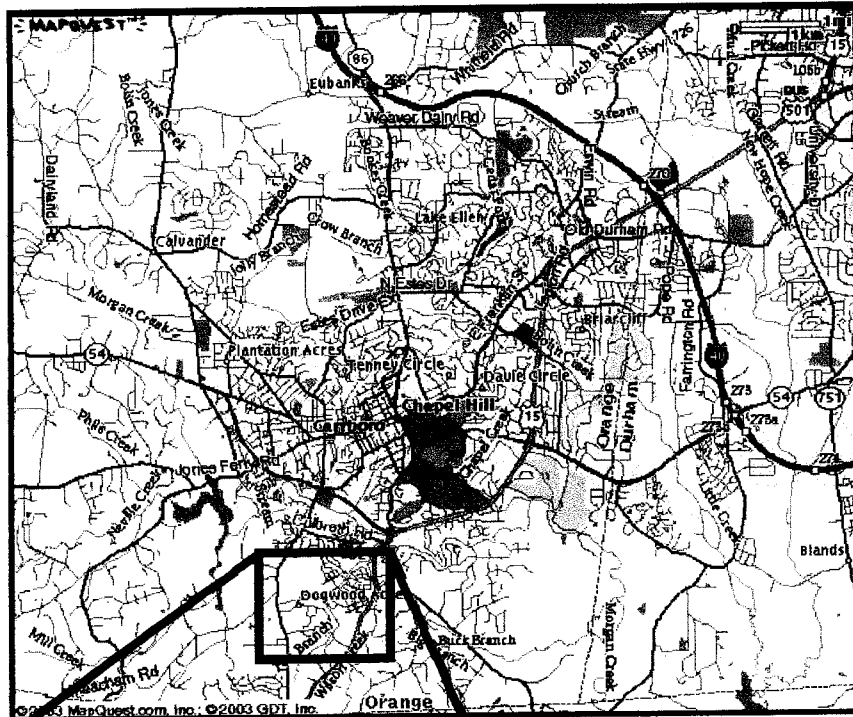


efficiency considerations that need to be addressed due to the development impact of Southern Community Park.

- Construct a deceleration lane for site traffic entering the park off of US 15-501 per criteria and guidelines in the *2001 AASHTO Policy Guidelines for Design of Highways and Streets*.
- Provide adequate external signage indicating access points to the park – primarily for entry at the main site driveway on US 15-501 southbound and at Main Street for US 15-501 northbound and exit from the Town Park and Ride Lot to Main Street to US 15-501. Avoid additional signage to prompt vehicle to access the park at Dogwood Acres Drive.
- Prohibit on-street parking along Dogwood Acres Drive within the park property.
- Provide conspicuous upstream advance pedestrian crossing signs for any nature or greenway trails crossing Dogwood Acres Drive. It is recommended to provide street lighting at crossing locations, due to limited visibility, roadway geometrics, and dense foliage along Dogwood Acres Drive.
- Provide active traffic calming measures, such as raised speed humps to reduce travel speeds along Dogwood Acres Drive through the park and deter cut-through traffic from Dogwood Acres via Smith Level Road. Speed humps (or other pavement treatment) should be placed an adequate distance upstream of pedestrian crossings.
- Reduce speed limit on Dogwood Acres Drive to 25 mph within park limits.
- Set posted speed limit on main access driveway at 15 mph.
- Improve internal driveway circulation to include a roundabout for a single entrance to the main parking lot (and fourth leg to the recycling facility) OR have two access points for the parking lot and recycling facility that align along the main access roadway.



Not to Scale



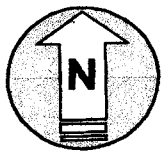
- Note:
- Existing Intersections = Included in Study
 - Site Driveways = Included in Study

Site Location Map

Figure ES-1

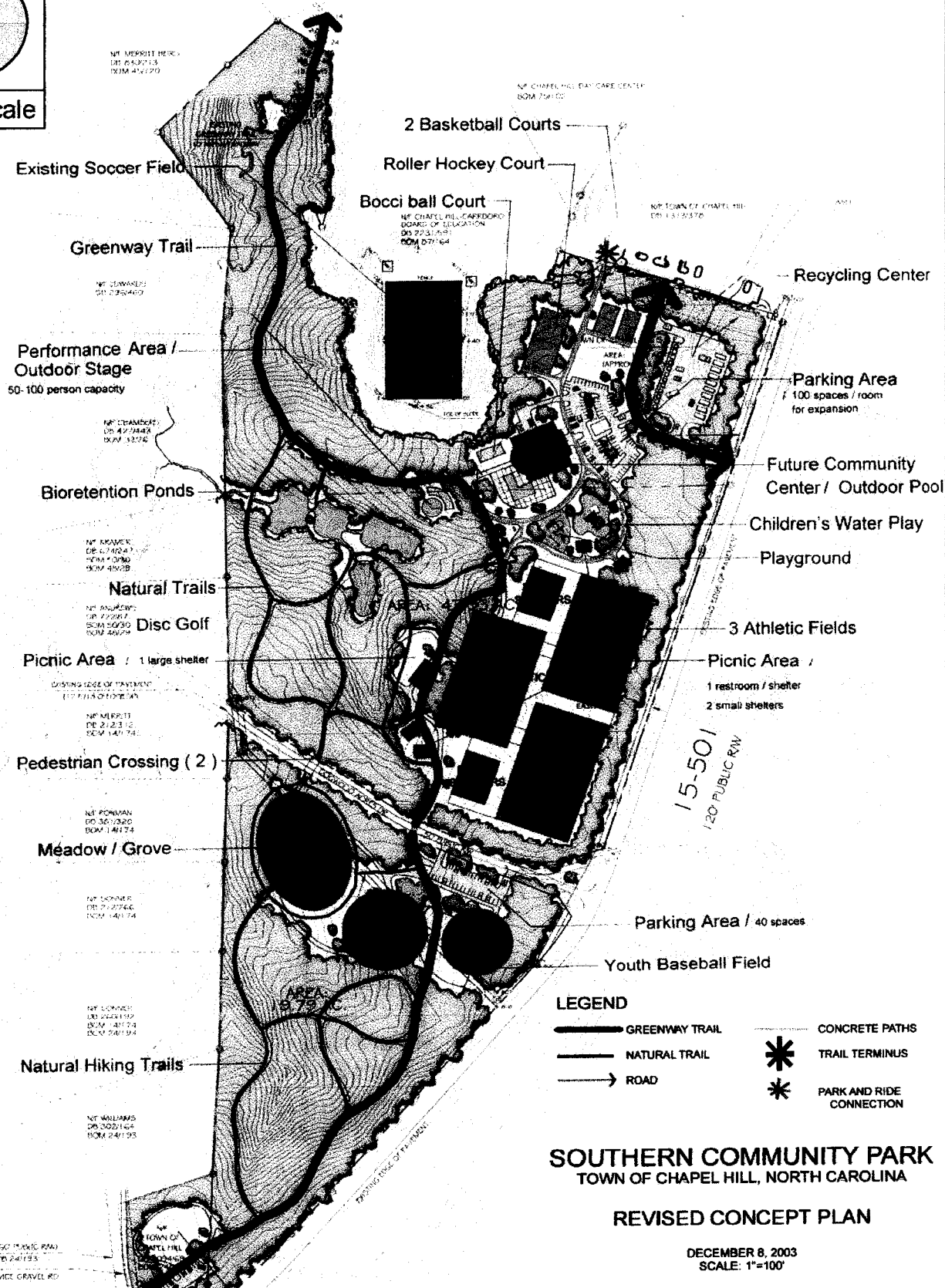
**Southern Community Park
Traffic Impact Study**





Not to Scale

(61)



LEGEND

- GREENWAY TRAIL
- NATURAL TRAIL
- ROAD
- CONCRETE PATHS
- TRAIL TERMINUS
- PARK AND RIDE CONNECTION

SOUTHERN COMMUNITY PARK
TOWN OF CHAPEL HILL, NORTH CAROLINA

REVISED CONCEPT PLAN

DECEMBER 8, 2003
SCALE: 1"=100'

MERRITT DR. (50' TRUNK RWAY)
SEE PLAN SHEETS
APPROX. 12" WIDE GRAVEL RD.

Dog Park Parking / 15 sp

Figure ES-2
HNTB

Southern Community Park
Traffic Impact Study



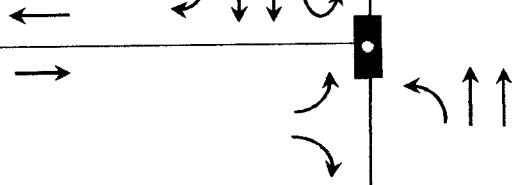
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(62)

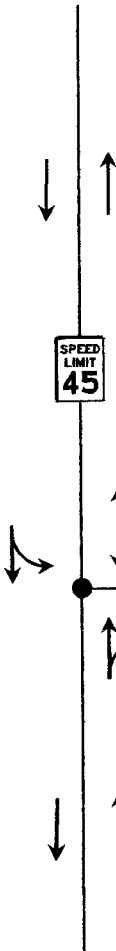
US 15-501



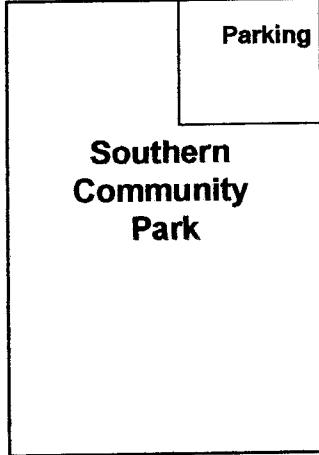
Main Street



Smith Level Road



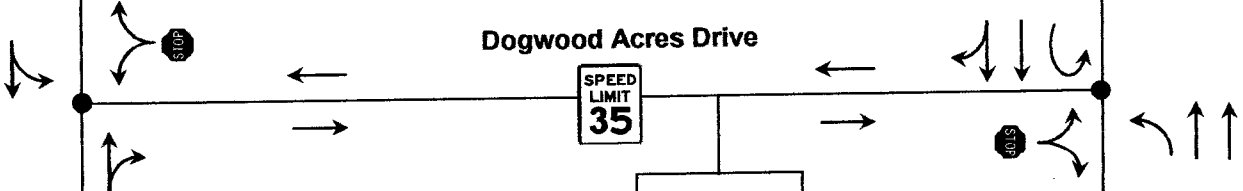
SPEED LIMIT 45



Southern Community Park

Parking



Dogwood Acres Drive



SPEED LIMIT 35

Parking

Note:

-  = Laneage Improvements Prior to The Southern Community Park TIS
-  = Laneage Improvements Due To The Southern Community Park TIS

2007 Study Related Improvements
Showing Speed Limits and Traffic Control

Figure ES-3



Southern Community Park
Traffic Impact Study

