

NC-EIS-92-01-D

**Eastern/Northern Urban Loop from
I-85 east of Greensboro to Lawndale Drive
north of Greensboro, approximately 13 miles
in Gullford County, North Carolina**

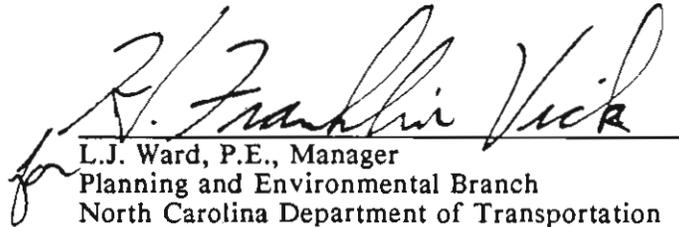
**State Project No. 6.498003T
Guilford County
TIP No. U-2525**

**ADMINISTRATIVE ACTION
DRAFT ENVIRONMENTAL IMPACT STATEMENT**

Submitted Pursuant to the North Carolina Environmental Policy Act
G.S. 113A-1 through 113A-10

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS**

8/19/92
Date


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This statement documents the need for transportation improvements east and north of Greensboro and also the planning process leading to the selection of viable alternative corridor locations. Existing and projected conditions in the study area are described and alternatives are evaluated in terms of environmental consequences, social-economic impacts, compatibility with local planning goals, and public opinion.

Comments on this draft EIS are due by NOV 13 1992 and should be sent to Mr. L.J. Ward at the above address.

Eastern/Northern Urban Loop from north of
the interchange with I-85 and the proposed
I-85 Bypass east of Greensboro to Lawndale Drive
north of Greensboro, approximately 12.5 miles
in Guilford County, North Carolina

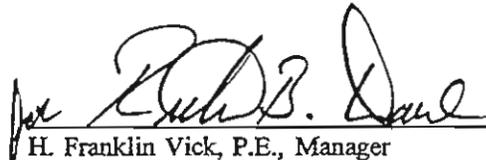
State Project No. 6.498003T
Guilford County
TIP No. U-2525

ADMINISTRATIVE ACTION
FINAL ENVIRONMENTAL IMPACT STATEMENT

Submitted Pursuant to the North Carolina Environmental Policy Act
G.S. 113A-1 through 113A-10

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

8/12/94
Date



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This action involves construction of the Greensboro Eastern/Northern Urban Loop in Guilford County. This Final Environmental Impact Statement (EIS) presents the Preferred Alternative selected based on the findings of the Draft EIS as well as agency comments and public input obtained at the Corridor Public Hearing. The Draft EIS was published in August 1992. The Public Hearing was held October 27, 1992. Comments were accepted through November 13, 1992. All comments and public input received subsequent to publication of the Draft EIS are included in this document.

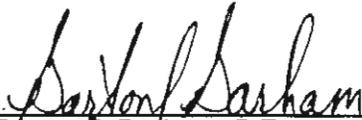
This Final EIS is an abbreviated document which presents only those sections of the Draft EIS which required modification or clarification. The Draft EIS is incorporated into this Final EIS by reference.

Eastern/Northern Urban Loop from
I-85 east of Greensboro to Lawndale Drive
north of Greensboro, approximately 13 miles
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State Project No. 6.498003T
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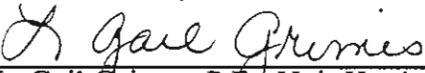
ADMINISTRATIVE ACTION
DRAFT ENVIRONMENTAL IMPACT STATEMENT

DOCUMENTATION PREPARED BY KIMLEY-HORN AND ASSOCIATES, INC.


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FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION


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SUMMARY

1. NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

Administrative Action Environmental Statement:

Draft Final

2. CONTACTS

The following individual may be contacted for additional information concerning this environmental impact statement:

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3. BRIEF DESCRIPTION OF THE PROPOSED ACTION

The proposed action is the construction of the Greensboro Eastern/Northern Urban Loop, a multi-lane freeway on new location in Guilford County. The project extends from a proposed interchange with I-85 and the proposed I-85 Bypass, east of the City of Greensboro, to Lawndale Drive (SR 2303) between Regents Park Lane and Cottage Place in northern Greensboro at the northern terminus of the proposed Greensboro Western Urban Loop.

4. ACTION PROPOSED BY OTHERS

An interchange with existing I-85 is included in the proposed I-85 Bypass around the southern portion of Greensboro. This interchange would be the southern terminus for the Greensboro Eastern/Northern Urban Loop. The location of the interchange will be determined from planning and environmental studies for the proposed I-85 Bypass currently being performed. In addition, an environmental study is underway for the Western Urban Loop. Several major projects related to this project have been listed in the North Carolina Department of Transportation's Transportation Improvement Program (TIP) for 1993 to 1999. In addition to the previously mentioned freeway projects, the widening of I-40/I-85 to eight lanes is proposed. The rehabilitation of the concrete pavement of US 29 is also planned.

An extension of North Elm Street is being constructed from Pisgah Church Road to Lake Jeanette Road. This street is proposed to interchange with the Greensboro Eastern/Northern Urban Loop.

5. SUMMARY OF MAJOR ALTERNATIVES

This report documents the numerous alignments within the study area which were investigated and refined and the three reasonable and feasible "build" alternatives and two crossovers as transitions between the alternatives. In addition to the "build" alternatives, this study also examined the feasibility of the No-Build Alternative, the Transportation System Management (TSM) Alternative, and Multi-Modal System Alternatives.

The three "build" alternatives are shown in Figure II-2A and described below. In addition to addressing the environmental impacts of each alternative, this report also addresses the potential for mitigating the adverse impacts associated with the construction of the Greensboro Eastern/Northern Urban Loop.

- **Eastern Alternative**

The Eastern Alternative begins at I-85, approximately 3,000 feet east of the I-85/McConnell Road interchange. It proceeds north, first crossing Mount Hope Church Road and then US 70, approximately 1,200 feet east of the US 70/Mount Hope Church Road intersections. After crossing McLeansville Road, Southern Railway, and South Buffalo creek, the alternative heads north-northwest to a crossing with Huffine Mill Road just west of Harvest Road. From Huffine Mill Road, it proceeds in a more northern direction, crossing Camp Burton Road, North Buffalo Creek, and Creekview Road approximately 3,500 feet east of Hines Chapel Road. The corridor then turns to the west-northwest, crossing Hines Chapel Road and Rankin Mill Road before connecting with the Middle Alternative approximately 2,000 feet east of McKnight Mill Road. From there, the corridor proceeds west-northwest, crossing McKnight Mill Road at the intersection of Briarmeade Road, US 29 north of the Oakwood Forest Mobile Home Park, Summit Avenue north of Brightwood School Road, Lee's Chapel Road north of the Rankin Fire Station, and the Southern Railway at Hillcroft Road. This alternative then follows a west-southwest path, crossing both Yanceyville Road and Church Street 2,000-3,000 feet north of Lee's Chapel Road before connecting with the Western Alternative in the vicinity of the proposed Elm Street Extension. From here the corridor turns more westerly, crossing Lake Jeanette Road north of Cottage Place and continuing for a distance of approximately 4,800 feet to its terminus with Lawndale Drive, south of Richland Creek.

Interchanges are included at the crossings of I-85, US 70, Huffine Mill Road, US 29, Yanceyville Road, proposed Elm Street Extension, and Lawndale Drive. All other crossings would be by grade separation, relocation, or termination of the cross streets. The Eastern Alternative is 13.0 miles in length.

- **Middle Alternative**

The Middle Alternative begins at the same I-85 interchange as the Eastern Alternative. This alternative proceeds to the north-northwest, crossing Clapp Farms Road approximately 4,800 feet west of Mount Hope Church Road. It then crosses South Buffalo Creek, US 70 and Southern Railway just east of the railroad underpass before crossing Fourmile Loop east of Willowlake Road. From here, the corridor turns more north to a crossing of Huffine Mill Road approximately 1,500 feet west of Harvest Road. The Middle Alternative then turns to the northwest, crossing Camp Burton Road just to the west of the prison. Heading northwest, it crosses North Buffalo Creek, Rankin Mill Road, and Hines Chapel Road west of Rankin Mill Road before connecting with the Eastern Alternative approximately 2,000 feet to the east of McKnight Mill Road. The alternative continues along the same route as the Eastern Alternative to the interchange with Lawndale Drive. Interchanges are included at the crossings of I-85, Fourmile Loop, Huffine Mill Road, US 29, Yanceyville Road, proposed Elm Street Extension, and Lawndale Drive. All other crossings would be by grade separation, relocation, or termination of the cross streets. The Middle Alternative is 12.5 miles in length.

- **Western Alternative**

The Western Alternative begins at I-85 approximately 4,800 feet west of the I-85/McConnell Road interchange. From here, the alternative proceeds in a generally northerly direction crossing McConnell Road east of Youngs Mill Road, South Buffalo Creek, the Southern Railway, and US 70 in the vicinity of Maxfield Road. The alignment then follows a more northwesterly direction to a crossing of Huffine Mill Road just south of Rankin Mill Road. The alternative continues in the same general direction, crossing White Avenue and North Buffalo Creek. Between White Avenue and North Buffalo Creek, the route of the Western Alternative is contained within a narrow right-of-way bounded on its east and west sides by the Greensboro City landfill property. The alignment then proceeds in a northwesterly direction where it crosses McKnight Mill Road at Hines Chapel Road and US 29 north of Lakeview Memorial Park Cemetery. This alternative continues in the same northwesterly direction crossing Pineneedle Road at Brightwood School Road and Summit Avenue approximately 1,500 feet south of Brightwood School Road.

Approximately 1,600 feet to the northwest of Summit Avenue, the alignment turns to the west, crossing Lee's Chapel Road south of Brightwood School Road, the Southern Railway, and Yanceyville Road about 1,800 feet north of Lee's Chapel Road. The Western Alternative proceeds west, crossing Church Street approximately 1,600 feet north of Lee's Chapel Road before connecting with the Eastern and Middle Alternatives in the vicinity of the proposed Elm Street Extension and continuing to its intersection with Lawndale Drive. Interchanges are proposed at the Western Alternative's crossings of I-85, US 70, Rankin Mill Road/Huffine Mill Road, US 29, Yanceyville Road, proposed Elm Street Extension, and Lawndale Drive. All other crossings would be by grade separation, relocation, or termination of the cross streets. The Western Alternative is 11.0 miles in length.

Two crossovers between the alternatives are also included in this study. Crossover 2 would allow the Middle Alternative to intersect with the Western Alternative north of

US 70 while Crossover 1 allows the Western Alternative to interchange with I-85 between McConnell Road and Mount Hope Church Road.

6. ELIMINATION OF WESTERN ALTERNATIVE

After the review and analysis of impacts on the City of Greensboro's White Street Landfill, as well as on residential displacements and wetlands, it was decided that the Western Alternative should be eliminated from further consideration in this study. Consequently, the Western Alternative, as described in this Draft Environmental Impact Statement, will not be presented for review and consideration at the Public Hearing. The decision to eliminate the Western Alternative was made in conjunction with the Greensboro Eastern/Northern Urban Loop Steering Committee and the North Carolina Department of Transportation.

It is believed that the acquisition of approximately 8.4 acres of permitted landfill property for the Western Alternative would present serious legal, environmental, and operational constraints that would be difficult to overcome and would result in costly and time consuming remediation to mitigate adverse effects. Correspondence from the Public Works Department of the City of Greensboro is contained in Appendix A. In addition to the encroachment on the White Street Landfill, the Western Alternative would also impact the greatest amount of wetlands (34 acres) and would require 364 residential displacements, a total that is second only to the Crossover 1 Alternative of the five alignments studied. The major problem with the Western Alternative, however, is with its involvement with the White Street Landfill.

7. ELIMINATION OF CROSSOVERS 1 AND 2

The recent identification of the preferred alternative for the I-85 Bypass (TIP No. 1-2402), which would utilize the easternmost interchange with I-85, has eliminated the need for Crossover 2. Crossover 1 existed to provide a possible transition for the Western Alternative. Since the Western Alternative was eliminated after detailed study, then Crossover 1 is also eliminated. The retained alternatives are shown on Figure II - 2B.

8. SUMMARY OF BENEFICIAL AND ADVERSE ENVIRONMENTAL EFFECTS:

The primary benefits of the proposed action are improved transportation accessibility and mobility within and around Greensboro and the economic gains resulting from the improvement in highway transportation. Construction of the proposed freeway will help meet traffic needs and fulfill the goals of the 1989 Greensboro Urban Area Thoroughfare Plan. The Thoroughfare Plan, which includes this project, received considerable public review before its adoption by the City of Greensboro, Guilford County, and the North Carolina Board of Transportation. The Eastern/Northern Urban Loop will connect existing and planned thoroughfares, and will connect to other portions of the planned urban loop. Safety benefits will be realized by the road users transferring from more congested and hazardous highways. By improving the flow of traffic within Guilford County and the City of Greensboro, the highway will reduce travel time, fuel consumption, and vehicle operating costs, and will improve air quality. Because of these factors, the proposed action will improve the overall quality of life in Greensboro. The Middle and Eastern Alternatives provide improved traffic service in comparison with the No-Build Alternative.

Adverse impacts include the displacement of 307 to 311 residences and nine to 10 businesses. An increase in the noise levels is anticipated for some areas adjacent to the project. An estimated 12 to 15 acres of wetlands and six to 16 acres of floodplain will be impacted by the proposed project. In addition, an estimated 262 to 317 acres of prime farmland will be taken for highway right-of-way. Temporary adverse impacts during construction will consist of potential erosion and siltation, construction noise, and public inconvenience.

Tables S-1 and S-2 summarize the environmental impacts and the engineering comparisons, respectively, of the retained alternatives.

TABLE S-1
ENVIRONMENTAL COMPARISON OF RETAINED ALTERNATIVES

	ALTERNATIVE	
	Eastern	Middle
Length (miles)	13.0	12.5
Displacements		
Residences (minority)	311(55)	307(55)
Businesses	10(0)	9(0)
Other	0	0
Acreage Required		
Field (inc. Agriculture)	78.4	63.1
Forest	293.1	288.3
Urban (man-dominated)	<u>223.2</u>	<u>206.4</u>
Total	594.7	557.8
Acres of Prime Farmland	317.0	262.0
Acres of Wetland (includes open water)	11.7	15.0
Acres of Floodplain	6.2	16.5
Number of Stream Crossings	23	22
Number of Receptors Exceeding Noise Abatement Criteria or with Substantial Increase	168	119
National Register Historic Sites	0	0
National Register Archaeological Sites	0	0
Potential Hazardous Material Sites In or Near Corridors	1	1

TABLE S-2
ENGINEERING COMPARISON OF RETAINED ALTERNATIVES

	ALTERNATIVE	
	Eastern	Middle
Length (miles)	13.0	12.5
Interchanges (number)	7	7
Other Structures		
Railroad	2	2
Drainage	16	16
Grade Separation	19	17
Traffic (high/low) (vehicles per day)	33,400/ 18,400	33,400/ 18,400
Level-of-Service	C-B	C-B
Construction Cost (millions)	\$81.0	\$82.6
Right-of-Way Cost (millions)	\$39.5	\$41.5
Total Cost (millions)	\$120.5	\$124.1

9. AREAS OF CONTROVERSY

The alternatives have been presented to the public and to other public agencies and officials during the study process. No major areas of controversy have surfaced other than concern regarding the impacts on the City of Greensboro Landfill and individual concerns by persons living within the study corridors.

10. ACTIONS REQUIRED BY OTHER AGENCIES

A permit from the U.S. Army Corps of Engineers will be required for this project under the provisions of Section 404 of the Federal Water Pollution Control Act Amendments of 1972. Section 404 requires the application for and approval of a permit before wetlands or other waters of the United States can be dredged or filled. The Clean Water Act requires public notice and review of Section 404 permits as well as U.S. Fish and Wildlife Service review. Stream relocations also will be coordinated with the U.S. Fish and Wildlife Service. Encroachment into floodways will be coordinated with the Federal Emergency Management Agency (FEMA).

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CHAPTER I PURPOSE AND NEED FOR ACTION

A. GENERAL

This chapter documents the need for construction of the approximate 13-mile eastern/northern portion of the Greensboro Urban Loop from I-85 east of Greensboro to Lawndale Drive in northern Greensboro (see Figures I-1 and I-2). The current and projected traffic is evaluated in relation to the existing and proposed transportation system surrounding Greensboro. Alternatives are developed to respond to the social, economic, and environmental consequences anticipated in introducing a major freeway corridor through the study area. The impacts of each alternative are identified and discussed. To respond adequately to these environmental, engineering, and planning issues associated with the Greensboro Eastern/Northern Urban Loop, this draft environmental impact statement was prepared.

B. PROJECT SETTING

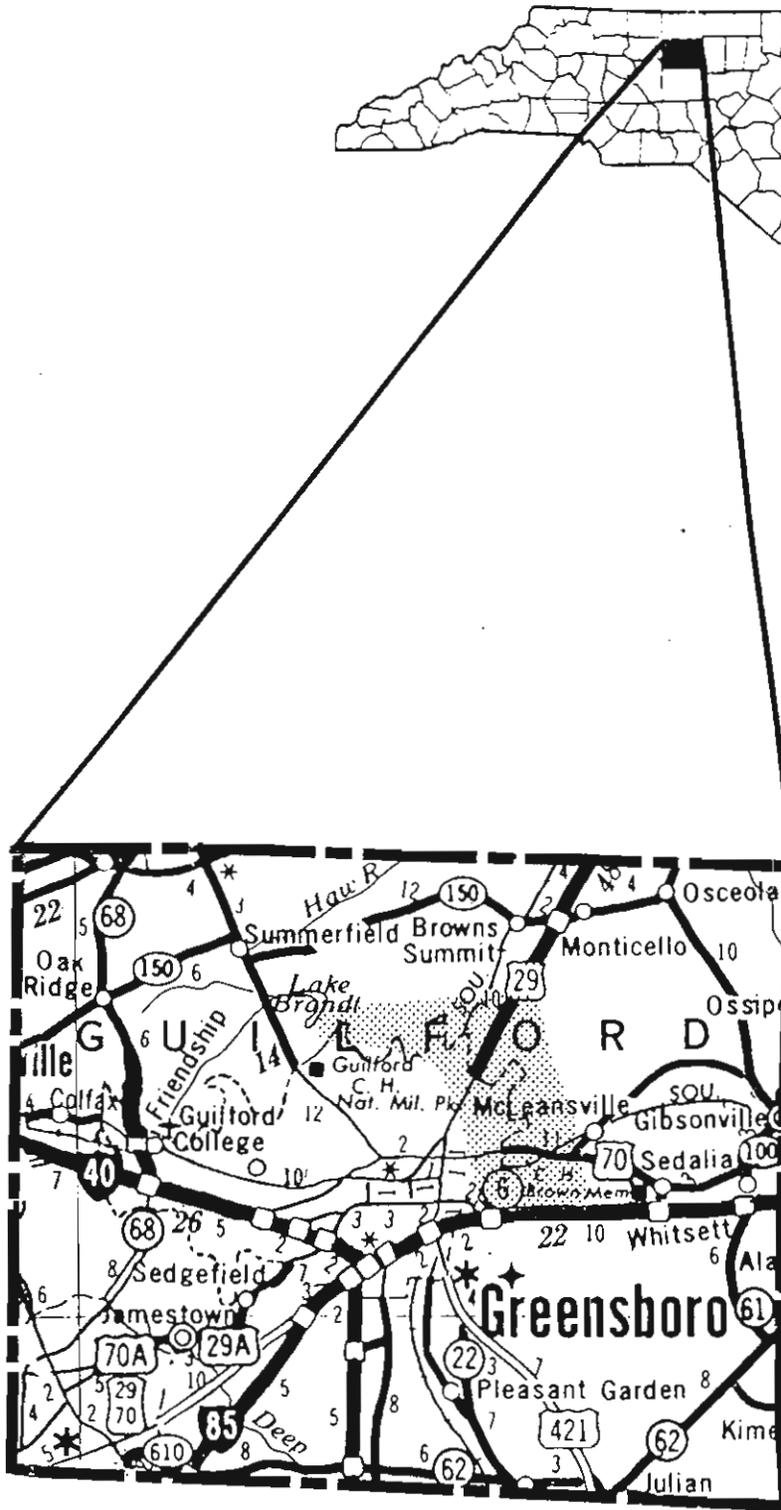
The project is located in Guilford County in north-central North Carolina. As shown in Figure I-2, parts of the northern and western limits of the study area lie within the City of Greensboro, which comprises the largest municipality in the Piedmont Triad area. The Piedmont Triad, consisting of Greensboro, High Point, and Winston-Salem, is linked by Interstate 85 and Interstate 40.

The Greensboro Eastern/Northern Urban Loop study area is located within the Piedmont Province and is characterized by a moderately rolling upland surface with nearly level broad ridges and moderately steep side slopes adjacent to the stream valleys. Relief across the study area is in the order of 180 feet. North Buffalo Creek and South Buffalo Creek are the largest streams in the study area.

The study area includes a mix of forested rural, agricultural, and residential land uses interspersed with scattered commercial and industrial development along the major traffic arteries. The primary employment centers are located along the Interstate 85 corridor, the US 29 corridor, and the western boundary of the study area. The relocation of high-tech firms and major warehouse and distribution facilities to the area has partly offset the decline of traditional markets for tobacco, textiles, apparel, and furniture. Chapter III presents a more detailed review of the area's affected environment.

C. PROJECT STATUS

The Greensboro Eastern/Northern Urban Loop is designated in the North Carolina Department of Transportation 1993-1999 Transportation Improvement Program (TIP) as U-2525. Right-of-way acquisition for U-2525 is scheduled to begin in Fiscal Year 1993. Construction is scheduled to begin in Fiscal Year 1994.



NOT TO SCALE

Map Source: NCDOT

GREENSBORO EASTERN/NORTHERN
URBAN LOOP

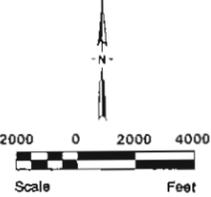
VICINITY MAP

FIGURE
I-1

**GREENSBORO
EASTERN/NORTHERN
URBAN LOOP
GUILFORD COUNTY, NC**

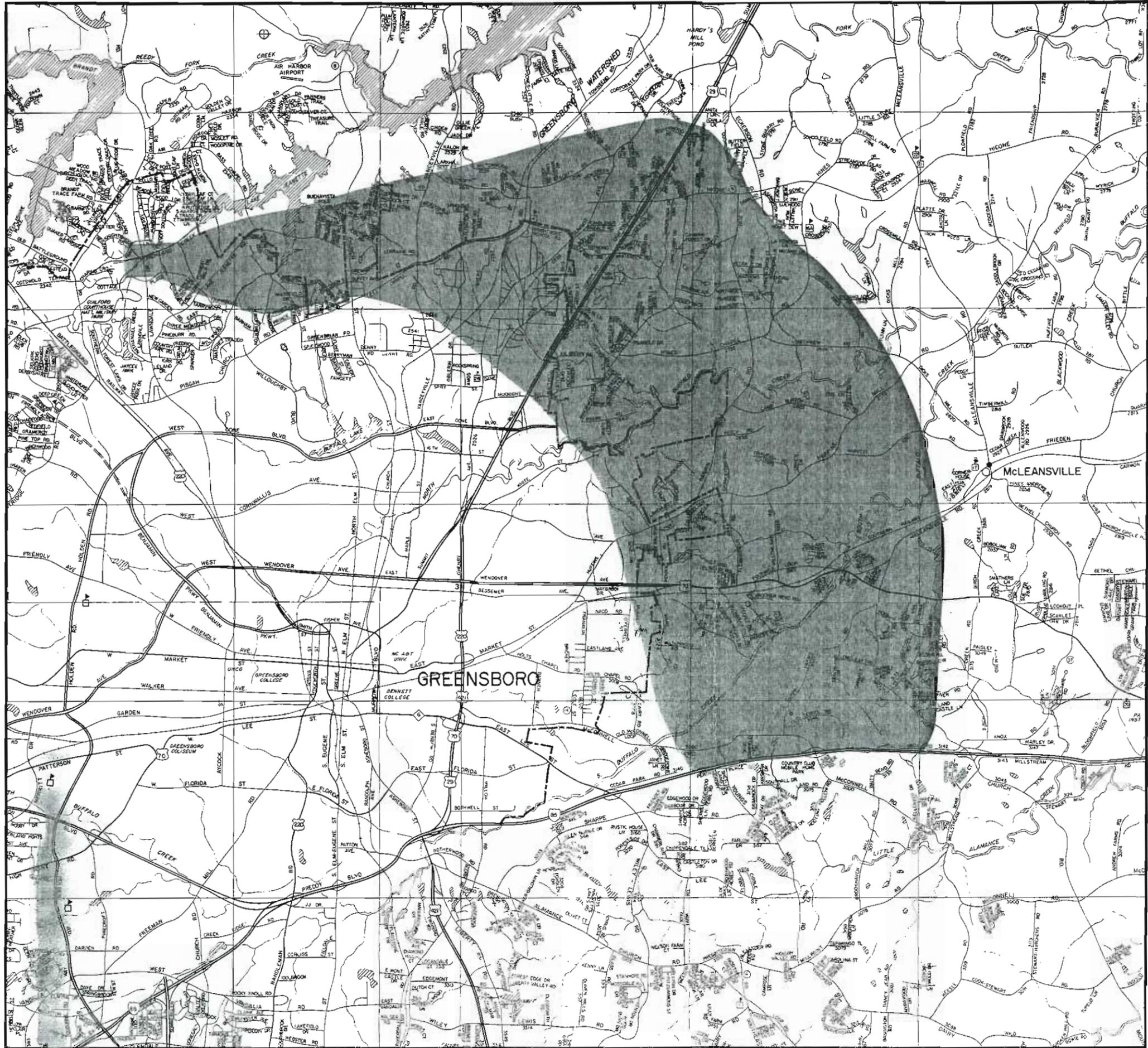
LEGEND

--- CITY LIMITS



PROJECT STUDY AREA

FIGURE I-2



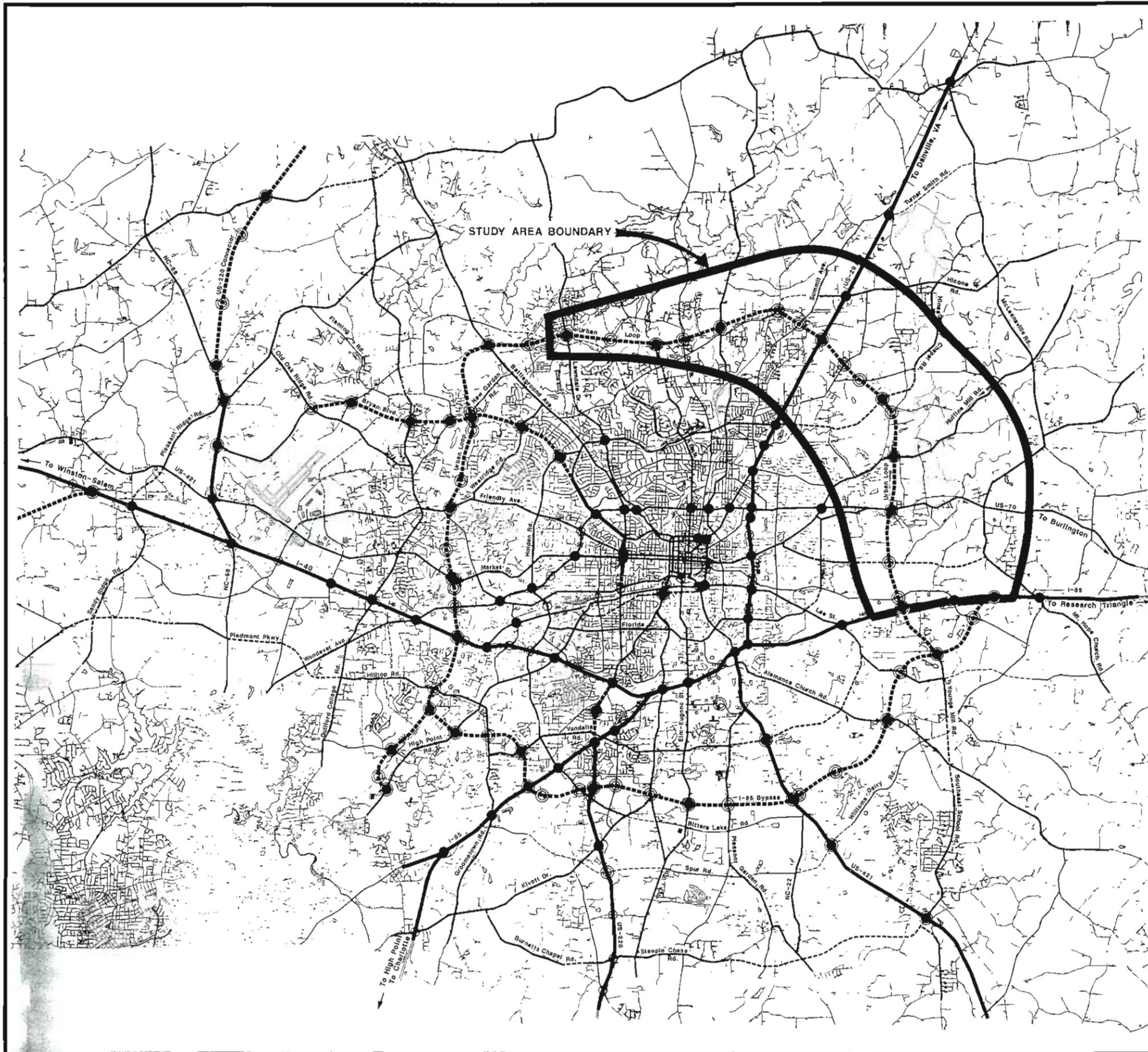
The concept of an urban loop around the City of Greensboro is included in the Greensboro Urban Area Thoroughfare Plan and shown in Figure I-3. A chronology of events leading to the inclusion of the Greensboro Eastern/Northern Urban Loop in the Transportation Improvement Program is shown in Table I-1.

TABLE I-1
CHRONOLOGY OF EVENTS
GREENSBORO EASTERN/NORTHERN URBAN LOOP

DATE	EVENT
1967	Urban Loop as a freeway included in the City of Greensboro Transportation Plan.
June 1977	Thoroughfare Plan (including the Urban Loop) adopted by the City of Greensboro, Guilford County, and the North Carolina Board of Transportation.
November 1988	Alternative analyses conducted as part of Thoroughfare Plan update.
July 1989	North Carolina Highway Trust Fund Law enacted, which provides a trust fund for designated urban loops.
September 1989	Updated Thoroughfare Plan adopted by City of Greensboro and Guilford County.
November 1989	Updated Thoroughfare Plan adopted by North Carolina Department of Transportation.
November 1989	The Eastern/Northern Urban Loop included in the State's 1990-1996 Transportation Improvement Program.
July 1990	Planning and environmental impact studies on the Greensboro Eastern/Northern Urban Loop began.

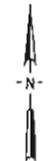
The first City of Greensboro Transportation Plan was prepared in 1954. An urban loop shown on that plan was later developed as Holden Road and Cone Boulevard. The 1960 update showed a loop in about the same location as the proposed Western Alternative. A 1964 update showed the loop in the same location, but then functionally classified it as a four-lane divided arterial road. The controlled-access freeway concept emerged in the 1967 update. This plan was modified slightly in 1973 and 1977. The most recent update of the Thoroughfare Plan occurred in 1989. The updated plan was adopted by the City of Greensboro on September 5, 1989 and by the North Carolina Board of Transportation on November 3, 1989.

**GREENSBORO
EASTERN/NORTHERN
URBAN LOOP
GUILFORD COUNTY, NC**



LEGEND

EXISTING	PROPOSED	
————	-----	MAJOR THOROUGHFARES
————	-----	FREEWAYS
————	-----	OTHER
●	○	MINOR THOROUGHFARES
○	○	INTERCHANGE
		GRADE SEPARATION



1989 GREENSBORO URBAN AREA
THOROUGHFARE PLAN

FIGURE I-3

With the adoption of the 1989 Thoroughfare Plan, the City also adopted goals and objectives. The adopted purpose and goals of the Thoroughfare Plan are listed in Table I-2.

TABLE I-2
GREENSBORO THOROUGHFARE PLAN
PURPOSE AND GOALS

PURPOSE

The purpose of the Greensboro Thoroughfare Plan is to be a guide to meet the future transportation needs of the Greensboro Urban Area. The plan should be used to assist the public, decision-makers, and transportation professionals in identifying and meeting those needs. The plan is not intended to be a long statement of lofty goals and objectives but to reflect the overall commitment to the continued high quality of life of the entire area. As the urban area changes, so must its Thoroughfare Plan. The process that will identify and help meet the future transportation needs of the citizens must begin here.

GOAL 1

Provide an adequate highway and street system to serve the current and long-term needs of the community.

GOAL 2

Provide for and encourage the use of other modes of transportation. Planning activities should include activities that increase the use of other modes which will more effectively utilize the existing transportation network.

GOAL 3

Design transportation projects so as to improve, or at least minimize negative impacts on: neighborhoods, noise levels, air quality, energy usage, etc.

GOAL 4

Develop, maintain, update, and follow a long-range comprehensive plan for transportation.

GOAL 5

To adopt a transportation plan that reflects the needs and desires of the community while recognizing that there will be disagreements.

With the inclusion of the Urban Loop in the North Carolina Highway Trust Fund and in the 1989 Transportation Improvement Program, a major step in fulfilling a 22-year planning goal was taken.

The City of Greensboro has encouraged protecting the location shown on the proposed Thoroughfare Plan, which generally follows the Western Alternative alignment. The City's zoning map showing the Thoroughfare Plan alignment has been available to the public since 1986. However, the City's jurisdictional authority for zoning is limited to within the corporate limits. The majority of the study area is outside the corporate limits and is subject to zoning regulations by Guilford County. The Thoroughfare Plan location is not included on the Guilford County Zoning Map, and no right-of-way has been specifically designated for the proposed thoroughfare outside the corporate limits.

D. SYSTEM LINKAGE

The Greensboro region is served by two major interstate highways (see Figure I-3). I-85 links the Piedmont Triad area (Greensboro, Winston-Salem, and High Point) to the Research Triangle area to the east and to Charlotte to the southwest. I-40 connects Greensboro with Winston-Salem and Asheville to the west. Two major US routes provide access north and east: US 29, to the north, connects Greensboro with Reidsville and Danville, Virginia; and US 70 parallels I-85 to the east and links Burlington, McLeansville, and Greensboro.

The Greensboro Urban Loop is included in the North Carolina Department of Transportation's 1993-1999 Transportation Improvement Program (TIP). The 13-mile portion of the loop, referred to as the Greensboro Eastern/Northern Urban Loop, is the subject of this study. Environmental Impact Statements (EIS) are also being prepared for two other sections of the Urban Loop, the I-85 Bypass from I-40/I-85 east of Greensboro to I-85 west of Greensboro and the Greensboro Western Urban Loop from I-85 to Lawndale Drive.

Completion of these three projects will result in an unbroken beltway encircling the City of Greensboro. A missing link or gap in this outer loop would occur if any of these projects were not completed. As a result, the Greensboro area would not receive the maximum economic and road-user benefits associated with a complete circumferential transportation system.

The Greensboro Eastern/Northern Urban Loop will function as part of the City's urban principal arterial system. The urban principal system serves the major centers of activity, the highest traffic volume corridors, and the longest trip movements. The principal arterial system carries most of the trips entering and leaving the urban area, as well as most of the through movements bypassing the central city. In addition, substantial intra-city travel, such as between central business districts and outlying residential areas, between major inner-city communities, and between major suburban centers, is served by this system. The principal arterial system carries important intra-urban and inter-city bus routes. Finally, in urbanized areas, this system provides continuity for all rural arterials that cross the urban boundary.

Although Greensboro has a well developed radial system composed of major and minor thoroughfares, the existing street system does not provide a continuous, high-capacity, circumferential roadway. The need for such a roadway is increasing as suburbanization and growth continue and daily trip origins and destinations become more dispersed throughout the Greensboro area. The Greensboro Urban Loop will eliminate this

deficiency by encircling Greensboro and connecting the radial streets, thereby providing a cross-town or circumferential connection.

E. TRAFFIC CAPACITY AND LEVEL OF SERVICE

The operating conditions within a traffic stream are qualitatively referred to as **levels-of-service (LOS)**. These conditions are generally described in terms of speed, travel time, maneuverability, traffic interruption, convenience, and safety. The Transportation Research Board has defined LOS in categories from A to F. LOS A represents ideal, free-flow conditions, while LOS F represents unacceptable forced or breakdown flow with stop and go conditions. Generally, LOS D is considered the lowest limit at which traffic flow is acceptable during peak periods in urban areas. Traffic flow at LOS D is considered stable, but becoming susceptible to congestion and unstable flow. Therefore, traffic volumes that exceed LOS D (E or F) are considered to be exceeding the capacity at which they can operate safely and efficiently.

Capacity analyses were performed on the affected major arterials in the project study area. The results of these analyses are summarized in Table I-3. The table includes a list of roadways with road names and limits of each section analyzed. The following information is included for each section:

- Number of existing travel lanes (not including turn lanes).
- Existing daily roadway capacity at LOS D.
- 1989 average daily traffic volume (Refer to Figure I-4).
- 1989 LOS.
- Number of travel lanes projected to exist in 2010, based on the 1989 Greensboro Urban Area Thoroughfare Plan.
- Projected 2010 daily roadway capacity, at LOS D, based on number of travel lanes.
- 2010 average daily traffic volume for No-Build Alternative.
- 2010 level-of-service (No-Build).
- 2010 average daily traffic volume for build alternatives (Eastern, Middle, or Western Alternative).
- 2010 level-of-service (Build).
- Reduction in 2010 average daily traffic with Greensboro Eastern/Northern Urban Loop in place, as compared with No-Build (negative number indicates an increase).
- Percent reduction in 2010 average daily traffic volumes with Greensboro Eastern/Northern Urban Loop in place, as compared with No-Build (negative number indicates increase).

TABLE I-3
IMPACT OF GREENSBORO EASTERN/NORTHERN URBAN LOOP ON TRAFFIC VOLUMES

LINK	BETWEEN	1989 EXISTING				2010 FUTURE CONDITIONS				2010 NO-BUI TRAFFIC VOL				2010 BUI TRAFFIC VOL				REDUCTION FROM NO-BUILD
		LANES CAPACITY	ADT	LOS	LANES CAPACITY	ADT	LOS	LANES CAPACITY	ADT	LOS	ADT	LOS	ADT	LOS	ADT	LOS		
I-85 AND I-40	LEE ST & MCCONNELL RD	4	54000	53700	D	6	81000	61000	C	52200	C	8800						
	MCCONNELL RD & URBAN LOOP	4	54000	52900	D	6	81000	61000	C	47600	C	13400						
	URBAN LOOP AND MT. HOPE CHURCH RD	4	54000	52900	D	8	108000	100000	D	100000	D	0						
LEE ST	ARDMORE DR & FLORIDA ST	4	36000	11500	A	4	38000	31200	D	24600	C	6600						
	FLORIDA ST & I-85	4	36000	14300	A	4	38000	33600	D	26800	C	6800						
	I-85 & SHARPE RD	2	11000	7800	D	2	11000	18800	E	15800	E	3000						
	SHARPE RD & WILEY LEWIS RD	2	11000	4400	C	2	11000	12900	E	9500	D	3400						
	WILEY LEWIS RD & I-85 BYPASS	2	11000	3100	B	2	11000	11300	E	7800	D	3500						
US 70	HUFFINE MILL RD & MARKET ST	4	45000	13800	A	4	45000	22000	B	17800	A	4200						
	MARKET ST & URBAN LOOP	2	21000	16100	D	2	21000	28500	E	30100	E	-1600						
	URBAN LOOP & MCCLEANSVILLE RD	2	21000	12500	C	2	21000	23200	E	16100	D	7100						
HUFFINE MILL RD	US 70 & NEALTOWN RD	2	15000	5700	C	2	15000	7400	C	6500	C	900						
	NEALTOWN RD & RANKIN MILL RD	2	13000	3200	B	2	13000	7100	C	5400	C	1700						
	RANKIN MILL & URBAN LOOP	2	13000	1800	B	2	13000	8200	C	2400	B	5800						
	URBAN LOOP & CAMP BURTON RD	2	9000	1900	B	2	9000	5500	C	1500	B	4000						
RANKIN MILL RD	HUFFINE MILL RD & CAMP BURTON RD	2	11000	2000	B	2	11000	4900	C	3200	B	1700						
	CAMP BURTON & HINES CHAPEL RD	2	11000	1900	B	2	11000	2900	B	2200	B	700						
	HINES CHAPEL & HICONE RD	2	11000	1200	B	2	11000	2400	B	7600	D	-5200						
HINES CHAPEL RD.	MCNIGHT MILL RD. & RANKIN MILL RD.	2	11000	1900	B	2	11000	3000	B	2000	B	1000						
	RANKIN MILL RD. & HICONE RD.	2	11000	1600	B	2	11000	2700	B	2200	B	500						
HICONE RD.	US 29 & RANKIN MILL RD.	2	11000	7300	C	2	11000	11100	E	10000	D	1100						
US 29	TURNER SMITH RD & HICONE RD	4	48000	26000	B	4	48000	48600	E	51300	E	-2700						
	HICONE RD & URBAN LOOP	4	48000	30700	C	4	48000	50500	E	55000	E	-4500						
	URBAN LOOP & CONE BLVD	4	48000	34600	C	4	48000	52500	E	45100	D	7400						
	CONE BLVD. & US 29 A	4	48000	42000	D	4	48000	55200	E	44000	D	11200						
	US 29 A & E. MARKET ST.	4	48000	53200	E	4	48000	57600	E	47600	D	10000						
SUMMIT AVE	E. MARKET ST. & E. LEE ST.	4	48000	55600	E	4	48000	60000	E	50000	E	10000						
	CONE BLVD & SPRY ST	2	16000	13800	D	2	16000	17300	E	15400	D	1900						
	SPRY ST & S.R. 2604	2	16000	9700	C	2	16000	12200	D	7800	C	4400						
YANCEYVILLE RD	S.R. 2604 & COOY ST	2	9000	5600	C	2	9000	8500	D	2400	B	6100						
	CONE BLVD & PISGAH CHURCH RD	4	35000	8300	A	4	35000	10600	A	11200	A	-600						
	PISGAH CHURCH & URBAN LOOP	2	11000	3000	B	2	11000	5100	C	12300	E	-7200						
CHURCH ST	URBAN LOOP & HILLCROFT RD	2	11000	3000	B	2	11000	5100	C	5000	C	100						
	CONE BLVD & PISGAH CHURCH	2	12000	9800	D	2	12000	20200	E	18400	E	1800						
	PISGAH CHURCH & URBAN LOOP	2	12000	7500	C	2	12000	15200	E	8300	D	6900						
PISGAH CHURCH RD	URBAN LOOP & BASS CHAPEL RD	2	12000	7000	C	2	12000	13900	E	6100	C	7800						
	LAWDALE DR & N. ELM ST	4	32000	16200	B	4	32000	27900	D	14900	B	13000						
	N. ELM & CHURCH ST	2	11000	8500	D	4	32000	27000	D	22300	C	4700						

TABLE I-3
IMPACT OF GREENSBORO EASTERN/NORTHERN URBAN LOOP ON TRAFFIC VOLUMES

LINK	BETWEEN	1989 EXISTING		2010 FUTURE CONDITIONS		2010 NO-BUILD TRAFFIC VOL		2010 BUI TRAFFIC VOL		REDUCTION FROM NO-BUILD
		LANES CAPACITY	ADT	LOS	LANES CAPACITY	ADT	LOS	ADT	LOS	
---	YANCEYVILLE ST. & US 29	4	38000	18200	4	38000	45000	31000	D	14000
LEES CHAPEL DR	CHURCH ST & YANCEYVILLE	2	9000	7300	4	32000	22000	8300	A	13700
	YANCEYVILLE & TOWNSEND RD	2	9000	5100	4	32000	15000	7500	A	7500
	TOWNSEND RD & US29	2	NA	NA	2	9000	10000	5500	B	4500
LAWDALE DR.	PISGAH CHURCH RD & LAKE JEANETTE RD	4	32000	23200	4	32000	34800	28300	D	6500
	LAKE JEANETTE RD & REGENTS PARK LAN	4	32000	14000	4	32000	22000	22000	C	0

Source: Traffic and Capacity Analysis Technical Memorandum,
Kimley-Horn and Associates, Inc., June, 1991.

Under present traffic conditions, the existing transportation system is beginning to experience congestion on portions of major routes such as US 29, Summit Avenue, Lee's Chapel Road, and Church Street. Levels-of-service for both no-build and build alternatives for the proposed Greensboro Eastern/Northern Urban Loop were calculated using projected 2010 traffic volumes. The No-Build Alternative assumes completion of the 1989 Greensboro Urban Area Thoroughfare Plan road improvements, with the exception of the Eastern/Northern Urban Loop. With the proposed project in place, 25 of the 44 affected major arterial segments analyzed will have an improved level-of-service, while only two segments will have a reduced level-of-service. The LOS for the remaining 17 segments showed no change, although improvement within the same level of service is possible. Only six segments showed an increase in traffic over the No-Build Alternative. This occurs in the vicinity of proposed interchanges.

Among the radial routes projected to operate at LOS E or F in the No-Build Alternative in 2010 are:

- Lee Street from I-85 to I-85 Bypass.
- US 70 from Market Street to McLeansville Road.
- Hicone Road from US 29 to Rankin Mill Road.
- US 29 from Turner Smith Road to East Lee Street.
- Summit Avenue from Cone Boulevard to Spray Street.
- Church Street from Cone Boulevard to Bass Chapel Road.
- Lawnsdale Drive from Pisgah Church Road to Lake Jeanette Road.

The following east-west circumferential arterial routes are projected to operate at LOS E or F in the No-Build Alternative in 2010:

- Cone Boulevard from Yanceyville Street to US 29.
- Lees Chapel Drive from Townsend Road to US 29.

Analyses of year 2010 traffic assignments with and without the Greensboro Eastern/Northern Urban Loop indicate that total vehicle-miles travelled in the Greensboro Urban area will remain about the same while vehicle-hours travelled will be reduced by about 1,000 hours per day. This decrease will result in reduced fuel consumption, air pollution, and user cost throughout the region, particularly because of reduced congestion and more efficient operating conditions.

F. MODAL INTERRELATIONSHIPS

Available modes of transportation in Greensboro and Guilford County include the private automobile (the primary mode), bus service, ride-sharing, rail service, and air service.

Bus service does not extend into the study area. Duke Power Transit Company provides bus service that radiates outward from the downtown Greensboro hub along routes that follow Summit Boulevard, East Cone Boulevard, and Market Street/Huffine Mill Road. These routes end before reaching the western study area boundary. Currently, there are no plans to extend bus service into the study area.

The City of Greensboro operates a ride-sharing program called *Municipool*. A major goal of this program is to increase auto occupancy, which would result in fuel conservation and reduce the need for new roadway and parking facilities. Because the proposed freeway would serve circumferential and bypass travel, this travel demand would not be met by ride-sharing, which primarily serves radially-oriented trips.

Two railroad lines, owned by Southern Railway, cross the study area. One line parallels US 70 and the other roughly parallels US 29. These lines generally carry two passenger trains and four freight trains per day. The build alternatives anticipate that all railroad crossings would be grade-separated.

The Piedmont Triad International Airport does not lie within the study area. It is most directly affected by the Western Urban Loop. However, access to the Airport from east Guilford County will improve with the completion of the Greensboro Eastern/Northern Urban Loop and its connection to the Western Urban Loop and Bryan Boulevard.

G. ACCIDENT DATA AND SAFETY

A traffic accident rate analysis was prepared for selected travel routes that will be affected by this project. The traffic analysis covers the 36-month period from October 1, 1987, through September 30, 1990, and is summarized in Table I-4. This table provides a statistical overview of actual accident rates on selected routes compared with the average statewide accident rates for similar roadway facilities.

The accident rates on many of the urban and rural state roads in the study area, as shown in Table I-4, greatly exceed the statewide averages. This indicates that selected routes in the study area experience a substantially higher number of accidents than similar routes in other areas of the state. As traffic increases in the study area and roads become more congested, the accident rates are expected to increase further if no improvements are made.

Statewide average accident rates for urban freeways are lower than for other types of highway facilities. The addition of a newly designed, multi-lane freeway in this portion of Greensboro and Guilford County would alleviate traffic congestion on most existing streets in the area because many motorists would elect to use the new highway. This should reduce the existing and future accident potential on existing routes. In addition, traffic on the access-controlled road would operate under safer conditions and would have fewer accidents than if it were travelling on existing roads.

**TABLE I-4
ACCIDENT RATE COMPARISON**

Roadway Classification	Facility	Between	Accident Rate Per 100 Million Vehicle Miles		
			Total Accident	Fatal Accident	Non-Fatal Injury Accident
Urban Interstate	I-40/85	NC 6 & Mt. Hope Church Road	50.08	0.65	18.54
		STATEWIDE AVERAGE	(171.3)	(0.9)	(66.7)
Urban US Route	US 29	US 70 & Esterwood Road	150.59	1.72	59.64
		US 70	139.34	2.03	70.18
		STATEWIDE AVERAGE	(306.3)	(0.9)	(117.7)
Urban NC Route	Cone Boulevard	Lawndale Drive & US 29	442.35	2.95	204.95
		Pisgah Church Road	156.80	0.00	71.64
	Brightwood School Road	Pisgah Church Road & Assembly Road	2,571.43	0.00	1,285.71
		Assembly Drive	1,333.33	0.00	833.33
	Summit Avenue	Brightwood School Road & US 29	259.39	0.00	89.45
	Hicone Road	Summit Avenue & McLeansville Road	234.74	6.71	93.90
		STATEWIDE AVERAGE	(382.0)	(1.0)	(146.5)
Rural NC Route	Mt. Hope Church Road	I-40/85 & US 70	1,629.21	0.00	730.34
		McLeansville Road	1,645.57	126.58	759.49
	McLeansville Road	Dicks Mill Road & Hicone Road	476.19	0.00	211.64
	Hinas Chapel Road	Creekview Road & McKnight Mill Road	461.10	57.64	172.91
	Rankin Mill Road	Huffine Mill Road & Hicone Road	540.54	15.02	300.30
		STATEWIDE AVERAGE	(331.7)	(4.0)	(152.2)

H. ECONOMIC DEVELOPMENT

Guilford County is the third most populous county in North Carolina. The population has increased nearly 10 percent in the past 10 years. The County's largest City, Greensboro, is experiencing rapid growth on the east towards Burlington and on the west towards Winston-Salem and High Point. This influx of people has resulted in considerable economic growth and development. Guilford County and Greensboro provide a substantial employment base for central North Carolina. To accommodate the increasing numbers of vehicles, an improved roadway network is necessary. The proposed action will improve accessibility to major employers, shopping centers, schools, and recreational centers.

The Greensboro Eastern/Northern Urban Loop will provide the improved transportation system that is needed for the continued economic growth and health of Greensboro and Guilford County.

I. SUMMARY OF NEED FOR ACTION

The proposed action is compatible with the local, regional, and statewide transportation and land use goals for the Greensboro and Guilford County area, particularly those goals adopted with the 1989 Greensboro Urban Area Thoroughfare Plan. This Thoroughfare Plan includes the construction of a multi-lane facility that will completely encircle the City of Greensboro to serve developed and developing areas of the city.

The proposed action will also allow for the orderly and planned relief to traffic congestion in the Greensboro area. Based upon capacity analyses, the existing roads will experience increased congestion if the Greensboro Eastern/Northern Urban Loop is not built.

The Greensboro Eastern/Northern Urban Loop is needed to connect major thoroughfares such as I-85, I-40, US 29, and US 70. Without this project, existing radial thoroughfares will carry increasing volumes, negatively impacting adjacent properties and surrounding communities. This project will also connect with other portions of the planned urban loop.

The planned freeway will provide safer traffic conditions than do existing roads. The average accident rate for freeways is less than one-half the rate for multi-lane urban surface streets. Traffic diverted to this road will thus be travelling under safer conditions. In addition, since traffic on other roads will decrease with this route in place, safety will be improved on those as well.

This freeway will serve both existing and future development in eastern Greensboro by providing a safe, direct route between residences, businesses, and public facilities. Economic development will continue in this growing portion of the urbanized area with adequate transportation to serve it. The route will decrease the number of hours spent travelling, allowing time for people to pursue other activities.

In summary, this route will help to fulfill local, regional, and state transportation goals; will increase safety; will improve overall urban mobility; will help to improve air quality; will serve and promote existing and planned development; and will help to maintain the quality of life in Greensboro.

CHAPTER II ALTERNATIVES

This chapter addresses various alternative courses of action (build) and non-action (no-build). The following alternatives are presented for consideration:

- No-Build
- Transportation System Management
- Multi-Modal Systems
- Widen Existing Highways
- Construction Alternatives
- Reduced Facility Concept

A. NO-BUILD

The **No-Build Alternative** assumes that the Greensboro Eastern/Northern Urban Loop is not in place, but that other elements of the 1989 Greensboro Urban Area Thoroughfare Plan have been implemented. The No-Build Alternative would result in a 13-mile gap in the proposed Greensboro Urban Loop system and, therefore, is not compatible with the transportation goals specified in this Thoroughfare Plan to provide a complete circumferential loop around the City of Greensboro. This alternative is not compatible with the transportation, land use, and primary planning goals established by the state, region, county, and city. Traffic generated by growth and development in this portion of the county would have to find alternative existing routes, which would result in longer trip lengths, more congestion, and less safety.

The continued economic growth of the region is vitally dependent on an adequate transportation network to serve the traffic demand. Because the transportation improvement goals and objectives are not met with the No-Build Alternative, the region's competitiveness in maintaining and attracting important industries would be weakened. The No-Build Alternative would decrease the job opportunities in this region and adversely impact the economy.

The level-of-service (LOS) provided by the No-Build Alternative is unacceptable. As discussed in Chapter I, several important arterial routes will operate at very poor levels of service with the No-Build alternative. Among the routes projected in the year 2010 to operate at LOS E or F in the No-Build alternative are:

- Lee Street (NC 6)
- US 70
- Hicone Road
- US 29
- Summit Avenue
- Church Street
- Lawndale Drive
- Cone Boulevard
- Lees Chapel Drive

Cone Boulevard and Lees Chapel Drive function as circumferential facilities, while the others listed function as radial facilities.

With the No-Build Alternative, there would be more vehicle-hours of travel (1,000 hours per day) in the study area than if the Eastern/Northern Urban Loop were built. This would result in increased fuel consumption, air pollution, and user cost. More of the public's time would be spent in travelling rather than in more productive activities. Consequently, there would be an overall decline in the quality of life in the Greensboro area if the No-Build Alternative were selected.

The No-Build Alternative would avoid the adverse impacts associated with constructing a freeway facility on a new location as discussed in Chapter IV of this document.

B. TRANSPORTATION SYSTEM MANAGEMENT

Transportation System Management (TSM) alternatives are aimed at bringing about a more effective use of the existing transportation system. TSM alternatives consist of minor improvements to existing highways to allow traffic to flow more smoothly and efficiently. Such measures include improving signals and signal progression, installing a computerized signal system, adding high occupancy vehicle lanes, adding turn lanes, and other similar capacity and operational improvements. However, there are no reasonably contiguous or direct routes within the corridor between I-85 and Lawndale Drive that could be adequately improved by TSM. The current road system is primarily a radial system leading to the Central Business District (CBD). The study area, especially west of US 29, has a minimal capability for circumferential movement. TSM improvements to other arterials in the study area would not be sufficient to remedy the lack of circumferential routes. TSM, therefore, is not considered a viable alternative to construction of the Greensboro Eastern/Northern Urban Loop.

TSM will not meet the long-term purpose of the proposed action and will only temporarily defer the need for completing the freeway. Therefore, implementing the proposed action later would make the adverse impacts identified in Chapter IV even greater. Increased development occurring in that period would offer even less flexibility in locating the facility and mitigating any adverse impacts associated with it.

C. MULTI-MODAL SYSTEMS

Transit service is provided within the Greensboro urban area by Duke Power Transit. The City of Greensboro is in the process of acquiring the transit system from Duke Power. The present system is designed to serve radial needs. Transit services for circumferential trips were reviewed as part of the 1989 Greensboro Urban Area Thoroughfare Plan Update and the Greensboro Transit Service Plan. Both studies show that transit cannot meet current or projected circumferential trip needs. Due to low projected ridership and the resultant high cost per passenger, cross-town or circumferential routes were not included in the Transit Service Plan.

Transit service is not available in the study area and is not a viable alternative to completing this 13-mile segment of the Greensboro Urban Loop because of an absence of concentrated trip origins and destinations.

The cities of Greensboro and High Point operate a ride-share program, *Municipool*, that offers assistance in matching passengers and in providing vehicles. The objective of this program is to reduce vehicular travel demand by increasing auto occupancy. However, data from the City of Greensboro shows that auto occupancy has decreased in recent years, from 1.25 passengers per vehicle in 1980 to 1.17 in 1988, indicating that ride-sharing will not be effective in reducing travel demand sufficiently to reduce the need for this project. Ride-sharing is similar to transit service in that it is more effective in providing a viable alternative for radial commuting trips, while a circumferential facility like the Greensboro Eastern/Northern Urban Loop will serve suburban cross-town trips. Ride-sharing is not considered a viable alternative to the proposed action.

D. BUILD ALTERNATIVES

1. Widen Existing Highways

No segments of existing roadways in the project area could be considered as alternatives to the Greensboro Eastern/Northern Urban Loop. North-south roadways like Mount Hope Church Road, Clapp Farms Road, and Rankin Mill Road, and east-west roads, such as Hines Chapel Road, Hicone Road, and Lake Jeanette Road, are neither direct nor continuous and would not provide safe and efficient movement of traffic from I-85 northward to US 29 and Lawndale Drive. Even if the widening of existing highways were possible, this alternative would result in a very circuitous route and would not provide as desirable a level of service as would a freeway with control of access and grade-separated interchanges.

While the areas north and east of Greensboro have a strong radial network in place, the circumferential system is weak, particularly on the east side. It consists almost entirely of discontinuous segments of two-lane rural roads, often with less than desirable alignments and pavement and shoulder widths. As these areas develop from rural fringe into suburbs, this deficiency will become more detrimental to the function of the roadway. The existing circumferential roads serve an important local access function, a function that conflicts with the need to move large volumes of traffic through the area. Simply widening these roads will not eliminate this conflict, nor will it provide adequate service. Obtaining control of access would be prohibitively expensive and disruptive. A major new access-controlled thoroughfare with system integrity and continuity is needed.

This alternative does not appear to offer an adequate or cost-effective solution to City and County transportation goals. Consequently, widening existing highways is not compatible with the Thoroughfare Plan and is not considered a viable alternative to building a new facility.

2. Preliminary Alternatives

The proposed project begins at I-85 east of Greensboro and ends at Lawndale Drive in north-northwest Greensboro. The project termini are coordinated with the adjacent

proposed I-85 Bypass and Greensboro Western Urban Loop projects. The proposed project generally follows the conceptual location of the Greensboro Eastern/Northern Urban Loop, as shown on the Greensboro Thoroughfare Plan (see Figure I-3).

The study area for the Greensboro Eastern/Northern Urban Loop is shown on Figure I-2. The area is constrained at its western boundary by the urban development associated with the City of Greensboro, beginning in the area of Cone Boulevard. The study area is constrained to the north by critical watershed areas, and to the east by McCleansville. Also, extending the study area to the east would result in a lengthy corridor with unacceptable environmental and road user costs which could not be economically justified.

A series of preliminary study lines was developed on the basis of the combined efforts of NCDOT engineers, the consultant team, the steering committee, and the public. The preliminary study lines are shown on Figure II-1. Citizens were encouraged to identify their preferred alignments at the first citizens informational workshop. These alternatives were subsequently evaluated to assess their feasibility with regard to engineering, design, and environmental constraints.

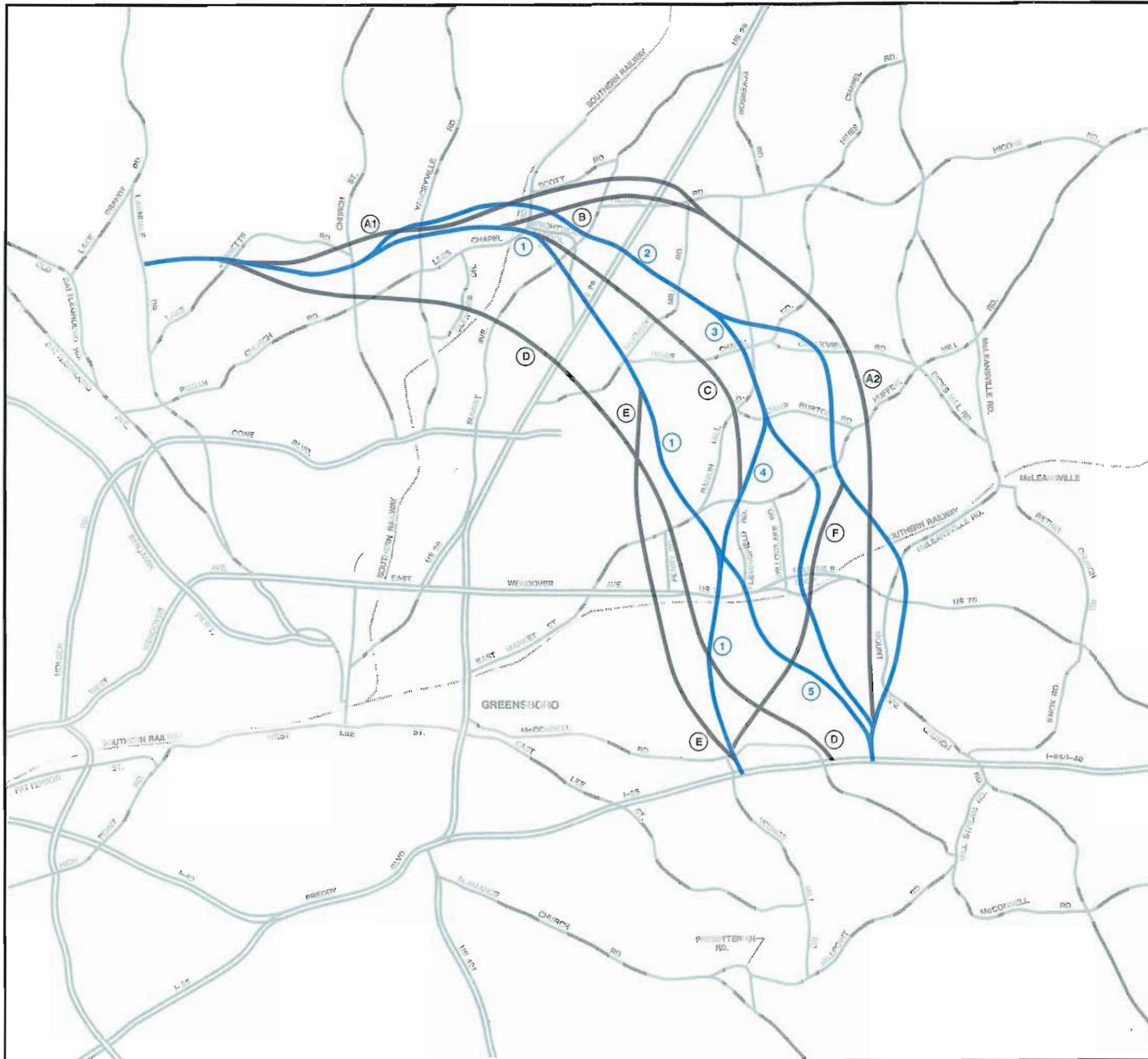
A wide variety of environmental and engineering criteria was used to evaluate the preliminary alternatives developed for this study. This evaluation resulted in the elimination of some lines from further study because they were not feasible or practical from the engineering and/or environmental standpoint. The evaluation criteria were based on the following factors:

- Adverse impacts on known developments, residential communities, archaeological and historic architectural sites, protected species, parks and greenways, and natural systems.
- Adverse economic impacts on businesses.
- Inconsistency with adopted thoroughfare plan or state transportation goals.
- Encroachments in protected watershed critical areas.
- Recognized geological or soils instability (mines, quarries, or sinkholes).
- Potential hazardous material sites.
- Undesirable traffic operational and safety conditions and congestion.
- Conflicts with accepted geometric design standards and criteria.

3. Alternatives Considered But Not Recommended For Further Study

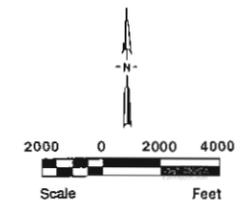
Table II-1 lists the seven study lines eliminated from further study and the reasons for their elimination. The remaining lines were aggregated into three alternatives and carried forward for more detailed analysis. These three alternatives are identified as the Eastern, Middle, and Western Alternatives.

**GREENSBORO
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LEGEND

- PRELIMINARY STUDY LINES RETAINED
- PRELIMINARY STUDY LINES ELIMINATED



PRELIMINARY STUDY LINES

FIGURE II-1

TABLE II-1
PRELIMINARY ALTERNATIVE STUDY LINES ELIMINATED

SEGMENT	REASON FOR ELIMINATION
A1	<ul style="list-style-type: none"> • Encroaches on southern end of Lake Jeanette. • Located within Tier 3 of Lake Townsend Watershed Critical Area. • Disruptive to established residential/commercial development along Lake Jeanette Road, Church Street Extension, and Scott Road.
A2	<ul style="list-style-type: none"> • Disruptive to residential/commercial communities along Rankin Mill Road, Hines Chapel Road, Huffine Mill Road, US 70, and McLeansville Road. • Requires relocation/realignment of one-mile section of McLeansville Road.
B	<ul style="list-style-type: none"> • Disrupts highly developed residential/commercial sections along Hicone Road. • Requires major relocation of existing US 29/Hicone Road interchange.
C	<ul style="list-style-type: none"> • Impacts directly upon City of Greensboro (White Street) landfill. • Severs Oakwood Forest Mobile Home Park.
D	<ul style="list-style-type: none"> • Impacts existing I-85/McConnell Road interchange. • Impacts Shady Grove Church and Cemetery. • Impacts proposed borrow area for City of Greensboro (White Street) landfill. • Clips extreme southwest corner of City of Greensboro asbestos landfill. • Extensive residential disruption in the Summit Avenue and Church Street corridors.
E	<ul style="list-style-type: none"> • Disruptive to commercial establishments in US 70 corridor. • Disrupts densely populated areas in the vicinity of Huffine Mill Road and Phillips Avenue.
F	<ul style="list-style-type: none"> • Severs Southfork Mobile Home community. • Severs Gallant Estates Mobile Home Park.

4. Alternatives Selected for More Detailed Study

Three alternative corridors were selected for further study and evaluation: an Eastern Alternative, a Middle Alternative, and a Western Alternative (Figure II-2A). These alternatives, which are the most reasonable and feasible alignments for construction, are described below.

Eastern Alternative

The Eastern Alternative begins at I-85, approximately 3,000 feet east of the I-85/McConnell Road interchange. It proceeds north, first crossing Mount Hope Church Road and then US 70, approximately 1,200 feet east of the US 70/Mount Hope Church Road intersection. After crossing McLeansville Road, Southern Railway tracks, and South Buffalo Creek, the alternative heads north-northwest to a crossing with Huffine Mill Road just west of Harvest Road. From Huffine Mill Road, it proceeds in a more northern direction, crossing Camp Burton Road, North Buffalo Creek, and Creekview Road approximately 3,500 feet east of Hines Chapel Road. The corridor then turns to the west-northwest, crossing Hines Chapel Road and Rankin Mill Road before connecting with the Middle Alternative approximately 2,000 feet east of McKnight Mill Road. From there, the corridor proceeds west-northwest, crossing McKnight Mill Road at the intersection of Briarmeade Road, US 29 north of the Oakwood Forest Mobile Home Park, Summit Avenue north of Brightwood School Road, Lee's Chapel Road north of the Rankin Fire Station, and Southern Railway at Hillcroft Road. This alternative then follows a west-southwest path, crossing both Yanceyville Road and Church Street approximately 1/2 mile north of Lee's Chapel Road before connecting with the Western Alternative in the vicinity of the proposed Elm Street Extension. From here the corridor turns more westerly, crossing Lake Jeanette Road north of Cottage Place and continuing for a distance of approximately 4,800 feet to its terminus with Lawndale Drive south of Richland Creek.

Interchanges are included at the crossings of I-85, US 70, Huffine Mill Road, US 29, Yanceyville Road, proposed Elm Street Extension, and Lawndale Drive. All other crossings would be by grade separation, relocation, or termination of the cross streets. The Eastern Alternative is 13.0 miles in length.

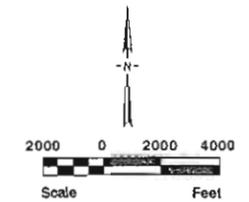
Middle Alternative

The Middle Alternative begins at the same I-85 interchange as the Eastern Alternative. This alternative proceeds to the north-northwest, crossing Clapp Farms Road approximately 4,800 feet west of Mount Hope Church Road. It then crosses South Buffalo Creek, US 70, and the Southern Railway east of the railroad underpass before crossing Fourmile Loop east of Willowlake Road. From there, the corridor turns more north to a crossing of Huffine Mill Road approximately 1,500 feet west of Harvest Road. The Middle Alternative then turns to the northwest, crossing Camp Burton Road just to the west of the prison. Heading northwest, it crosses North Buffalo Creek, Rankin Mill Road, and Hines Chapel Road west of Rankin Mill Road, before connecting with the Eastern Alternative approximately 2,000 feet east of McKnight Mill Road. The alternative continues along the same route as the Eastern Alternative to the interchange with Lawndale Drive. Interchanges are included at the crossings of I-85, Fourmile Loop, Huffine Mill Road, US 29, Yanceyville Road, proposed Elm Street Extension, and Lawndale Drive. All other crossings would be by grade separation, relocation, or termination of the cross streets. The Middle Alternative is 12.5 miles in length.

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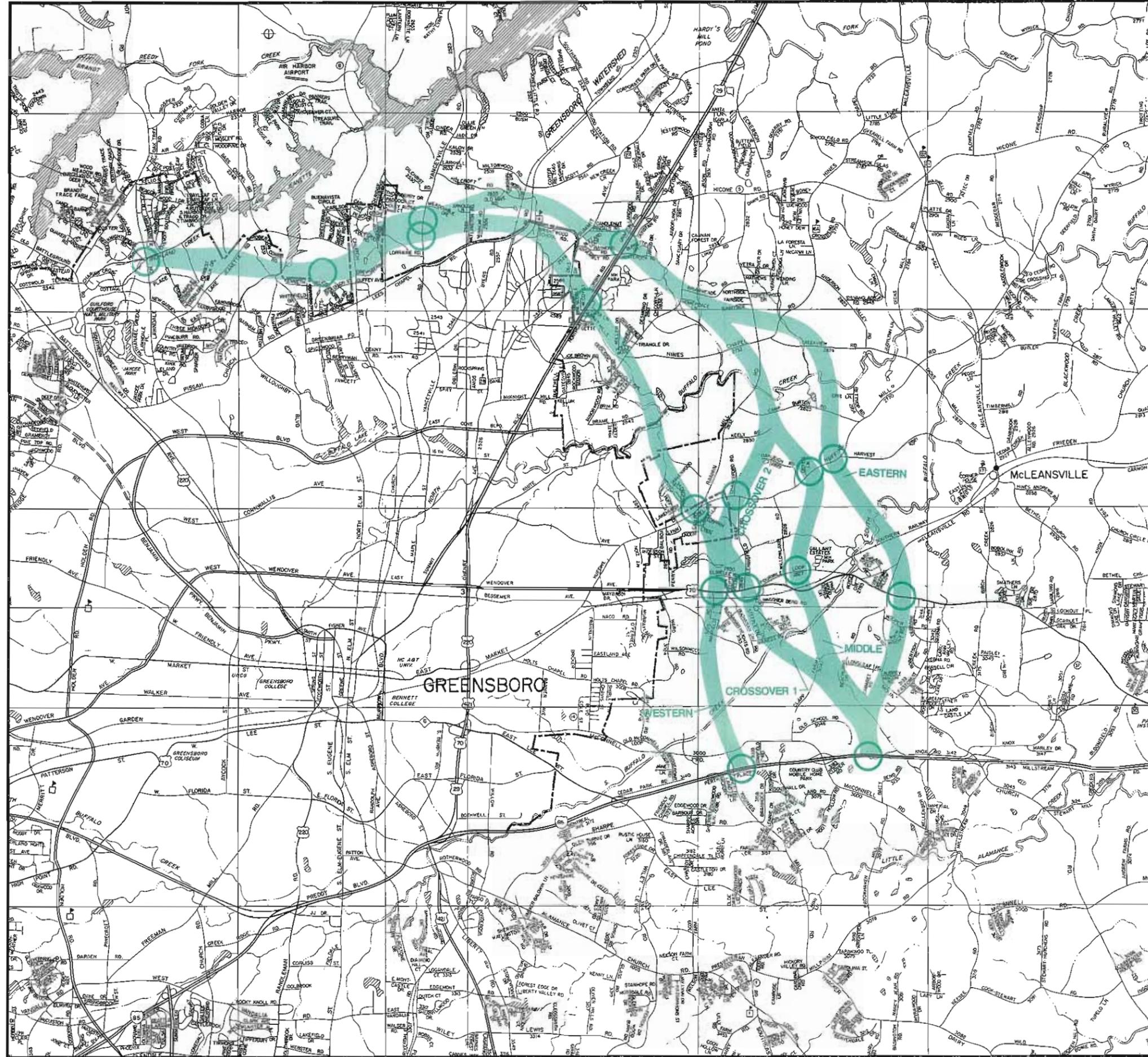
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-  CITY LIMITS
-  PROPOSED INTERCHANGE



CORRIDOR ALTERNATIVES

FIGURE II-2A



Western Alternative

The Western Alternative begins at I-85 approximately 4,800 feet west of the I-85/McConnell Road interchange. From here, the alternative proceeds generally north, crossing McConnell Road east of Youngs Mill Road, South Buffalo Creek, Southern Railway, and US 70 in the vicinity of Maxfield Road. The alignment then follows a more northwesterly direction to a crossing of Huffine Mill Road just south of Rankin Mill Road. The alternative continues in the same general direction, crossing White Avenue and North Buffalo Creek. Between Huffine Mill Road and North Buffalo Creek, the route of the Western Alternative is contained within the Greensboro City landfill property (White Street Landfill). The alignment then proceeds northwest where it crosses McKnight Mill Road at Hines Chapel Road and US 29 north of Lakeview Memorial Park Cemetery. Continuing in this direction, it crosses McCoy Street, Pineneedle Road at Brightwood School Road, and Summit Avenue approximately 1,500 feet south of Brightwood School Road.

Approximately 1,600 feet to the northwest of Summit Avenue, the alignment turns to the west, crossing Lee's Chapel Road south of Brightwood School Road, Southern Railway, and Yanceyville Road about 1,800 feet north of Lee's Chapel Road. The Western Alternative proceeds west, crossing Church Street approximately 1,600 feet north of Lee's Chapel Road before connecting with the Eastern and Middle Alternatives in the vicinity of the proposed Elm Street Extension and continuing to its intersection with Lawndale Drive. Interchanges are proposed at the Western Alternative's crossings of I-85, US 70, Rankin Mill Road/Huffine Mill Road, US 29, Yanceyville Road, proposed Elm Street Extension, and Lawndale Drive. All other crossings would be by grade separation, relocation, or termination of the cross streets. The Western Alternative is 11.0 miles in length.

Crossovers

Two crossovers are included in the routes to be studied between corridors. These crossovers are referred to as Crossover 1 and Crossover 2 on Figure II-2A.

- Crossover 1: Provides a transition from the Eastern Alternative to the Western Alternative. This crossover begins at a point just north of the proposed I-85 interchange and follows a northwest alignment before connecting with the Western Alternative approximately 4,400 feet to the north of the proposed interchange at US 70. Crossover 1, combined with the northern portion of the Western Alternative and the southern terminus of the Eastern Alternative, is 11.5 miles in length.
- Crossover 2: Provides a transition from the Western Alternative to the Middle Alternative. This crossover begins at a point some 2,800 feet north of the proposed interchange of the Western Alternative and US 70 and generally follows a north-northeastern direction to its connection with the Middle Alternative at Camp Burton Road. Crossover 2, when combined with portions of the Western, Middle, and Eastern Alternatives, is 12.3 miles in length.

5. Elimination of Western Alternative

After the review and analysis of impacts on the City of Greensboro's White Street Landfill, as well as on residential displacements and wetlands, it was decided that the Western Alternative should be eliminated from further consideration in this study. Consequently, the Western Alternative, as described in this Draft Environmental Impact Statement, will not be presented for review and consideration at the Public Hearing. The decision to eliminate the Western Alternative was made in conjunction with the Greensboro Eastern/Northern Urban Loop Steering Committee and the North Carolina Department of Transportation.

It is believed that the acquisition of approximately 8.4 acres of permitted landfill property for the Western Alternative would present serious legal, environmental, and operational constraints that would be difficult to overcome and would result in costly and time consuming remediation to mitigate adverse effects. Correspondence from the Public Works Department of the City of Greensboro is contained in Appendix A. In addition to the encroachment on the White Street Landfill, the Western Alternative would also impact the greatest amount of wetlands (34 acres) and would require approximately 364 residential displacements, a total that is second only to the Crossover 1 Alternative of the five alignments studied. The major problem with the Western Alternative, however, is with its involvement with the White Street Landfill.

Specifically, the Western Alternative has been eliminated from further consideration in this study because of the following legal, environmental, and operational issues associated primarily with encroachment on the landfill property:

1. The severing of a portion of the landfill by the proposed roadway corridor could result in future liability to the State because the entire 500-acre landfill complex is listed as a potential hazardous waste site by the North Carolina Division of Solid Waste Management.
2. The deed for the property identifies the site as a landfill. Consequently, the deed accompanying the transfer or sale of any portion of the property to the State must necessarily identify its use as a landfill. This means that liability for any future remedial actions would also be transferred along with the deed to this property.
3. The old solid fill area would be directly encroached by the Western Alternative for a length of approximately 1,000 feet. This solid fill area has been in existence since the mid-1960's, and dumping was essentially unregulated until the mid to late 1970's. This site is known to contain asbestos and other hazardous materials, further adding to its potential liability if it were to be acquired for the right-of-way.
4. The severing of the landfill by the proposed roadway corridor would cause serious impacts to ongoing waste disposal operations, as well as to the City of Greensboro's plan to acquire new property to the south of the existing site for landfill expansion. The Public Works Department of the City of Greensboro has voiced official and strong objection to any consideration of this site for roadway use (Appendix A). The Department indicates that the site cannot be bisected without serious hindrance to waste disposal operations and that relocation of the landfill would be a difficult and costly process.

Replacement Alternative

Various alternative alignments were examined on the east and west sides of the Western Alternative to avoid encroachment with the White Street Landfill. The relocation of the Western Alternative to the west of its present route is not recommended because it would be constrained by increasing urban development associated with the City of Greensboro. A shift of the Western Alternative to the east would still result in potential encroachment with the active area of the White Street Landfill. A relocation of the alignment further to the east beyond the landfill property would move the Western Alternative close to the Middle Alternative, and would result in the partial overlapping of the alignments. On this basis, it is concluded that there are no viable replacement alternatives available, and the Western Alternative has been eliminated from further consideration in this study.

6. Elimination of Crossovers 1 and 2

The recent identification of the preferred alternative for the I-85 Bypass (TIP No. I-2402), which would utilize the easternmost interchange with I-85, has eliminated the need for Crossover 2. Crossover 1 existed to provide a possible transition for the Western Alternative. Since the Western Alternative was eliminated after detailed study, then Crossover 1 is also eliminated.

The crossovers are no longer needed or relevant. Consequently, the Middle and Eastern Alternatives should be retained as viable alignments for the Greensboro Eastern/Northern Urban Loop (see Figure II-2B) and be carried through the Public Hearing stage.

7. Design Criteria for Build Alternatives on New Location

The characteristics of the three build alternatives are based upon the following criteria:

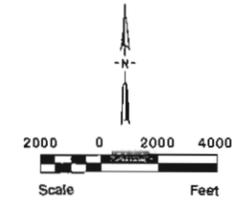
- a. Type of facility - freeway.
- b. Access control - full.
- c. Right-of-way - 300 feet minimum.
- d. Intersecting road treatment - all intersecting roads are to be either interchanged, grade separated with no contact, terminated, or provided with service roads.
- e. Roadway design criteria (see Table II-2).
- f. Railroad crossings - all intersecting railroad crossings are to be grade separated.

Typical cross-sections are shown in Figure II-3.

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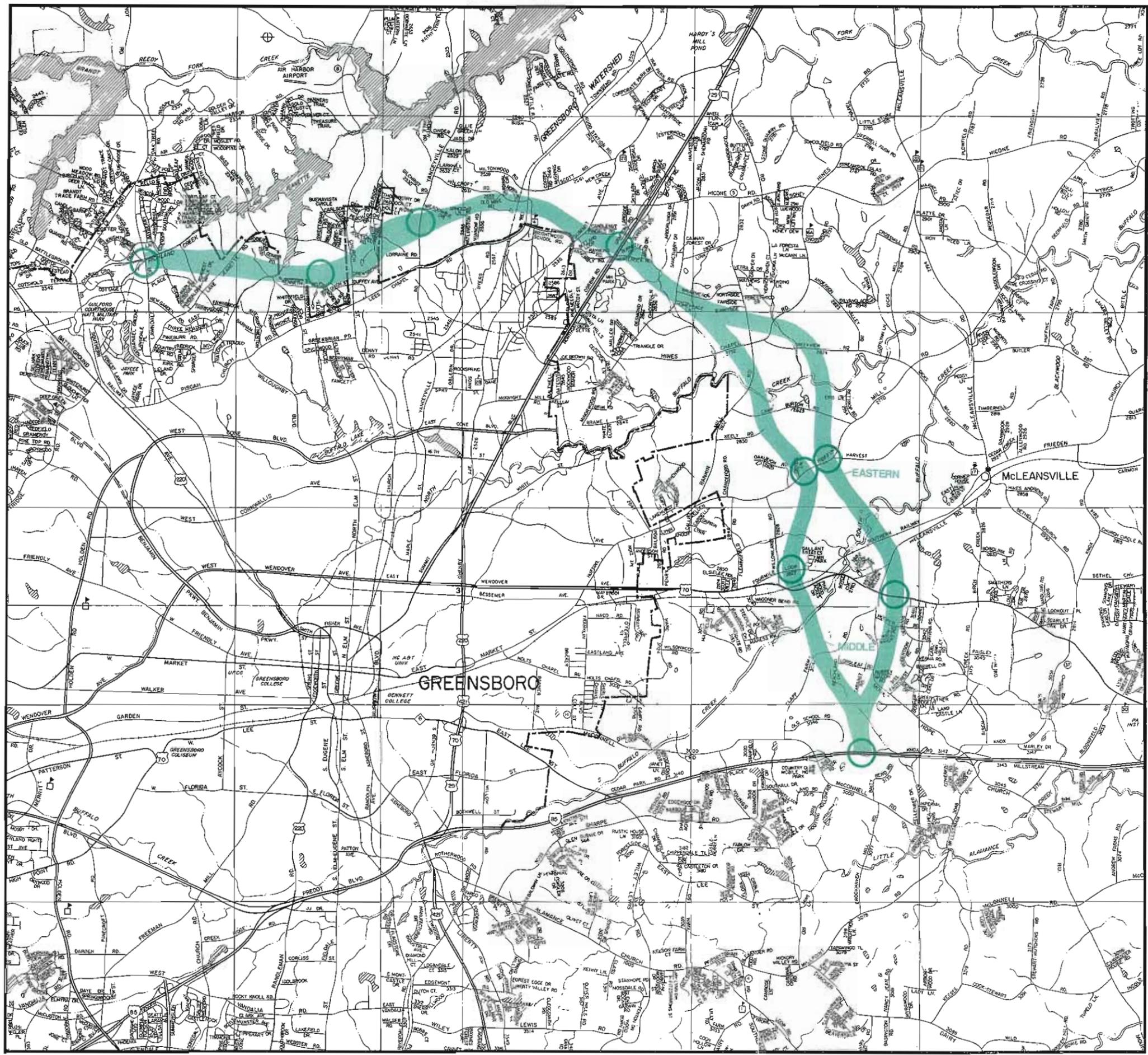
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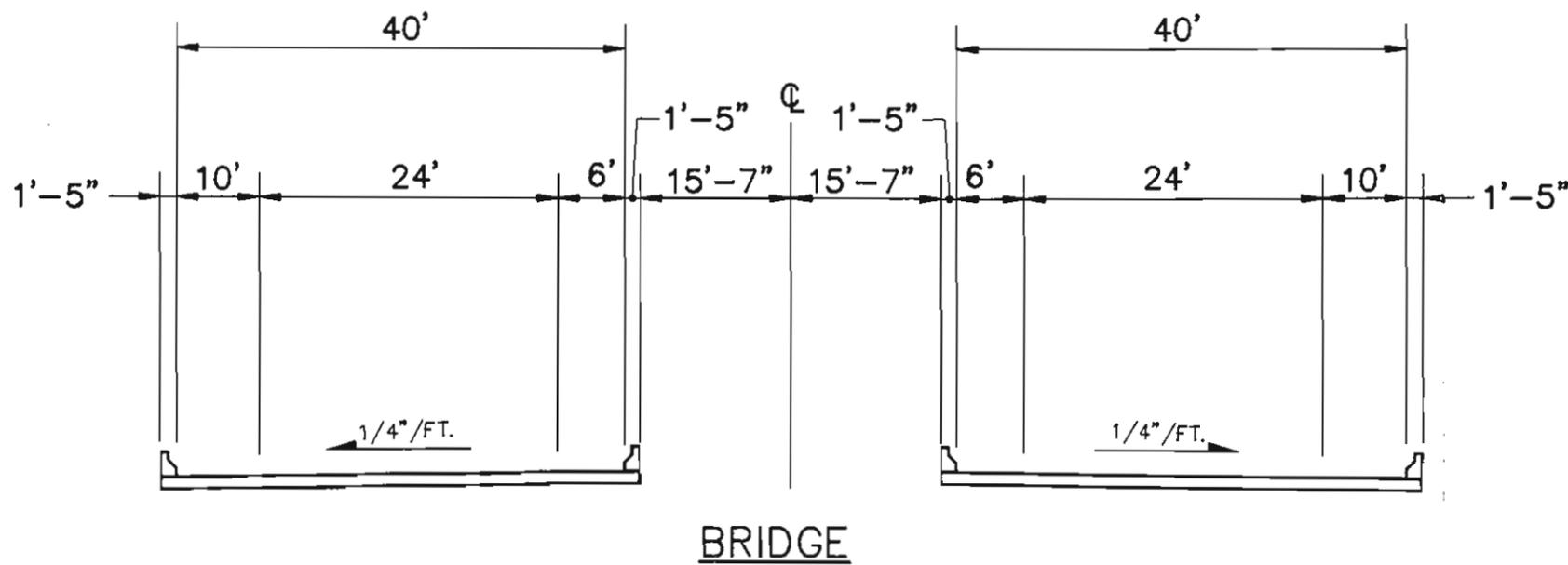
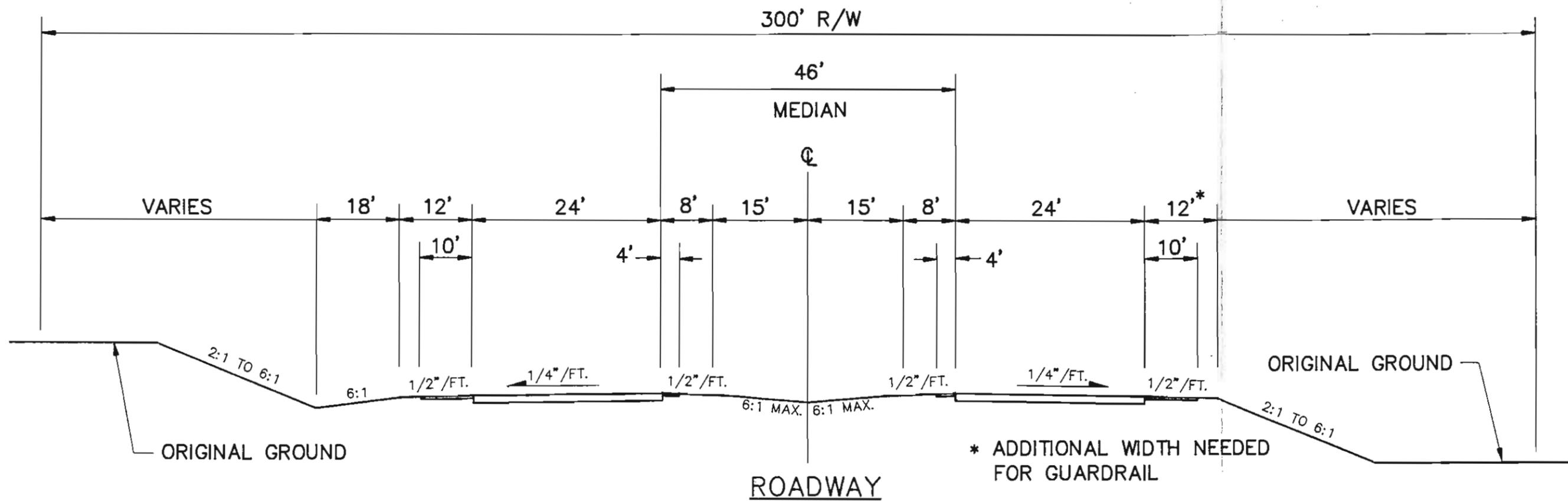
--- CITY LIMITS



RETAINED ALTERNATIVES

FIGURE II-2B





TYPICAL SECTIONS - ROADWAY & BRIDGE

TABLE II-2
ROADWAY DESIGN CRITERIA
GREENSBORO EASTERN/NORTHERN URBAN LOOP

Speeds:	Freeway	-	60 MPH North Loop; 70 MPH East Loop
	Ramp	-	50 MPH (desirable); 40 MPH (minimum)
	Loop	-	25 MPH (minimum)
	Cross Street	-	In accordance with functional classification
Right-of-Way Width:	300 feet minimum		
Lane Width:	Freeway	-	12 feet
	Ramp	-	16 feet
	Cross Street	-	12 feet
Shoulder Width:	Freeway	-	12 feet - 10 feet paved outside 8 feet - 4 feet paved inside
	Ramp	-	12 feet (desirable); 10 feet (minimum) 4 feet paved left and right
	Bridge	-	10 feet outside; 4 to 10 feet inside
Median Width:	Freeway	-	46 feet (minimum)
Degree of Curvature:	Freeway	-	3°- 30' maximum (70 MPH) 5°- 15' maximum (60 MPH)
	Ramp	-	7°- 30' maximum
	Loop	-	150' maximum radius
Superelevation Rate:	Freeway	-	e max = 0.10 ft./ft.
	Other	-	e max = 0.08 ft./ft.
Length of Super-elevation Runoff:	Freeway	-	300 feet minimum
Rates of Grade:	Freeway	-	3% maximum; 0.5% minimum
	Ramps	-	5% maximum; 0.5% minimum
Stopping Sight Distance:	1990 AASHTO Standards		
Length of Vertical Curves:	1990 AASHTO Standards		
Cross Slopes (Normal Section):	1/4"/foot downward		
Vertical Clearances:	16.5 feet (minimum) - over freeways & arterials		
	15.0 feet (minimum) - over local & collector roads		
	23.0 feet (minimum) - over railroads		

SOURCE: "A Policy on Geometric Design of Highways and Streets," AASHTO, 1990 North Carolina Department of Transportation Roadway Design Manual.

8. Traffic Operations and Level of Service

Traffic operations and levels-of-service were evaluated for the three alternatives based upon 2010 traffic projections developed from the Greensboro urban area transportation model. Analyses included levels-of-service for basic lane sections; merge, diverge, and weave analyses for freeway ramps; and planning capacity analyses for ramp termini at interchanges. Assumptions included balanced daily traffic flow by direction, level terrain, ten percent peak hour/average daily traffic and 60/40 peak hour directional split for autos, and 4.2 percent peak hour/average daily traffic and 50/50 peak hour directional split for trucks. This is equivalent to 3.7 percent trucks on the mainline and the ramps. These assumptions are conservative and provide a design that allows for future growth. A summary of the capacity analysis is shown in Table II-3.

**TABLE II-3
CAPACITY ANALYSIS SUMMARY**

Section	Number of Lanes In Each Direction	LEVEL OF SERVICE (LOS)		
		Eastern Alternative	Middle Alternative	Western Alternative
Lawndale Drive to Elm Street	2	C	C	C
Elm Street to Yanceyville Road	2	C	C	C
Yanceyville Road to US 29	2	B	B	B
US 29 to Cone Boulevard	2	B	B	C
Cone Boulevard to Huffine Mill Road	2	B	B	C
Huffine Mill Road to US 70	2	B	B	C
US 70 to I-85	2	C	C	C

Levels-of-service, as defined by the Transportation Research Board, were used for qualitative evaluation of the alternatives. Levels-of-service range from "A" to "F", with A being the least congested and F being the most congested. LOS A through C are considered desirable for all facilities. LOS D is acceptable for existing facilities during peak hours, but is not desirable. A level-of-service exceeding D (E or F) is considered prone to congestion, unstable, and unacceptable.

Traffic volumes on the Eastern and Middle Alternatives range from approximately 18,400 vehicles per day (VPD) south of US 29 to 33,400 VPD east of Lawndale Drive. Traffic volumes on the Western Alternative range from approximately 20,100 VPD north of US 29 to 33,400 VPD north of Elm Street and north of I-85.

Capacity analyses were performed for mainline freeway sections, ramp merges and diverges, and weaving sections. The lane requirements shown in Table II-3 reflect the results of these analyses. In some cases, lane requirements were dictated by ramp movements rather than mainline volumes alone.

Based upon the capacity analyses, the three alternatives will require four basic lanes, two in each direction.

Capacity analyses were conducted for the proposed interchanges and used to determine lane requirements on ramps and intersecting surface arterials. Based on this capacity analysis, all interchanges will operate at LOS D or better in the design year.

Figures II-4A, II-4B, and II-4C show projected 2010 traffic volumes for the Eastern, Middle, and Western Alternatives, respectively. The traffic volumes and capacity analyses are further documented in the Traffic and Capacity Analysis Technical Memorandum (Kimley-Horn and Associates, Inc., June 1991), appended by reference and available from the Department.

GREENSBORO EASTERN/NORTHERN
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PROJECTED YEAR 2010 TRAFFIC VOLUMES
WESTERN ALTERNATIVE

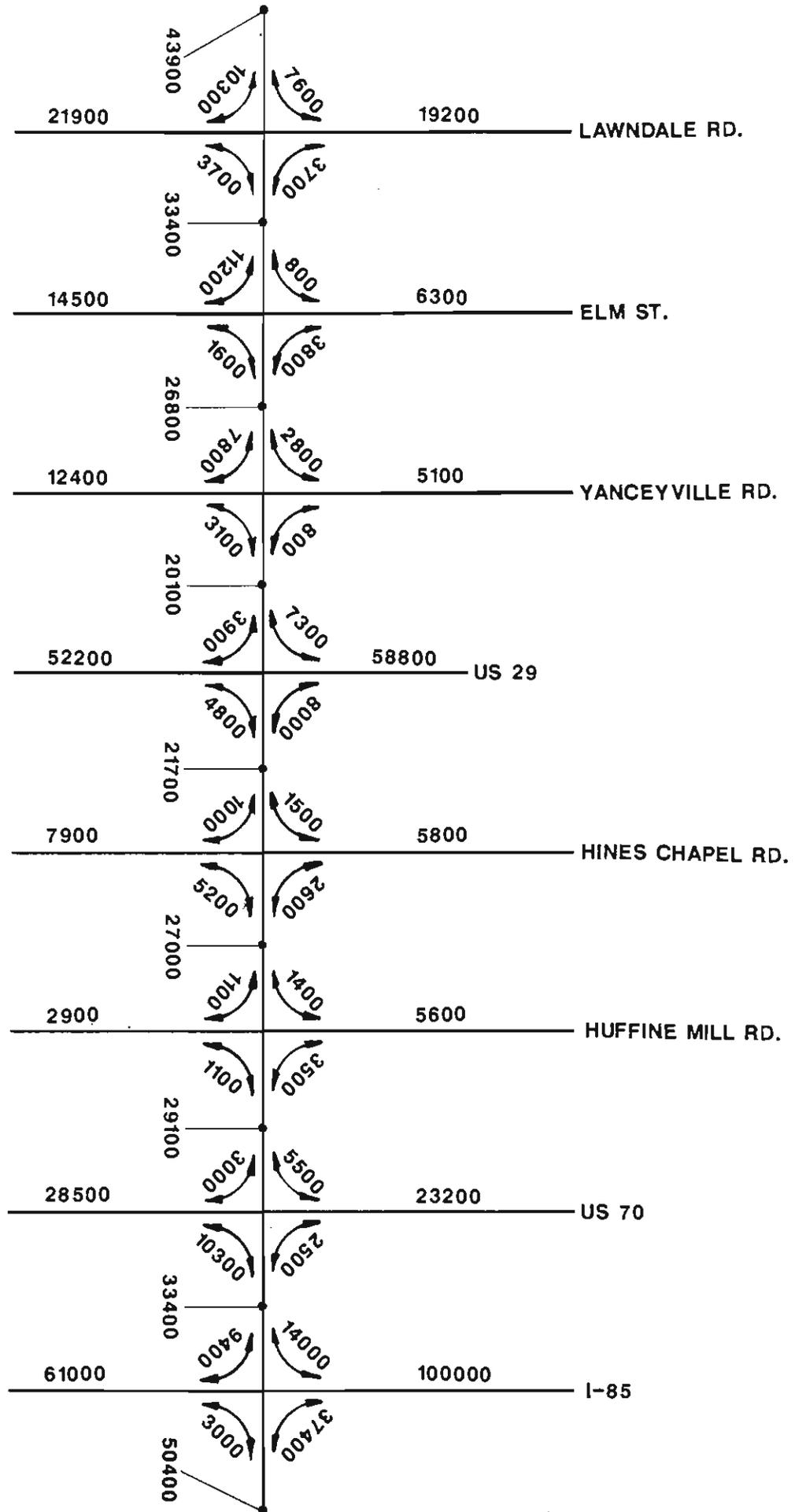


FIGURE
11-4C

GREENSBORO EASTERN/NORTHERN
URBAN LOOP

PROJECTED YEAR 2010 TRAFFIC VOLUMES
MIDDLE ALTERNATIVE

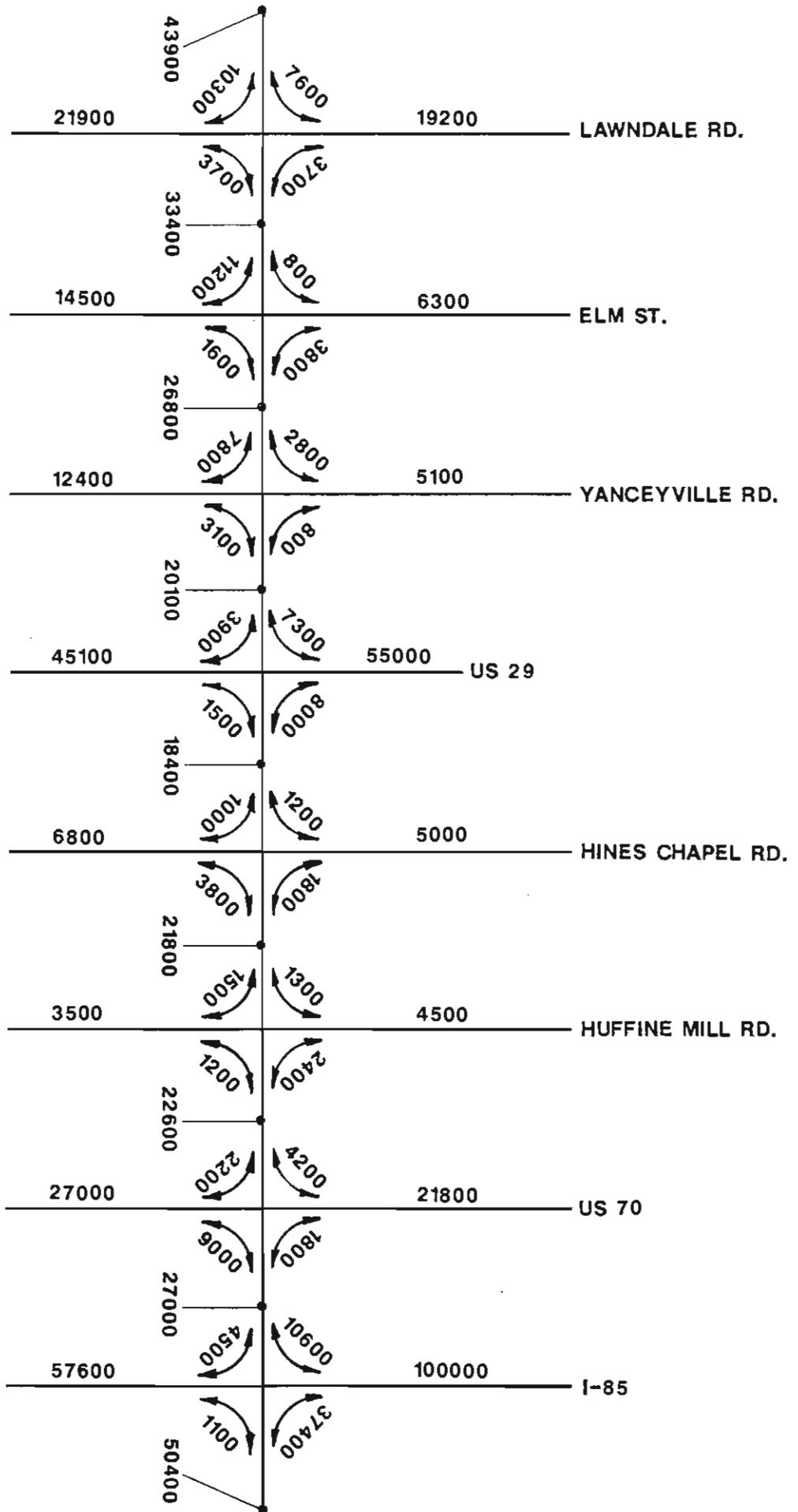


FIGURE
11-4B

GREENSBORO EASTERN/NORTHERN
URBAN LOOP

PROJECTED YEAR 2010 TRAFFIC VOLUMES
EASTERN ALTERNATIVE

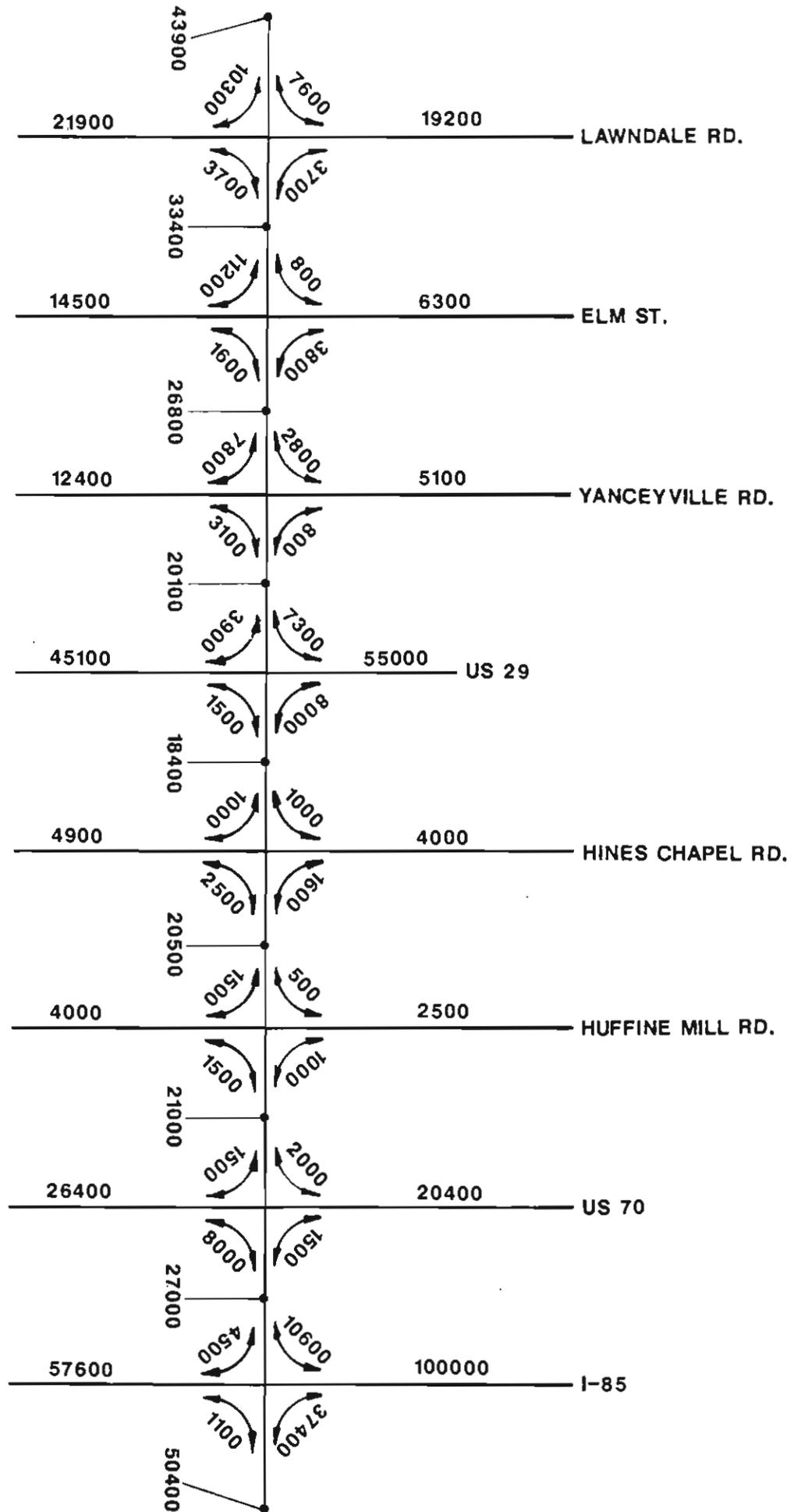


FIGURE
II-4A

9. Construction and Right-of-Way Cost Estimate

Construction costs were estimated for each alternative based on the functional design plans. These plans include horizontal and vertical alignment of the highway and were developed using the design criteria and typical sections described previously. The following elements were included in developing the construction cost estimate:

- Mobilization
- Clearing and grubbing
- Earthwork (excavation and embankment)
- Drainage
- Stabilization and pavement
- Structures
- Guardrail
- Erosion control
- Traffic control
- Signing and marking
- Widening cross-streets at interchanges
- Engineering and contingencies

Estimated construction costs in 1990 dollars are \$81.0 million for the Eastern Alternative, \$82.6 million for the Middle Alternative, and \$76.4 million for the Western Alternative. Construction costs for Crossovers 1 and Crossover 2 are \$72.0 million and \$76.1 million, respectively.

Estimated right-of-way costs were prepared for each alternative, including crossovers. These costs totaled \$39.5 million for the Eastern Alternative, \$41.5 million for the Middle Alternative, \$36.4 million for the Western Alternative, \$37.4 million for Crossover 1, and \$40.2 million for Crossover 2.

By combining the construction and right-of-way costs, the estimated total costs for the three alternatives and crossovers are \$120.5 million for the Eastern Alternative, \$124.1 million for the Middle Alternative, and \$112.8 for the Western Alternative \$109.4 million for Crossover 1, and \$116.3 million for Crossover 2.. The 1993-1999 TIP estimates the total cost of the Eastern and Northern Loop portions to be \$185.4 million. Costs for each alternative are summarized in Table II-4.

**TABLE II-4
ESTIMATED COSTS**

COSTS (millions, 1990)	ALTERNATIVE				
	Eastern	Middle	Western	Crossover 1	Crossover 2
Construction	\$81.0	\$82.6	\$76.4	\$72.0	\$76.1
Right-of-Way	\$39.5	\$41.5	\$36.4	\$37.4	\$40.2
TOTAL COST	\$120.5	\$124.1	\$112.8	\$109.4	\$116.3

E. REDUCED FACILITY CONCEPT

A reduced facility, one with partial control of access, was considered but eliminated from further study. Based on the heavy traffic demand, a facility without full control of access and with at-grade intersections could not carry projected traffic volumes at an acceptable level-of-service. Traffic signals, intersecting streets, and driveways reduce the capacity, operating speed, and safety of the road, making such a facility undesirable for high volumes and long trips. A reduced freeway facility, with full control of access and a narrower right-of-way would serve some of the purposes of this project, but would not provide full safety and capacity benefits.

**CHAPTER III
AFFECTED ENVIRONMENT**

This chapter details the existing social, economic, and natural environmental setting for the Greensboro Eastern/Northern Urban Loop study area. Evaluation of this data will serve as the basis for assessing the environmental consequences of the proposed action.

A. SOCIAL ENVIRONMENT

1. Population and Housing

Guilford County is among the fastest growing counties in North Carolina. Population estimates covering the period 1960-1990 for the City of Greensboro, Guilford County, and North Carolina are shown in Table III-1. Table III-2 gives the projected populations for the City, County, and State for the years 2000 and 2010. As this table indicates, the growth rate projected for Guilford County is somewhat lower than that projected for the state between the years 1990 and 2000. Population density, i.e., population per square mile of land area, has also increased steadily during the period 1960-1990, as shown in Table III-3.

**TABLE III-1
POPULATION ESTIMATES 1960 - 1990
(in thousands)**

Area	1960	1970	1980	1990
City of Greensboro	119.6	144.1	155.6	183.5
Guilford County	246.5	288.6	317.2	348.0
State of North Carolina	4,556.2	5,084.4	5,881.7	6,492.8

SOURCE: North Carolina State Government Statistical Abstract, Fifth Edition, 1991, U.S. Department of Commerce, Bureau of the Census, Office of State Budget and Management, Research and Planning Services.

TABLE III-2
POPULATION PROJECTIONS 2000 - 2010
(in thousands)

Area	2000	2010	Percent Increase 1990-2000	Percent Increase 2000-2010
City of Greensboro ¹	202.4	222.2	10.3%	9.8%
Guilford County ²	369.0	387.0	6.0%	4.9%
State of North Carolina ³	7,005.4	N/A	7.9%	N/A

SOURCE: 1 - City of Greensboro Planning Office, 1991.
2 - Guilford County Planning Department, 1989.
3 - North Carolina Office of State Budget and Management, 1989.

TABLE III-3
POPULATION DENSITY
(persons per square mile)

Area	1960	1970	1980	1990
City of Greensboro	2,411	2,648	2,581	1,988
Guilford County	379	441	487	534
State of North Carolina	93	104	120	132

SOURCE: North Carolina State Government Statistical Abstract.

As the population level is growing, characteristics of the population are correspondingly changing. In generalized terms, the population of Guilford County is becoming older and more educated. The median age in Guilford County in 1960 was 27 years. In 1980, the median age was 30.1 years. Similarly, the number of college graduates in Guilford rose from 12.8 percent in 1970 to 19.7 percent in 1980.¹

In Guilford County, the number of households increased 27.0 percent between 1960 and 1970, and 29.9 percent between 1970 and 1980. The average statewide increase during these periods was 25.3 percent and 35.4 percent, respectively. The number of households in Guilford County and in North Carolina is shown in Table III-4.

TABLE III-4
NUMBER OF HOUSEHOLDS & PERSONS PER HOUSEHOLD
(1960, 1970, 1980)

Year	North Carolina		Guilford County		City of Greensboro	
	Number of Households	Persons Per Household	Number of Households	Persons Per Household	Number of Households	Persons Per Household
1960	1,204,715	3.66	69,128	3.45	33,923	3.35
1970	1,509,564	3.24	87,827	3.16	43,696	3.09
1980	2,043,291	2.78	114,084	2.67	56,702	2.57

SOURCE: North Carolina State Government Statistical Abstract.

2. Land Use Planning

Existing Land Use

Existing land use in the study area is a mix of rural, agricultural, and residential interspersed with scattered commercial and industrial development along the major traffic arteries.

¹Source: Comprehensive Plan, Guilford County, North Carolina, 1986.

The area extending from I-85 northward to US 29 is primarily rural and agricultural in character. Scattered clusters of single-family residential and commercial development occur along segments of McLeansville Road, Clapp Farms Road, US 70, Huffine Mill Road, Rankin Mill Road, Hines Chapel Road, McKnight Mill Road, and US 29. There are no major industries or employers except the White Street Landfill, the NCDOT Maintenance Division, and the State Prison Farm on Camp Burton Road. The commercial development is primarily small business strip development along the major roads. There is a K-Mart Distribution Center under construction on Penry Road north of US 70.

From US 29 westward to Church Street Extension, land use is primarily residential, consisting of single-family subdivisions, mobile home parks, and only a minor amount of intervening commercial strip development. Between Church Street Extension and Lawndale Drive, land use is predominantly rural with some single-family residential development in the area of Pisgah Church Road and the proposed Elm Street Extension. Plans have been approved for mixed use development of a major portion of the land east of the proposed Elm Street interchange with the urban loop and south of Lake Jeanette Road. The planning for the urban loop was incorporated in the development plans. The vicinity of Lawndale Drive is primarily residential in character, consisting of relatively newer medium density single-family subdivisions, townhome clusters, and multi-family apartments.

Land Use Planning

Greensboro does not have a current comprehensive land use plan. Instead, the City has small area studies and the existing zoning map. The City is currently working with Guilford County on several area plans. Within the project study area, the Brightwood and McLeansville Community plans are being developed. Land use decisions within the City are determined by the City Zoning and Planning Boards, with appeal to the Greensboro City Council. Both of these boards serve by appointment of the City Council.

The Comprehensive Land Use Plan for Guilford County was adopted in 1986 and is shown in Figure III-1. The adopted land use plan closely approximates the existing land use patterns in major portions of the study area. The area between I-85 and Huffine Mill Road is classified residential, with industrial development planned to occur in the US 70 corridor. The South Buffalo Creek floodplain is designated open space. From Huffine Mill Road to McKnight Mill Road, the land is classified for agriculture and low density residential use. The floodplain of North Buffalo Creek is designated open space. The western part of the study area extending from McKnight Mill Road to Lawndale Drive is primarily designated residential, with clusters of mixed use (commercial, office, light industrial) and industrial development planned for the US 29 corridor and the Southern Railway corridor. The area adjacent to Lake Jeanette is shown as open space.

In 1986 a private/public partnership in strategic planning was formed and called Greensboro Visions. Greensboro Visions was sponsored by the Greensboro Area Chamber of Commerce, the Greensboro Development Corporation, the Guilford County Commissioners, and the Greensboro City Council with its goal to plan for the community in the year 2000. Five critical issues that the Visions task force focused on were on economic development, education, housing, land use planning, and transportation. The transportation objectives identified by the Visions task force include the following:

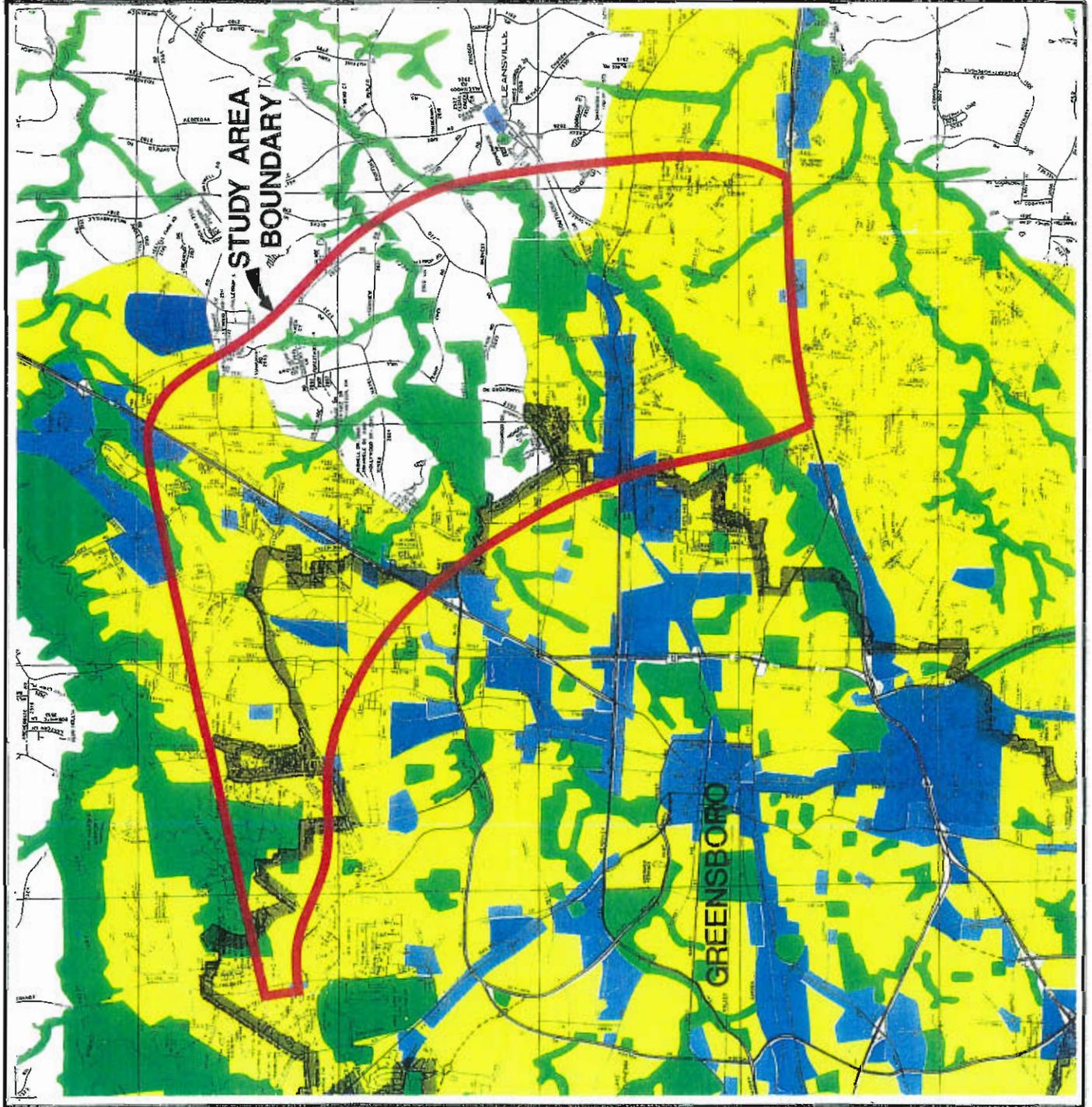
GREENSBORO EASTERN/NORTHERN URBAN LOOP

LAND USE

-  AGRICULTURE & LOW DENSITY RESIDENTIAL
-  RESIDENTIAL
-  MIXED USE : COMMERCIAL, OFFICE, LOBBY INDUSTRIAL, MULTI-FAMILY RESIDENTIAL USE
-  POTENTIAL MIXED USE
-  INDUSTRIAL
-  OPEN SPACE : FLOODPLAIN, RECREATION, AREAS, PAVED PARKS, MAJOR INFRASTRUCTURE

LAND USE PLAN

FIGURE III-1



- Develop a formal system of transportation planning, first at the city and county level and then at the regional level.
- Increase spending for road maintenance and major roadway improvements, consistent with planning.
- Improve public transportation to meet the needs of current users and attract new users.

3. Transportation

The Greensboro Urban area is served by two major interstate highways. I-85 links Greensboro to the Charlotte area to the south and to Petersburg, Virginia, and I-95 to the north. I-40 provides a connection to Asheville and Winston-Salem to the west and to Durham and the Research Triangle to the east. The interstate system also provides a critical intercity routing for the Piedmont Triad Area (Greensboro, Winston-Salem, and High Point). Major US routes include US 29, US 70, US 220, and US 421. Each of these are major thoroughfares that run radially into Greensboro. These routes, together with other major thoroughfares, provide Greensboro with a well-developed radial system. The Urban Loop will encircle Greensboro, connecting all these radials, thereby providing the cross-town or circumferential connection that is a major component of the adopted Thoroughfare Plan.

Thoroughfares in the study area, as designated by the Greensboro Urban Area Thoroughfare Plan (see Figure I-3) include the following:

<u>Freeways</u>	<u>Major Thoroughfares</u>	<u>Minor Thoroughfares</u>
- I-85	- US 29	- McConnell Road
- I-40	- Hines Chapel Road	- McKnight Mill Road
	- Lawndale Drive	- Creekview Road
	- North Elm Street	- Summit Avenue
	- US 70	- Church Street
	- Huffine Mill Road	- Pisgah Church Road
	- Holt Chapel Road Extension (proposed)	
	- Yanceyville Road	
	- Hicone Road	
	- North Elm Street Extension (proposed)	
	- Cone Boulevard Extension (proposed)	

The continuing, comprehensive, and cooperative planning process (3-C Process) is conducted in the Greensboro Urban Area in accordance with Title 23 of the Code of Federal Regulations, Part 450, Subpart C. The Metropolitan Planning Organization (MPO) is a forum for transportation planning policy. Projects are submitted to the State as priorities set by the MPO, an effort required by Federal statutes. The Metropolitan Planning Organization is composed of two committees:

- (1) The Technical Coordinating Committee, composed of professional transportation staff members from the City and County Planning Departments; the Council of Governments; representatives of transportation providers such as Duke Transit and Greensboro Agency Transit Express (GATE) which provide general service to the elderly, handicapped, and other special groups; NCA&T University; City and County Planning Boards; and Federal and State officials.
- (2) The Transportation Advisory Committee, composed of elected officials from the jurisdictions included in the planning area and the State Transportation Board member.

The Technical Coordinating Committee recommends projects to the Advisory Committee, which then includes them in the area's transportation plan (the Greater Greensboro Urban Area Transportation Improvement Program). These priorities, in turn, are considered by the State Department of Transportation for possible inclusion in the North Carolina Transportation Improvement Program.

The North Carolina Department of Transportation's 1993-1999 Transportation Improvement Program (TIP) includes the following major construction projects related to this proposed action:

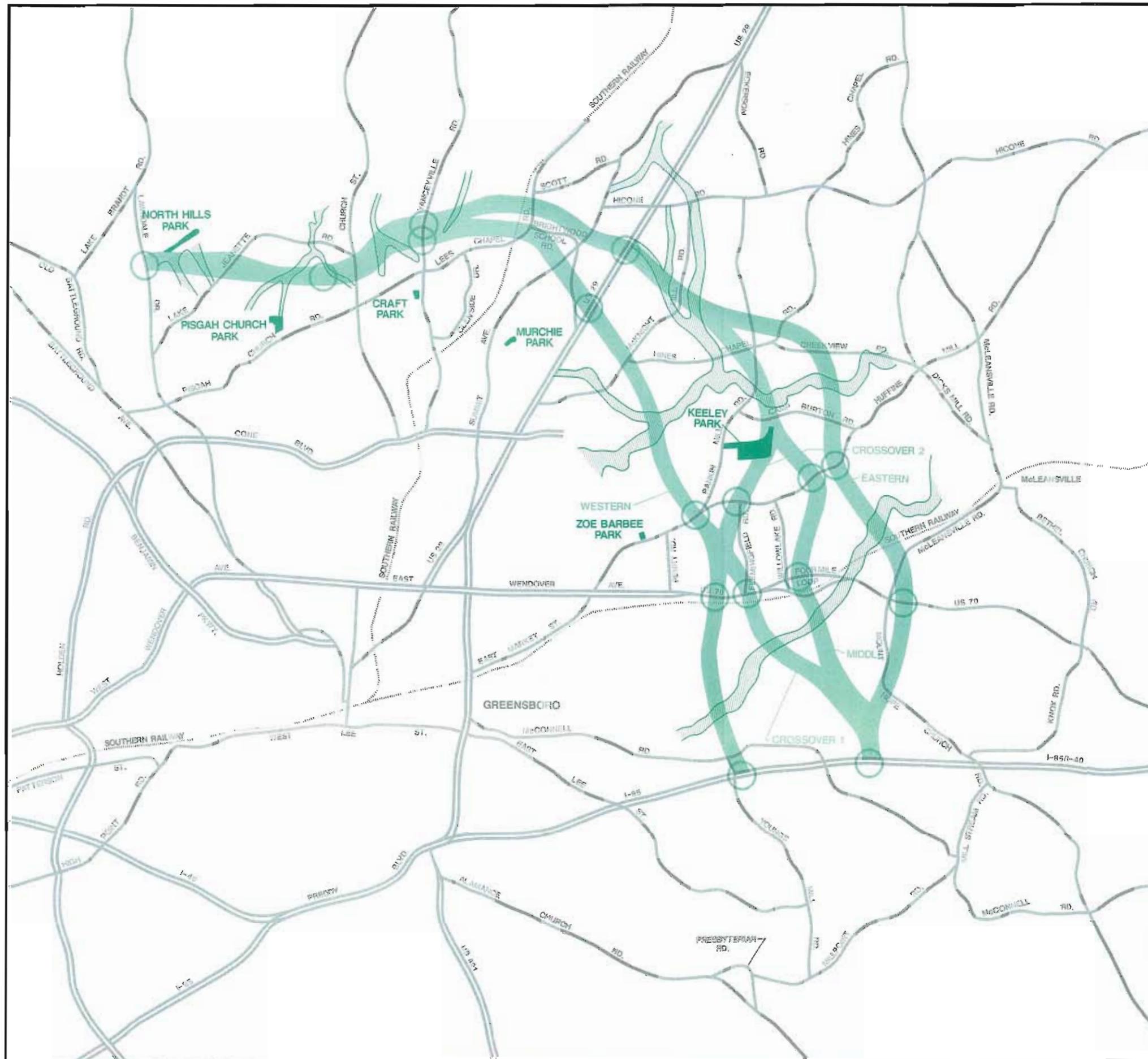
- I-2402 (Greensboro Bypass, I-85 south of Greensboro to I-40/I-85 east of Greensboro)
- I-303 (Widen I-40/I-85 to eight lanes)
- R-984 (Concrete rehabilitation of US 29)
- U-2524 (Greensboro Western Urban Loop)

In the study area, the major mode of transportation is the automobile. The study area is not served by public transportation. The City of Greensboro also has a functioning and extensive bicycle plan. Although several signed bicycle routes approach the western and southern edges of the proposed study area, none cross over into the study area. Therefore, no special accommodations for bicycles are needed on this roadway.

4. Parks, Recreational Facilities, and Greenways

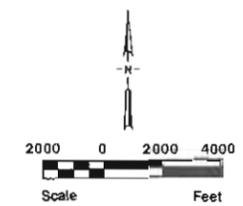
Six parks are located in the study area, as shown on Figure III-2. These include Keeley Park, Craft Park, Pisgah Church Park, Murchie Park, Zoe Barbee Park, and North Hills Park. Craft, Murchie, Zoe Barbee, and Pisgah Church Parks will not be impacted by any of the alternatives. Crossover 2 clips the extreme eastern edge of Keeley Park. Coordination with the City of Greensboro Parks and Recreation Department reveals that Keeley Park functions as a nursery operation for the City of Greensboro and is not used for recreational purposes. North Hills Park, near the northern terminus of the project, lies within the floodplain of Richland Creek. The corridor has been aligned so as to avoid this park.

**GREENSBORO
EASTERN/NORTHERN
URBAN LOOP
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LEGEND

- PARKS
- FUTURE OPEN SPACE



PARKS AND OPEN SPACE

FIGURE III-2

The private recreational facilities located in the study area are the Forest Lake Country Club, the Woodmen of the World Club, Guilford Wildlife Club, and the McLeansville Wildlife Club. The Eastern Alternative affects the extreme western portion of the Woodmen of the World property and passes to the west of the McLeansville Wildlife Club.

Figure III-2 also shows land that is planned for future open space which may be used as greenways through subdivision dedication. No greenway facilities have been developed within the study area.

5. Neighborhoods and Community Facilities

The area extending northward from I-85 to US 29 consists primarily of rural and agricultural lands interspersed with scattered residential clusters and commercial areas. These areas cannot be truly classified as neighborhoods since they are in essence clusters of residential development. The more identifiable neighborhoods are located between US 29 and Lawndale Drive, including Summit Hills and Battle Forest. The neighborhoods in this area are largely homogeneous residential subdivisions comprised of single-family homes, with some townhouses and multi-family units concentrated near Lawndale Drive.

In unincorporated areas, fire protection is provided by volunteer fire departments, and the City of Greensboro provides fire protection in the incorporated portions. The fire stations in the study area are shown on Figure III-3 and are listed below:

<u>Map Designation</u>	<u>Fire Stations</u>
1	McLeansville VFD #7
2	Rankin VFD #5
3	Rankin VFD #13
4	Greensboro #14

Police protection is provided by the City of Greensboro or the Guilford County Sheriff's Department in the study area.

The North Carolina State Prison Farm on Camp Burton Road (P-1 on Figure III-3) is located approximately 400 feet to the east of the centerline of the Middle Alternative.

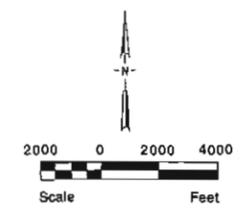
Schools

All of the public schools within the study area are in the Guilford County School District. These are shown on Figure III-3 and listed below:

**GREENSBORO
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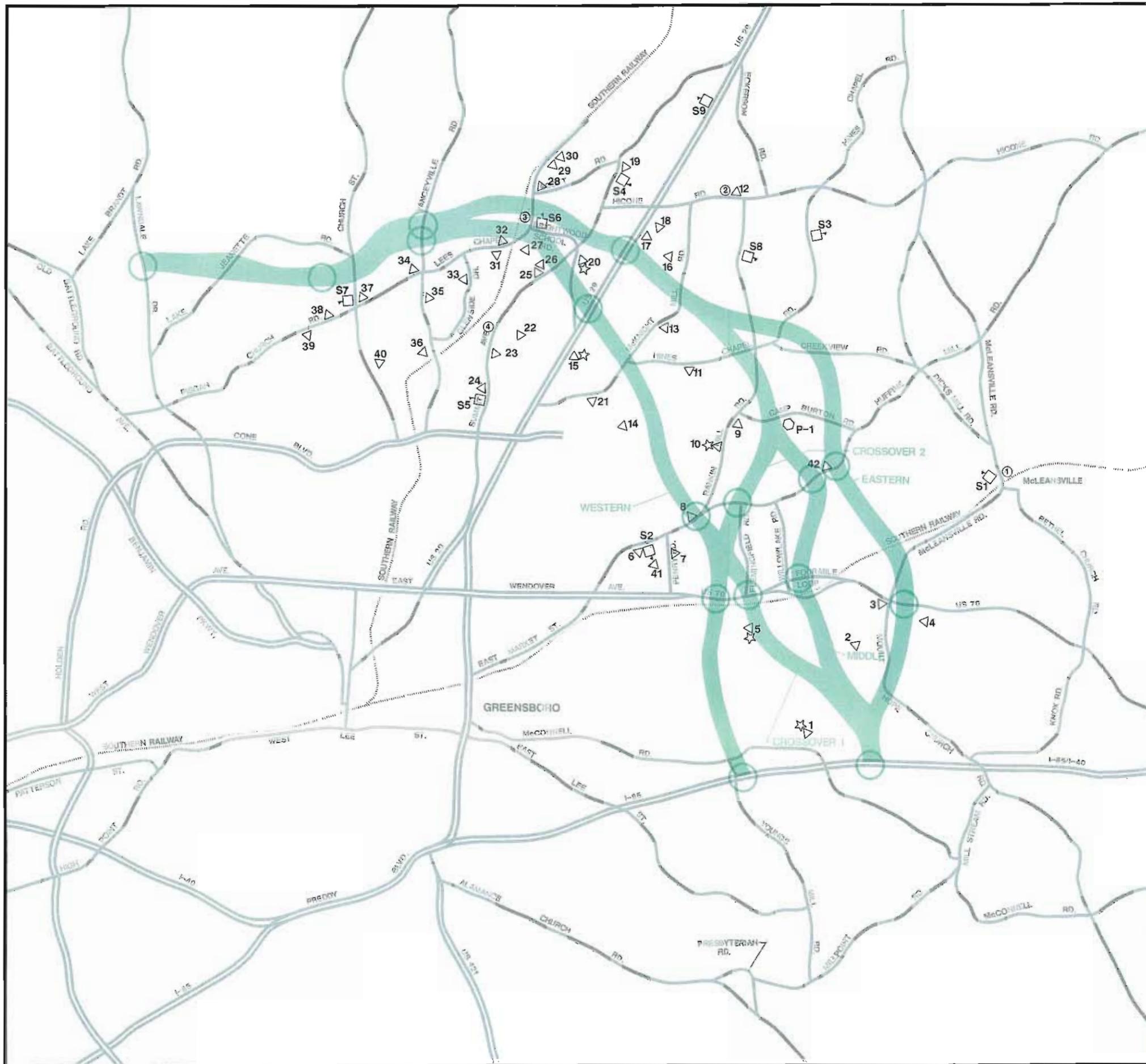
LEGEND

- SCHOOLS
- △ CHURCHES
- ☆ CEMETERIES
- FIRE STATIONS
- ◇ STATE PRISON FARM



**SCHOOLS, CHURCHES, CEMETERIES,
AND COMMUNITY FACILITIES**

FIGURE III-3



<u>Map Designation</u>	<u>School</u>
S1	McLeansville Elementary School
S2	Mount Zion School (Private)
S3	Madison Elementary School
S4	Poplar Elementary School
S5	Rankin Elementary School
S6	Brightwood Elementary School
S7	Jesse Wharton Elementary School
S8	Glenwood School House
S9	Central North Carolina School for the Deaf

No future schools are planned in the study area.

Churches and Cemeteries

The locations of churches and cemeteries in the study area are shown in Figure III-3. These include the following:

<u>Map Designation</u>	<u>Church/Cemetery</u>
1	Shady Grove Church and Cemetery
2	Mount Hope Pentecostal Holiness
3	Mount Pleasant United Methodist
4	Gateway Baptist
5	Buchanan Baptist Church and Cemetery
6	Mount Zion Church
7	Macedonia Church of God
8	Holy Temple
9	Briggs Memorial Baptist Church and Day Care
10	Revelation Baptist Church and Cemetery
11	Hines Chapel Church
12	Lebanon Baptist Church and Cemetery
13	Jehovah's Witness
14	Solid Rock Baptist Church
15	Lakeview Memorial Park
16	Our Lord's Church
17	United Holy Church
18	Fellowship Hall
19	Poplar Elementary Church
20	White Oak Grove Church and Cemetery
21	Memorial Presbyterian Church
22	Martin Avenue Baptist Church
23	Northside Church of the Nazarene
24	Church
25	Church
26	Church of Faith and Power
27	St. John Baptist Church
28	Church
29	Gods Prayer Church
30	St. Paul's Holiness Church
31	Bethel Baptist Church
32	Lees Chapel Church
33	Sheldon Road Baptist Church

<u>Map Designation</u>	<u>Church/Cemetery</u>
34	New Hope Baptist Church
35	Episcopal Church
36	Hope View Presbyterian Church
37	Lake Jeanette Baptist Church
38	Gospel Baptist Church
39	Hillcrest Baptist Church
40	Third Assembly of God
41	Church
42	Church

6. Cultural Resources

Cultural resources in the study area include historic structures and archaeological resources.

Historic Structures

A file search was conducted at the State Historic Preservation Office (SHPO) to identify known historic architectural resources within the study area. No structures listed in the National Register of Historic Places or on other State Study Lists were identified in the study area. Sites identified by the SHPO are located outside of the study area. One structure of local historical or architectural importance, the Maness House, is located on the north side of Secondary Road (SR) 2827 (Four Mile Loop), approximately 1,400 feet east of the junction with SR 2828 (Willowlake Road). This structure would be razed by the Middle Alternative.

Archaeological Resources

Consultation with the SHPO has indicated that no archaeological sites currently listed in the National Register of Historic Places are located within the boundaries of the study area. (See Appendix A).

B. ECONOMIC ENVIRONMENT

The economic environment of Guilford County has traditionally found its strength in tobacco, furniture, apparel, and textiles. Lately, however, Guilford County has attracted major warehouse and distribution operations and the corporate offices of several facilities such as manufacturers of electronic components. While these new employers create new jobs, this employment is offset somewhat by the decline in markets for domestic textiles, apparel, and furniture.²

²SOURCE: Guilford County Comprehensive Plan.

1. Employment and Labor Force

The relocation of corporate offices and high-tech firms to Guilford County partly offsets the decline of employment from the shrinking manufacturing businesses. Within the project study area, the primary employment centers are located along the I-85 corridor, the US 29 corridor, and along the western boundary of the study area. One of the major employment centers near the study area is the Carolina Circle Mall. K-Mart is currently developing a 94-acre site in the northeast quadrant of the Penry Road/US 70 intersection, which will serve as a regional warehouse distribution facility. This facility is scheduled to be operational by August 1992 and is expected to employ some 250 to 300 individuals.

2. Income

In 1988, the total personal income in Guilford County was \$6.1 billion. This income was the third highest for any county in North Carolina. In fact, the per capita personal income was the third or fourth highest in each year studied between 1969 and 1989 (see Table III-5).

3. Labor Force

Characteristics of the civilian labor force by race in Guilford County are shown in Table III-6.

4. Greensboro Visions

In 1986, a private/public partnership in strategic planning was formed called **Greensboro Visions**. The primary goal of Greensboro Visions is to plan for the community in the year 2000. This partnership is sponsored by the Greensboro Area Chamber of Commerce, the Greensboro Development Corporation, the Guilford County Commissioners, and the Greensboro City Council. The Visions task force focuses on five critical issues: economic development, education, housing, land use planning, and transportation.³

Although specific transportation projects are not addressed in the Greensboro Visions Action Plan, the construction of the Greensboro Eastern/Northern Urban Loop is consistent with the identified objectives.

Greensboro Visions has not developed a land use plan. It has, however, proposed policies that the City and County can use to guide growth.

³SOURCE: Creating Our Future: A Plan to Move Us Forward, June 1988.

TABLE III-5
PER CAPITA PERSONAL INCOME

<u>Year</u>	<u>North Carolina</u>	<u>Guilford County</u>
1970	\$3,236	\$4,147
1980	\$7,999	\$9,893
1984	\$10,999	\$13,712
1985	\$11,658	\$14,668
1986	\$12,457	\$15,584
1987	\$13,333	\$16,751
1988	\$14,297	\$18,117

SOURCE: North Carolina Office of State Budget and Management, State Data Center, Statistical Abstract of North Carolina Counties, May 1991, p. I-46 - I-47.

TABLE III-6
CIVILIAN LABOR FORCE BY RACE
(Guilford County - 1986)

Race	Civilian Labor Force		Percent Distribution			Unemployment Rate
	Civilian Labor Force	Employed	Unemployed	Employed	Unemployed	
Total	164,199	156,335	7,864	100.0	100.0	4.8
- White	124,936	120,847	4,089	76.1	52.0	3.3
- Black	37,123	33,612	3,510	22.6	46.4	9.8
- Native American	500	469	31	0.3	0.4	6.3
- Other	556	469	87	0.3	1.1	15.6
- Hispanic*	1,032	938	94	0.7	1.2	9.1
- Total Minority**	39,283	35,488	3,861	23.9	49.1	9.8

*Persons of Hispanic origin may be of any race.

**Sum of Black, Native American, Other, and Hispanic.

SOURCE: Employment Security Commission of North Carolina, Labor Market Information Division.

5. Utilities and Services

Electrical service to the study area is provided by Duke Power Company. Telephone service is provided by Southern Bell and natural gas service is furnished by Piedmont Natural Gas. Cable television is available from Cablevision of Greensboro and Alert Cable TV.

A major portion of the study area is served by public water and sewer, including wastewater treatment facilities. Specifically, in the southern part of the study area, water and sewer service are available only along the I-85 and US 70 corridors. The sewer lines run into the Osborne Wastewater Treatment Plant, located adjacent to the floodplain of South Buffalo Creek. The area extending from US 29 westward to Lawndale Drive is completely served by water and sewer lines. The water intake plant and pump station are located at Lake Brandt. The Comprehensive Plan indicates there are no plans to provide water and sewer service to the area between Huffine Mill Road and McKnight Mill Road, which currently uses well and septic systems for its water and sewer needs. Guilford County maintains a revolving trust fund to be used in conjunction with city and private funds, to extend water and sewer services to areas outside of the city limits.

6. Hazardous Material Sites and Underground Storage Tanks

Hazardous material sites include generators, treaters, and disposers of hazardous materials, landfills, sewage treatment facilities, and garbage dumps.

A hazardous materials site survey was conducted within the Greensboro Eastern/Northern Urban Loop study area. The survey consisted of contacting the following agencies responsible for regulating hazardous materials and underground storage tanks:

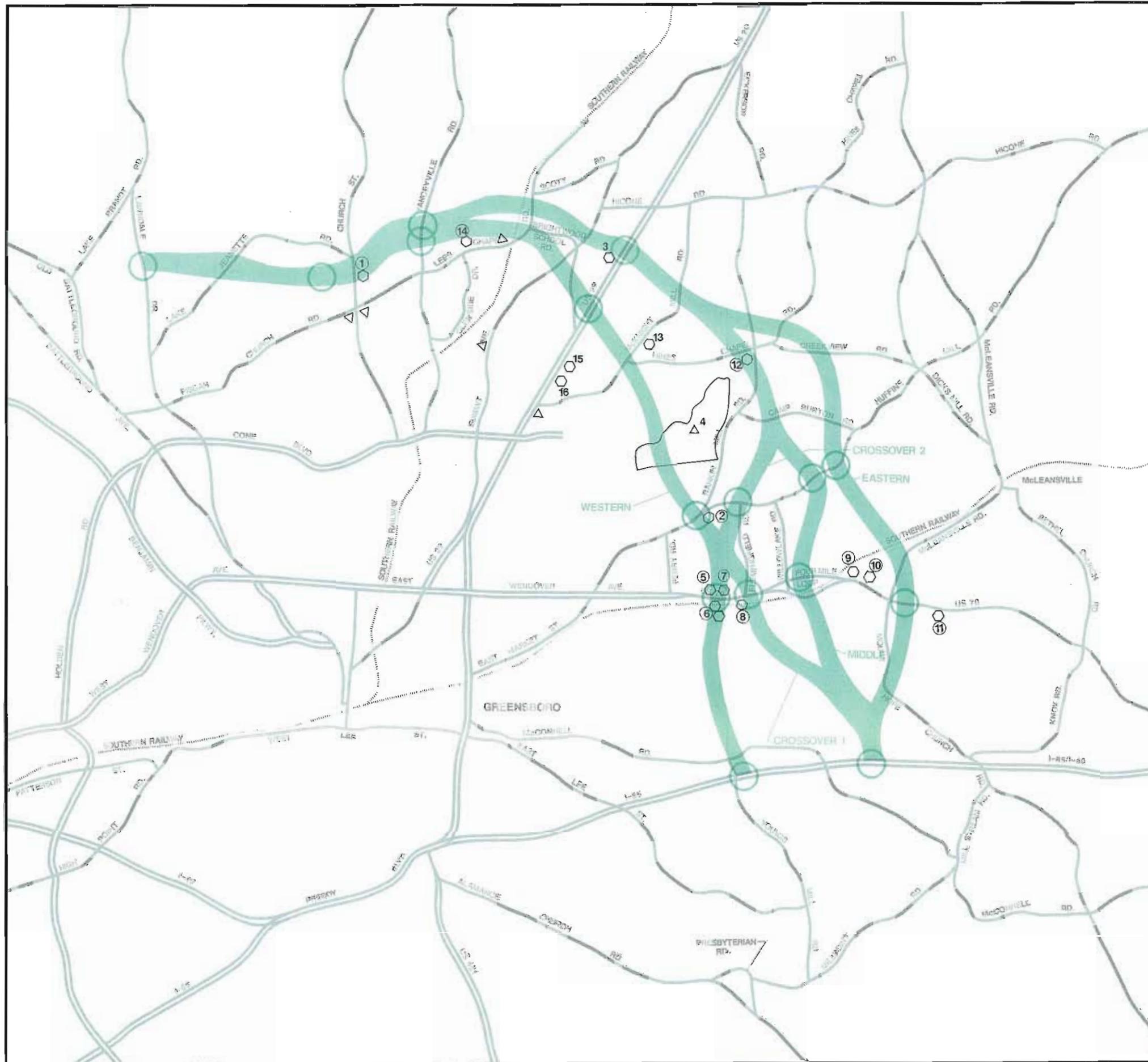
- City of Greensboro
- Guilford County
- Environmental Protection Agency
- North Carolina Department of Environmental, Health, and Natural Resources (NCDEHNR)

The following sources have been reviewed to ascertain if any hazardous material sites or underground storage tanks are located within the project area:

- Wasteland Preremedial Report 20
- North Carolina Inactive Hazardous Sites Program, Status Report, February 1991
- EPA Wasteland (CERCUS-ERRIS) Sites
- Hazardous Waste Branch File, NCDEHNR
- Underground Storage Tank File, NCDEHNR, Division of Environmental Management, Ground Water Section

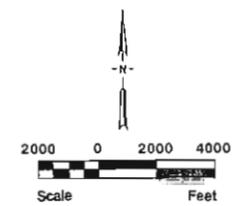
Potential hazardous material sites in the Greensboro Eastern/Northern Urban Loop study area are listed in Table III-7. The corresponding locations of these sites are shown on Figure III-4. The potential hazardous material sites that could be impacted by the proposed action are discussed in Chapter IV.

**GREENSBORO
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LEGEND

- POTENTIAL HAZARDOUS MATERIALS SITE (Refer to Table III-7)
- △ LANDFILL SITE
- ☞ WHITE STREET LANDFILL
- ② UNDERGROUND STORAGE TANK LOCATION (Refer to Table III-7)



**POTENTIAL HAZARDOUS MATERIALS,
UNDERGROUND STORAGE TANKS, AND
LANDFILL SITES**

FIGURE III-4

**TABLE III-7
HAZARDOUS MATERIAL SITES AND UNDERGROUND STORAGE TANKS**

MAP DESIGNATION	NAME	STREET ADDRESS
1	Buffalo Park Store*	4204 North Church Street
2	Longview Curb Market*	1916 Huffine Mill Road
3	J. P. Stevens	US 29 and Assembly Road
4	City of Greensboro (White Street) Landfill	2000 White Street
5	East Wendover Mobil*	3845 Burlington Road
6	Dodson Auto Parts/Junk Yard*	3848 Burlington Road
7	Shoprite Market/Gas Station*	3917 Burlington Road
8	Texaco*	4210 Burlington Road
9	Superior Petroleum Products*	4801 Burlington Road
10	Shell Gas Station*	5001 Burlington Road
11	Wades Oil & Gas Company*	5150 Burlington Road
12	Franks Grocery and Service Station*	1483 Rankin Mill Road
13	Auto Junk Yard	McKnight Mill Road
14	Ole' Gas Station*	1907 Lees Chapel Road
15	Intertech Corporation	3240 N. O'Henry Boulevard
16	Spray Plating Systems	3240 N. O'Henry Boulevard

*Sites with underground storage tanks.

The City of Greensboro Landfill is located at the end of White Street at Nealtown Road on the south side of North Buffalo Creek. This facility is a fully functional, large municipal landfill complex that fulfills the solid waste needs of the City of Greensboro, the Town of Gibonsville, and approximately 75 percent of Guilford County. It handles over 350,000 tons of waste each year. This facility has been in operation for decades and reportedly contains volatile materials disposed of by the Vicks Company. The complex consists of an existing permitted fill facility, a site proposed for vertical expansion, and an old fill area proposed for a compost site. The interpretation of historical aerial

photography of the landfill property reveals that the old fill area, consisting of solid fill and asbestos, was in existence before 1966 and could contain materials other than solid fill. The existing permitted site and the site proposed for vertical expansion are fairly contiguous; the old fill area is located some 300 feet to the west of the proposed vertical expansion fill site. As part of its long-term acquisition program, the City of Greensboro is currently negotiating for additional land to the south of the current site for landfill expansion.

The Western Alternative passes through the landfill property between the proposed vertical expansion fill site and the old fill area (proposed compost site). The eastern boundary of the alternative would avoid the landfill site proposed for vertical expansion. The western boundary, however, would encroach upon the old fill area, necessitating a slight shift in alignment to the east to avoid encroachment on the old fill site. The Western Alternative would also pass through a segment to the proposed southern landfill expansion area.

Of 2.8 billion pounds of hazardous wastes generated in North Carolina in 1988, 18.1 million pounds were generated in Guilford County. In 1988, there were 63 hazardous waste generators in Guilford County and six treatment, storage, and disposal facilities (TSDs) which handled 7.8 million pounds of hazardous waste. No sites in Guilford County are included on the North Carolina National Priorities List.⁴

7. Mines and Quarries

There are no mines or quarries in the study area.

C. NATURAL ENVIRONMENT

1. Topography

The study area is located in the Piedmont Province, a moderately rolling upland surface characterized by nearly level broad ridges and moderately steep side slopes adjacent to the stream valleys. The stream valleys occupy fairly wide floodplains. The streams in the study area have well defined rectangular drainage patterns. Elevations in the study area generally range from 700 feet in the southern part of the study area in the valley of South Buffalo Creek to more than 880 feet on the ridges in the Yancyville Road area. Relief across the study area is in the order of 180 feet.

2. Geology, Soils, and Mineral Resources

The study area is underlain by crystalline rocks consisting of granite, gabbro, and diorite. These rocks are overlain by a variable thickness of residual soil cover comprised chiefly of red clays. Depth to bedrock is also variable; bedrock is generally deep on the uplands and more shallow in the steep side slopes adjacent to the stream valleys, where outcrop may be encountered in localized exposures. Rock blasting is anticipated in the steeper side slope cuts adjacent to the stream valleys, particularly in those areas where the depth of the weathered rock and overlying saprolite are thin.

The two major residual soil associations in the study area are the Cecil-Madison association and the Enon-Mecklenburg association. Enon-Mecklenburg soils generally occur in the area east of US 29, while the Cecil-Madison soils are found in the area west

⁴SOURCE: North Carolina Department of Human Resources, North Carolina Hazardous Waste 1987 Annual Report.

of US 29. Both soils occupy upland terrain that is gently to moderately sloping and well drained. They consist chiefly of clay soils with a seasonal high water table at a depth of more than six feet.

Transported alluvial soils consisting of sands, silts, and clays occupy the stream valleys of the study area. The primary alluvial soil in the area is the Wehadkee silt loam, a nearly level, poorly drained soil occurring on broad floodplains. Another poorly drained transported soil in the project area is the Chewacla sandy loam. Both the Wehadkee and the Chewacla soils are hydric soils and generally indicate wetlands.

There are no known mineral resources in the project area.

3. Surface Water

The project area is in the extreme northern portion of the Cape Fear River Basin. The principal streams in the area are:

- Richland Creek
- North Buffalo Creek
- South Buffalo Creek
- Little Alamance Creek

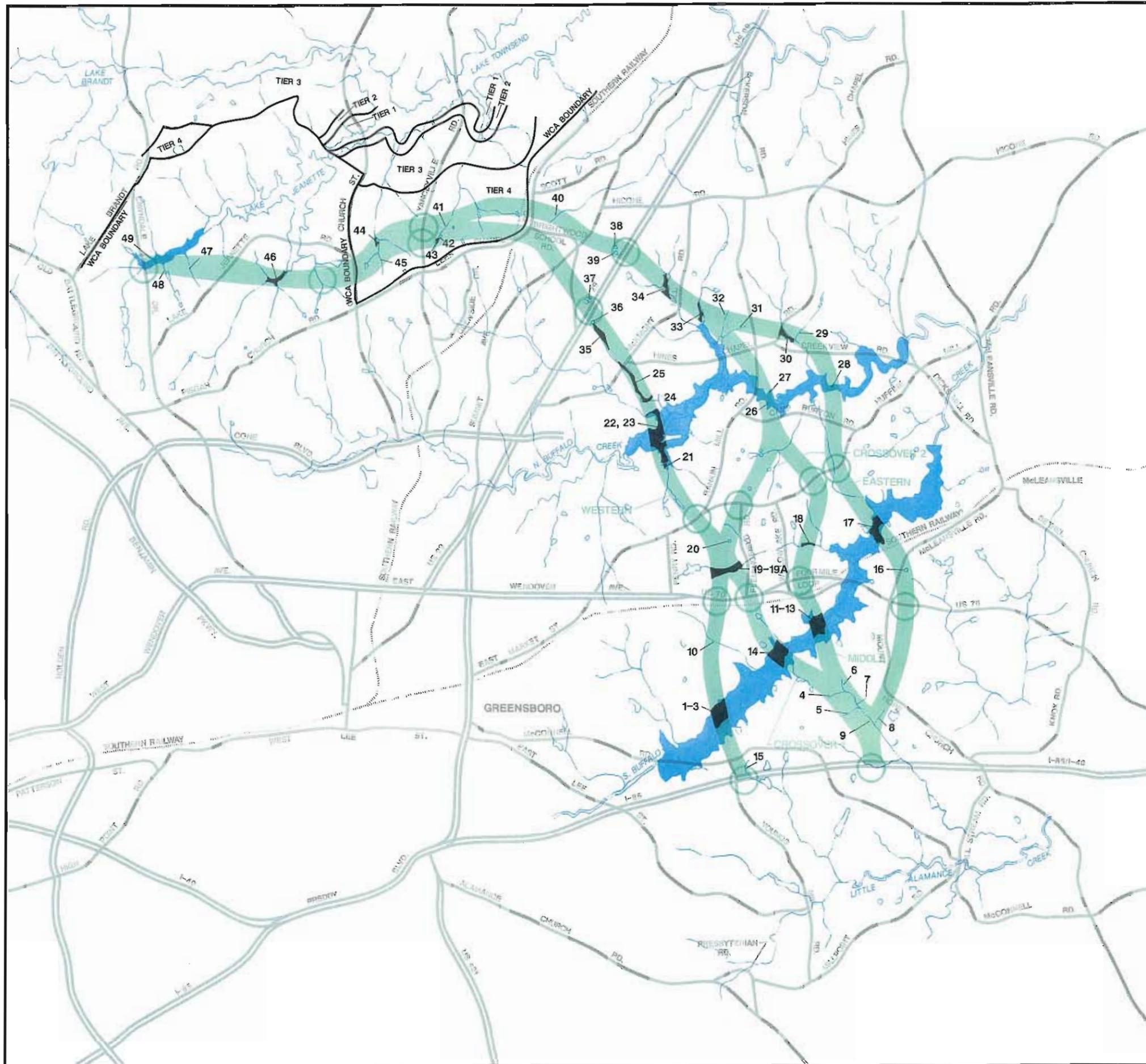
These streams are tributaries of the Haw River. The tributaries in the Haw River drainage system are shown in Table III-8, along with the use classifications assigned by the North Carolina Department of Environment, Health, and Natural Resources. The Haw River originates at the Guilford County/Forsyth County line and flows generally east and then southeast, eventually draining into B. Everett Jordan Lake some 50 miles southeast of the project area.

In the western portion of the project area, Richland Creek flows northeast into Lakes Jeanette (Richland) and Townsend, and is a tributary of Reedy Fork Creek. Lake Townsend is one of the water supply reservoirs serving the City of Greensboro and is subjected to Greensboro's Watershed Critical Area (WCA) Protection Ordinance. This ordinance is intended to reduce urban runoff and pollution (sediment, nutrients, toxins) into water supply reservoirs. Lake Townsend has a defined WCA that extends to the ridge line of its basin or to the nearest road or travel easement crossing each feeder stream one-half mile or more upstream (see Figure III-5). Within each WCA are four concentric tiers with different restrictions on types and density of development.⁵ Lake Jeanette is privately owned and is not protected by the ordinance.

- Tier 1 consists of land within 200 feet of normal pool elevation and land within one mile of Lake Townsend's water intake. According to the recently revised zoning ordinance, Tier 1 land is intended for public ownership and should remain undisturbed.
- Tier 2 is also intended for public ownership and consists of land extending from the Tier 1 boundary to a line 750 feet from rural pool elevation.

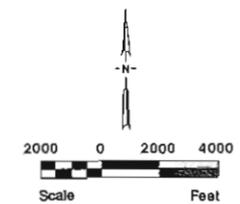
⁵SOURCE: City of Greensboro Ordinance for Protection of Watershed Critical Area Protection Act.

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LEGEND

- STREAMS
- LAKES
- FLOODPLAINS
- TIER 0 WATERSHED CRITICAL AREAS
- WETLANDS
- 1-3 SITE NUMBERS (Include Streams)
(Refer to Table IV-12)



**STREAMS, LAKES, FLOODPLAINS, WETLANDS,
AND WATERSHED CRITICAL AREAS**

FIGURE III-5

- Tier 3 consists of those lands within an area bounded by Tier 2 and a line parallel to 3,000 feet in distance from the normal pool elevation, but not to exceed the WCA boundary.
- Tier 4 consists of land beyond the Tier 3 boundary but within the WCA boundary.

TABLE III-8
WATER RESOURCES AND CLASSIFICATION

WATER RESOURCE	CLASSIFICATION
Haw River	C NSW
Richland Creek	WS-III NSW
South Buffalo Creek	C NSW
Little Alamance Creek	WS-II NSW

Fresh Water Classifications:

Class WS-I	Waters protected as water supplies are natural and uninhabited or predominantly undeveloped (not urbanized) watersheds; no point source discharges are permitted and local land management programs to control non-point source pollution are required; suitable for all Class C uses.
Class WS-II	Waters protected as water supplies which are low to moderately developed (urbanized) watersheds, discharges are restricted to primarily domestic wastewater or industrial non-processed waters specifically approved by the commission, local land management programs to control non-point source pollution are required, suitable for all Class C uses.
Class WS-III	Water supply segment with no categorical restrictions on watershed development or discharges, suitable for all Class C uses.
Class B	Suitable for swimming, primary recreation, and all Class C uses.
Class C	Suitable for secondary recreation and fish propagation.
NSW	Nutrient-Sensitive Watershed

All three of the build alternatives would pass through a portion (Tier 4) of the Lake Townsend WCA. Any development within the WCA boundary must meet the requirements of Article VII, Division 2, of the City of Greensboro Code of Ordinances. The restrictions from this recently revised code of ordinances are intended to minimize runoff and land disturbance activities, reduce risk of spills, and manage stormwater.

North Buffalo, South Buffalo, and Little Alamance Creeks and their tributaries drain the eastern and southern portion of the project area. North Buffalo and South Buffalo Creeks receive effluent from Greensboro's two municipal wastewater treatment plants (WWTP), two small industrial discharges, and urban runoff from most of the City. These streams converge approximately ten miles northeast of Greensboro to form Buffalo Creek, which flows to the northeast another six miles before entering Reedy Fork Creek. Little Alamance Creek flows in a generally eastern direction, roughly paralleling the south side of Interstate 85. This stream eventually drains into Alamance Creek before entering the Haw River further downstream in Alamance County.

Surface Water Quality

A survey of surface water quality in the study area was conducted. The results of the survey are summarized in this section and discussed in detail in the Technical Memorandum on Natural Resources, appended by reference and available from the Department. Since the project area is characterized by a mix of urban and rural lands, most streams in the area receive non-point source pollution from surface runoff. The streams that do not receive treated effluents from wastewater treatment plants exhibit variable water quality.

The earliest available water quality assessments are from a North Carolina Wildlife Resources Commission (WRC) fish survey conducted during the summers of 1962 and 1963 (Carnes et al., 1964). Sewage treatment was primitive at this time, and the waters downstream of Greensboro were severely degraded. Buffalo Creek, below the confluence of its north and south tributaries, was described as "a thoroughly offensive stream; the odor and color of the water resembled those of sewage" and the dissolved oxygen (DO) concentration was 3.6 mg/l, uninhabitable for fish. The water of Reedy Fork Creek downstream of its confluence with Buffalo Creek "had a grey color and much surface foam was present"; DO was 5.0 mg/l.

Only four fishes of three species were collected from a limited sampling of Reedy Fork Creek; all were pollution tolerant species. Reedy Fork Creek upstream of its confluence with Buffalo Creek yielded 15 fish species from a similar sample area, including good numbers of relatively pollution-sensitive species (shiners, darters, madtoms). DO at this site was 7.0 mg/l, normal for Piedmont streams in the summer.

Recent North Carolina Division of Environmental Management (DEM) water quality data for three sites in the Buffalo Creek drainage area showed severely degraded habitat qualities based on their benthic communities. Two of the sites are below wastewater outfalls, but the third one is degraded primarily by urban runoff. Reedy Fork Creek, just above its mouth, showed slightly better conditions than Buffalo Creek. Buffalo Creek supplies approximately 40 percent of Reedy Fork Creek's flow. The quality of the Haw River declines from upstream of Reedy Fork Creek to downstream. It recovers slightly just upstream of B. Everett Jordan Lake, which is a future raw water supply.

The U.S. Geological Survey collected chemical water quality data from the Reedy Fork and Buffalo Creek basins from April 1986 through September 1987 to assess surface water supplies and downstream impacts in the rapidly urbanizing Haw River basin (Davenport, 1989). Samples were taken during eight surveys from seven sites within Greensboro's water supply watershed, two sites downstream on Reedy Fork Creek, six sites in the Buffalo Creek drainage system, two treated drinking water supplies, and two wastewater effluents. Some samples from the raw water supply watershed exceeded

standards or criteria for EPA priority pollutants, including arsenic, lead, cyanide, mercury, chloroform, chlorophenol, and various halogenated hydrocarbons. Finished drinking water supplies were in compliance with State and Federal standards on criteria for all inorganic compounds measured. Benzene, trichloromethane, and trihalomethanes exceeded standards on criteria in several samples.

4. Floodplain

Guilford County is a participant in the National Flood Insurance Program. Boundaries of the 100-year floodplain are shown in Figure III-5, as determined from the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps. South Buffalo Creek is a designated floodway from the western boundary of the study area downstream to the vicinity of US 70.

5. Groundwater

Groundwater depths are variable and are dependent upon seasonal patterns. Specifically, depths on ridge tops are expected to be 10 to 15 feet in seasonally wet periods and 20 to 25 feet in drier periods. The water table generally occurs within the clay soils or saprolite. Groundwater also occurs in interconnecting fractures in the underlying bedrock. Water enters the fractures by seeping through the overlying saprolite and clay, and drilled wells draw water from these fractures.

Although the homes and businesses in a major portion of the project area are served by municipal water reservoirs, groundwater is the primary source of domestic supply in the eastern part of the area between McKnight Mill Road and Huffine Mill Road. The wells are generally deep, and the water is obtained primarily from fractured crystalline bedrock. Yields are variable and dependent upon location, lithology, and secondary porosity (fracture) characteristics.

6. Meteorology and Climatology

Guilford County is located in the eastern Piedmont climatic region. The summers are generally hot and humid, and the winters are moderately cold and of relatively short duration because the mountains to the west protect the county against moist cold waves. The average summer temperature is 76°F, and the average winter temperature is 40°F.

Prevailing winds in the area are from the southwest and the average wind speed is 9 miles per hour.

Of the total annual rainfall of 42 inches, 22 inches usually falls during the period from April through September. The average seasonal snowfall is 11 inches, and the average number of days per year with 0.10 or more inches of precipitation is 82.

7. Biotic Communities

The results of the survey of biotic resources are summarized in this section and discussed in detail in the Technical Memorandum on Natural Resources, appended by reference and available from the Department.

a. Vegetation

Eight biotic communities within the study area were defined and described from aerial photographic interpretation and field data collected during a reconnaissance trip in February 1991. These include upland hardwood forests, upland mixed forests, pine forests, alluvial forests, old fields, agricultural lands, open water habitat, and man-dominated communities.

Upland Hardwood Forest Upland hardwood forests are scattered throughout the project area, usually occurring in more mesic conditions adjacent to upland mixed forest. White oak (*Quercus alba*), scarlet oak (*Q. coccinea*), sycamore (*Platanus occidentalis*), and mockernut hickory (*Carya tomentosa*) dominate the canopy. Understory species are those which do not usually reach the stature of canopy trees. Typical subcanopy species are red maple (*Acer rubrum*), white oak, sweet-gum (*Liquidambar styraciflua*), and flowering dogwood (*Cornus florida*). Red cedar (*Juniperus virginiana*) and beech (*Fagus grandifolia*) also occasionally occur among the understory.

Shrub and herb species are highly variable in occurrence. Blackhaw (*Viburnum prunifolium*), blue haw (*V. rufidulum*), and other viburnums (*V. rafinesquianum*, *V. acerifolium*), are among the most frequently encountered shrubs in hardwood stands. Fringe-tree (*Chionanthus virginicus*), sparkleberry (*Vaccinium arboreum*), squaw-huckleberry (*V. stamineum*), fragrant sumac (*Rhus aromatica*) and a variety of blueberries (*Vaccinium* spp.) and huckleberries (*Gaylussacia* spp.) are characteristic of upland hardwoods in the area. Late spring or summer herb species include goldenrods (*Solidago* spp.), asters (*Aster* spp.), elephant's foot (*Elephantopus tomentosus*), and panic grasses (*Panicum* spp.). Vines common to this community are greenbrier (*Smilax* spp.), yellow jessamine (*Gelsemium sempervirens*), poison ivy (*Toxicodendron radicans*), muscadine (*Vitis rotundifolia*), and Virginia creeper (*Parthenocissus quinquefolia*).

Upland Mixed Forest - The upland mixed forest, which can be considered an earlier successional level, is very similar to the upland hardwood forest community. A well-developed pine-hardwood forest may represent a post-mature pine forest in which the pines are becoming less common. Upland mixed forests are the dominant forest type found in the study area. Shortleaf pine (*Pinus echinata*) and Virginia pine (*P. virginiana*) are present in various amounts, and share canopy dominance with such hardwood species as tulip tree (*Liriodendron tulipifera*), black oak (*Quercus velutina*), and sweet-gum. Understory species are the same as those occurring in the upland hardwood forest, with the addition of winged elm (*Ulmus alata*) and holly (*Ilex opaca*). Shrub and herb species also are much the same as those in upland hardwood.

Pine Forest - Pine forests are scattered and few within the project area. The canopy is dominated by even-aged trees of a single species, either Virginia pine or shortleaf pine. This forest type appears to occur more commonly in areas previously cleared by timbering, development, or agricultural practices. The subcanopy contains younger trees of the same species. The shrub layer is more diverse and is dominated by a combination of evergreen and deciduous species. These may include squaw-huckleberry, black cherry (*Prunus serotina*), blackjack oak (*Quercus marilandica*), holly, and red cedar. The herbaceous layer is sparse and contains lichens and mosses. Greenbrier and poison ivy are the dominant vines.

Alluvial Forest Alluvial forests have developed in sediments deposited along lowlands parallel to North Buffalo Creek and South Buffalo Creek, including portions of their

tributaries. Recurrent flooding in areas adjacent to stream bodies over long periods of time has resulted in deposition of sediments, typically clays, sands, and silts. This transported material contributes to the formation of alluvial soils of the Wehadkee and Chewacla Series in the area of the Greensboro Eastern/Northern Urban Loop.

Many of the alluvial forests along these creeks have been cleared for agricultural purposes because of level topography and/or rich soil. Some areas have also been cleared for residential or commercial purposes. The plant species composition is variable due to both natural physical features (drainage in particular) and to past and present use of the sites by man. The canopy contains sycamore, sweet-gum, tulip-tree, water oak (*Quercus nigra*), and occasionally short leaf pine and loblolly pine (*Pinus taeda*). The subcanopy includes such species as red maple, red cedar, slippery elm (*Ulmus rubra*), American elm (*U. americana*), willow oak (*Quercus phellos*), and cottonwood (*Populus deltoides*). Small trees and shrubs are abundant and diverse. Common ones include slippery elm, holly, ironwood (*Carpinus caroliniana*), red cedar, alder (*Alnus serrulata*), sourwood (*Oxydendrum arboreum*), and various viburnums (*V. prunifolium*, *V. dentatum*, *V. rafinesquianum*). Japanese honeysuckle (*Lonicera japonica*) and poison ivy form dense mats throughout this community. Other vines frequently present are several species of greenbrier (*Smilax* spp.) and muscadine. Herbaceous species include buttercup, Solomon's seal (*Polygonatum biflorum*), violets (*Viola* spp.), field garlic (*Allium vineale*), panic grass, wood sorrel (*Oxalis* sp.), wild geranium (*Geranium carolinianum*) and various sedges (*Carex* spp., *Rhynchospora* spp.).

Old Fields - Old fields refer to any abandoned agricultural fields or disturbed terrestrial habitats with a well-developed soil base exhibiting distinct horizons. Immediately following abandonment, a well-documented successional complex evolves which eventually leads to successional stages with open canopy and thus yielding little or no open unshaded space. Old fields are at a very early stage of this succession. Characteristic plant species found in this community include broomsedge (*Andropogon* sp.), sorrel (*Rumex acetosella*), lobelia (*Lobelia nuttallii*), dog fennel (*Eupatorium capillifolium*), and buttercup (*Ranunculus recurvatus*).

Agricultural Lands - Agricultural lands, intensively managed by man, are scattered throughout the predominantly rural portions of the Greensboro Eastern/Northern Urban Loop area and produce corn, grain sorghums, spring small grains, tobacco, and forage crops. Crop rotational practices have created new cultivated areas and allowed others to lie fallow. Many agricultural areas have been converted to maintained communities (residential, industrial, and commercial uses), a trend that will undoubtedly intensify in the future.

Open Water Habitat - Most of the ponds scattered throughout the study area are man-made on farms to provide water storage, or associated with residential developments. Ponds and lakes occur in low, depressional areas. Both ponds and lakes occasionally have outlet streams and both trap sediments brought in by runoff. The accretion of sediments may eventually cause these water bodies to succeed to an upland terrestrial community.

Waters in the area are comprised of slowly moving or stagnant waters (lentic waters) and running water (lotic water). There can be a shift from one to the other during temporary alteration in flow rates. Various green and blue-green algae and an aquatic moss (*Fontinalis* sp.) constitute the primary plant life in the streams. Higher plants, in and around ponds, include smartweeds (*Polygonum* spp.), panic grasses (*Panicum* spp.), and cattails (*Typha* spp.).

Man-Dominated Communities - Man-dominated communities are areas with a suppressed level of vegetative growth due to mowing, spraying, clearing, or other man-initiated activities. Examples of man dominated communities in the project area are private residences (including small garden plots and expansive lawns), churches, commercial areas, farms (including pastoral areas) and remnant forests used as buffers or landscaping in residential areas. Evidence of activities which have resulted in construction or clearing for utility corridors, railroad tracks, roads, and highways also are incorporated into the man-dominated community type.

b. Wildlife and Fisheries

Wildlife - Common birds occurring in upland hardwood forests are common flicker (*Colaptes auratus*), tufted titmouse (*Parus bicolor*), white-breasted nuthatch (*Sitta carolinensis*), and red-bellied woodpecker (*Melanerpes carolinus*). Avian species observed in this community include Carolina chickadee (*Parus carolinensis*), northern cardinal (*Cardinalis cardinalis*), and Carolina wren (*Thryothorus hidovicianus*). Some of the more characteristic mammals of the upland hardwood forest are Virginia opossum (*Didelphis virginiana*), northern short-tailed shrew (*Blarina brevicauda*), silver-haired bat (*Lasiorycteris noctivagans*), red bat (*Lasiurus borealis*), Seminole bat (*Lasiurus seminolus*), gray squirrel (*Sciurus carolinensis*), southern flying squirrel (*Glaucomys volans*), white-footed mouse (*Peromyscus leucopus*), gray fox (*Urocyon cinereoargenteus*), and white-tailed deer (*Odocoileus virginianus*).

The upland mixed forest community has more varied terrestrial vertebrate animal life than either the upland hardwood forest or the pine forest because of the greater diversity of plant species, more stratified habitat, and intermingling of species from both pine and hardwood communities. While the mixed forest is a definite community, both in biotic components and percentage presence in the area, its animal life is perhaps best understood as a combination of wildlife found in the pine forest and upland hardwood communities. Birds extending into the upland mixed forest from the pine forest community are the pine warbler (*Dendroica pinus*) and ovenbird (*Seiurus aurocapillus*). Transient birds from the upland hardwood forest community are the red-bellied woodpecker, downy woodpecker (*Picoides pubescens*), and great crested flycatcher (*Myiarchus crinitus*). Additional vertebrate species present in this community type are eastern fence lizard (*Sceloporus undulatus*), rat snake (*Elaphe obsoleta*), slimy salamander (*Plethodon glutinosus*), the eastern hognose snake (*Heterodon platyrhinos*), marbled salamander (*Ambystoma opacum*), American toad (*Bufo americanus*), and white-footed mouse.

None of the mammals occurring in the Greensboro Eastern/Northern Urban Loop area are found exclusively in pine forests. Likewise, many reptiles and amphibians are common in pine forests, but none are restricted to this forest type. Birds commonly found in pine forests include pine warbler, Carolina chickadee, tufted titmouse, and Carolina wren.

The alluvial forest provides the food, cover, and moisture required for the survival and reproduction of many vertebrate species. Species diversity and populations of wildlife are often high in these communities. Common reptiles and amphibians include common garter snake (*Thamnophis sirtalis*), rough green snake (*Ophedrys aestivus*), watersnakes (*Nerodia* spp.), snapping turtle (*Chelydra serpentina*), painted turtle (*Chrysemys picta*), eastern newt (*Notophthalmus viridescens*), and many other species of frogs (*Hyla* spp., *Rana* spp.). Upland chorus frogs (*Pseudacris triseriata*) were heard in this community. Avian species are numerous and include northern cardinal, red-eyed vireo (*Vireo*

olivaceus), wood thrush (*Hylocichla mustelina*), Acadian flycatcher (*Empidonax vireescens*), downy woodpecker, and red-bellied woodpecker. In some piedmont areas, the screech owl (*Otus asio*), eastern phoebe (*Sayornis phoebe*), yellow-throated vireo (*Vireo flavifrons*), Louisiana water-thrush (*Seiurus motacilla*), American redstart (*Setophaga ruticilla*), and whip-poor-will (*Caprimulgus vociferus*) have restricted their nesting to this habitat (LeGrand 1972). Mammals found in the area are usually not restricted to the bottomland hardwood forest community. Beaver (*Castor canadensis*) and muskrat (*Ondatra zibethicus*) may be somewhat limited to this habitat; whereas, raccoon (*Procyon lotor*), white-footed mouse, and southeastern shrew (*Sorex longirostris*) may utilize the area as part of their home range.

Old fields have a distinctive and rich bird life both winter and summer. Species representative of this community include eastern meadowlark (*Sturnella magna*), grasshopper sparrow (*Ammodramous savannarum*), prairie warbler (*Dendroica discolor*), yellow-breasted chat (*Icteria virens*), field sparrow (*Spizella pusilla*), and blue grosbeak (*Guiraca caerulea*) (LeGrand 1972). Old fields and the small animals found in this habitat provide good hunting grounds for birds of prey such as the red-tailed hawk (*Buteo jamaicensis*). Mammals found in old fields are likewise different from the woodland species, except for such wide-ranging species as the Virginia opossum, eastern cottontail (*Sylvilagus floridanus*), gray fox, white-tailed deer, and various bats. The hispid cotton rat (*Sigmodon hispidus*) and eastern harvest mouse (*Reithrodontomys humulis*) are characteristic inhabitants of early old field successional stages. Reptiles and amphibians are, on the whole, more restricted by their habits and requirements to areas typically wetter and/or more vegetatively complex than old fields. However, several species of snakes, lizards, and toads typically are found in these old field herbaceous communities. These herptofaunal species include black racer (*Coluber constrictor*), rat snake, broad-headed skink (*Eumeces laticeps*), and American toad.

The occurrence of wildlife in agricultural fields is limited due to a number of factors including lack of suitable protective cover, intermittent presence of man, disruption of soil habitat by cultivation, and seasonal cover changes. The vertebrate wildlife of an overall farm or farming area can be rich and abundant, but this situation would require many patches of all community types and their ecotones. Fields intensively farmed for corn, wheat, sorghum, soybeans, tobacco, or forage, will not contain many birds, mammals, reptiles, or amphibians as permanent residents but may be important feeding areas for transient and migrant birds and for wildlife residing in more stable adjoining natural communities. European starlings (*Sturnus vulgaris*) and common grackles (*Quiscalus quiscula*) were observed feeding in recently plowed fields. Wide-ranging animals, such as mourning dove (*Zenaida macroura*), northern bobwhite (*Colinus virginianus*), white-tailed deer, red fox (*Vulpes vulpes*), various hawks and owls, and fossorial mammals, such as the woodland vole (*Microtus pinetorum*) and southern short-tailed shrew (*Blarina carolinensis*), are major faunal components of this community.

Fisheries and Aquatic Habitats - Streams in the Greensboro Eastern/Northern Urban Loop area include South Buffalo Creek, North Buffalo Creek, and Richland Creek. There are numerous un-named tributaries within the study area from the following sources: Little Alamance Creek, North Buffalo Creek, South Buffalo Creek, Reedy Fork, Richland Creek, Richland Lake, and Lake Townsend. Lakes and ponds, both natural and man-made (borrow pits), comprise lentic waters. Lakes in the area include Lake Townsend, Lake Brandt, and Richland Lake. Small farm ponds are scattered throughout the project area.

Aquatic organisms, including both invertebrates and fishes, inhabit the creeks, ponds, and lakes in or near the project area. Insect larvae are the dominant invertebrates and include stoneflies (*Plecoptera*), mayflies (*Ephemeroptera*), dragonflies (*Odonata*), damselflies (*Odonata*), caddis flies (*Trichoptera*), and crane flies (*Diptera*). Various snails (*Gastropoda*), segmented worms (*Oligochaeta*), and crayfishes (*Decapoda*) also inhabit this aquatic environment. Typical fish species include bluehead chub (*Nocomis leptoccephalus*), pirate perch (*Aphredoderus sayanus*), creek chub (*Semotilus atromaculatus*), green sunfish (*Lepomis cyanellus*), and fantail darter (*Etheostoma flabellare*). Typical mussel species include *Elliptio complanata* and *Elliptio icterira*. Farm ponds are usually stocked with game fish, such as bluegill (*Lepomis macrochirus*) and largemouth bass (*Micropterus salmoides*).

8. Wetlands

Wetlands are defined by the U.S. Army Corps of Engineers (CE, 33 CFR 328.3) and the Environmental Protection Agency (EPA, 40 CFR 230.3) as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Wetlands possess three essential characteristics: hydrophytic vegetation, hydric soils, and wetland hydrology. All three characteristics must be present to be identified as wetland (Federal Interagency Committee for Wetland Delineation 1989). Under Federal guidelines, an area may be designated as a regulatory wetland and fall under the jurisdiction of the U.S. Army Corps of Engineers. If an area is determined to be a regulatory wetland, Federal permits are required before any fill material may be placed in these wetlands. The early design of alternative alignments for this project took into account the location of potential wetland areas.

The results of preliminary wetlands inventory conducted for this project are documented in this section and in Chapter IV.B.7. An estimate of the location and extent of wetlands within the project corridor was developed through the review of U.S.G.S. topographic maps, the Soil Survey of Guilford County, consultation with the U.S. Army Corps of Engineers' Wilmington District, the stereoscopic interpretation of black and white aerial photography, and a field reconnaissance in February 1991. U.S. Fish and Wildlife Service National Wetland Inventory (NWI) maps are not available for the project area. All perennial streams and many intermittent streams were examined, and floodplains were searched for isolated wetlands.

Figure III-5 shows the location of the wetlands within each of the alternative alignments. Wetlands recognized within the study area include bottomland (alluvial) forests, scrub/shrub wetlands, marsh wetlands, bank-to-bank wetlands, and open-water areas commonly represented by stock ponds. Bottomland forests are the most frequently encountered wetlands in the study area, followed by scrub/shrub, and marsh wetlands. Open-water areas and bank-to-bank wetlands are of limited areal extent. The majority of the forested wetlands occur in the area between I-85 and US 29.

Bottomland forests are dominated by such species and sycamore, sweetgum, water oak and red maple. Scrub/shrub wetlands, found in the vicinity of stream systems in the study area, consists of thickets of shrub and or young hardwood species. This wetland type can be a natural feature of a result of past disturbances by man. Woody species include sweet-gum (*Liquidambar styraciflua*), cottonwood (*Populus deltoides*), alder, river birch (*Betula nigra*), red maple (*Acer rubrum*), ironwood (*Carpinus caroliniana*), willows, buckeye (*Aesculus sylvatica*), and spicebush (*Lindera benzoin*).

Some low-lying areas adjacent to the creeks in the study area have formed into marshes. The herbaceous layer is dominant in this community. Herbs include sedges (*Cares spp.* and *Scirpus spp.*), rushes (*Juncus spp.*), seedboxes (*Ludwigia spp.*), jewelweed (*impatiens capensis*), knotweeds (*Polygonum spp.*), common cattail (*Typhalatifolia*), false nettle (*Boehmeria cylindrica*), and nonewort (*Cryptotaenia canadensis*). Wetland shrubs such as buttonbush (*Cephalanthu occidentalis*), alder (*Alnus serrulata*), willows (*Salis spp.*), and swamp rose (*Rosa palustris*) can be found along the more upland edge of the marsh. In areas where bank-to-bank wetlands occur, flora and fauna components are characteristic of the surrounding upland biotic community type. Open-water areas support such species as aquatic moss and algae; smartweeds, panic grasses, and cattails are found along the water margins.

Numerous streams and intermittent tributaries traverse the study area. Although narrow wetland corridors exist along most streams, floodplains are extensive only in a few areas along the larger streams located between I-85 and US 29. The forested wetlands are primarily associated with the floodplains of North Buffalo Creek and South Buffalo Creek and their second order tributaries. As shown on Figure III-5, wetland sites occur within each of the alternative corridor alignments, as well as the crossovers. These wetlands have been influenced to some degree by man's activities.

9. Protected Species

Federally-listed Endangered, Threatened, Proposed Endangered, and Proposed Threatened species which may occur in the project area have been identified from 15A North Carolina Administrative Code 10I and U.S. Fish and Wildlife (1990) listings. State-listed species were ascertained from the N.C. Wildlife Resources Commission's official list of endangered wildlife of North Carolina (13 June 1990), and the North Carolina Department of Agriculture Plant Conservation Programs' list of Endangered, Threatened, and Candidate plant species (Sutter 1990). The North Carolina Natural Heritage Program database was reviewed for Guilford County to document any occurrences within the project area.

a. Federally-Listed Species

Federally-listed floral and faunal species have been granted protection under the Endangered Species Act of 1973 (16 U.S.C. 1531-1543) which mandates that Federal agencies ensure that any actions authorized, funded, or carried out by that agency do not jeopardize the "continued existence" of listed species, or result in the destruction or adverse modification of critical habitat (16 U.S.C. 1536). Proposed species are offered "limited protection" under Section 7 (A) (3) of the Endangered Species Act of 1973, as amended.

Pursuant to Section 7 of the Endangered Species Act, as amended (16 U.S.C. 1531-1543), USFWS provided written notification that one species may occur in the proposed project corridor. It is the plant nestronia (*Nestronia umbellula*). The federal status for this species is C2 and indicates that it is a candidate species presently under status review for federal listing for which information indicates that listing as Endangered or Threatened is possibly appropriate, but for which adequate data on biological vulnerability and threat(s) are not currently known on file to support proposed rules (Sutter 1990). "Status Review" species are not legally protected under the Act, and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as threatened or endangered. Nestronia occurs in sandy, open woodlands and creek borders,

usually parasitic on oak and pine roots. The N.C. Natural Heritage Program database has records for this species in the general area around Greensboro. This species was not observed during fieldwork; however, their presence cannot be ruled out due to the existence of suitable habitat within the study corridor.

A loggerhead shrike (*Lanius ludovicianus*), listed as C2 (migratory status) on the federal list, was observed during fieldwork in a rural area adjacent to the study corridor. This species was not indicated in the written notification provided by USFWS. The loggerhead shrike is listed by the State as Special Concern.

b. State-Listed Species

The State Endangered Species Act (G.S. 113-331 to 113-337) provides for the conservation, management, enhancement, and protection of rare fauna in North Carolina. This law makes it unlawful to possess or disturb, for any reason not approved by the North Carolina Wildlife Resources Commission, any animal on the protected list. State-listed plant species are protected under the State of North Carolina Plant Protection and Conservation Act of 1979 (G.S. 196 106-202.12 to 106-202.19). It is illegal to 1) dig, otherwise disturb, or remove any protected species without written permission of the landowner, or 2) sell, barter, or trade for any purpose any plant on the protected list, unless approved and permitted by the State Department of Agriculture. Two additional species listed by the state but not federally-listed are discussed below.

The N.C. Natural Heritage Program database reports the four-toed salamander (*Hemidactylium scataium*) as possibly occurring near the study area. This species is currently listed as Special Concern (SC = any species needing population monitoring) and presently has no federal ranking. It requires seepages or shallow ponds with moss-covered logs, roots, and grass clumps over quiet water. This species was not observed during fieldwork; however, their presence cannot be ruled out due to the existence of suitable habitat within the study corridor.

The loggerhead shrike is listed by the state as Special Concern. As previously mentioned, one was observed adjacent to the study corridor. It is uncommon to fairly common permanent resident throughout North Carolina, usually being more numerous in the Piedmont than elsewhere. The resident population is increased in winter by an influx from the north (Potter et al. 1980). The loggerhead shrike occurs in open country where scattered trees, telephone wires, and fences offer suitable perches for hunting small animals.

10. Prime and Important Farmlands

Farmland can be described as either prime farmland, state and locally important farmland, or other lands. The U.S. Department of Agriculture, Soil Conservation Service, describes these three categories as follows:

- **Prime Farmland:** These soils are best suited for producing food, feed, fiber, forage, and oilseed crops. They have good qualities and favorable growing seasons, and receive the available moisture needed to produce high yields on an average of 8 out of every 10 years.

- **State and Locally Important Farmland:** These soils have either seasonal wetness, erosion, or droughtiness that limits their suitability for some crops. Crops that are adapted to wet or droughty conditions, or if erosion is controlled, produce moderate to high yields if treated and managed according to modern farming methods.
- **Other Lands:** These soils are generally not suited to crop production without applying extensive management. Some of these lands are in urban and built-up areas.

According to the USDA Soil Conservation Service, the eastern half of the study area has the most soils that qualify for prime or state and locally important farmland. The western half is located in a more urbanized area and has a lesser amount of prime agricultural soils.

Table III-9 presents farm statistics for Guilford County and for North Carolina.

11. Ambient Air Quality

The U.S. Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (NAAQS) for six pollutants: particulate matter (PM-10), carbon monoxide (CO), ozone (O₃), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), and lead (Pb). Monitoring of these pollutants, except lead, is performed statewide by the North Carolina Division of Environmental Management (NCDEM) and four local agencies. Table III-10 is a summary of the EPA and NCDEM air quality standards. Primary standards were established allowing an adequate margin of safety for protection of public health. Secondary standards were established with an adequate margin of safety to protect the public welfare from adverse effects associated with pollutants in the ambient air. When these standards are exceeded as outlined, an area is labeled as non-attainment for that pollutant.

The project is located within the Northern Piedmont Air Quality Control Region. During 1988, there were eight recorded instances where the ozone standard was exceeded within Guilford County; as a result, this county has been designated nonattainment for this pollutant. Guilford County is classified as attainment for carbon monoxide, sulfur dioxide, nitrogen dioxide, lead, and particulate matter. On November 15, 1990, the President signed into law the Clean Air Act Amendments (CAAA), and the provisions of these amendments must be followed on highway projects. Since the MPO highway program for this area is in conformity, this project is considered to be in conformity.

TABLE III-9
FARM STATISTICS
(North Carolina and Guilford County)

	1974	1978	1982	1987
<u>Number of Farms</u>				
- North Carolina	91,300	81,700	72,800	59,284
- Guilford County	1,607	1,144	1,354	1,141
<u>Average Farm Size (acres)</u>				
- North Carolina	123	135	142	159
- Guilford County	102	98	100	111
<u>Land in Farms (acres)</u>				
- North Carolina	11,244,000	10,999,000	10,321,000	9,447,705
- Guilford County	164,200	142,000	136,000	126,369
<u>Harvested Cropland (acres)</u>				
- North Carolina	4,075,000	4,467,000	4,659,000	3,779,000
- Guilford County	42,800	43,000	43,500	40,827
<u>Woodland on Farms (acres)</u>				
- North Carolina	4,037,000	3,869,000	3,327,000	2,753,255
- Guilford County	51,800	45,000	41,000	32,500
<u>Farms by Size - 1982</u>				
	<u>North Carolina</u>		<u>Guilford County</u>	
	<u>%</u>	<u>Acres</u>	<u>%</u>	<u>Acres</u>
- Less than 10 acres	8.9%	5,253	6.7%	85
- 10 to 49 acres	30.5%	18,088	38.8%	450
- 50 to 179 acres	38.3%	22,680	25.4%	423
- 180 to 499 acres	15.7%	9,337	21.0%	142
- 500 to 1,000 acres	4.5%	2,676	7.5%	30
- More than 1,000 acres	2.1%	1,250	0.6%	11
		-----		-----
		59,284		1,141

SOURCE: U.S. Census of Agriculture

NOTE: Census Bureau definition of a farm is any place from which \$1,000 or more of agricultural products are sold each year.

TABLE III-10
SUMMARY OF EPA AND NCDEM
AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	EPA Primary Standard	EPA Secondary Standard	NCDEM Standard
TSP _a	Annual Geometric Mean 24 hour _b	75 ug/m ³ 260 ug/m ³	None ₃ 150 ug/m ³	75 ug/m ³ 150 ug/m ³
PM-10 _a	Annual Arithmetic Mean 24 hour _c	50 ug/m ³ 150 ug/m ³	Same as Primary Same as Primary	50 ug/m ³ 150 ug/m ³
SO ₂	Annual Arithmetic Mean 24 hour _b 3 hour _b	80 ug/m ³ 365 ug/m ³ None	None None 1,300 ug/m ³	80 ug/m ³ 365 ug/m ³ 1,300 ug/m ³
NO ₂	Annual Arithmetic Mean	100 ug/m ³	Same as Primary	100 ug/m ³
CO	8 hour _b 1 hour _b Mean 24 hour _b	9 ppm 35 ppm	None None	9 ppm 35 ppm
O ₃	1 hour _c	0.12 ppm	Same as Primary	0.12 ppm
Pb	Quarterly Arithmetic Mean _b	1.5 ug/m ³	Same as Primary	1.5 ug/m ³

a = TSP standards were replaced by PM-10 standards on 7/31/87 by the EPA. The North Carolina adoption of the PM-10 standard was effective July 1, 1988.

b = Not to be exceeded more than once per year.

c = Not to be exceeded more than one day per day averaged over a three-year period.

ug/m³ = Micrograms per cubic meter of air.

mg/m³ = Milligrams per cubic meter of air.

ppm Parts per million.

Microgram = one millionth of a gram, where 454 grams = 1 pound.

SOURCE: Ambient Air Quality, 1988, North Carolina Division of Environmental Management, Air Quality Section.

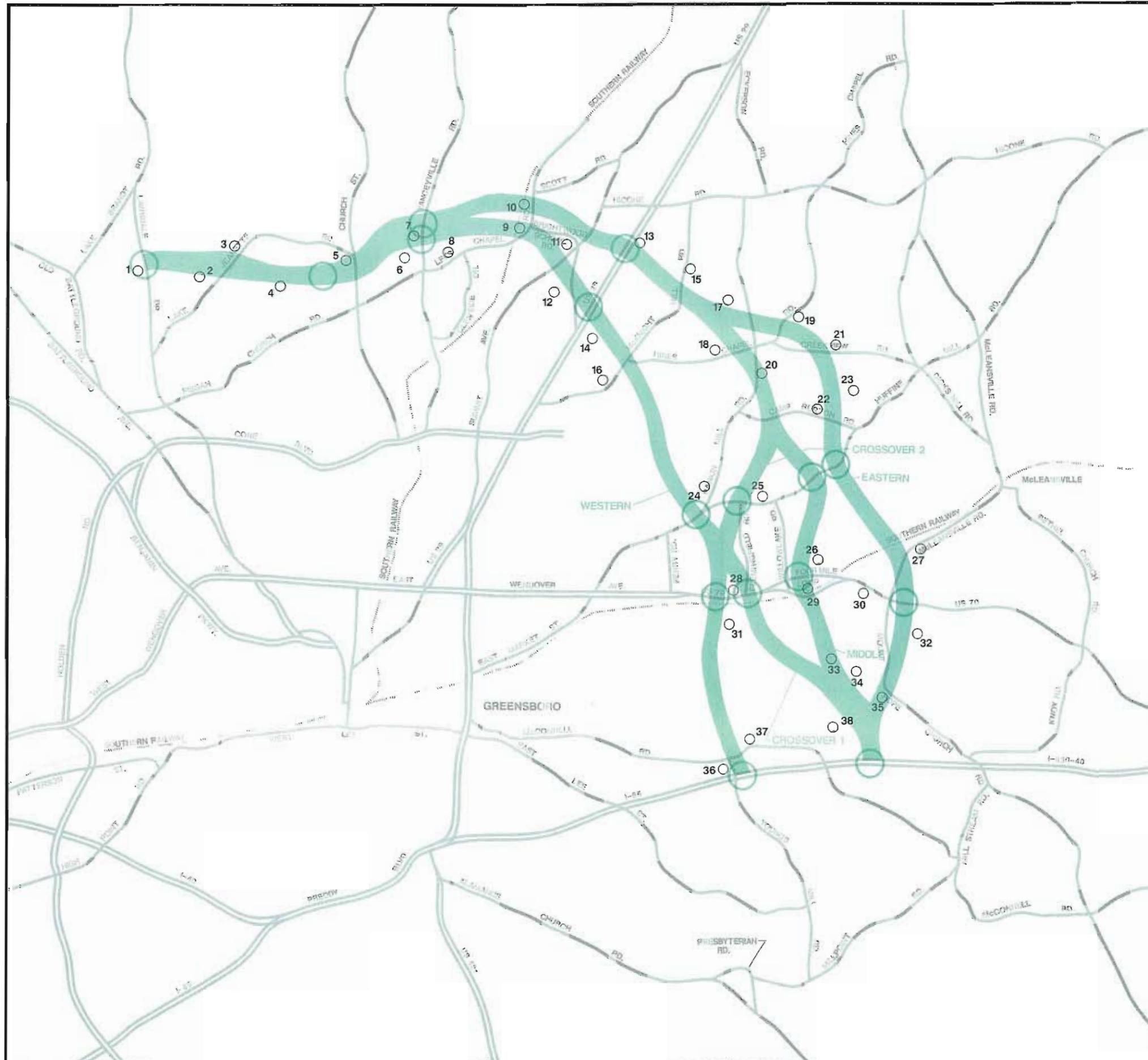
12. Ambient Noise Levels

Ambient noise is the noise resulting from natural and mechanical sources and human activity considered to be usually present in a particular area. The purpose of this information is to quantify the existing acoustic environment, thus providing a base for assessing the impact of noise for residences and other noise-sensitive receptors. Differences in the measured noise levels are attributed to variations in site conditions and traffic volumes.

Field measurements were taken at 38 locations (see Figure III-6) to determine existing noise levels at receptors along the project. The procedures used are documented in the Technical Memorandum on Noise Analysis, appended by reference and available from the Department. Traffic counts were also taken during the sampling periods at 31 roadside sites. The noise measurement locations and ambient noise levels are listed in Table III-11⁶.

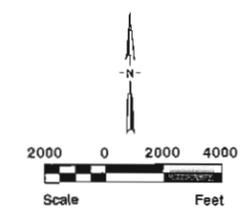
⁶SOURCE: Technical Memorandum on Noise Analysis, Kimley-Horn and Associates, Inc., May 1991 (appended by reference).

**GREENSBORO
EASTERN/NORTHERN
URBAN LOOP
GUILFORD COUNTY, NC**



LEGEND

○ MONITORING LOCATIONS



NOISE MONITORING LOCATIONS

FIGURE III-6

TABLE III-11
SUMMARY OF AMBIENT NOISE LEVELS

Number	Location	Existing Level Leq dB(A)
1	West of Lawndale Drive (130 feet south of Regents Park Lane)	62
2	Forrest Walk Drive (at end of cul-de-sac)	44
3	East of Lake Jeanette Road (500 feet south of Roberson Comer Road)	56
4	Kenneth Road (at west end of cul-de-sac)	39
5	West of Church Street (580 feet north of Drewsberry Drive)	60
6	Lorraine Road (at end of cul-de-sac)	44
7	East of Yanceyville Road (1,190 feet north of Lorraine Road)	58
8	South of Lees Chapel Road (220 feet east of Mitchell Street)	60
9	South of Lees Chapel Road (440 feet west of Brightwood School Road) - School	55
10	North of Lees Chapel Road (735 feet east of Brightwood School Road) - School	55
11	East of Summit Avenue (45 feet north of Pindals Drive)	61
12	Allyson Avenue (at west end of cul-de-sac)	46
13	East of US 29 (440 feet north of Dunstan Road)	74
14	Lakeview Memorial Park - Cemetery	59
15	West of McKnight Mill Road (0.2 miles north of Briarmeade Road)	56
16	East of McKnight Mill Road (630 feet south of Minorwood Road) - Church	60
17	Fairside Drive (at end of cul-de-sac)	44

TABLE III-11 (continued)
SUMMARY OF AMBIENT NOISE LEVELS

Number	Location	Existing Level Leq dB(A)
18	North of Hines Chapel Road (0.5 mile east of McKnight Mill Road)	59
19	East of Hines Chapel Road (0.5 mile north of Creekview Road)	55
20	West of Rankin Mill Road (480 feet south of Hines Chapel Road)	58
21	North of Creekview Road (0.6 mile east of Hines Chapel Road)	47
22	South of Camp Burton Road (645 feet east of Rankin Mill Road)	52
23	Rettrop Road (at end of cul-de-sac)	43
24	West of Rankin Mill Road (1,250 feet north of Huffine Mill Road)	62
25	South of Huffine Mill Road (1,090 feet east of Flemingfield Road)	59
26	Gallant Estates Mobile Home Park (as far north as possible)	44
27	East of McLeansville Road (0.4 mile south of Frieden Church Road)	60
28	North of US 70 (130 feet east of Elsielee Road)	68
29	North of US 70 (260 feet east of Willowlake Road)	70
30	South of US 70 (140 feet east of Royce Circle)	68
31	North of Porte Place (160 feet east of Buchanan Heights Road)	48
32	North of Hooper Road (810 feet east of Myrna Road)	44

TABLE III-11 (continued)
SUMMARY OF AMBIENT NOISE LEVELS

<u>Number</u>	<u>Location</u>	<u>Existing Level Leq dB(A)</u>
33	East of Clapp Farms Road (1.3 miles south of Mount Hope Church Road)	55
34	South of Longleaf Road (520 feet east of Beachland Drive)	40
35	West of Mount Hope Church Road (600 feet north of Fastcrest Road)	59
36	North of Perth Place (85 feet west of Youngs Mill Road)	71
37	North of McConnell Road (810 feet east of Youngs Mill Road)	56
38	South of Old School Road (220 feet east of Clapp Farms Road)	49

CHAPTER IV ENVIRONMENTAL CONSEQUENCES

This chapter discusses the probable positive and negative effects on the social, economic, cultural, physical, and natural environment from each of the alternatives chosen for detailed study. The Eastern, Middle, and Western Alternatives and the two transition crossovers were evaluated and compared to assess their relative advantages and disadvantages. Subsequent to these studies, it was determined that the Western Alternative and the two transition crossovers were not viable alternatives and were eliminated. (See Chapter II, D, 5). The analysis of environmental impacts from the alternative alignments will be used in conjunction with comments received during the public and agency review process to identify a preferred alternative alignment for the Greensboro Eastern/Northern Urban Loop.

A. URBAN AND COMMUNITY IMPACTS

The proposed action would provide improved transportation service to the study area and is compatible with proposed land use plans. The proposed action would also encourage development which, in turn, would provide improved employment opportunities in the area and substantially reduce travel times and commuting distances for local residents.

1. Land Use and Transportation Planning

The Eastern/Northern Urban Loop has been identified in the Greensboro Urban Area Thoroughfare Plan since 1967. The Thoroughfare Plan was revised, updated, and adopted by the City of Greensboro on September 5, 1989, and by the North Carolina Department of Transportation on November 3, 1989. The alignment shown in that plan follows the same general alignment as the Western Alternative described in this document with the exception of a shift in the vicinity of US 29 to avoid the Oakwood Mobile Home Park and in the vicinity of the White Street Landfill.

The construction of the Greensboro Eastern/Northern Urban Loop will have both positive and negative impacts on existing land use within and abutting the right-of-way for the road. Table IV-1 provides a summary of the acreage of proposed right-of-way estimated to occupy the four land uses defined for the study area.

The Eastern Alternative would have the greatest impact on agricultural fields, with approximately 78.4 acres of the proposed right-of-way passing through this land use category. By contrast, the Western Alternative would have the least overall impact, with only 35.9 acres of right-of-way estimated to traverse this land use.

The Eastern Alternative would have the greatest impact on forest lands with approximately 303 acres of proposed right-of-way traversing this land use. Of the remaining alternatives, the Western Alternative would have the least overall impact, at approximately 259 acres.

With approximately 223 acres passing through urban and built-up areas, the Eastern Alternative would have the greatest direct impact on this land use category. Crossover 1 would have the least impact, with approximately 200 acres of right-of-way traversing urban lands.

Impacts to the open water land use category would be minimal for all alternative alignments.

TABLE IV-1
SUMMARY OF LAND USE BY ALTERNATIVE ALIGNMENT

Alternative	Agricultural Fields	Forest Lands	Urban Areas	Open Water	Total
EASTERN					
Acres	78.4	302.7	223.2	2.1	606.4
% of Total	18%	80%	37%	<1%	100%
MIDDLE					
Acres	63.1	301.7	206.4	1.6	572.8
% of Total	11%	53%	36%	<1%	100%
WESTERN					
Acres	35.9	258.5	210.8	1.8	507.0
% of Total	7%	51%	42%	<1%	100%
CROSSOVER 1					
Acres	54.3	280.7	200.3	1.8	537.1
% of Total	10%	53%	37%	<1%	100%
CROSSOVER 2					
Acres	57.8	300.8	204.4	2.4	565.4
% of Total	10%	54%	36%	<1%	100%

Future land use changes resulting from the construction of the Greensboro Eastern/Northern Urban Loop should be compatible with the comprehensive plan because the majority of the area to be served by this freeway is designated to be urbanized. Local government will be responsible to ensure that any future development encouraged by this facility is compatible with the comprehensive plan.

In the Greensboro Vision Strategic Plan, one common objective was identified for both land use planning and transportation: the need for coordinated planning within Guilford County. One goal from the Visions Task Force on Land Use Planning and Natural Resources addressed "the need to balance growth within all geographic areas of the County." The task force states that "we count as a strength the efforts already made by local government to spur development in the northeast and southeast parts of the County." The Eastern/Northern Urban Loop has been planned for and incorporated into the City's and County's planning through the adopted Thoroughfare Plan. The project is also compatible with the desire to balance growth in the County by improving accessibility to its northeast portions, thereby stimulating residential growth and the creation of jobs.

2. Social Impacts

All three alternatives and the crossovers traverse land that is primarily undeveloped or contains scattered residential and commercial development. There are very few established residential neighborhoods and subdivisions in the study area, with the exception of the Summit Hills Community between US 29 and Summit Avenue and the Battle Forest subdivision at Lawndale Drive in the extreme western part of the study area. Therefore, few neighborhoods and communities would be impacted.

The corridors were developed to minimize community impacts by using existing undeveloped land and skirting the borders of developed areas whenever feasible.

The Eastern Alternative has minimal impact on the community, existing neighborhoods, and proposed subdivisions. The common portion of the Eastern/Middle/Western Alternatives across the north would impact a few multi-family residential units of the Battle Forest subdivision at Lawndale Drive. With regard to community services and facilities, the combined Eastern and Middle Alternatives pass within 400 feet of the Gateway Baptist Church and the Fire Station at Lees Chapel Road, and lie just to the south of the United Holy Church. It is anticipated that none of these facilities will have to be relocated. The Eastern Alternative affects the extreme western portion of the Woodmen of the World property and passes approximately 200 feet to the west of the McLeansville Wildlife Club, two private recreational facilities.

The Middle Alternative also has minimal impact on the community, existing neighborhoods, and proposed subdivisions. This alternative passes within 150 feet of the Gallant Estates Mobile Home Park and is within 400 feet of the Prison Farm.

The Western Alternative has minimal to moderate impact on the community, existing neighborhoods, and proposed subdivisions. This alternative passes within 25 feet of the South Fork subdivision and would encroach slightly upon the Oakwood Forest Mobile Home Park and the small trailer park on the west side of US 29. With regard to community services and facilities, the Western Alternative passes within 300 feet of Holy Temple and Lees Chapel and is just to the north of Lakeview Memorial Park. None of the churches would be relocated.

Crossover 1 passes within 200 feet of the Buchanan Baptist Church while Crossover 2 clips the extreme eastern edge of Keeley Park. Consultation with the City of Greensboro Parks and Recreation Department indicates that Keeley Park functions as a nursery operation for the City of Greensboro and is not used for recreational purposes. Hence, Crossover 1 and Crossover C will have no impact on recreational properties.

All three alternatives would improve accessibility throughout eastern Greensboro and Guilford County, with the greatest benefit from the Western Alternative due to greater travel demand. Sufficient grade separations and interchanges would be provided to minimize disruption of travel patterns, although some changes in travel routes are inevitable with any limited access facility.

No particular social or ethnic group will be unduly affected by any of the alternatives. More renters will be displaced than homeowners, due to selection of routes to avoid established communities wherever possible.

No libraries, fire stations, hospitals, or cemeteries will be directly impacted by the proposed alternatives.

The study area contains seven public schools. School system officials have been given an opportunity to review the alternatives and have not expressed any objections to the project. The construction alternatives were developed to avoid any major disruptions to the school system. Although no school will be relocated, the Western Alternative passes some 500 feet to the south of the Brightwood Elementary School and the Middle and Eastern Alternatives pass within 500 feet of Brightwood Elementary School on the north. These Alternatives would not affect use of school property nor impact pedestrian or vehicular access.

The Parks and Recreation Department of the City of Greensboro and the Guilford County Planning Department have been contacted with regard to existing and proposed parks in the area. Parks identified in the study area are shown on Figure III-2. None of the alternatives are anticipated to impact these parks.

The City of Greensboro has a functioning and extensive bicycle plan. Although several signed bicycle routes approach the western and southern edges of the study area, none cross over into the study area. Therefore, no special accommodation for bicycles are needed on this roadway and none are planned.

All three alternatives require land that is designated as future open space, as shown in Figure III-2. It has been determined that this land can be used for multiple purposes, including thoroughfares.

3. Economic Impacts

The Greensboro Eastern/Northern Urban Loop will affect the region's economy by providing employment to contractors during the construction of the project, thereby resulting in additional income generation; removing some land from property tax rolls; and changing the value of other land near the freeway. On a longer-term basis, the project will further encourage economic development in eastern and northern

Guilford County by increasing access; providing a direct, high-speed route for through and local traffic; and relieving congestion on existing streets.

The 1990 construction cost of the project is estimated to range from \$72.0 million to \$82.6 million, depending on the alternative selected.

These funds would be paid to contractors and suppliers, with a portion of these funds spent in the Greensboro area.

Privately owned land that is currently taxable would be converted to highway use. This conversion would remove this land from tax roles. Owners would be compensated for the land and improvements, and such payment would likely be used to purchase another home or business in Guilford County (see IV.A.4. Relocation).

Some homes near the freeway could lose value or, more likely, not appreciate at the rate they would have otherwise. Conversely, commercial property would tend to increase in value, particularly near interchanges.

4. Relocation

The studied construction alternatives will require the relocation of residences and businesses and other land uses within their respective right-of-way limits. Because portions of the study area are already experiencing urbanization, deferring the proposed action will only result in additional relocation impacts.

To compare the relative impact of the studied alternatives, an evaluation was made of the numbers and types of displacements and other demographic data for each alternative. This information is included in Appendix D and is summarized in Table IV-2 for each construction alternative.

It is the policy of the NCDOT to ensure that comparable replacement housing will be available prior to construction of state and federally-assisted projects. Furthermore, the North Carolina Board of Transportation has the following three programs to minimize the inconvenience of relocation:

- Relocation Assistance,
- Relocation Moving Payments, and
- Relocation Replacement Housing Payments or Rent Supplement.

With the Relocation Assistance Program, experienced NCDOT staff will be available to assist displacees with the information such as availability and prices of homes, apartments, or businesses for sale or rent and financing or other housing programs. The Relocation Moving Payments Program, in general, provides for payment of actual moving expenses encountered in relocation. Where displacement will force an owner or tenant to purchase or rent property of higher cost or to lose a favorable financing arrangement (in cases of ownership), the Relocation Replacement Housing Payments or Rent Supplement Program will compensate up to \$22,500 to owners who are eligible and qualify and up to \$5,250 to tenants who are eligible and qualify.

The relocation program for the proposed action will be conducted in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), and the North Carolina Relocation Assistance Act (GS -133-5 through 133-18). The program is designed to provide assistance to displaced persons in relocating to a replacement site in which to live or do business. At least one relocation officer is assigned to each highway project for this purpose.

The relocation officer will determine the needs of displaced families, individuals, businesses, non-profit organizations, and farm operations for relocation assistance advisory services without regard to race, color, religion, sex, or national origin. The NCDOT will schedule its work to allow ample time, prior to displacement, for negotiations and possession of replacement housing which meets decent, safe, and sanitary standards. The displacees are given at least a 90-day written notice after NCDOT purchases the property. Relocation of displaced persons will be offered in areas not generally less desirable in regard to public utilities and commercial facilities. Rent and sale prices of replacement property will be within the financial means of the families and individuals displacees and will be reasonably accessible to their places of employment. The relocation officer will also assist owners of displaced businesses, non-profit organizations, and farm operations in searching for moving to replacement property.

All tenant and owner residential occupants who may be displaced will receive an explanation regarding all available options, such as (1) purchase of replacement housing, (2) rental of replacement housing, either private or public, or (3) moving existing owner-occupant housing to another site (if possible). The relocation officer will also supply information concerning other state or federal programs offering assistance to displaced persons and will provide other advisory services as needed in order to minimize hardships to displaced persons in adjusting to a new location.

The Moving Expense Payments is designed to compensate the displacee for the costs of moving personal property from homes, businesses, non-profit organizations, and farm operations acquired for a highway project. Under the Replacement Program for Owners, NCDOT will participate in reasonable incidental purchase payments for replacement dwellings such as attorney's fees, surveys, appraisals, and other closing costs and, if applicable, make a payment for any increased interest expenses for replacement dwellings. Reimbursement to owner-occupants for replacement housing payments, increased interest payments, and incidental purchase expenses may not exceed \$22,500 (combined total), except under the Last Resort Housing provision.

A displaced tenant may be eligible to receive a payment, not to exceed \$5,250, to rent a replacement dwelling or to make a down payment, including incidental expenses, on the purchase of a replacement dwelling. The down payment is based upon what the state determines is required when the rent supplement exceeds \$5,250.

It is a policy of the state that no person will be displaced by the NCDOT's state or federally-assisted construction projects unless and until comparable or adequate replacement housing has been offered or provided for each displacee within a reasonable period of time prior to displacement. No relocation payment received

will be considered as income for the purposes of the Internal Revenue Code of 1954 or for the purposes of determining eligibility or the extent of eligibility of any person for assistance under the Social Security Act or any other federal law.

Last Resort housing is a program used when comparable replacement housing is not available, or when it is unavailable within the displacee's financial means, and the replacement payment exceeds the federal/state legal limitation. The purpose of the program is to allow broad latitudes in methods of implementation by the state, so that decent, safe, and sanitary replacement housing can be provided. It is not felt that this program will be necessary on the project, since there appear to be adequate opportunities for relocation within the area.

**TABLE IV-2
NUMBER OF DISPLACEMENTS FOR
THE CONSTRUCTION ALTERNATIVES**

	<u>ALTERNATIVE</u>				
	<u>Eastern</u>	<u>Middle</u>	<u>Western</u>	<u>Crossover</u>	
				<u>1</u>	<u>2</u>
Displacements					
Residences (minority)	311(55)	307(55)	364(79)	371(79)	295(55)
Businesses	10(0)	9(0)	9(0)	12(0)	12(0)
Other	0	0	0	0	0

5. Visual

The construction of the Greensboro Eastern/Northern Urban Loop will have some visual impacts on adjacent areas. Each of the construction alternatives under consideration will create a new roadway within a landscape setting that consists of a mix of urban and rural land uses. Consequently, no one alternative would be more visually compatible than another because of similarities in setting. In such instances, the visual impacts will be greatest in existing residential areas and at local street crossings where the roadway is elevated above the surrounding uses. Roadway elevation in these areas will require the construction of retaining walls and other structural elements which tend to create visual barriers. Likewise, a new roadway location in a rural area can create negative visual impacts with regard to barriers and obtrusions to the natural landscape setting.

The aesthetic quality of the urban and rural areas adversely affected by each of the construction alternatives can be lessened by providing:

- (1) A smooth flowing, curvilinear design to blend in with the landscape;
- (2) Landscape planting and natural revegetation of the cut-and-fill slopes;
- (3) Proper texturing and coloring to structural elements to enhance visual appearance;
- (4) Depressed vertical alignment.

6. Utilities and Services

Each of the build alternatives will involve the crossing of power lines, railroads, and pipelines in the project area. A comparison of alternatives with regard to utility impacts is as follows:

<u>Crossings</u>	<u>Eastern Alternative</u>	<u>Middle Alternative</u>	<u>Western Alternative</u>	<u>Crossover 1</u>	<u>Crossover 2</u>
Powerline	3	3	2	3	3
Railroad	2	2	2	2	2
Pipeline	9	12	11	11	10

Electrical Transmission Lines

Several major transmission lines are located in the study area. These include a north-south line located to the east of, and roughly parallel to, Rankin Mill Road, an east-west line north of Huffine Mill Road, and a north-south line located midway between Yanceyville Road and Church Street. The effects of crossing these lines have been considered to minimize their involvement and have been included in the economic comparison of the build alternatives. The Eastern and Middle Alternatives and the crossovers will require three transmission line crossings, whereas the Western Alternative will cross two transmission lines. The build alternatives are not expected to adversely affect any electrical transmission facilities, and no power substations will be impacted by any of the alignments.

Railroads

Two railroad lines of the Southern Railway system are located within the study area. One line runs east and west along a corridor that is roughly parallel to US 70 and McLeansville Road. The other line runs north and south and is located to the west of Summit Avenue. Each of the build alternatives will require two railroad crossings.

The railroad crossings will be grade-separated with structures, and no interruption in rail service is anticipated. The potential impacts on rail service facilities will be minimized because the structures will span the crossings.

Sewer and Water Service

The location of existing major sanitary sewer and water lines has been considered in an effort to avoid any major disruption to utilities. The Eastern Alternative would require the fewest pipeline crossings. The City of Greensboro and Guilford County have an agreement to encourage the extension of public utilities to developing areas adjacent to Greensboro. Approximately 75 percent of Guilford County residents live in areas where public water and sewer service is available. Public utilities are available in a major portion of the study area with the exception of the area between Huffine Mill Road and McKnight Mill Road, which are served by private wells and septic systems.

B. PHYSICAL IMPACTS

1. Air Quality

Urban air pollution results from industrial emissions, internal combustion engine emissions, and other sources. The impacts of highway construction or improvement can range from aggravating existing air pollution problems to improving air quality. Carbon monoxide (CO), hydrocarbons (HC), and nitrogen oxides (NO_x) are produced by the combustion of fuel in diesel and gasoline engines. Small amounts of Pb, SO_x, PM-10, and particulates are also emitted by motor vehicles.

The most prevalent air emission from motor vehicles is CO. High ambient CO concentrations are known to occur immediately adjacent to heavily traveled freeway routes under certain conditions. Prolonged exposure to excessive concentrations of CO can have severe health effects. Because CO is a non-reactive pollutant, it is easily modeled on a microscale basis. HC emissions originate from fuel tanks and as a byproduct of internal combustion engines. The action of sunlight on atmospheric emissions of HC and NO_x may lead to the formation of photochemical oxidants such as O₃.

The effect of the proposed project on ambient air quality was estimated using the CALINE3 air dispersion computer model and emission factors computed from the MOBILE4 computer model. MOBILE4 considers such factors as forecast year, vehicle mix, vehicle speed, inspection/maintenance programs, ambient temperature, and percent hot and cold starts to project emission factors in grams per mile for various roadway segments. These emission factors are then put into the CALINE3 program, which considers traffic volume, roadway geometry, and atmospheric conditions to project concentrations of CO on a microscale basis. This is further documented in the Technical Memorandum on Air Analysis, appended by reference and available from the Department.

The procedure was applied to year 2010 projected traffic volumes at two proposed interchange locations with US 29 (Eastern/Middle and Western Alternatives). These locations were judged to be worst-case due to heavy traffic volumes at US 29, as well as nearby residential use. Five receptors were selected in each interchange quadrant for a total of 20 receptors. The receptors used were located on the right-of-way line in each quadrant of the interchange. One-hour concentrations for each receptor are summarized in Table IV-3.

The maximum one-hour CO concentration is 5.5 ppm for the Western Alternative (receptor E2) and 4.9 ppm for the combined Eastern/Middle Alternative (receptor W1). Table IV- lists the CO concentration at each modeled receptor. Comparison of the predicted CO concentrations with the NAAQS (maximum 1 hour = 35 ppm) indicates no violation of this standard. Since the results of the "worst-case" one-hour CO analysis do not exceed the eight-hour standard of 9.0 ppm, it can be concluded that the eight-hour CO level does not exceed the standard.

TABLE IV-3
AIR QUALITY ANALYSIS/CO CONCENTRATION
(YEAR 2010)

Location	Maximum One-Hour CO Concentration (parts per million)	
<u>Receptor Number</u>		
US 29 (Western Alternative)	N1	3.2
	N2	3.6
	N3	3.2
	N4	4.5
	N5	4.3
	E1	4.7
	E2	*5.5
	E3	3.1
	E4	3.5
	E5	3.3
	S1	3.2
	S2	3.6
	S3	3.1
	S4	4.6
	S5	4.4
	W1	4.7
	W2	4.6
	W3	3.0
	W4	3.7
	W5	3.3
US 29 (Eastern/Middle Alternative)	N1	2.9
	N2	3.6
	N3	2.9
	N4	4.0
	N5	3.9
	E1	4.2
	E2	4.2
	E3	3.1
	E4	3.4
	E5	3.4
	S1	2.7
	S2	2.8
	S3	3.0
	S4	3.7
	S5	4.0
	W1	*4.9
	W2	4.0
	W3	2.9
	W4	2.9
	W5	2.9

* = Maximum Concentration

The project is located within an area administered by the Winston-Salem regional office of the North Carolina Division of Environmental Management. Since this project is located in an area where the State Implementation Plan (SIP) does not currently contain any transportation control measures, the conformity procedures of 23 CFR 770 do not apply.

Any of the three construction alternatives should provide higher overall air quality in the region than the No-Build Alternative because of reduced vehicle-miles and vehicle-hours of travel, increased operating speed, and reduced congestion.

2. Noise

An evaluation of the probable traffic noise impacts associated with this project was made in accordance with the procedures and provisions of Title 23, Code of Federal Regulations (CFR), Part 772, U.S. Department of Transportation, Federal Highway Administration (FHWA), Procedures for Abatement of Highway Traffic Noise and Construction Noise. The first step in this evaluation entailed the measurement of existing background noise levels in the vicinity of the project. Design year peak-hour traffic noise was then predicted for receptors within 600 feet of the project centerline, based on projected traffic volume.

Sound Levels

Equivalent Sound Levels (Leq) were computed using the FHWA Noise Barrier Cost Reduction Procedure programs STAMINA 2.0 and OPTIMA. By definition, the Leq is the level of constant sound which, in a given situation and time period, has the same energy as does time varying sound. In other words, the fluctuating sound levels of traffic noise are represented in terms of steady noise level with the same energy content.

Typical sound levels for common indoor and outdoor activities are shown in Table IV-4. Illustrated sound levels range from the threshold of hearing at 5 dBA to a jet takeoff at 120 dBA. Typical urban sound levels range from 50 dBA to 80 dBA.

**TABLE IV-4
TYPICAL SOUND LEVELS**

SOURCE	DISTANCE	SOUND LEVEL (dBA)
Jet Takeoff	200 feet	120
Noisy Rock Concert	--	110
Gas Lawn Mower	3 feet	94
Diesel Truck	50 feet	88
Noisy Urban Daytime	--	80
Gas Lawn Mower	100 feet	72
Heavy Traffic	300 feet	60
Vacuum Cleaner	10 feet	68
Normal Speech	3 feet	64
Quiet Urban Daytime	--	50
Quiet Urban Nighttime	--	40
Threshold of Hearing	--	5

Noise Abatement Criteria

The FHWA has established noise abatement criteria based on land use or activity category. The noise abatement criteria for various land uses are summarized in Table IV-5 and are considered to be the absolute levels where abatement must be considered. The Category A criterion applies to tracts of land for which the preservation of serenity and quiet are of paramount importance. The Category B criterion is an exterior condition applied to schools, churches, residences, parks, and in some cases, institutional land uses. The Category C criterion is also an exterior condition applied to commercial and industrial activities. The Category E criterion is an interior condition which applies to noise-sensitive activities such as in schools, churches, and hospitals.

One factor for considering traffic noise mitigation is when future noise levels either approach or exceed the criteria levels for each activity category. Title 23 CFR, Section 772.11(a) states: "In determining and abating traffic noise impacts, primary consideration is to be given to exterior areas. Abatement will usually be necessary only where frequent human use occurs and a lowered noise level would be of benefit." For this project, all of the identified receptors are residential or commercial (Categories B and C). No Category A receptors were identified.

TABLE IV-5
NOISE ABATEMENT CRITERIA
(Hourly A-Weighted Sound Level - Decibels (dBA))

Category	Leq(h)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residence, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, auditoriums.

Future Noise Levels and Noise Impact

Future highway noise levels were evaluated using the FHWA computer program STAMINA 2.0. Input parameters for STAMINA include alignment, grade, vehicle mix and speed, and topographic data to determine noise impact at various distances from the highway. The following assumptions were made during the evaluation:

- Projected year 2010 ADT volumes.
- Total ADT during peak hour - 10%.
- Truck ADT during peak hour - 4.2%.
- 60/40 directional split for autos, 50/50 directional split for trucks.

- All traffic in outer lane for each direction, high traffic volume on receptor side.
- Soft surface attenuation (drop-off rate = 4.5 dBA).
- North of US 70: 2.5% heavy trucks, 1.7% medium trucks (in the peak hour).
- South of US 70: 3.7% heavy trucks, 1.7% medium trucks (in the peak hour).
- 55 miles-per-hour operating speed (free-flow) and 60-70 miles-per-hour design speed.

The noise predictions in this analysis are for highway-related noise for the peak-hour traffic conditions during the design year. Design hour and level-of-service (LOS) volumes were compared. The volume which resulted in the greatest traffic noise was used with posted speeds to predict future noise levels.

STAMINA 2.0 was used to determine the receptors within 600 feet of the project centerline that would be impacted during the peak hour of the design year. Future noise levels were projected at 541 receptors. Projected highway noise levels for the receptors are summarized in Table IV-6 and shown in detail in the Technical Memorandum on Noise Analysis, available at the Department. This table shows the number of receptors calculated to approach (within 1 dBA) or exceed FHWA NAC, and the number of locations with existing noise levels less than 50 dBA that will experience substantial increases in project noise levels of 15 dBA or more. This table also summarizes the number of locations with existing noise levels greater than 50 dBA that will experience substantial increases of 10 dBA or more if this project were built.

As shown in Table IV-6, the Eastern Alternative would have the greatest impact and the Middle Alternative would have the least noise impact. The No-Build Alternative would also have increased noise impact along existing roads in the project area due to increased volumes and stop-and-go traffic. Noise abatement measures were considered for those areas where the proposed project would cause noise abatement criteria to be exceeded or would cause substantial increases in noise level.

**TABLE IV-6
SUMMARY OF NOISE IMPACT**

Type of Locations	ALTERNATIVE				
	Eastern	Middle	Western	Crossover 1	Crossover 2
Approaching or Exceeding FHWA Noise Abatement Criteria	39	31	37	34	36
With Substantial Impact (15 dBA increase or more; existing noise <50 dBA)	109	77	95	93	81
With Substantial Impact (10 dBA increase or more; existing noise >50 dBA)	20	11	15	17	22

Barrier Analysis

Concrete noise barrier walls were considered for 28 locations along the project. These were assumed to be located 150 feet from the centerline at the edge of the project right-of-way. Walls ranging from 10 to 20 feet in height were evaluated.

Noise reduction goals were developed from the barrier evaluation based on NCDOT guidelines. For a barrier to be recommended, it must provide a minimum insertion loss of 6 dBA for the most impacted receivers it is designed to protect. Noise levels at receivers impacted should be 64 dBA or less with the barrier. Barriers should also reduce the increase in noise level at impacted receivers to 15 dBA or less, the threshold for substantial impact. Barriers were considered to be cost-feasible if the cost per benefited receptor was \$25,000 or less.

Twenty-eight barriers were examined for the three alternative corridors. The evaluation addressed existing noise conditions, predicted noise levels without the barrier, dBA increases over ambient levels, noise levels with the barrier, and the dBA reduction (insertion loss) with the barrier. The approximate location of each barrier, the number of impacted receptors benefited, barrier dimension, estimate of cost, and cost per receptor were also determined. Details of the barrier analysis are included in the previously referenced Technical Memorandum.

This analysis concluded that most barriers high enough and long enough to significantly reduce noise have a relatively high cost per dwelling unit because of the low population density in major portions of the study area. Of the 28 barriers evaluated, the cost per impacted receptor ranged from \$10,638 to over \$66,000. Two barrier locations were estimated to provide substantial noise reduction for less than \$25,000 per receptor (see Figure IV-1). One cost-feasible barrier, located along the eastern edge of the Eastern Alternative between US 70 and Mount Hope Church Road, would cost \$41,500 and would abate noise at two receptor locations. The other cost feasible barrier is located along the southern edge of the common Eastern/Middle/Western Alternative segment between Elm Street and Lawndale Drive. This barrier would cost \$382,980 and would abate noise at 36 receptor locations (\$10,638 per receptor).

The preliminary conclusions regarding likely barrier abatement measures for this project are based on preliminary studies and cost data. A final decision on the installation of abatement measures will be made at the completion of project design.

Other Noise Abatement Measures

When the noise levels of a proposed roadway project approach or exceed noise abatement criteria, various noise abatement measures are considered. The following discussion addresses the applicability of these measures to the proposed project.

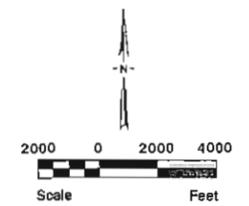
Alignment selection involves the horizontal or vertical orientation of the proposed improvements in such a way as to minimize impacts. Since sensitive areas are found on both sides of the proposed roadway, shifting the horizontal alignment is not considered to be a viable alternative. Changes in the vertical alignment of the proposed roadway are also not considered applicable.

Traffic system management measures which limit vehicle type, speed, volume, and time of operations are not considered appropriate for noise abatement due to their effect on the capacity and level-of-service on the proposed roadway. It was determined that a reduction in speed limit of 10 miles-per-hour would result in a noise level reduction of approximately 1 to 2 dBA. Because most people cannot detect a noise reduction of less than 3 dBA and because reducing the speed limit would reduce roadway capacity and increase user cost, it is not considered a viable noise abatement measure.

**GREENSBORO
EASTERN/NORTHERN
URBAN LOOP
GUILFORD COUNTY, NC**

LEGEND

■■■■ POSSIBLE NOISE BARRIERS



POTENTIAL NOISE BARRIER LOCATIONS

FIGURE IV-1



The use of vegetation for noise barriers is not considered to be effective in the actual reduction of noise levels for this project. This is due to the substantial amount of right-of-way necessary to make vegetative barriers effective. FHWA research has shown that vegetative barriers should be composed of closely-spaced, densely foliated trees and shrubs, and should be approximately 100 feet wide to provide a 3 dBA reduction in noise levels. To provide a 5 dBA reduction, substantial amounts of additional right-of-way would be required. The cost to acquire the right-of-way and to plant the vegetation is estimated to exceed the \$25,000-per-unit cost-effectiveness requirement. While vegetation alone is not effective as a sound barrier, visual screening may be considered appropriate.

The acquisition of property in order to provide buffer zones to minimize noise impacts is not considered a feasible noise abatement measure for this project. The cost to acquire impacted residences for buffer zones would exceed the NCDOT's abatement threshold of \$25,000 per residential unit. The use of buffer zones to minimize impacts to future sensitive areas is not recommended because this could be accomplished through land use controls.

One of the most effective noise abatement measures is proper land use controls to minimize future impacts. Local jurisdictions with zoning control should use the information contained in the final noise evaluation to develop policies to limit the growth of noise-sensitive land uses adjacent to the freeway. These policies could include setback requirements, building codes, and zoning.

A detailed barrier evaluation performed after the selection of the recommended alignment may provide for the design and development of more cost-effective barriers. Earthen berms may be effective in some areas, especially where parallel barriers may be necessary to protect impacted areas on both sides of the proposed freeway. While earthen berm generally provide more cost-effective noise attenuation than other barrier materials, they are limited by right-of-way and other engineering considerations (e.g., drainage, access, future development).

Construction Noise Impact

Noise impacts during project construction are typically of short duration. This noise occurs mostly through the use of diesel and other combustion engine-powered equipment. Peak noise levels from this equipment as measured at a distance of 50 feet may vary from 70 dBA to 100 dBA. Specifically, the construction noise will result from activities such as earth removal, hauling, grading, pile driving, and paving.

Although specific impacts from construction noise are difficult to determine, the following general steps should be performed:

- Identify land use of activities which may be affected by noise from construction.
- Determine appropriate minimizing measures to eliminate adverse construction impacts to the community.

- Incorporate the needed abatement measures in the contract plans and specifications.

No areas in the project vicinity where extreme quiet is required (i.e., hospitals) should be impacted by construction noise. Limiting the permitted days and/or hours of operation of certain construction activities will minimize adverse effects of construction noise. Temporary work areas and material storage areas will be located away from noise-sensitive receptors. Moreover, contract specifications will require that construction operations be performed in such a manner that specific maximum construction noise levels are not exceeded. The City of Greensboro and Guilford County have no noise ordinance that applies to road construction.

3. Water Quality

The potential for impacts to surface water quality will not be significantly different among the build alternatives. The Eastern, Middle, and Western Alternatives pass through approximately 2.2 miles of Lake Townsend's watershed critical area east of Church Street Extension. This watershed critical area is classified as Tier 4 by the City of Greensboro Watershed Critical Area Protection Ordinance, as discussed in Chapter III. Approximately 2.5 miles of the common portion of the alternatives drain into Lake Jeanette. The alternative alignments in this area will require particular attention to sedimentation and erosion control measures to minimize adverse affects on Lake Townsend from siltation. Best management practices commonly recommended for sedimentation and erosion control include mulching, sodding, diversion berms, sediment catch basins, and clean-up practices. Furthermore, construction activities should be organized in stages so that exposure of cleared areas and erodible earth is minimized to the extent possible.

A comparison of the build alternatives with regard to stream crossings by water quality is shown below:

Stream Crossings	Alternatives				
	Eastern	Middle	Western	Crossover 1	Crossover 2
Class WS-II	4	1	1	2	1
Class WS-III	9	9	9	9	9
Class C	10	12	8	8	14
Totals	23	22	18	19	24

This table indicates that the Eastern and Crossover 2 Alternatives have the greatest potential for surface water quality impacts and require the most stream crossings. The Western Alternative, on the other hand, has the lowest potential for surface water quality impacts. The Eastern Alternative also has the largest number of stream crossings of tributaries to Little Alamance Creek, which is designated a Class WS-II water supply. These crossings are primarily transverse to the stream channels.

Mitigation measures for adverse water quality impact due to highway runoff should consider the characteristics of highway runoff. First, more frequent minor storms should be considered rather than the infrequent major storms that are the focus of flood management. Second, the critical period for highway runoff is the "first-flush" stage, which produces relatively high concentrations of pollutants during the initial stages of storm runoff. Thirdly, the loadings of heavy metals and other particulates are of greater concern than loadings of nutrients and organic material.

Management measures that best take advantage of the above characteristics are described below:

- Elimination of curbs reduces accumulation of pollutants between storms and allows them to disperse without producing heavy loadings. This project is planned to be constructed without curb and gutter, as shown in the typical sections, Figure II-3.
- Litter control will limit potential pollutant sources, as well as providing aesthetic and safety benefits. North Carolina's Adopt-a-Highway program has proven successful in reducing litter along roadsides.
- Management of the use of de-icing chemicals and pesticides/herbicides reduces the total load of these pollutants that can affect water quality.
- Avoidance of direct discharge of highway runoff into receiving waters can be attained through routing stormwater to such management measures as vegetative controls (grassed channels or overland flow); detention basins, which retain stormwater for sedimentation of particulates away from receiving waters and also store a portion of the peak flow from stormwater to infiltrate into the ground and to be filtered through percolation into the soil; and wetlands, which are often effective at removing selected pollutants from stormwater runoff.
- Reduction of runoff velocity reduces the ability of the runoff to carry particulates to receiving waters. Management measures that can reduce runoff velocity include reducing gradients of runoff channels, installing velocity reduction devices such as drop structures and baffles, and using grassed rather than paved waterways.

- Establishment and maintenance of vegetation provides filtration, sedimentation, and infiltration. Measures that will enhance the runoff treatment of vegetation include establishing dense grass cover wherever practicable, minimizing the number of grass cuttings to increase grass height, and leaving grass cuttings on the ground as additional filter material.

Additional development in the study area will result in more impervious surface area, reduced rainwater infiltration, and greater potential for contamination, stream habitat alteration, and flooding. Good stormwater design and management practices can ameliorate these negative impacts. Both the City of Greensboro and Guilford County have zoning ordinances that regulate stormwater design and management in new developments.

The City of Greensboro and Guilford County have procedures for responding to chemical spills on highways and at other locations. If a spill occurs in the City, the City Department of Transportation crews provide a first-response of containing the spill. A local contractor removes spilled material. If the spill occurs outside the city limits, it is reported to the County Hazardous Materials Coordinator, who inspects the spill. The County Health Department is responsible for the clean-up. The County Office of Emergency Management maintains records of spills and provides coordination with state agencies.

This project will be subject to the National Pollutant Discharge Elimination System (NPDES) stormwater regulations, since it involves construction resulting in the disturbance of five acres or more. A permit will be required from the North Carolina Division of Environmental Management 90 days prior to commencement of construction. Water pollution control measures will be described in the permit application.

4. Hydrology and Floodplain Management

Floodplain Impacts

Guilford County is a participant in the regular program of the National Flood Insurance Program. Therefore, particular care will be taken to comply with the program and its requirements. Where a detailed flood study has been made, the discharge and frequency information will be used in the design of hydraulic structures. The project will cross major creeks which have designated floodplains and floodways. There is no practical way to avoid crossings of this type for the alternatives.

Table IV-7 summarizes the major 100-year floodplain encroachment for the project alternatives. The 100-year floodplain is based on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps, and is shown on Figure III-5. All project alternatives will encroach upon the 100-year floodplains of South Buffalo Creek and North Buffalo Creek to some extent. The Western Alternative would have the greatest floodplain involvement, impacting approximately 26 acres, followed in decreasing order by Crossover 1 with 23 acres, and the Middle Alternative and Crossover 2 with 16.5 acres each. The Eastern Alternative would have the least impact, with an estimated floodplain involvement of 6.2 acres. South Buffalo Creek

is also designated by FEMA as a regulatory floodway on the upstream side of US 70. The Western and Middle Alternatives and Crossover 1 will each involve the crossing of the regulatory floodway of South Buffalo Creek, with the Western Alternative having the most impact (5.5 acres) and the Middle Alternative the least (3.4 acres).

Floodplain crossings will be as close to 90 degrees as practical to minimize floodplain encroachments. The proposed highway will be designed such that the floodway will carry the 100-year flood without increasing the flood water elevation more than one foot at any given point. The dimensions of the drainage structures and the roadway grades will be adjusted and designed to avoid increasing the flood hazard in the project area. In addition, methods to minimize harm and preserve the floodplains could include minimizing fill and grading requirements, preserving the free natural drainage wherever possible, maintaining vegetation buffers, controlling urban runoff, and minimizing erosion and sedimentation during construction. Based on these conditions, the project will not constitute a significant floodplain encroachment.

The final designs will be coordinated with appropriate state and local officials and FEMA to assure compliance with federal, state, and local floodway regulations.

**TABLE IV-7
MAJOR FLOODPLAIN CROSSINGS**

Alternative	Location	Approximate Acres of Floodplain Involvement
Eastern	South Buffalo Creek (north of McLeansville Road)	4.1
	North Buffalo Creek (north of Camp Burton Road)	2.1
Middle	South Buffalo Creek (south of US 70)	11.0
	North Buffalo Creek (north of Camp Burton Road)	5.5
Western	South Buffalo Creek (north of McConnell Road)	11.0
	North Buffalo Creek (south of Hines Chapel Road)	15.2
Crossover 1	South Buffalo Creek (south of US 70)	7.6
	North Buffalo Creek (north of Hines Chapel Road)	15.2
Crossover 2	South Buffalo Creek (north of McConnell Road)	11.0
	North Buffalo Creek (north of Camp Burton Road)	5.5

Major Drainage Structures

Bridges or culverts are proposed for all hydrologic and regulatory floodway crossings for each alternative. Table IV-8 identifies the hydrologic crossings for each alternative and the type and preliminary design size of the structures proposed for each hydrologic crossing.

Stream Relocations

A relocation of approximately 600 feet of North Buffalo Creek and 600 feet of its tributary in the vicinity of the White Street landfill may be required with the Western Alternative, depending upon the actual alignment of the roadway in this area. This stream relocation would require detailed flood studies during design and coordination with FEMA and appropriate state and local agencies during final design. A relocation of approximately 450 feet of channel for a tributary of the Little Alamance Creek south of US 70 would be required for the Eastern Alternative. In addition, stream channelization may be required at several interchange locations. These streams would likely have to be placed in new culverts or in extensions of existing culverts to allow for roadway construction. The locations and approximate lengths of proposed stream relocations required for project alternatives are presented in Table IV-9.

Stream relocation designs are not expected to substantially alter stream lengths, gradients, or velocities. The design of any required stream relocation or channelization will be coordinated with the U.S. Fish and Wildlife Service and the North Carolina Wildlife Resources Commission in accordance with the Fish and Wildlife Coordination Act of 1958. Design measures to protect water quality include:

- Avoiding public water supplies and high quality aquatic habitats.
- Minimizing the number of stream crossings.
- Minimizing segments where roads lie closely parallel to streams.
- Maximizing the distance from roads to streams to allow for stormwater infiltration and deposition of pollutants associated with road runoff.

Mitigation includes restoring linear feet of stream bottom habitat taken by construction and replacing riparian vegetation.

Methods to minimize harm and preserve the floodplains could include minimizing fill and grading requirements, preserving the free natural drainage wherever possible, maintaining vegetation buffers, controlling urban run-off, and minimizing erosion and sedimentation during construction.

TABLE IV-8
STRUCTURES PROPOSED FOR HYDROLOGIC CROSSINGS

Alternative	Stream	Type	Approximate Length (feet)
Eastern	Little Alamance Creek Tributary	C	205
	Little Alamance Creek Tributary	C	160
	South Buffalo Creek	B	180
	North Buffalo Creek	B	120
	North Buffalo Creek Tributary	P	300
	North Buffalo Creek Tributary	C	360
	North Buffalo Creek Tributary	C	185
	North Buffalo Creek Tributary	C	240
	Richland Creek Tributary	P	375
	Richland Creek Tributary	P	300
	Richland Creek Tributary	P	260
	Richland Creek Tributary	P	375
	Richland Creek Tributary	P	850
	Richland Creek Tributary	C	250
	Richland Creek Tributary	P	450
	Richland Creek Tributary	C	185
	Middle	Little Alamance Creek Tributary	C
South Buffalo Creek		B	210
South Buffalo Creek Tributary		C	200
North Buffalo Creek Tributary		C	350
North Buffalo Creek Tributary		P	200
North Buffalo Creek		B	185
North Buffalo Creek Tributary		C	185
North Buffalo Creek Tributary		C	240
Richland Creek Tributary		P	375
Richland Creek Tributary		P	300
Richland Creek Tributary		P	260
Richland Creek Tributary		P	375
Richland Creek Tributary		P	850
Richland Creek Tributary		C	250
Richland Creek Tributary		P	450
Richland Creek Tributary		C	185
Western		South Buffalo Creek	B
	South Buffalo Creek Tributary	C	280
	South Buffalo Creek Tributary	C	360
	North Buffalo Creek Tributary	C	210
	North Buffalo Creek	B	160
	North Buffalo Creek Tributary	C	160
	North Buffalo Creek Tributary	P	400
	North Buffalo Creek Tributary	P	600
	North Buffalo Creek Tributary	P	170
	North Buffalo Creek Tributary	P	250

TABLE IV-8, continued
STRUCTURES PROPOSED FOR HYDROLOGIC CROSSINGS

Alternative	Stream	Type	Approximate Length (feet)
Western	Richland Creek Tributary	P	260
	Richland Creek Tributary	P	850
	Richland Creek Tributary	C	250
	Richland Creek Tributary	P	450
	Richland Creek Tributary	C	185
Crossover 1	South Buffalo Creek	B	310
	South Buffalo Creek Tributary	C	275
	North Buffalo Creek Tributary	C	210
	North Buffalo Creek	B	160
	North Buffalo Creek Tributary	C	160
	North Buffalo Creek Tributary	P	400
	North Buffalo Creek Tributary	P	600
	North Buffalo Creek Tributary	P	170
	North Buffalo Creek Tributary	P	250
	Richland Creek Tributary	P	260
	Richland Creek Tributary	P	850
	Richland Creek Tributary	C	250
	Richland Creek Tributary	P	450
	Richland Creek Tributary	C	185
Crossover 2	South Buffalo Creek	B	140
	South Buffalo Creek Tributary	C	280
	South Buffalo Creek Tributary	C	360
	South Buffalo Creek Tributary	P	165
	North Buffalo Creek Tributary	C	210
	North Buffalo Creek	B	185
	North Buffalo Creek Tributary	C	185
	North Buffalo Creek Tributary	C	240
	Richland Creek Tributary	P	375
	Richland Creek Tributary	P	300
	Richland Creek Tributary	P	260
	Richland Creek Tributary	P	375
	Richland Creek Tributary	P	850
	Richland Creek Tributary	C	250
Richland Creek Tributary	P	450	
Richland Creek Tributary	C	185	

LEGEND: C = CULVERT
 P = PIPE
 B = BRIDGE

TABLE IV-9
STREAM CHANNELIZATION REQUIREMENTS

<u>Alternative</u>	<u>Stream</u>	<u>Location</u>	<u>Approximate Structure Size</u>	<u>Approximate New Length Channelized</u>
Eastern/Middle/Western	Richland Creek Tributary	Proposed Elm Street Interchange	72"	800'
Eastern/Middle/Western	Richland Creek	Lawndale Drive Interchange	8' x 10'	200'
Western	North Buffalo Creek Tributary	US 29 Interchange	72"	1,100'
Western	North Buffalo Creek	Vicinity of Landfill	Open Channel	600'
Western	North Buffalo Creek Tributary	Vicinity of Landfill	Open Channel	600'
Eastern	Little Alamance Creek Tributary	South of US 70	Open Channel	450'

5. Natural Systems

a. Impacts to Vegetation

The primary direct impacts to vegetation from the proposed construction of the Greensboro Eastern/Northern Urban Loop will result from the removal of existing vegetation within the right-of-way. The right-of-way is 300 feet in width and expands to approximately 1,000 feet at proposed interchange locations. The right-of-way acreage potentially impacted is considered "worst case," and the actual area cleared may be less.

The acreage of the vegetation communities potentially affected by each of the alternative alignments is presented in Table IV-10. Impacts to the eight vegetation communities were quantified to the right-of-way widths based upon the functional designs. Measurements were made from 1"=1,000' scale black-and-white aerial photography acquired in January 1990 by the NCDOT.

Of the five alternatives, the Western Alternative would require the least amount of clearing of forested land with approximately 259 acres of the right-of-way passing through upland hardwood forest, upland mixed forest, pine forest, and alluvial (bottomland) forest. The Eastern Alternative, Middle Alternative, and Crossover 2 would require the greatest amount of forested land to be cleared (approximately 300 acres).

Native vegetation of the study area is probably best represented by stands of upland mixed forest. Even though this vegetative community is not pristine, it appears to be less disturbed than other areas such as upland hardwood forests, and pine forests and it supports the greatest amount of biological diversity in the study area. Consequently, the Middle, Eastern, and Crossover 2 Alternatives, respectively, would have the greatest impact on native vegetation, ranging from 150 to 156 acres of upland mixed forest. The Western Alternative would impact the least with 107 acres of upland mixed forest stands.

The Eastern Alternative would cross the greatest amount of agricultural and old fields, with approximately 78 acres of right-of-way traversing these habitats. The Western Alternative would cross the least with approximately 36 acres traversing agricultural and old field habitats. All five alternatives cross very little open water.

The construction of an alignment on a new corridor location, such as the Greensboro Eastern/North Urban Loop, could result in a variety of potential indirect impacts to vegetation, such as: (1) the accumulation of fugitive dust on vegetation foliage adjacent to the construction site; (2) sedimentation of downstream plant communities due to soil erosion; (3) potential occurrence of off-site pollution from run-off of oil and grease from construction equipment to adjacent plant communities. These indirect impacts will be minimized by implementing proper run-off and erosion-control measures, dust suppression, and control and removal of accidental spills of fuel or waste oil during construction. Exposed soils will be stabilized by re-vegetation as soon as possible after construction is complete.

b. Impacts to Wildlife

The vegetation impacts by community type for each alternative, as shown on Table IV-10, are directly linked to wildlife habitat impacts. Specifically, adverse impacts to wildlife by any of the alternative alignments can be expected from clearing activities during construction. Clearing activities would result in the direct destruction of certain forms of wildlife that are not mobile enough to avoid construction operations. These include several species of amphibians, reptiles, mammals, nestling and fledgling birds, and some burrowing animals. The larger, more mobile wildlife species, such as deer and adult birds, may be alerted by the noise associated with initial clearing activity and respond by moving into adjacent areas outside the project site or into areas within the project boundaries that are not under construction. These species would encounter competition in adjacent habitats. This may result in indirect adverse impact on wildlife populations adjacent to construction areas.

A control-of-access freeway would be fenced along its entirety, which would result in some fragmentation of habitat and obstruct normal animal movement and land migration. Any of the alternatives would have essentially the same affect on these impacts. However, the further out the alternative is from the city, the more habitat area would be crossed. One purpose of fencing the entire right-of-way is to prevent wildlife from being killed by vehicles. For reptiles, rodents, and small mammals capable of climbing the fence, some incidence of road kill will occur.

The upland mixed forest community has more varied terrestrial vertebrate animal life than either the upland hardwood forest or the pine forest because of the greater diversity of plant species, more stratified habitat, and intermingling of species from both pine and hardwood communities. The Middle, Eastern, and Crossover I Alternatives would have the greatest impact on this diverse vegetative habitat. Likewise, species diversity and wildlife populations are often high in the alluvial forest communities because this habitat provides food, cover, and moisture required for the survival and reproduction of many vertebrate species. The Crossover I and Western Alternatives would have the greatest impact on alluvial forest communities (approximately 20 acres); the Eastern Alternative would have the least impact (approximately two acres).

Increased noise levels and human activity during construction could potentially disturb breeding or other activities of species that inhabit the adjacent areas. These adverse effects would be largely limited to the perimeter of the work areas. Noise is expected to be temporary in most cases and once construction activities have ceased, it is anticipated that the surrounding populations will habituate to noise from increased traffic volumes.

c. Impacts to Fisheries/Aquatic Habitats

Adverse direct impacts on aquatic habitats and fisheries are expected to result from any of the study alternatives because of construction activities at stream crossings, including vegetation clearing and fill placement in streambeds or floodplains. Long-term indirect impacts on fisheries may include erosion and siltation of streams in the construction area. Mitigation of these potential impacts may include control of erosion and siltation, limiting movement of machinery in the construction corridor stream bottoms; adherence to clean-up procedures; and minimizing fills to streams, intermittent drainage, and wetlands.

**TABLE IV-10
VEGETATION IMPACTS BY COMMUNITY TYPE FOR EACH ALTERNATIVE**

Habitat (Biotic Community)	Acres Affected By Alternative				
	Eastern Alternative	Middle Alternative	Western Alternative	Crossover 1	Crossover 2
Upland Hardwood Forest	111.6	99.6	98.4	99.8	104.4
Upland Mixed Forest	153.2	155.9	107.3	109.4	150.4
Pine Forest	28.3	32.8	20.6	41.4	30.6
Alluvial Forest	9.6	13.4	32.2	30.1	15.4
Old Field	19.8	10.2	5.1	5.7	7.1
Agricultural Fields	58.6	52.9	30.8	48.6	50.7
Open Water	2.1	1.6	1.8	1.8	2.4
Man-Dominated Areas	<u>223.2</u>	<u>206.4</u>	<u>210.8</u>	<u>200.3</u>	<u>204.4</u>
Total Acres	606.4	572.8	507.0	537.1	565.4

6. Protected Species

Potential impacts of the proposed project to rare, threatened, or endangered plant or animal species are dependant on the occurrence and abundance of these species within

the study area. U.S. Fish and Wildlife Service (USFWS) records indicate that these are no Federally-listed or proposed endangered or threatened plant or animal species in the impact area of the project (Appendix A). As discussed in Chapter III.C.8, nestronia is listed by the USFWS as a Category 2 species and by the State as threatened. Nestronia was not observed during field reconnaissance; however, its presence cannot be ruled out because this rare plant species is associated with woodland areas of the type found in the study area. Additional field surveys would be necessary during appropriate seasons to determine whether or not nestronia may occur within prospective impact zones of the proposed action. Since no legal protection is offered to the plant for highway construction, no further field survey or biological assessment for this species is required.

The North Carolina Heritage Program data base reports the occurrences of the four-toed salamander in areas around the project corridor. Although no records are known within the project corridor, suitable habitat is present. Additional field surveys would be required to determine whether or not this species may occur within the prospective impact zones of the project. The loggerhead shrike, an avian species, was observed in a rural portion adjacent to the prospective impact zone. Potential impact, if any, to this species should be minor because suitable habitat is adjacent to the project corridor. Suitable habitat consists of open grass land areas with bordering hedgerows and dense shrubs.

7. Farmland

The proposed right-of-way of each of the construction alternatives would encroach upon prime farmland and farmland of statewide and local importance, as designated by the Soil Conservation Service (SCS). Farmland classifications are based on soil type rather than on the actual use of the land, therefore, these areas may have other uses such as urban development, pastureland, and open space.

Table IV-11 gives the estimated acres for prime and important farmland for the construction alternatives.

**TABLE IV-11
FARMLAND INVOLVEMENT
(INCLUDING DEVELOPED AREAS)**

Alternative	Acres of Prime and Unique Farmland	Acres of Important Farmland
Eastern	317	165
Middle	262	182
Western	233	131
Crossover 1	N/A	N/A
Crossover 2	N/A	N/A

Since this project is state-funded, the farmland impacts are considered under North Carolina Executive Order No. 96, Conservation of Prime Agricultural and Forest Lands. This determination of impacts was based on the methodology required by the Farmland Protection Policy Act.

Form AD 1006, completed by the Guilford County SCS (see Appendix A), notes that prime and unique farmland within the study area would be impacted by the proposed alignments, as follows: Eastern Alternative, 317 acres; Middle Alternative, 262 acres; Western Alternative, 233 acres. Farmlands of statewide or local importance that would be impacted by the proposed alignments are as follows: Eastern Alternative, 165 acres; Middle Alternative, 182 acres; Western Alternative, 131 acres. The Eastern Alternative is in the most rural setting of the alternatives studied and would convert the most active farmland (approximately 58 acres). By contrast, the Western Alternative, located in a more urban setting, would convert the least amount of active farmland, totalling approximately 31 acres.

The land evaluation and site assessment scoring used in Form AD 1006 indicates that project-related impacts to farmlands are minimal. Farmland scoring on Form AD 1006 is based upon a possible 260 points, with 160 points being the critical score. Those sites receiving scores totalling less than 160 points are given a minimal level of consideration for protection. All project alternatives scored less than 160 points in the ranking form. The Eastern Alternative had the highest score in the project area at 156 points, followed by the Middle Alternative (148 points), and the Western Alternative (143 points). These scores indicate that the evaluation of additional alternatives will not be required for this project because of minimal impact to prime farmland. In addition, most of the farmland is already in or planned for urban development and is not subject to the Farmland Protection Policy Act.

8. Wetlands

The location of the impacted wetlands is illustrated on Figure III-5. The estimates of wetland acreages impacted by the proposed alignments are shown in Table IV-12. The largest extent of potential wetlands are found in association with the wider floodplains of North Buffalo Creek and South Buffalo Creek and their second-order tributaries.

The Western Alternative impacts more wetland acreage than any other build alternative, 34 acres. Approximately 70 percent of the wetlands within the construction limits of the Western Alternative are hardwood forest, 20.3 acres. The Crossover 1 Alternative would involve approximately 32 acres of wetlands; a major portion of the impacted wetlands would be hardwood forest (21.1 acres). The Eastern Alternative contains the least amount of impacted wetland acreage, 11.7 acres, with two acres of these wetlands consisting of hardwood forest. Major wetland impacts to hardwood forest areas occur at South Buffalo Creek (Western and Middle Alternatives, Crossover 1) and North Buffalo Creek (Western Alternative), north of the City of Greensboro landfill. The forested wetlands within the Western Alternative are afforded buffering from man-dominated land influences by adjacent upland forested communities.

Activity that will cause loss or substantial adverse modification of water of the United States is considered for coverage under a nationwide permit issued by the Corps of Engineers. For those impacts to wetlands that exceed one third of an acre in size, written coordination with the Corps of Engineers is required. Ten sites on the Eastern Alternative, 11 sites on the Middle Alternative, seven sites on the Western Alternative, six sites on Crossover 1, and 11 sites on Crossover 2 qualify by size for inclusion under a nationwide permit.

TABLE IV-12
SUMMARY OF WETLAND INVOLVEMENT

Site	Wetland	Type	Acres Affected By Alternative				
			Eastern	Middle	Western	Crossover	
						1	2
1	South Buffalo Creek	M,S			2.7	2.7	
2,3	South Buffalo Creek	F			5.1	5.1	
4,5	Little Alamance Creek, UT	B				0.2	
6-8	Little Alamance Creek, UT	B		0.5			
9	Little Alamance Creek, UT	B	0.2	0.2			
10	South Buffalo Creek, UT	B			0.1		0.1
11,12	South Buffalo Creek	F		4.6			
13	South Buffalo Creek	M		1.5			
14	South Buffalo Creek	F				5.7	0.3
15	Little Alamance Creek, UT	B			0.3		
16	Little Alamance Creek, UT	L	0.7				
17	South Buffalo Creek	M,S	3.2				
18	South Buffalo Creek	F		1.4			
19	South Buffalo Creek, UT	F			2.2		2.2
19A	South Buffalo Creek, UT	F				2.4	
20	South Buffalo Creek, UT	L					0.8
21	North Buffalo Creek, UT	F			0.7	0.7	

TABLE IV-12 (continued)
SUMMARY OF WETLAND INVOLVEMENT

Site	Wetland	Type	Acres Affected By Alternative				
			Eastern	Middle	Western	Crossover	
						1	2
22	North Buffalo Creek, UT	M,S			4.5	4.5	
23	North Buffalo Creek	F			10.6	10.6	
24	North Buffalo Creek	L			0.3	0.3	
25	North Buffalo Creek	F			0.7	0.7	
26	North Buffalo Creek	B		0.3			0.3
27	North Buffalo Creek, UT	L		0.2			0.2
28	North Buffalo Creek, UT	B	0.2				
29	North Buffalo Creek, UT	B	0.1				
30	North Buffalo Creek, UT	M,S	2.2				
31	North Buffalo Creek, UT	B		0.1			0.1
32	North Buffalo Creek, UT	B	0.1	0.2			
33	North Buffalo Creek, UT	M,S	0.7	1.1			1.1
34	North Buffalo Creek, UT	F	1.0	1.6			1.6
35	North Buffalo Creek, UT	M,S			3.0	3.0	
36	North Buffalo Creek, UT	L			0.4	0.4	
37	North Buffalo Creek, UT	L			0.6	0.6	

TABLE IV-12 (continued)
SUMMARY OF WETLAND INVOLVEMENT

Site	Wetland	Type	Acres Affected By Alternative				
			Eastern	Middle	Western	Crossover	
						1	2
38,39	North Buffalo Creek, UT	L	1.4	1.4			1.4
40	Richland Creek, UT	B	0.1	0.1			0.1
41	Richland Creek, UT	B	0.2	0.2			0.2
42	Richland Creek, UT	L			0.5	0.5	
43	Richland Creek, UT	M,S			0.7	0.7	
44	Richland Creek, UT	B	0.1	0.1			0.1
45	Richland Creek, UT	B			0.1	0.1	
46	Richland Creek, UT	F	1.0	1.0	1.0	1.0	1.0
47	Richland Creek, UT	B	0.1	0.1	0.1	0.1	0.1
48	Richland Creek, UT	B	0.1	0.1	0.1	0.1	0.1
49	Richland Creek	B	0.3	0.3	0.3	0.3	0.3
SUBTOTALS:		F	2.0	8.6	20.3	21.1	9.9
		M,S	6.1	2.6	10.9	8.2	3.8
		B	1.5	2.2	1.0	0.8	1.7
		L	<u>2.1</u>	<u>1.6</u>	<u>1.8</u>	<u>1.8</u>	<u>2.4</u>
TOTALS:			11.7	15.0	34.0	31.9	17.8

UT = UNNAMED TRIBUTARY

WETLAND VEGETATION CODES:

F = MATURE HARDWOOD WETLAND FOREST, HIGHEST QUALITY
 S = SCRUB/SHRUB - DOMINATED WETLAND
 M = MARSH
 B = BANK-TO-BANK WETLAND, WITH CANOPY OF UPLAND VEGETATION
 L = LAKES AND PONDS

Where encroachment in wetlands is unavoidable, mitigation to minimize impacts is required. The Council on Environmental Quality (CEQ) has defined mitigation in its regulation (40 CFR 1508.20) to include: avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts. The three general types of mitigation are avoidance, minimization, and compensation. A Memorandum of Agreement (MOA) was signed on November 15, 1989, by the Department of Army and the Environmental Protection Agency (EPA) that clarifies the procedures to be used in determining the type and level of mitigation necessary to demonstrate compliance with the Clean Water Act, Section 404(b)(1) Guidelines. The MOA became effective February 7, 1990.

Mitigation of impacts to wetlands within the project area may include the following methods:

- Selection of an alignment that avoids wetlands to the maximum extent possible.
- Minimization of adverse impacts through project modification.
- Restoration and/or enhancement of existing degraded wetlands or creation of manmade wetlands in areas adjacent or contiguous to the discharge site.
- Maintenance of historic hydrologic flows.

Compensation by creation or restoration of in-kind wetlands or out-of-kind wetlands of equal or greater value in accordance with the U. S. Fish and Wildlife Service Mitigation Policy is a mitigation option.

The proposed alignments were evaluated to determine locations suitable for the enhancement or creation of wetlands. Wetlands of similar habitat will be mitigated at a minimum 1:1 ratio. Several stream crossings and associated floodplain areas were identified as potential sites for enhancement or creation of wetlands. Potential mitigation sites include the low-lying agricultural areas adjacent to the unnamed tributary of North Buffalo Creek in the vicinity of Sites 31-33 of the Eastern and Middle Alternatives and the cleared agricultural areas adjacent to the South Buffalo Creek floodplain between the Middle and Western Alternatives. The exact method used to create wetlands will probably vary from site to site. As a general rule, however, each site will be graded to about the same elevation as existing adjacent wetlands, or surface water, and then planted with wetland vegetation. Topsoil might be added and some natural colonization by wetland plants may also occur.

Several streams and their tributaries will be culverted and/or diverted for this project. Many of the smaller wetland sites which could be impacted occur at creek and minor stream crossings. The wetlands are limited to within the stream banks at most of these crossings. Impacts to wetlands throughout the project area have been minimized by crossing streams at right angles, or at their narrowest point, where feasible. It is anticipated that Individual Permits, under Section 404 of the Clean Water Act, will be required for all of the forested wetlands. These wetlands occur mainly within the floodplains of the major streams (South Buffalo Creek, North Buffalo Creek) and some of their larger tributaries.

9. Hazardous Material Sites and Underground Storage Tanks

A survey was conducted to identify known hazardous material and underground storage tank sites within the Greensboro Eastern/Northern Urban Loop study area. A discussion of the survey methodology and the results is found in Chapter III.B.6. State regulatory agencies were consulted and lists of known potential hazardous material sites scheduled for cleanup by EPA and the regulatory agencies were reviewed. This includes a review of the EPA's National Priorities List (NPL) of heavily contaminated sites and the sites scheduled for priority cleanup with Superfund money. No hazardous material sites in Guilford County are listed on the National Priorities List.

As a result of the survey, 16 hazardous material and underground storage tank sites were identified. Figure III-4 illustrates the approximate location of each site in relation to the alignment alternatives. A preliminary assessment of each site was made to determine its potential to impact the alternative alignments. The site assessments were based on site observations, storage of hazardous materials or generation of hazardous waste or pollution, reported contamination or regulatory enforcement, and distance to the proposed project right-of-way of each alignment alternative.

The preliminary assessment revealed that eight sites pose some risk of impacting one or more of the alternative alignments. Table IV-13 provides a breakdown of the individual alternatives and the sites which could potentially impact them. The Western Alternative is potentially involved with six sites; Crossovers 1 and 2 are potentially impacted by four sites each. The Eastern and Middle Alternatives will be minimally impacted by hazardous material sites.

The eight sites and their potential to impact the alternative alignments are discussed individually in the following paragraphs:

Site No. 1 (Buffalo Park Store) is a gasoline station and smals and their potential to impact the alternative alignments are discussed individually in the following paragraphs:

Site No. 1 (Buffalo Park Store) is a gasoline station and small convenience store. The NCDEHNR, Division of Environmental Management Underground Storage Tank Files have no listing as to the number of underground storage tanks on this property. The Western Alternative and Crossover 1 may require the acquisition of a portion of this site.

Site No. 2 (Longview Curb Market) is a gasoline station and small convenience store containing four underground storage tanks. There may be a potential for contamination at this site because the tanks were installed some 20 years ago. However, no evidence of contamination was observed. The Western Alternative would require the complete acquisition of this site because it is located within the proposed right-of-way of the Western Alternative/Huffine Mill Road interchange.

**TABLE IV-13
HAZARDOUS MATERIAL SITE INVOLVEMENT
AND UNDERGROUND STORAGE TANKS**

SITE	ALTERNATIVES				
	Eastern	Middle	Western	Crossover	
				1	2
#1 Buffalo Park Store			x	x	
#2 Longview Curb Market			x	x	
#3 J. P. Stevens	x	x			x
#4 White Street Landfill			x	x	
#5 East Wendover Mobil			x		x
#6 Dodson Auto Parts/Junkyard			x		x
#7 Shoprite Market/ Gas Station			x		x
#8 Texaco				x	
TOTALS	1	1	6	4	4

Site No. 3 (J. P. Stevens) had a number of underground storage tanks on the property for fuel oil, diesel, gasoline, and mixed/used oil. According to NCDEHNR files, all tanks were removed in September 1989. The property is located approximately 300 feet to the west of the proposed right-of-way of the combined Eastern, Middle, and Crossover 2 Alternatives/US 29 interchange. Although neither of these alternatives would require right-of-way acquisition at this site, this property is located up gradient from the proposed interchange area. Hence, the potential for groundwater contamination may exist.

Site No. 4 (City of Greensboro White Street Landfill) is 500+-acre site located at the end of White Street at Nealtown Road on the south side of North Buffalo Creek. This facility is a fully functional, large municipal landfill complex that fulfills the solid waste needs of the City of Greensboro, the Town of Gibsonville, and approximately 75 percent of Guilford County. It handles over 350,000 tons of waste each year.

This facility has been used for the disposal of municipal solid waste since the late 1950's. Landfilling generally has progressed from west to east across the site, with the oldest material deposited in the western part of the facility. The approximate limits of the currently filled and/or permitted landfill property are shown on Figure IV-2. The landfill complex consists of two old solid-fill areas on the west, a site proposed for vertical expansion in the center, and an active permitted fill area in the eastern and northeastern portions of the facility. The landfill area is drained by two northwest flowing tributaries to North Buffalo Creek. One of these tributary valleys separates the old fill areas from the proposed vertical expansion fill area, while the second, narrower stream valley separates the proposed vertical expansion fill area from the active permitted site.

The Western Alternative would, in effect, bisect the landfill property because it follows an alignment that is contained within the 300-foot-wide stream valley that separates the old fill area on the west from the site proposed for vertical expansion on the east (Figure IV-2). Although it appears that this alignment will avoid the proposed vertical fill site, its western boundary will encroach directly upon approximately 2.5 acres of the old fill area. Correspondence from the NCDOT Geotechnical Unit is included in Appendix A, along with an attached map showing the encroachment of the Western Alternative into the old solid fill area. In addition, as part of its long-term acquisition program, the Public Works Department of the City of Greensboro is currently negotiating for additional land to the south of the current site for landfill expansion, as shown in Figure IV-2. A segment of this proposed landfill expansion area will also be affected by the Western Alternative right-of-way along a length of approximately 3,600 feet.

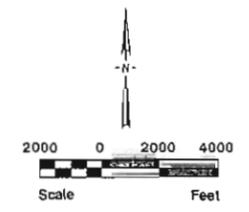
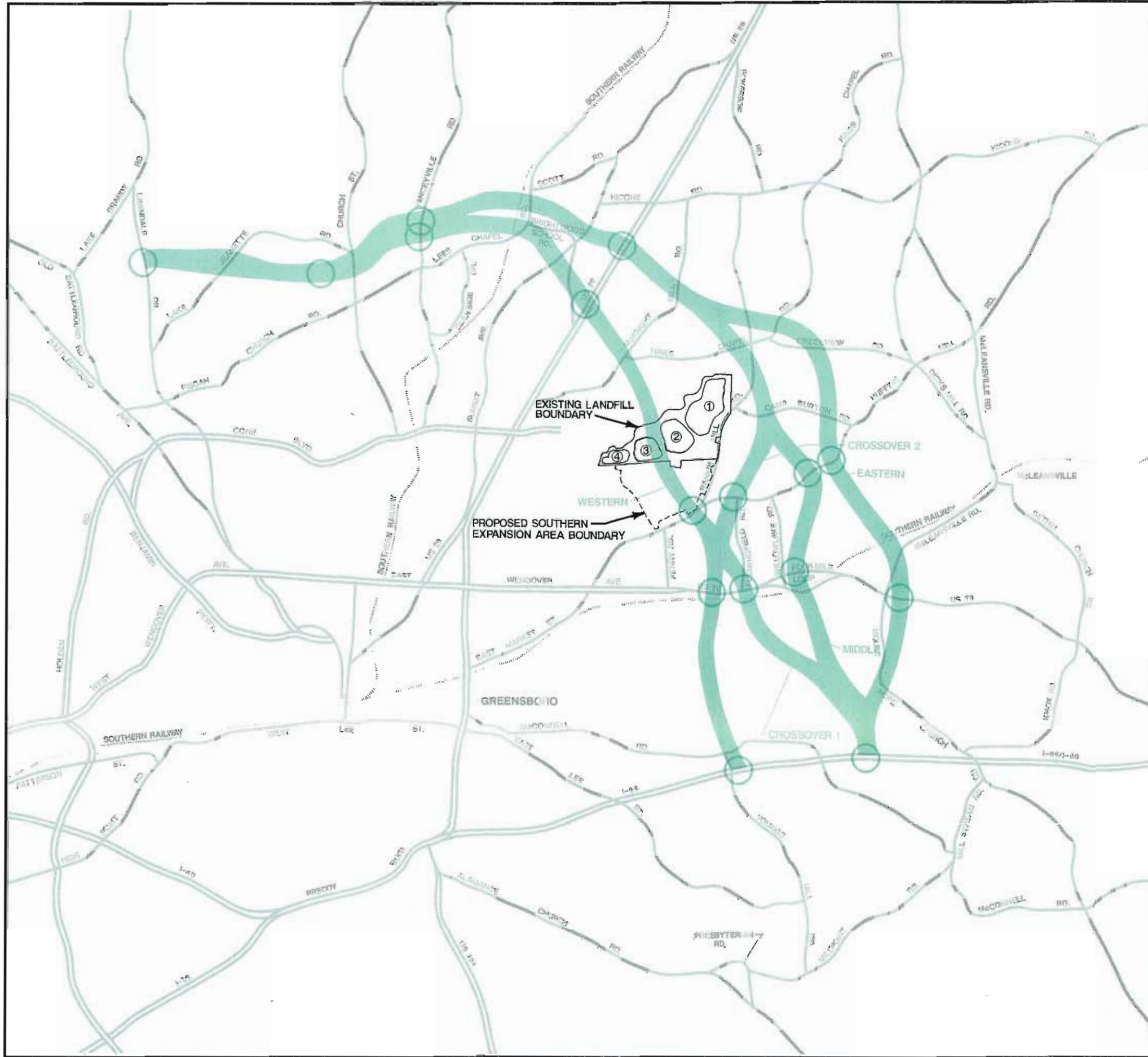
According to the Superfund Section of the NCDEHNR, the White Street landfill was first added to the Federal Wasteland List in 1981. This landfill is presently identified in the North Carolina Inactive Hazardous Sites Program Status Report (February 1991) as a site which requires further investigation to assess its contamination potential. There are no indications as to when these investigations will be performed. If the site is determined to be contaminated, it will be added to the Inactive Site Priority List for subsequent remediation and cleanup. If the site is found to be clean, it will be transferred to the "No Further Action" classification.

The Public Works Department of the City of Greensboro has voiced official and strong objection to any consideration of this site for roadway use (Appendix A). They indicate that the site cannot be bisected without serious hindrance to waste disposal operations and that relocation of the landfill would be a difficult and costly process. Correspondence from the Public Works Department of the City of Greensboro is contained in Appendix A.

**GREENSBORO
EASTERN/NORTHERN
URBAN LOOP
GUILFORD COUNTY, NC**

LEGEND

- ① ACTIVE PERMITTED LANDFILL AREA
- ② EXISTING LANDFILL - PROPOSED FOR VERTICAL EXPANSION
- ③ OLD SOLID FILL (ASBESTOS)
- ④ OLD FILL AREA



**RELATIONSHIP OF WESTERN ALTERNATIVE
TO WHITE STREET LANDFILL**

FIGURE IV-2

Site No. 5 (East Wendover Mobil) had three underground storage tanks removed in 1990. These were subsequently replaced by the installation of three new underground storage tanks. Soil samples taken during the tank removal operation indicated that a release had occurred and ground water may have been impacted. A Special Incident Report has been filed for this site. This site is adjacent to the Western Alternative and the Crossover 2 right-of-way.

Site No. 6 (Dodson Auto Parts/Junkyard) contains one underground gasoline storage tank that was installed in 1982. The adjacent junkyard is characterized by numerous automobiles, equipment, and materials that are randomly scattered over several acres. Housekeeping and maintenance appear to be generally poor. Surficial, and possibly, subsurface soil contamination is likely to exist on this property because of leaking automotive fluids. The Western Alternative and Crossover 2 will require the complete acquisition of the junkyard property; the auto parts store will be immediately adjacent to the proposed Western Alternative right-of-way.

Site No. 7 (ShopRite Market/Gas Station) is a combined gasoline station/convenience store operation that contains five underground storage tanks. Three are for gasoline, one stores diesel fuel, and the fifth is used to store kerosene. No contamination is known to exist. The Western Alternative and Crossover 2 will require the complete acquisition of this site.

Site No. 8 (Texaco) has no record of underground storage tanks. However, a Special Incident Report was filed for this property in August 1990. Although the source of the leak is unknown, it is apparently the result of gasoline contamination. A nearby well sampled by the Guilford County Health Department revealed the presence of benzene in excess of 2,000 ppb. This site is presently under investigation. The property is approximately 175 feet from the proposed right-of-way of Crossover 1.

10. Mineral Resources

The proposed highway alternatives will not impact mineral resources in the project area.

C. CULTURAL RESOURCES IMPACTS

1. Parks and Recreation

The proposed alternative alignments will not impact any parks, recreational facilities, or greenways. Crossover 2 clips the extreme eastern edge of Keeley Park and will involve the taking of approximately 11.8 acres of property. Coordination with the City of Greensboro Parks and Recreation Department reveals that Keeley Park functions as a nursery operation for the City of Greensboro and is not used for recreational purposes. Consequently, this alignment will not impact any significant recreational resources.

2. Historic Structures

The proposed alternative alignments will not impact any properties listed on the National Register of Historic Places or on other State Study Lists. The Middle Alternative, however, will impact the Maness House, a property of local historical interest. This property is located on the north side of SR 2827 (Four Mile Loop), approximately 1,400 feet east of the junction with SR 2828 (Willowlake Road). This house is a privately-owned, two-story frame structure that was built in the mid-19th century.¹

Construction of the Middle Alternative would require the acquisition of the entire Maness property because it is located within the right-of-way of the proposed Four Mile Loop interchange. Use of the Eastern or Western Alternative would not affect this property.

3. Archaeological Sites

The proposed alternative alignments will not impact any archaeological sites that are currently listed, or eligible for listing, in the National Register of Historic Places. However, it is likely that the State Historic Preservation Office (SHPO) will request that surveys be conducted for the North and South Buffalo Creek crossings, as well as on the north side of I-85 for the interchange. A prehistoric lithic site with five artifacts was reportedly found within the interchange area on the south side of I-85. These artifacts were not considered significant (Appendix A). At this time, this project will have no impact on any archeological sites.

D. ENERGY IMPACTS

The construction alternatives will require initially expending additional energy resources to complete the facility; however, this energy will be more than recovered over the life of the project by this more efficient transportation system. Energy savings will be realized because there will be fewer travel delays and a more direct route for travel. Interchanges and grade separations will ease the "stop-and-go" traffic operation on the existing highway system. The construction alternatives also provide decreased energy consumption by diverting traffic to the freeway system that now has to travel the less efficient and more congested highways within the Greensboro urbanized area.

Specifically, the beneficial impacts of the completed facility could be assessed in several categories:

- **Decreased vehicle-hours travelled:** The No-Build Alternative requires approximately 1,000 VHT per day more than for the Build Alternatives.

¹SOURCE: Architectural Resources, An Inventory of Historic Architecture, Guilford County, North Carolina Department of Cultural Resources, Division of Archives and History.

- **Decrease in vehicle delays and attraction from a less efficient roadway system:** The Build Alternatives as compared to the No-Build Alternatives improve level-of-service (traffic flow).
- **Reduced fuel consumption:** Approximately 219,000 gallons of fuel will be saved each year due to lower VHT and increased operating speeds.

E. CONSTRUCTION IMPACTS

The actual construction of a selected alternative has the potential of impacting the environment; however, potential impacts can be minimized by careful adherence to established construction methods. Included are the following measures:

- (1) Waste and debris will be disposed of in areas outside of the right-of-way and provided by the contractor, unless otherwise required by the plans or special provisions, or unless disposal within the right-of-way is permitted by the Engineer. Disposal of waste or debris in active public waste or disposal areas will not be permitted without prior approval by the Engineer. Such approval will not be permitted when, in the opinion of the Engineer, it will result in excessive siltation or pollution. In addition, a large amount of waste would decrease the anticipated life of a municipal or county landfill. Appropriate permits as detailed by the North Carolina Department of Environment, Health, and Natural Resources and other agencies will be obtained for all disposal.
- (2) During construction of the proposed project, all material resulting from clearing and grubbing, demolition, or other operations will be removed from the project and disposed of safely by the contractor. If vegetation is disposed of by burning, all burning shall be done in accordance with applicable local laws and regulations of the North Carolina SIP for air quality in compliance with 15 NCAC2D.0520.
- (3) Borrow pits and all ditches will be drained insofar as possible to alleviate breeding areas for mosquitoes.
- (4) An extensive rodent control program will be established where structures are to be removed or demolished.
- (5) Care will be taken not to block existing drainage ditches.
- (6) There will be strict adherence to the erosion plan by the contractor, including limiting areas and duration of exposed earth and the stabilization of exposed areas as quickly as possible. Careful attention to erosion control will be concentrated at the numerous stream crossings required by the Greensboro Eastern/Northern Urban Loop.
- (7) Measures will be taken to alleviate the dust generated by construction when the control of dust is necessary for the protection, safety, and comfort of motorists and nearby residents.

F. RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Short-term impacts to the human environment include the taking of right-of-way and other structures and the relocating of a number of families and businesses. The Division of Highway's relocation and financial assistance program will minimize this inconvenience.

During the construction phase of the project, some short-term impacts such as erosion and siltation of local creeks and streams are likely to occur; however, with current erosion control measures, this siltation is not anticipated to adversely affect the environment.

The proposed construction will provide a substantial portion of the circumferential loop system for the Greensboro urban area. The proposed loop system can certainly be classified as a long-term productive facility. This project will provide for a safer and more efficient highway system and is designed to serve both the existing and future needs for this area. The long-term benefits offered by this project, including reduced vehicular operating costs, savings in travel time, reduced potential for accidents, and the enhancement of the general economy of the area, should more than offset the short-term inconveniences and adverse effects on the human environment.

G. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The acquisition of additional land for the construction of the proposed action is for all practical purposes an irreversible commitment. The additional land acquired for the project will no longer serve the natural environment and, therefore, an irretrievable commitment of approximately 265 to 325 acres of wildlife habitat will be made.

The proposed project will remove approximately 233 to 317 acres of prime farmland (some already urbanized) from production or the possibility of ever being in production. It may also accelerate changes in land use patterns adjacent to the facility.

The physical elements of material used for construction and the energy consumed during construction, along with the manhours required, are considered to be both irreversible and irretrievable. Construction of the proposed project will also commit the state to provide operating, maintenance, and repair costs throughout the life of the facility.

H. SUMMARY OF IMPACTS

Tables IV-14 and IV-15 summarize the quantifiable engineering and environmental impacts of the alternatives.

TABLE IV-14
ENVIRONMENTAL COMPARISON OF ALTERNATIVES

	ALTERNATIVE				
	Eastern	Middle	Western	Crossover	
				1	2
Length (miles)	13.0	12.5	11.0	11.5	12.3
Displacements					
Residences (minority)	311(55)	307(55)	364(79)	71(79)	295(55)
Businesses	0(0)	9(0)	9(0)	12(0)	12(0)
Other	0	0	0	0	0
Acreage Required					
Field (inc. agricultural)	78.4	63.1	35.9	54.3	57.8
Forest Lands	302.7	301.7	258.5	280.7	300.8
Urban (man-dominated) Areas	223.2	206.4	210.8	200.3	204.4
Open Water	2.1	1.6	1.8	1.8	2.4
Acres of Prime Farmland	317.0	262.0	233.0	--	--
Acres of Wetland	11.7	15.0	34.0	31.9	17.8
Mature Hardwood Wetland Forest	2.0	8.6	20.3	21.1	9.9
Sapling or Shrub-Dominated Wetland/Marsh	6.1	2.6	10.9	8.2	3.8
Bank-to-Bank	1.5	2.2	1.0	0.8	1.7
Lakes and Ponds	2.1	1.6	1.8	1.8	2.4
Acres of Floodplain	6.2	16.5	26.2	22.8	16.5
Number of Stream Crossings	23	22	18	19	24
Number of Receptors Exceeding Noise Abatement Criteria or with Substantial Increase	168	119	147	144	139
National Register Historic Sites	0	0	0	0	0
Archaeological Sites National Register	0	0	0	0	0
Potential Hazardous Material Sites In or Near Corridors	1	1	6	4	4

TABLE IV-15
ENGINEERING COMPARISON OF ALTERNATIVES

	ALTERNATIVE				
	Eastern	Middle	Western	Crossover	
				1	2
Length (miles)	13.0	12.5	11.0	11.5	12.3
Interchanges (number)	7	7	7	7	7
Other Structures					
Railroad	2	2	2	2	2
Drainage	16	16	15	14	16
Grade Separation	19	17	17	17	17
Traffic (high/low)	33,400/ 18,400	33,400/ 18,400	33,400/ 18,400	--	--
Level-of-Service	C-B	C-B	C-B	C-B	C-B
Construction Cost (millions)	\$81.0	\$82.6	\$76.4	\$72.0	\$76.1
Right-of-Way Cost (millions)	\$39.5	\$41.5	\$36.4	\$37.4	\$40.2
Total Cost (millions)	\$120.5	\$124.1	\$112.8 ¹	\$109.4	\$116.3

¹Construction cost estimate does not include cost associated with removal and/or treatment of the potential contamination of the right-of-way through the landfill.

CHAPTER V
LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS
TO WHOM COPIES OF THE STATEMENT ARE SENT

Federal Agencies

Environmental Protection Agency
Department of Agriculture
Federal Emergency Management Administration

Regional Offices

Environmental Protection Agency
U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service
Federal Emergency Management Agency

State Agencies

North Carolina Department of Human Resources
North Carolina Department of Environment, Health, and Natural Resources
North Carolina Wildlife Resources Commission
North Carolina Department of Cultural Resources
North Carolina Department of Public Instruction

Local Governments

Piedmont-Triad Council of Governments
Chairman, County Commissioners
Mayor of Greensboro

Local Agencies

Guilford County Planning Department
Greensboro-Guilford County Schools
Greater Greensboro Chamber of Commerce
Greensboro Department of Transportation
City of Greensboro Public Libraries

CHAPTER VI COORDINATION AND PUBLIC INVOLVEMENT

Early coordination with appropriate agencies and interested citizens was accomplished through project scoping, regular meetings of the technical steering committee, and an extensive public involvement program. Although there was no formal interagency scoping meeting for this project, the Department sent scoping letters to State and Federal agencies and other interested parties defining the project and soliciting their comments. The scoping process expedites project development and provides a substantial issue identification/problem solving effort. The technical steering committee was formed in the early stages of the project to provide assistance in reviewing study assumptions, methodologies, and functional designs, and ensuring coordination of project planning efforts. Finally, in an effort to resolve all issues identified, the Department has conducted an extensive interagency coordination and consultation effort and a public participation process. This section of the document details the Department's program to fully identify, address, and resolve all project-related issues identified through the public involvement program.

A. AGENCIES AND ORGANIZATIONS

The North Carolina Department of Transportation, through the scoping process, informed a number of Federal, State, and Local agencies of the existence of this project and its scope. The Department initiated early project coordination on October 18, 1990, by distribution of a scoping letter soliciting comments related to this project. The scoping letter was sent to the following agencies: (An asterisk (*) indicates those agencies that have responded to the scoping letter; copies of their letters are included in the Appendix.)

- Federal Agencies

- U. S. Army Corps of Engineers *
- U. S. Department of Housing and Urban Development
- U. S. Environmental Protection Agency
- Federal Emergency Management Administration
- Federal Energy Regulatory Commission
- U. S. Fish and Wildlife Service *
- U. S. Geological Survey
- Soil Conservation Service *

- State Agencies

- North Carolina State Clearinghouse *
- North Carolina Department of Environment, Health, and Natural Resources
 - Division of Solid Waste Management *
 - Division of Planning and Assessment *
 - Division of Land Resources *
 - Division of Environmental Health*
 - Division of Forest Resources *
 - Division of Water Resources *
 - Division of Parks and Recreation *
 - Winston-Salem Regional Office

- North Carolina Department of Crime Control and Public Safety, Division of Emergency Management *
- North Carolina Wildlife Resources Commission, Division of Boating and Inland Fisheries *
- North Carolina Department of Cultural Resources, Division of Archives and History *
- North Carolina Department of Public Instruction, Division of School Planning *
- North Carolina Department of Transportation
 - Hydrographics Unit
 - Landscape Unit
 - Geotechnical Unit
 - Location and Survey Unit
 - Right-of-Way Branch
 - Statewide Planning
 - Bicycle Coordinator *
 - Division Engineer, Division 7
 - Division of Aviation*
- Regional Agencies
 - Piedmont Triad Council of Governments *
- Local Agencies
 - Guilford County School System, Director of Transportation *
 - Chairman, Guilford County Commissioners
 - Guilford County, Chief Planner *
 - Mayor of Greensboro
 - City of Greensboro, Community Development Planner *
 - City of Greensboro, Public Works Department *

B. UTILITIES

The following utilities were also contacted to provide locations of their lines and facilities:

- Duke Power Company
- AT&T
- Piedmont Natural Gas Company
- Norfolk Southern Railway
- Greensboro Utility Department
- Southern Bell

C. STEERING COMMITTEE

A steering committee of technical personnel was formed at the initiation of the project study to provide assistance and ensure coordination. Representatives from the following organizations attended steering committee meetings:

- Guilford County Planning Department
- Greensboro Department of Transportation
- Greensboro Planning Department
- North Carolina Department of Transportation
- Kimley-Horn and Associates, Inc.

D. PUBLIC INVOLVEMENT PLAN

A public involvement plan was developed at the initiation of the study process with the following primary objectives:

- To educate and inform the public on a timely basis regarding the study scope, schedule, findings, and recommendations.
- To obtain public comments regarding the study process, data, conclusions, and recommendations.

The public involvement plan included use of several communications media as well as meetings scheduled at various points during the study. These communications media and meetings are described in the following sections.

1. Newsletters and Mailing List

Two newsletters were distributed to interested citizens, groups, and officials during the study informing them of the study process and progress. A data base of citizen names was compiled, including persons attending citizen's workshops, persons requesting information, and neighborhood groups as provided by the City of Greensboro. This list was updated and expanded throughout the study period and now includes approximately 725 names and addresses of interested citizens.

2. Telephone Contact

A toll-free telephone number for Kimley-Horn's office was distributed through the newsletter and at public meetings. An engineer was available during regular office hours to answer questions and provide information regarding the study progress and results. If a question could not be answered immediately, the caller's telephone number or address was recorded and a response made within two business days. Approximately 350 calls were received from the public, mostly seeking information about the project.

3. Mail Contact

A mailing address for Kimley-Horn was distributed through the newsletters and at public meetings. All incoming mail was responded to by mail (or by telephone, if requested) within two days. Approximately 150 letters were received from groups or individuals. Most of these letters opposed the thoroughfare plan alignment.

4. Citizen's Informational Workshops

The first citizen's informational workshop was held in the Brightwood Elementary School Multipurpose Room on September 18, 1990. The workshop lasted from 4:00 PM until 8:00 PM. Approximately 200 citizens attended. Representatives from the NCDOT, the City of Greensboro, and Guilford County were also present. Exhibits for the workshop included maps of the alignments that showed potential hazardous waste sites, mines and quarries, streams and floodways, historic and archaeological sites, land use, schools, churches, and proposed parks and open space. An aerial photo base map with the previous alternatives displayed on an overlay was made available. Another aerial photo base map with a blank overlay was provided for citizens to indicate preferred routes or to make other comments. Citizens also had the opportunity to be added to the mailing list or to make comments on forms that were provided. A handout was provided which included printed maps of the study area.

The second citizen's informational workshop was held in the Brightwood Elementary School Multipurpose Room on March 6, 1991. The workshop lasted from 4:00 PM until after 8:00 PM. Approximately 200 citizens attended. Representatives from the NCDOT, the City of Greensboro, and Guilford County were also present. Exhibits for the workshop included maps of the Eastern, Middle, and Western Alternatives. An aerial photo base map with an overlay was used to display the alternatives.

5. Small Group Meetings

Civic groups and neighborhood organizations were contacted by mail early in the study process to inform them that consultant staff were available to meet with them during the course of the study for informal presentations and to answer questions.

6. Public Hearing

A corridor public hearing will be conducted by the NCDOT after approval of the Draft Environmental Impact Statement (DEIS). The purpose of the public hearing will be to receive comments from the public in a formal setting. These comments will be considered in the selection of a preferred corridor for the Greensboro Eastern/Northern Urban Loop. The recommended corridor will be addressed in the final environmental impact statement.

**CHAPTER VII
LIST OF PREPARERS**

This report was prepared by Kimley-Horn and Associates, Inc. in cooperation with the North Carolina Department of Transportation, Division of Highways; the City of Greensboro; and the County of Guilford.

North Carolina Department of Transportation

L.J. Ward, P.E.
Manager, Planning and Environmental Branch

B.S. in civil engineering with twenty-nine years experience in transportation engineering.

H. Franklin Vick, P.E.
Assistant Manager, Project Planning, Planning and Environmental Branch

B.S. in civil engineering with twenty years experience in transportation engineering.

Gail Grimes, P.E.
Unit Head, Consultant Engineering Unit
Planning and Environmental Branch

B.S. in civil engineering with seventeen years experience in transportation engineering.

Cynthia D. Sharer, P.E.
Project Manager
Consultant Engineering Unit
Planning and Environmental Branch

B.S. in civil engineering, M.P.A. in public administration with twenty-three years experience in transportation planning and engineering.

Kimley-Horn and Associates, Inc.

Barton J. Barham, P.E.
Project Manager

M.S. and B.S. in civil engineering and seventeen years of professional engineering experience. Responsible for management of transportation engineering and environmental studies.

Nathan B. Benson, P.E.
Senior Project Engineer

B.S. in civil engineering with thirty years of experience in transportation planning and environmental studies.

A.D. Beccasio, P.G.
Senior Environmental Specialist

M.S. and B.S. in geology with over thirty years of experience in environmental studies relating to transportation planning, site selection and feasibility, and natural resource inventory and development.

Laurence J. Meisner, P.E., AICP
Senior Project Planning

M.S. in regional planning and B.S. in industrial engineering with sixteen years of experience in transportation planning and environmental studies.

Thomas K. Goodwin, P.E.
Project Design Engineer

B.S. in civil engineering with over nine years of experience in highway design.

Lisa S. Hilliard, P.E.
Environmental Analyst

B.S. in civil engineering with five years of experience in transportation planning and environmental studies.

R. Michael Horn, P.E.
Senior Transportation Analyst

B.S. in civil engineering with ten years experience in transportation planning and traffic generation studies.

Brian A. Roper, E.I.T.
Transportation Analyst

M.S. and B.S. in civil engineering with two years of experience in transportation engineering and planning.

John E. McCullough, C.E.T.
Transportation Analyst

Associate's degree in civil engineering with twenty-four years experience in traffic operations, noise, and air quality analyses.

Annette Taylor
Staff Biologist
CZR, Inc.

M.S. in coastal ecology and B.S. in biology. Nine years experience in biotic, wetlands, and protected species surveys and assessments.

CHAPTER VIII

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CZR, Inc., Affected Environment and Environmental Consequences of the Greensboro Eastern/Northern Urban Loop, March 1991.

CHAPTER X
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Appendix B - Relocation Study Reports

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2. Meetings with Public

Appendix D - Glossary of Technical Terms

APPENDIX A

AGENCY RESPONSES



DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS

P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890

November 14, 1990

IN REPLY REFER TO



Planning Division

Mr. L. J. Ward, P.E., Manager
Planning and Environmental Branch
Division of Highways
North Carolina Department
of Transportation
Post Office Box 25201
Raleigh, North Carolina 27611-5201

Dear Mr. Ward:

We have reviewed your letter of October 18, 1990, requesting information for "State Environmental Impact Study of the Proposed Greensboro Eastern/Northern Urban Loop, Greensboro, Guilford County, T.I.P. Numbers U-2525 and U-2526" and offer the following comments.

The study area boundary includes several streams which have regulated flood plain and floodway boundaries; therefore, the design of this project should include features that will not cause increased flooding potentials or increased floodway widths outside of the right-of-way.

Department of the Army permit authorization, pursuant to Section 404 of the Clean Water Act of 1977, as amended, will be required for the discharge of excavated or fill material in waters of the United States or any adjacent and/or isolated wetlands in conjunction with this project, including disposal of construction debris. Under our mitigation policy, impacts to wetlands should first be avoided or minimized. We will then consider compensation or mitigation for unavoidable impacts. When final plans are completed, including the extent and location of any work within waters of the United States and wetlands, our Regulatory Branch would appreciate the opportunity to review these plans for a project-specific determination of Department of the Army permit requirements. Should you have any questions, please contact Mr. John Thomas, Regulatory Branch, at (919) 846-0648.

We appreciate the opportunity to comment on this project. If we can be of further assistance to you, please do not hesitate to contact us.

Sincerely,

Lawrence W. Saunders
Chief, Planning Division



United States Department of the Interior
FISH AND WILDLIFE SERVICE

Raleigh Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

Vick
Daus



October 25, 1990

Mr. L. J. Ward, Manager
Planning and Research Branch
Division of Highways
N.C. Department of Transportation
Post Office Box 25201
Raleigh, North Carolina 27611-5201



Subject: Scoping Comments for Proposed Greensboro Eastern/Northern Urban Loop, Greensboro, Guilford County; TIP Numbers U-2525 and U-2526

Dear Mr. Ward:

This responds to your letter of October 18, 1990, requesting comments on the proposed project. These comments are provided in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

The U.S. Fish and Wildlife Service (Service) is particularly concerned about potential impacts of the proposed project upon stream ecosystems and associated wetlands within the study corridor. At least four stream and/or wetland crossings are present in the study corridor. Special care should be exercised in the design and implementation of all stream crossing structures.

Based on our records, there are no Federally-listed or proposed endangered or threatened plant or animal species in the impact area of the project. Therefore, the requirements of Section 7(c) of the Endangered Species Act of 1973, as amended, are fulfilled. However, obligations under Section 7 of the Act must be reconsidered if: 1) new information reveals impacts of this action that may affect listed species or critical habitat in a manner not previously considered; 2) this action is subsequently modified in a manner which was not considered in this review; or, 3) a new species is listed or critical habitat determined that may be affected by this action.

The Service's review of any environmental document would be greatly facilitated if it contained the following information:

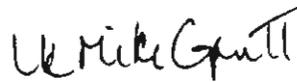
- 1) A description of the fishery and wildlife resources within existing and required additional right-of-way and any areas, such as borrow areas, which may be affected directly or indirectly by the proposed improvements.
- 2) Acreage of branches, creeks, streams, rivers or wetlands to be filled. Wetlands affected by the proposed project should be mapped

in accordance with the Federal Manual for Identifying and Delineating Jurisdictional Wetlands.

- 3) Linear feet of any water courses relocated.
- 4) Acreage of upland habitats, by cover type, which would be eliminated.
- 5) Techniques which will be employed for designing and constructing any relocated stream channels or for creating replacement wetlands.
- 6) Mitigation measures which will be employed to avoid, eliminate, reduce or compensate for habitat value losses associated with any of the proposed improvements.
- 7) Assessments of the expected secondary and cumulative impacts of the proposed project on fish and wildlife resources.

We appreciate the opportunity to provide these comments to you and encourage your consideration of them. Please continue to advise us of the progress of this project.

Sincerely yours,



L.K. Mike Gantt
Supervisor

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I (To be completed by Federal Agency)		Date Of Land Evaluation Request APRIL 24, 1991	
Name Of Project U-2526/2525 GREENSBORO EASTERN/NORTHERN LOOP		Federal Agency Involved FHWA	
Proposed Land Use HIGHWAY		County And State GUILFORD COUNTY, NC	
PART II (To be completed by SCS)		Date Request Received By SCS 4/26/91 WEW	

Does the site contain prime, unique, statewide or local important farmland? (If no, the FPPA does not apply - do not complete additional parts of this form.)		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Acres Irrigated None	Average Farm Size 100
Major Crop(s) Corn	Farmable Land In Govt. Jurisdiction Acres: 326,682 % 78.5	Amount Of Farmland As Defined In FPPA Acres: 326,682 % 78.5		
Name Of Land Evaluation System Used Guilford LE	Name Of Local Site Assessment System None	Date Land Evaluation Returned By SCS 5-6-91		

PART III (To be completed by Federal Agency)	Alternative Site Rating			
	WESTERN Site A	MIDDLE Site B	EASTERN Site C	CROSSOVER Site D
A. Total Acres To Be Converted Directly	290	330	348	123
B. Total Acres To Be Converted Indirectly	142	162	171	60
C. Total Acres In Site	432	492	519	183

PART IV (To be completed by SCS) Land Evaluation Information	WESTERN Site A	MIDDLE Site B	EASTERN Site C	CROSSOVER Site D
A. Total Acres Prime And Unique Farmland	233.1	262.4	316.8	93.6
B. Total Acres Statewide And Local Important Farmland	131.3	181.6	164.8	79.2
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted	0.10	0.13	0.14	0.05
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value	74.1	32.3	32.3	32.3

PART V (To be completed by SCS) Land Evaluation Criterion	WESTERN Site A	MIDDLE Site B	EASTERN Site C	CROSSOVER Site D
Relative Value Of Farmland To Be Converted (Scale of 0 to 100 Points)	59.3	64.2	69.0	66.9

PART VI (To be completed by Federal Agency)	Maximum Points	WESTERN Site A	MIDDLE Site B	EASTERN Site C	CROSSOVER Site D
Site Assessment Criteria (These criteria are explained in 7 CFR 658.5(b))					
1. Area In Nonurban Use	15	10	10	12	10
2. Perimeter In Nonurban Use	10	6	6	7	6
3. Percent Of Site Being Farmed	20	4	4	4	4
4. Protection Provided By State And Local Government	20	20	20	20	20
5. Distance From Urban Builtup Area	-				
6. Distance To Urban Support Services	-				
7. Size Of Present Farm Unit Compared To Average	10	5	5	5	5
8. Creation Of Nonfarmable Farmland	25	25	25	25	25
9. Availability Of Farm Support Services	5	5	5	5	5
10. On-Farm Investments	20	3	3	3	3
11. Effects Of Conversion On Farm Support Services	25	1	1	1	0
12. Compatibility With Existing Agricultural Use	10	5	5	5	5
TOTAL SITE ASSESSMENT POINTS	160	84	84	87	83

PART VII (To be completed by Federal Agency)	Maximum Points	WESTERN Site A	MIDDLE Site B	EASTERN Site C	CROSSOVER Site D
Relative Value Of Farmland (From Part V)	100	59.3	64.2	69.0	66.9
Total Site Assessment (From Part VI above or a local site assessment)	160	84	84	87	83
TOTAL POINTS (Total of above 2 lines)	260	143.3	148.2	156.0	149.9

Site Selected:	Date Of Selection:	Was A Local Site Assessment Used? Yes <input type="checkbox"/> No <input type="checkbox"/>
----------------	--------------------	---

Reason For Selection:

RECEIVED

DEC 4 1990

KIMLEY-HORN
TPTO OFFICE



North Carolina
Department of Administration

Distribution:

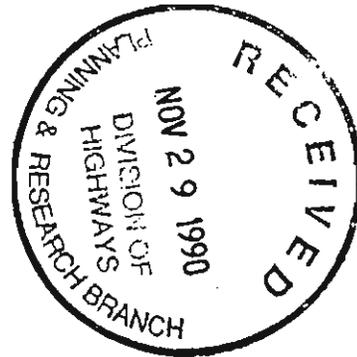
Poo	_____	Modlin	_____
Dud	_____	Shuler	_____
New	_____	Webb	_____
Norwood	_____	Elmore	_____
Modlin	_____	Grimes	_____
Tewell	_____		

James G. Martin, Governor

James S. Lofton, Secretary

November 27, 1990

Mr. L.J. Ward
N.C. Department of Transportation
Planning and Environmental Branch
Highway Building
Raleigh, North Carolina 27611



Dear Mr. Ward:

RE: SCH File #91-E-4220-0285; Scoping for State EIS Study of
the Proposed Greensboro Eastern Northern Urban Loop
(TIP #U-2525 & U-2526)

The above referenced environmental information has been reviewed
through the State Clearinghouse under the provisions of the
North Carolina Environmental Policy Act.

Attached to this letter are comments made by agencies, after
reviewing this document, which identify issues to be addressed
in the environmental review document. For compliance with the
North Carolina Environmental Policy Act, the appropriate
document should be forwarded to the State Clearinghouse for
environmental review. Should you have any questions, please
call 733-0499.

Sincerely,

Chrys Baggett

Chrys Baggett, Director
State Clearinghouse

cc: Region G

Attachment

CB/jt



State of North Carolina
Department of Environment, Health, and Natural Resources
512 North Salisbury Street • Raleigh, North Carolina 27611

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Douglas C. Lewis
Director
Planning and Assessment

MEMORANDUM

TO: Chrys Baggett
State Clearinghouse

FROM: Melba McGee *mm*
Project Review Coordinator

RE: 91-0285 - Scoping Greensboro
Eastern/Northern Urban Loop

DATE: November 21, 1990



The Department of Environment, Health, and Natural Resources has reviewed the proposed scoping notice to prepare planning/environmental studies for the Greensboro Eastern/Northern Urban Loop in Guilford County. Although the information that was circulated for review was not sufficient to evaluate potential environmental impacts, our divisions have identified areas of concerns that should be adequately addressed in the environmental document. More specific comments will be provided during that review.

Thank you for the opportunity to respond. If during the preparation of the environmental document additional information is needed, the Department of Transportation is encouraged to notify our respective divisions.

MM:bb

Attachments

cc: David Foster



VICK
Davis

State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Solid Waste Management
P.O. Box 27687 · Raleigh, North Carolina 27611-7687

James G. Martin, Governor
William W. Cobey, Jr., Secretary

November 6, 1990

William L. Meyer
Director

Mr. L.J. Ward, P.E., Manager
Planning and Environmental Branch
N.C. Department of Transportation
P.O. Box 25201
Raleigh, NC 27611-5201



Dear Mr. Ward:

SUBJECT: State Environmental Impact Study of the Proposed Greensboro Eastern/Northern Urban Loop, Greensboro, Guilford County, T.I.P. Numbers U-2525 and U-2526 Scoping Comments Concerning Solid Waste Disposal Facilities and their Relation to the Project

Regarding the proposed project (an approximate 13-mile portion of a proposed 42-mile Greensboro Urban Loop) and the preparation of the planning/environmental studies by Kimbey-Horn and Associates, Inc. for the North Carolina Department of Transportation, there are solid waste concerns that must be addressed in these studies.

The solid waste concerns within the geographic study area shown are as follows:

1. Primary Concern of Consequence - The City of Greensboro Sanitary Landfill (Permit 41-03) is located at the end of White Street at Nealtown Road and just south of the North Buffalo Creek. This facility is within the Greensboro City Limits. This facility, a fully-functional, large, municipal sanitary landfill, fulfills the solid waste needs of the City of Greensboro, the Town of Gibsonville, and approximately 75% percent of geographic Guilford County. Any thoroughfare construction violating the boundaries of this facility would have substantial, adverse impact upon the populace described solid waste disposal needs. The costs of siting, acquisition, development, and operation of a new municipal solid waste facility serving the populace described would conservatively run in the \$4 million to \$5 million range, also the time involved in closing out the existing facility properly and in the siting and acquiring a new facility would prove to be a complicating factor.

L.J. Ward, P.E.

November 6, 1990

Page 2

Also, other critical factors such as required groundwater monitoring would have to be adequately addressed and fulfilled.

2. Concern of Consequence - Christine J. Glass is permitted to operate the Christine J. Glass Demolition Landfill (Permit 41-88-6) which is located on McLeansville Road (S.R. 2819) approximately 0.9 mile+ North-Northeast of the McLeansville Road and U.S. Highway 70 intersection and just south of South Buffalo Creek and just north and adjacent to the Norfolk & Southern Railway tracks running Southwest to Northeast in this vicinity. This facility is a demolition landfill permitted to receive stumps, limbs, leaves, concrete, brick, and uncontaminated earth. This facility, along with other such facilities in Guilford County, serves in an ancillary role to meet certain solid waste(demolition waste) needs of the populace of the City of Greensboro and this geographic portion of Guilford County. The costs of siting, acquisition, development, and operation of this type facility are not currently available. As with above, the time involved in closing out the existing facility properly and in siting and acquiring a new facility would prove to be a complicating factor.

If you have any questions or comments of concern, please contact me.

Sincerely,

N.C. DIVISION OF SOLID WASTE MANAGEMENT



Jeff Rodgers
Waste Management Specialist
Solid Waste Section

Telephone: 919/292-4845 or 761-2390

cc: Don Smith, City of Greensboro
Christine J. Glass
Terry Cole, Guilford County Health Dept.
Julian Foscue



CITY OF GREENSBORO

NORTH CAROLINA

P.O. BOX 3136
GREENSBORO, NC 27402-3136

April 2, 1991

Mr. Bart Barham
Kimley-Horn
P.O. Box 33068
Raleigh, NC 27636

RECEIVED

APR 3 1991

KIMLEY-HORN
TPTO OFFICE

Dear Mr. Barham:

As a result of our conversation of last week, I am writing to document officially the position of the Public Works Department regarding the EIS study for the corridor selection for the North and East Section of the Greensboro Urban Loop. We are aware that there is consideration being given to routing the roadway through the White Street Landfill. I raise an official and strong objection to any consideration of this site for roadway use.

The White Street Landfill is an active site for the disposal of waste from the urban area surrounding Greensboro. We handle over 350,000 tons of waste each year. This site has been active for decades and because of the disposal of some volatile materials by the Vicks Company, the site is listed on the Superfund inventory of potential cleanup locations. In addition, the site cannot be bisected without serious hindrance to the operation of waste disposal. Relocation of the landfill would be a most difficult and costly process. We are currently working to acquire additional property surrounding the landfill to buffer the neighborhood from our operation and to ensure a long life for active landfilling at this site.

The cost of locating a roadway in this area would be extremely high, recognizing the need to protect the site from land

Kimley-Horn
April 2, 1991
Page 2

disturbing activities where the waste is buried and realizing the liability that would come with this particular site. We anticipate utilization of this landfill for many years to come and currently have a request in for State approval to add waste to the area adjacent to the corridor under consideration. We cannot support any encroachment on this property and request that this corridor be reassessed.

If you have any further questions or desire any information on this landfill, please call me at 373-2074.

Sincerely,



Elizabeth Treadway
Assistant Public Works Director for
Environmental Management

cc: City Manager
Public Works Director
City Attorney
Transportation Planning



CITY OF GREENSBORO

NORTH CAROLINA

P.O. BOX 3136
GREENSBORO, NC 27402-3136

July 19, 1991

Ms. Cindy Sharer
Project Engineer
Planning and Environmental Branch
NCDOT
P.O. Box 20251
Raleigh, NC 27611

Dear Cindy:

Enclosed for your use and assessment are the following documents offered for the environmental impact assessment of the City of Greensboro's White Street Landfill in consideration of its involvement in a potential corridor for TIP Project Number U-2525 and U-2526:

1. The 1990 Groundwater Assessment Report prepared under the requirements of the Division of Environmental Management's Solid Waste Unit's standards.

2. A copy of the vertical expansion presented to the Solid Waste Management Division in February, 1991 to improve a site currently on the EPA's CERCLA list for contamination. This expansion is planned for construction in 1992 and will increase the elevation approximately 100' at the peak.

3. A report from Law Engineering prepared for a long term land acquisition program for the White Street Landfill. We have acted on this report and continue to use it for guidance. I have also included recent photography of the area to show the land currently under negotiation.

Additional issues that must be considered as the environmental review is completed are:

1. Liability on this property. The deed for this property is annotated to show its use as a landfill and that annotation by regulation must accompany this property.

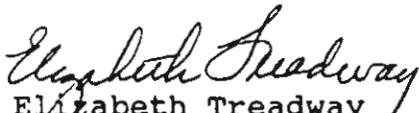
2. Should a spill occur from the proposed highway on to the landfill property, who will assume the liability for the contamination? Under the Clean Water Act, NPDES permit for storm water, landfills are uniquely identified and treated to the requirement of two permits (one for construction and one for industrial operation). Spills are to be addressed in the storm water programs and this potential roadway will have to be considered in the overall assessment of storm water run-off generated on site. Contamination generation can be attributed to the proposed roadway and remediation measures would be imposed.

3. The new Clean Air Act's proposed air quality regulations on landfill air quality clearly cover the White Street Landfill and will require the air emissions testing for nonmethane, organic compounds. What impact will the proposed roadway have on the degradation of the air quality in this area, compounding the potential problem that may exist? What liability will the State share for improving the air quality at this site?

4. The acres included in the proposed vertical expansion of the White Street Landfill as well as the old site to the west are identified by EPA under the CERCLA program due to materials delivered to the site many years ago from certain industries in our community. The listing by EPA references this entire site and is not limited to one particular location. Can the State sever this corridor from the CERCLA listing? If not what future liability is assumed on the proposed corridor?

This is a highly regulated site by existing EPA laws and regulations with the potential for increased controls. If you require further information on the material provided or additional materials, please advise me.

Best Regards,


Elizabeth Treadway
Assistant Public Works Director for
Environmental Management

cc: City Manager
Public Works Director
Transportation Director, Greensboro



RECEIVED

AUG 14 1991

KIMBLEY-HORN
TPTO OFFICE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
P.O. BOX 25201
RALEIGH 27611-5201

August 9, 1991

DIVISION OF HIGHWAYS

JAMES G. MARTIN
GOVERNOR

THOMAS J. HARRELSON
SECRETARY

WILLIAM G. MARLEY, JR., P.E.
STATE HIGHWAY ADMINISTRATOR

MEMORANDUM TO: Ms. Cindy Sharer, P.E., Project Planning Engineer
Planning and Environmental Branch
FROM: *D. E. Howey*
D. E. Howey, P. G., Environmental Geologist
Geotechnical Unit
SUBJECT: Greensboro Northern/Eastern Loop, Guilford County
TIP No. U-2525/U-2526, 6.498003T

After review of available information on the western alternative of this project, the following facts have been determined:

- 1) The corridor traverses an intermittent stream bed which dissects the landfill property.
- 2) The solid fill section of the landfill encroaches on the corridor for a length of approximately 1000 feet.
- 3) The solid fill landfill has been in existence since the mid 60's and dumping was unregulated until the mid to late 70's. It is known to contain asbestos, a hazardous substance.
- 4) The entire landfill is listed as a potential hazardous waste site by the Division of Solid Waste Management.
- 5) Liability for any future remedial actions would be transferred along with the deed to this property.

In view of the above facts, it is our recommendation that this alternate be eliminated from consideration.

If we can provide additional information, please advise.

DEH/dch

COPIES - NCDOT



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 P.O. BOX 25201
 RALEIGH 27611-5201



DIVISION OF HIGHWAYS

WILLIAM G. MARLEY, JR., P.E.
 STATE HIGHWAY ADMINISTRATOR

JAMES G. MARTIN
 GOVERNOR

THOMAS J. HARRELSON
 SECRETARY

June 19, 1991

STATE PROJECT: 6.498003T (U-2525, U-2526)
 COUNTY: Guilford
 DESCRIPTION: Greensboro Northern/Eastern Loop

MEMORANDUM TO: Ms. Cindy Sharer
 Planning and Environmental Branch

FROM: *Douglas E. Howey*
 Douglas E. Howey, P.G., Environmental Geologist
 Geotechnical Unit

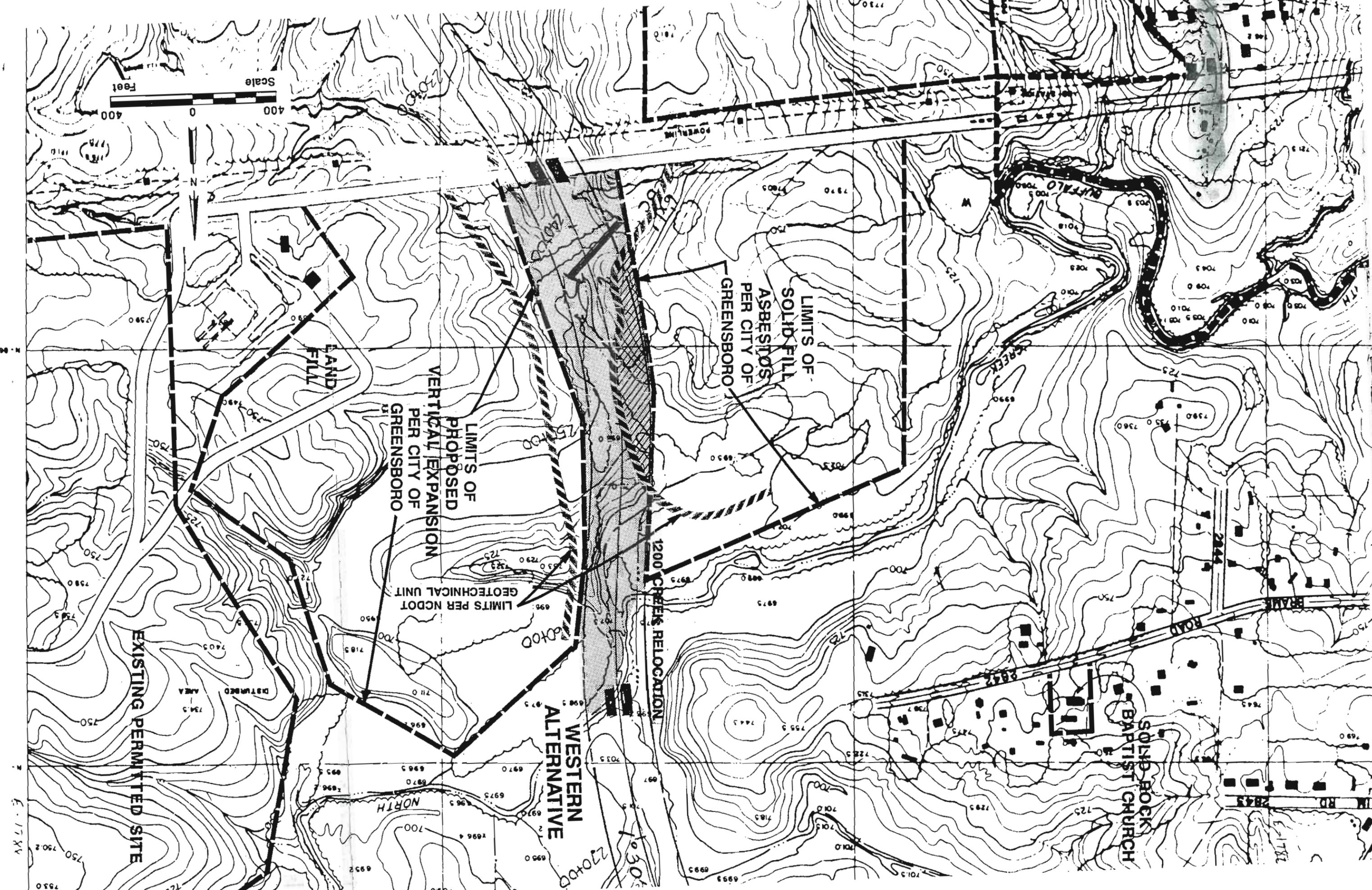
SUBJECT: Landfill Limits

After careful review of aerial photography of the subject area from the years 1955, 1960, 1966, 1977, 1980, and 1990, I have been able to determine the limits of the two landfills in question. I have attached photocopies of these photographs. I have drawn in the limits of the landfills as well as the project corridor on the 1990 aerial obtained from the Photogrammetry Unit.

It appears that the corridor along the creekbed will avoid the existing solid waste landfill which is proposed for expansion. However, the solid fill/asbestos landfill encroaches on the corridor for approximately 1000' (station 241+00 - 251+00). It should also be noted that this landfill has been in existence since before 1966 and could contain more than just solid fill.

attachments

DEH/deh



EXISTING PERMITTED SITE

LAND FILL

LIMITS OF PROPOSED VERTICAL EXPANSION PER CITY OF GREENSBORO

LIMITS PER NCDOT GEOTECHNICAL UNIT

WESTERN ALTERNATIVE

1200 CREEK RELOCATION

LIMITS OF SOLID FILL ASBESTOS PER CITY OF GREENSBORO

SOLID ROCK BAPTIST CHURCH

ROAD

RIM RD

E-178X

E-178Z



State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Land Resources

James G. Martin, Governor
William W. Cobey, Jr., Secretary

Charles H. Gardner
Director



MEMORANDUM

Date: November 5, 1990
To: Melba McGee
From: Gary Thompson
Subject: 91-0285, Guilford County, Proposed Greensboro
Eastern/Northern Urban Loop,
TIP Numbers U-2525 and U-2526

We have reviewed the above referenced project and find that it is very difficult to determine the impact on geodetic survey markers with such a broad study area. We would like to be contacted again once the exact project area is determined. We have enclosed a portion of our map to show possible impact.

The N.C. Geodetic Survey should be contacted at P.O. Box 27687, Raleigh, N.C. 27611, (919) 733-3836 prior to construction. Intentional destruction of a geodetic monument is a violation of N.C. General Statute 102-4.

GWT/ajs
cc: Joe Creech, NCDOT



State of North Carolina
 Department of Environment, Health, and Natural Resources
 Division of Forest Resources
 512 North Salisbury Street • Raleigh, North Carolina 27611

James G. Martin, Governor
 William W. Cobey, Jr., Secretary

Griffiths Forestry Center
 2411 Garner Road
 Clayton, North Carolina 27520
 October 31, 1990

Harry F. Layman
 Director

MEMORANDUM

~~TO: [Redacted]~~
~~Environmental Assessment Unit~~



FROM: Don H. Robbins
 Staff Forester *AHR*

SUBJECT: EIS of Scoping for the Proposed Greensboro Eastern Northern Urban Loop in Guilford County

PROJECT #91-0285

DUE DATE 11-14-90

To better determine the impact, if any, to forestry in the area of the proposed project, the combined Environmental Impact Statement/Corridor location report should contain the following information concerning the proposed alternative routes for the possible right-of-way purchases for the project:

1. The number of total woodland acres that would be taken out of timber production as a result of new right-of-way purchases.
2. The acres breakdown of this woodland concerning present conditions such as clear-cut areas, young growing timber, and fully stocked stands of very productive timber within the new right-of-way purchases for disturbed and undisturbed portions.
3. The site indexes of the forest soils that would be involved within the proposed right-of-way, so as to be able to determine the productivity of these forest soils in the area.
4. The number of woodland acres that would affect any watersheds in the area, if the woodland was removed.
5. The impact to any greenways in the area both present and future.

6. If woodland is involved, it is hoped that the timber could be merchandised and sold to lessen the need for piling and burning of debris during right-of-way construction.

Provisions should be indicated in the EIS that the contractor will make all efforts to salvage any merchantable timber to permit construction, once the contractor takes charge of the right-of-way.

7. The provisions that the contractor will take during the construction phase to prevent erosion, sedimentation and construction damage to the remaining standing trees outside of the right-of-way boundary and construction limits.

We would hope that a route could be chosen, that would have the least impact to forest and related resources in that area.

DHR:1a

pc: Warren Boyette - CO
Vic Owen - D-10
David Henderson - Guilford County
File

State of North Carolina
 Department of Environment, Health, and Natural Resources

Reviewing Office:

INTERGOVERNMENTAL REVIEW — PROJECT COMMENTS

Project Number:

91-0285

Due Date:

After review of this project it has been determined that the EHNR permit(s) indicated must be obtained in order for this project to comply with North Carolina Law.

Questions regarding these permits should be addressed to the Regional Office indicated on the reverse of the form.

All applications, information and guidelines relative to these plans and permits are available from the same Regional Office.

PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (statutory time limit)										
<input checked="" type="checkbox"/> Permit to construct & operate wastewater treatment facilities, sewer system extensions, & sewer systems not discharging into state surface waters.	Application 90 days before begin construction or award of construction contracts On-site inspection. Post-application technical conference usual	30 days (90 days)										
<input type="checkbox"/> NPDES - permit to discharge into surface water and/or permit to operate and construct wastewater facilities discharging into state surface waters.	Application 180 days before begin activity. On-site inspection. Pre-application conference usual. Additionally, obtain permit to construct wastewater treatment facility-granted after NPDES. Reply time, 30 days after receipt of plans or issue of NPDES permit-whichever is later.	90-120 days (N/A)										
<input type="checkbox"/> Water Use Permit	Pre-application technical conference usually necessary	30 days (N/A)										
<input type="checkbox"/> Well Construction Permit	N/A	7 days (15 days)										
<input checked="" type="checkbox"/> Dredge and Fill Permit	Application copy must be served on each riparian property owner. On-site inspection. Pre-application conference usual. Filling may require Easement to Fill from N.C. Department of Administration and Federal Dredge and Fill Permit.	55 days (90 days)										
<input checked="" type="checkbox"/> Permit to construct & operate Air Pollution Abatement facilities and/or Emission Sources	N/A	60 days (90 days)										
<input checked="" type="checkbox"/> Any open burning associated with subject proposal must be in compliance with 15 NCAC 2D.0520.												
<input checked="" type="checkbox"/> Demolition or renovations of structures containing asbestos material must be in compliance with NCAC 2D.0525 which requires notification and removal prior to demolition.	N/A	60 days (90 days)										
<input type="checkbox"/> Complex Source Permit required under 15 NCAC 2D.0800.												
<input type="checkbox"/> The Sedimentation Pollution Control Act of 1973 must be properly addressed for any land disturbing activity. An erosion & sedimentation control plan will be required if one or more acres to be disturbed. Plan filed with proper Regional Office (Land Quality Sect.) at least 30 days before begin activity.												
<input type="checkbox"/> The Sedimentation Pollution Control Act of 1973 must be addressed with respect to the referenced Local Ordinance:												
<input type="checkbox"/> Mining Permit	On-site inspection usual. Surety bond filed with EHNR as shown: Any area mined greater than one acre must be permitted. <table border="0"> <tr> <td>AFFECTED LAND AREA</td> <td>AMOUNT OF BOND</td> </tr> <tr> <td>Less than 5 acres</td> <td>\$ 2,500</td> </tr> <tr> <td>5 but less than 10 acres</td> <td>5,000</td> </tr> <tr> <td>10 but less than 25 acres</td> <td>12,500</td> </tr> <tr> <td>25 or more acres</td> <td>5,000</td> </tr> </table>	AFFECTED LAND AREA	AMOUNT OF BOND	Less than 5 acres	\$ 2,500	5 but less than 10 acres	5,000	10 but less than 25 acres	12,500	25 or more acres	5,000	30 days (60 days)
AFFECTED LAND AREA	AMOUNT OF BOND											
Less than 5 acres	\$ 2,500											
5 but less than 10 acres	5,000											
10 but less than 25 acres	12,500											
25 or more acres	5,000											
<input type="checkbox"/> North Carolina Burning permit	On-site inspection by N.C. Division Forest Resources if permit exceeds 4 days	1 day (N/A)										
<input type="checkbox"/> Special Ground Clearance Burning Permit - 22 counties in coastal N.C. with organic soils	On-site inspection by N.D. Division Forest Resources required "if more than five acres of ground clearing activities are involved. Inspections should be requested at least ten days before actual burn is planned."	1 day (N/A)										
<input type="checkbox"/> Oil Refining Facilities	N/A	90-120 days (N/A)										
<input type="checkbox"/> Dam Safety Permit	If permit required, application 60 days before begin construction. Applicant must hire N.C. qualified engineer to: prepare plans, inspect construction, certify construction is according to EHNR approved plans. May also require permit under mosquito control program. An a 404 permit from Corps of Engineers.	30 days (N/A)										

PERMITS		SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (statutory time limit)
<input type="checkbox"/>	Permit to drill exploratory oil or gas well	File surety bond of \$5,000 with EHNR running to State of N.C. conditional that any well opened by drill operator shall, upon abandonment, be plugged according to EHNR rules and regulations.	10 days (N/A)
<input type="checkbox"/>	Geophysical Exploration Permit	Application filed with EHNR at least 10 days prior to issue of permit Application by letter. No standard application form.	10 days (N/A)
<input type="checkbox"/>	State Lakes Construction Permit	Application fee based on structure size is charged. Must include descriptions & drawings of structure & proof of ownership of riparian property.	15-20 days (N/A)
<input type="checkbox"/>	401 Water Quality Certification	N/A	60 days (130 days)
<input type="checkbox"/>	CAMA Permit for MAJOR development	\$10.00 fee must accompany application	55 days (180 days)
<input type="checkbox"/>	CAMA Permit for MINOR development	\$10.00 fee must accompany application	22 days (60 days)
<input type="checkbox"/>	Several geodetic monuments are located in or near the project area. If any monuments need to be moved or destroyed, please notify: N.C. Geodetic Survey, Box 27687, Raleigh, N.C. 27611		
<input type="checkbox"/>	Abandonment of any wells, if required, must be in accordance with Title 15, Subchapter 2C.0100.		
*	Other comments (attach additional pages as necessary, being certain to cite comment authority): <i>Southeast portions of project lie within High Quality Waters and therefore require more stringent controls for sediment control.</i>		
<i>M. L. Wilson</i>		<i>SENR</i>	<i>11/21/90</i>
reviewer signature		agency	date

REGIONAL OFFICES

Asheville Regional Office
59 Woodfin Place
Asheville, NC 28801
(704) 251-6208

Mooresville Regional Office
919 North Main Street
Mooresville, NC 28115
(704) 663-1699

Washington Regional Office
1424 Carolina Avenue
Washington, NC 27889
(919) 946-6481



Fayetteville Regional Office
Suite 714 Wachovia Building
Fayetteville, NC 28301
(919) 486-1541

Raleigh Regional Office
Box 27687
Raleigh, NC 27611-7687
(919) 733-2314

Wilmington Regional Office
7225 Wrightsville Avenue
Wilmington, NC 28403
(919) 256-4161

Winston-Salem Regional Office
8003 Silas Creek Parkway Extension
Winston-Salem, NC 27106
(919) 761-2351



Project Number	91-0285
County	Gulfport

Inter-Agency Project Review Response

Project Name Greenboro (proposed) Eastern Northern loop Type of Project Ed.

The following are our comments on the above referenced subject.

_____ The applicant should be advised that plans and specifications for all water system improvements must be approved by the Division of Environmental Health prior to the award of a contract or the initiation of construction (as required by 10 NCAC 10D .0900 et. seq.). For information, contact the Public Water Supply Section, (919) 733-2460.

✓ _____ Several water lines possibly are located in the path of an adjacent to the proposed project. Due to a possible rupture during construction, the contractor should contact the appropriate water system officials to specify a work schedule.

✓ _____ The proposed project will be constructed near water resources which are used for drinking. Precautions should be taken to prevent contamination of the watershed and stream by oil or other harmful substances. Additional information is available by contacting the Public Water Supply Section at (919) 733-2321.

_____ Back flow preventors should be installed on all incoming potable water lines. Additional information is available by contacting the Public Water Supply Section at (919) 733-2321.

_____ This project will be classified as a community public water supply and must comply with state and federal drinking water monitoring requirements. For more information the applicant should contact the Public Water Supply Section, (919) 733-2321.

_____ If this project is constructed as proposed, we will recommend closure of _____ feet of adjacent waters to the harvest of shellfish. For information regarding the shellfish sanitation program, the applicant should contact the Shellfish Sanitation Branch (919) 726-6827.

_____ The applicant should be advised to contact the local health department regarding their requirements for septic tank installations (as required under 10 NCAC 10A .1900 et. seq. and/a sanitary facilities requirements for this project if applicable. For information concerning septic tank and other on-site waste disposal methods, contact the On-site Sewage Branch at (919) 733-2895.

✓ _____ The applicant should be advised that prior to the removal or demolition of dilapidated structures, an extensive rodent control project may be necessary in order to prevent the migration of the rodents to adjacent areas. For information concerning rodent control, contact the local health department or the Public Health Pest Management Section (919) 733-6407.

✓ _____ The spoil disposal area(s) proposed for this project may produce a mosquito breeding problem. For information concerning appropriate mosquito control measures, the applicant should contact the Public Health Pest Management Section at (919) 733-6407.

Brian Bowden Reviewer Envir Health/Wat-Supply Branch/Unit 11/5/90 Date

* watershed & intake bordering Northern pass



State of North Carolina
Department of Environment, Health, and Natural Resources
Division of Water Resources
512 North Salisbury Street • Raleigh, North Carolina 27611

James G. Martin, Governor
William W. Cobey, Jr., Secretary

John N. Morris
Director

November 16, 1990

MEMORANDUM

TO: Melba McGee
FROM: John Sutherland *John Sutherland*
SUBJECT: 91-0285 Urban Loop in Greensboro



We have the following comments on the above project:

1. At stream and wetland crossings, utilize bridges whenever possible to minimize habitat losses and floodplain encroachment.
2. Minimize the loss of timber and prime farmland.
3. Provide vegetation buffers when highway passes close to residential areas.
4. Mitigate the loss of wetlands and forests.
5. Minimize the use of curb and gutter; maximize the use of porous pavement and grass swales.
6. Involve local landowners in gathering data on impacts; be flexible on location of alternatives - adjust them to meet local concerns.

DIVISION OF PARKS AND RECREATION

November 14, 1990

MEMORANDUM

TO: Melba McGee
FROM: Mike Schafale^{MS}
THROUGH: Sue Regier^{SMR}
SUBJECT: Scoping - Urban Loop
REFERENCE: 91-0285



x We currently have no biological information on this part of Guilford County. A natural areas survey of Guilford County is currently being completed. This project should be reviewed in light of its findings when they become available. The presence of several major creeks and bottomlands suggests a high potential for significant habitat. The Natural Heritage Program should be consulted later in the planning of this project for information on areas identified in the survey.



North Carolina Department of Crime Control and Public Safety

James G. Martin, Governor
Joseph W. Dean, Secretary

Division of Emergency Management
116 W. Jones St., Raleigh, N. C. 27603-1335
(919) 733-3867

October 29, 1990

MEMORANDUM

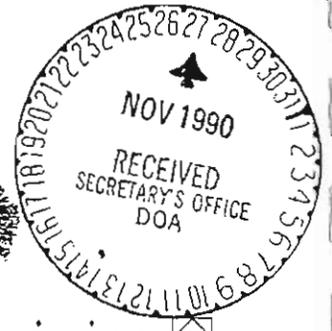
To: N.C. State Clearinghouse, Department of Administration
From: J. Russell Capps, Division of Emergency Management,
NFIP Section *JRC*

Subject: Intergovernmental Review

Re: State # N.C. 91-E-4220-0285

N.C. DOT - ESI study of the proposed Greensboro
Eastern Northern Loop.

For information purposes, the Commission is advised that on July 24, 1990, Governor Martin signed Executive Order 123, a Uniform Floodplain Management Policy, which must be followed for development on any site.



North Carolina Wildlife Resources Commission

512 N. Salisbury Street, Raleigh, North Carolina 27604-1188, 919-733-3391
Charles R. Fullwood, Executive Director

MEMORANDUM

TO: Melba McGee, Planning and Assessment
Dept. of Environment, Health and Nat. Res.

FROM: *Dennis Stewart*
for Fred Harris, Chief
Division of Boating and Inland Fisheries

DATE: November 15, 1990

SUBJECT: State Environmental Impact Study of the Proposed
Greensboro Eastern/Northern Urban Loop,
Greensboro, Guilford County, T.I.P. Numbers U-2525
and U-2526.

The Wildlife Resources Commission (WRC) has reviewed the proposed project for the Greensboro Eastern/Northern Urban Loop. Our comments are based on reviews by biologists on our staff familiar with habitat values of the project area. These comments are provided in accordance with provisions of the North Carolina Environmental Policy Act (G.S. 113A-1 et seq., as amended; 1 NCAC 25).

The project will impact a large quantity of both upland and lowland hardwood, mixed woodlands and several wetland areas. This habitat supports a variety of wildlife including deer, rabbit, squirrel, songbirds, raptors, quail, waterfowl and numerous furbearers. In some areas, large blocks of land (300+ acres) of hardwoods and mixed woodlands will be divided by the proposed roadway. Since very little wildlife habitat exists in Guilford County, loss of this habitat will eliminate much of the wildlife species from this currently occupied area.

Aquatic resources in the proposed project area include many small intermittent and headwater streams from the Haw River watershed. Several of these streams empty into ponds or lakes which provide fishing and/or supply water to Greensboro. Lakes which could be impacted include Lake Jeanette and Lake Townsend. Construction over or around these streams will lower their quality by increasing runoff

and silt and sediment loads. There is also a potential for degradation of fisheries and fishery habitat in the lakes or ponds into which these streams flow.

The Wildlife Resources Commission is concerned over direct and indirect adverse impacts on wildlife, fisheries, and wetland resources within and adjacent to the construction corridor. This project has the potential to affect a wide variety of wildlife and fishery habitats. It is our opinion that the the no-build alternative or proposing a corridor location in the western portion of the study area boundary would result in the least environmentally damaging project.

Due to limited information in Mr. Ward's memorandum of October 18, 1990, we can express our concerns and requests for information only in general terms. Our ability to evaluate project impacts and provide beneficial recommendations when reviewing project environmental documents will be enhanced by inclusion of the following information:

1. Complete inventories for wildlife and fisheries resources within, adjacent to, or utilizing the study corridors. Potential borrow areas to be used for project construction should be included in the inventories.
2. Accurate data on State and Federally listed rare, threatened, and endangered species, including State and Federal species of special concern, within, adjacent to, or utilizing study corridors.
3. Cover type maps showing wetland acreages impacted by the project. Wetland acreages should include all projected related areas that may undergo hydrologic change as a result of ditching, other drainage, or filling for project construction.
4. Cover type maps showing acreages of upland wildlife habitat impacted by the proposed project. Potential borrow sites should be included.
5. The extent of habitat fragmentation in uplands and wetlands and impacts associated with fragmentation.
6. The need for channelizing or relocating portions of streams crossed and the extent of such activities.
7. Mitigation for avoiding, minimizing or compensating for direct and indirect degradation in habitat quality as well as quantitative losses.

8. A cumulative impact assessment section which analyzes the environmental effects of highway construction and quantifies the contribution of this individual project to environmental degradation.

Thank you for the opportunity to comment on this proposed project. If we can provide further assistance, please call on us.

FAH/lp

cc: Shari L. Bryant, Fishery Biologist
Larry Warlick, Wildlife Biologist



North Carolina Department of Cultural Resources

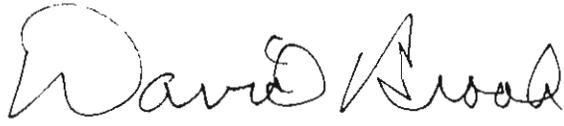
James G. Martin, Governor
Patric Dorsey, Secretary

Division of Archives and History
William S. Price, Jr., Director

December 17, 1990

MEMORANDUM

TO: L. J. Ward, P.E., Manager
Planning and Environmental Branch
Division of Highways
Department of Transportation

FROM: David Brook, Deputy State
Historic Preservation Officer 

SUBJECT: State environmental impact study of proposed
Greensboro Eastern/Northern Urban Loop, Guilford
County, TIP U-2525 and U-2526, CH 91-E-4220-0285

We have received notification from the State Clearinghouse concerning the above project.

Nine previously recorded archaeological sites are located within the boundaries of the proposed project's study area. Four of these sites (31Gf184-187) have been evaluated and determined not eligible for the National Register of Historic Places. The remaining five archaeological sites have not yet been evaluated. These sites (31Gf270**-272, 31Gf275, and 31Gf280) were recorded during a survey of the I-2402 project by Archaeological Research Consultants, Inc. Our office has not received the completed site forms or a report of the survey findings.

It is likely that significant archaeological sites do exist within the study area although the area does not contain any archaeological sites currently listed in the National Register. We request the opportunity to review the various alternate corridors when they are available.

We have conducted a search of our maps and files and have located the following structures of historical or architectural importance within the general area of the project:

Central North Carolina School for the Deaf. Greensboro vicinity, northeast, SR 2637 off SR 2526.

Kleeburg Barn, Whitsett vicinity. East corner of the junction of SR 3156 and SR 3066.

L. J. Ward
December 17, 1990, Page Two

Ranson Sanders Phipps House, Greensboro vicinity. Southeast side of SR 3045 0.2 mile west of junction with SR 3176.

Stewart House, Greensboro vicinity. East side of SR 3124 at the junction with SR 3045.

Henry Troxler House, Gibsonville vicinity. Southwest side of NC 61/100 0.1 mile north of the junction with SR 2756.

Bridge No. 158, Guilford County, over North Buffalo Creek on SR 2784.

Although this project will be state funded, any federal involvement such as Army Corps of Engineers permits or permission from the Federal Highway Administration to tie-in with an interstate highway will trigger review under Section 106 of the National Historic Preservation Act. We, therefore, recommend that your environmental planning work be done to, at least, the federal standard for compliance.

These comments are made in accord with G.S. 121-12(a) and Executive Order XVI. If you have any questions regarding them, please contact Ms. Renee Gledhill-Earley, environmental review coordinator, at 733-4763.

DB:slw

cc: State Clearinghouse



**Jack Ward, Manager
Planning and Research
Room 462, Hwy Building**

**STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
P. O. BOX 25201
RALEIGH 27611-5201**

JAMES G. MARTIN
GOVERNOR

November 16, 1990

Distribute to:

Pocle _____	Vick <input checked="" type="checkbox"/>	O'Quinn _____
Dudeck _____	Prevatt _____	Bruton _____
Newnam _____	Davis <input checked="" type="checkbox"/>	Shuller _____
Norwood _____	Elliott _____	Nedwidek _____
Modlin _____	Webb _____	Springer _____
Tewell _____	Elmore _____	

Grimes J. HARRELSON
SECRETARY

MEMORANDUM TO: L. J. Ward, P.E., Manager
Planning and Environmental

FROM: *Curt*
Curtis B. Yates, Bicycle Coordinator

SUBJECT: State Environmental Impact Study of the Proposed
Eastern/Northern Urban Loop, Greensboro, Guilford County, TIP
Numbers U-2525 and U-2526

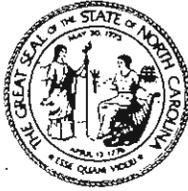
In your memorandum of October 18, 1990, you requested our comments regarding the proposed improvements to the above mentioned project.

No special accommodations for bicycles are needed on this roadway. Several signed bicycle routes approach the western and southern edges of the proposed study area, but none appear to actually cross over a study area boundary.

However, many roads without special bicycle facilities are frequently used by bicyclists in the Greensboro area as they commute between home and work, or travel out of the city to enjoy recreation rides. For those reasons, care should be taken to avoid the creation of new barriers to bicycle traffic, particularly in the design of planned crossing structures.

We appreciate the opportunity to comment on the above named project. Please feel free to contact us again regarding this or any other bicycle related matter.

CBY/jc



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
P.O. BOX 25201
RALEIGH 27611-5201

DIVISION OF AVIATION
AVIATION PARKWAY
RALEIGH-DURHAM AIRPORT
(919) 787-9618

JAMES G. MARTIN
GOVERNOR

THOMAS J. HARRELSON
SECRETARY

December 18, 1990

MEMORANDUM

TO: Richard Davis, Planning and Environmental Branch
FROM: Bruce Matthews, Manager of Aviation Development
SUBJECT: U-2525 and U-2526, Greensboro Urban Loop

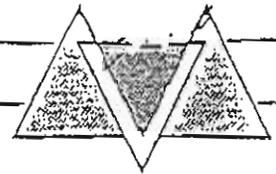
*Bruce
Matthews*

Initial review of the concept map indicates there should be no adverse affects on known airport facilities in the area. The western portion of the study area is beginning to approach the final approach course for runway 23 at the Piedmont Triad International Airport. Therefore, it is suggested that you contact Mr. Ted Johnson, Airport Engineer for the Triad Airport, to determine if the airport sees any concerns with the corridor. Mr. Johnson can be reached at 919 665-5600.

Please advise if you have any questions or comments.

BEM:sap

PIEDMONT TRIAD COUNCIL OF GOVERNMENTS



Intergovernmental Review Process
2216 W. Meadowview Road
Greensboro, North Carolina 27407-3480
Telephone: 819/294-4950

REVIEW & COMMENT FORM

The State Clearinghouse sent us the enclosed information about a proposal which could affect your jurisdiction. Please circulate it to the people you believe need to be informed.

If you need more information about the proposal, please contact the applicant directly. The name and phone number of a contact person are listed on the attached "Notification of Intent."

If you wish to comment on the proposed action, complete this form and return it to the PTCOG office by Nov. 19, 1990. We will send your comments to the State Clearinghouse to be included in a recommendation to the proposed funding agency.

State Application Identifier # 91-E-0285

Commenter's Name & Title James W. Morrison, Senior Planner

Representing Guilford County Phone # 373-3635
(local government)

Mailing Address Guilford County P. & D.P.O. Box 3427 Greensboro, N.C. 27402

James W. Morrison Date Signed 11-19-90
(signature)

Comments: (You may attach additional sheets.)

- 1) According to Kimley-Horn, there will only be "one" interchange for the I-85 Bypass and the Greensboro Urban Loop, where you have listed two.
- 2) Melinda Faley, of the Guilford County Joint Historic Properties Commission, is currently reviewing the study area for any potential or existing historic properties. Once completed, she will be submitting her comments to Kimley-Horn and Associated, Inc. Accordingly, there may be more than one Historic Property in the study area.



GUILFORD COUNTY

November 15, 1990

Distribute to:

Poole	_____	Vick	✓	O'Quinn	_____
Dudeck	_____	Prevatt	✓	Bruton	_____
Newman	_____	Davis	✓	Shuller	_____
Norwood	_____	Elliott	_____	Nedwitek	_____
Mcclin	_____	Webb	_____	Springer	_____
Tewell	_____	Elmore	_____		
		Grimes	_____		

L. J. Ward, P.E.
North Carolina Dept. of Transportation
P. O. Box 25201
Raleigh, North Carolina 27611-5201

RE: STATE ENVIRONMENTAL IMPACT STUDY (EIS)
FOR PROPOSED GREENSBORO EASTERN/NORTHERN URBAN LOOP

Dear Mr. Ward:

This letter is submitted in response to your letter of October 18, 1990 subject as above.

For your information, I have enclosed a copy of Architectural Resources (1979), an inventory of historic structures in Guilford County. Historic structures in the Eastern/Northern Urban Loop Study Area are found in both Northeast and Northwest Guilford County as indicated in the inventory. Please insure that all these historic resources are considered in your study.

Also enclosed is a copy of the Guilford County Soil Survey (1977). The study boundaries lie predominantly within Maps 15, 16, 17, 22, and 23 of the Soil Survey. As shown on these maps, the Wehadkee (Wh) Soils are hydric soils which invariably indicate wetlands. The Chewacla (Ch) series is also flood prone and frequently indicates inclusions of wetlands. These soils are found throughout the study area and should be included in your study.

Our Planning staff prepared a site scan study of the proposed Eastern Loop based on the routing shown on the Greensboro Thoroughfare Plan. A copy of this study is enclosed for your consideration. This study breaks out the Thoroughfare Plan routing into the following sections: (1) Lees Chapel Road to the Greensboro Landfill property; (2) Greensboro Landfill to US 70; (3) US 70 to I-85, and (4) I-85 to the proposed I-85 Bypass.

Section 1 (Lees Chapel to Greensboro Landfill) shows an alternative which avoids Oakwood Mobile Home Park which is the largest mobile home park in Guilford County with 491 spaces. An interchange at this location on US 29N would significantly impact the mobile home park and cause serious disruption. The study should consider the upgrade of the US 29N/Hicone Road interchange with the extension of Hicone Road from Summit Avenue to Lees Chapel Road.

Section 2 (Greensboro Landfill to US 70) considers using the Chanceford Road right-of-way to avoid crossing Keely Park, the Greensboro Nursery, and routing the alignment further west. This section also considers an alignment to the east of Flemingfield Road avoiding the intense industrial and commercial development along US 70.

L. J. Ward, P.E.
Page 2
November 15, 1990

Section 3 (US 70 to I-85) shows an alternative to the Thoroughfare Plan to avoid an interchange at Youngs Mill Road and expanding the Youngs Mill Road right-of-way to connect with the I-85 Bypass. This section appears to have the least environmental impact because of the predominant rural-residential and agricultural character of the area.

Section 4 (I-85 to proposed I-85 Bypass) recommends an interchange between McConnell Road and Youngs Mill Road to avoid using the Youngs Mill Road alternative which would impact approximately 33 houses and cause significant disruption to the surrounding neighborhood.

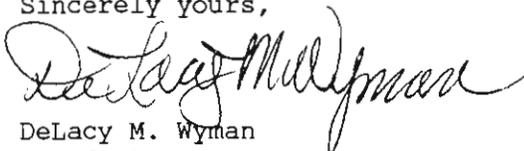
The Northern Loop would significantly impact the Greensboro Watershed and drainage into Lake Townsend. At a minimum the study should incorporate the following measures for mitigating the impact to the watershed:

- (1) Providing flush shoulder and grass-line drainage channels;
- (2) Eliminating curb and gutter to the maximum extent feasible;
- (3) Permanent wet detention and retention basins for stormwater runoff;
- (4) Wide separation of drainage inlet structures and the prevention of bridge drainage directly into receiving streams;
- (5) Litter and pesticide control;
- (6) Use of natural infiltration of stormwater;
- (7) Use of wetlands for chemical and biological pollutant removal; and,
- (8) Vegetation establishment and maintenance.

Since there are only three (3) potential interchange locations for the Northern Loop, acquisition of right-of-way should be based on a design and level of service which are consistent with the above mitigation measures. The study should also consider the ability of existing collector and local streets to handle the projected traffic since current traffic volumes on Lees Chapel Road do not appear to warrant a new parallel facility.

Your consideration of these matters is appreciated. Please contact us if you need additional information.

Sincerely yours,



DeLacy M. Wyman
Chief Planner

/1

Enclosures

cc: Guilford County Commissioners
John Witherspoon
Richard Atkins

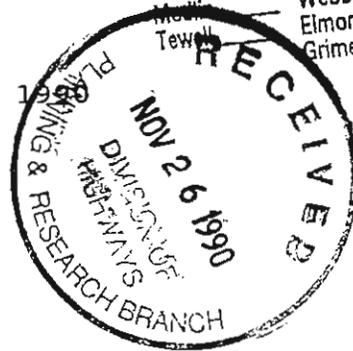


CITY OF GREENSBORO
NORTH CAROLINA

Distribute to:

- Pope _____
- Dudeck _____
- Newnam _____
- Norwood _____
- Mohr _____
- Tewell _____
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- Davis _____
- Elliot _____
- Webb _____
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- Grimes _____
- O'Quinn _____
- Bruton _____
- Shuller _____
- Neddeck _____
- Springer _____

November 16, 1990



Mr. L. J. Ward, P.E., Manager
Planning and Environmental Branch
Department of Transportation
P. O. Box 25201
Raleigh, NC 27611-5201

Dear Mr. Ward:

This is in response to your letter dated October 18 concerning the EIS of the proposed Greensboro Eastern/Northern Urban Loop. The Greensboro Historic District Commission is the agency responsible for maintaining a comprehensive inventory of historic resources within the City limits of the City of Greensboro. Currently, we are involved in updating this inventory. Ms. Callie Dalton, an architectural historian, is conducting the survey under the supervision of the Survey and Planning Branch of the N. C. Division of Archives and History.

Although the field work and documentation has been completed, the City has not received its copy of the final survey results. Ms. Dalton has submitted a list of properties potentially eligible for the National Register of Historic Places and they have been accepted by the State and are available for purposes of this study. Ms. Dalton was asked to look at the study area boundary, and she shared her findings with Mr. Tim Saunders of the City of Greensboro Transportation Division.

At this point, the Historic District Commission has not had an opportunity to review the complete results of the architectural survey with the Urban Loop in mind. The Commission will be happy to provide additional comments based on their review of the survey and cooperate with your staff in any way that it can.

Please let me know if you need additional information.

Sincerely,

Mike Cowhig

Mike Cowhig
Community Development Planner

cc: Tim Saunders

APPENDIX B

RELOCATION STUDY REPORTS

RELOCATION REPORT

North Carolina Department of Transportation

X E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

EASTERN ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT E-1: from I-85 to approximately

I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A 2000' North of I-85 (0.5 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,

Multi-Lane facility on new location

ESTIMATED DISPLACED					INCOME LEVEL				
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP
Individuals									
Families									
Businesses					VALUE OF DWELLING			DSS DWELLINGS AVAILABLE	
Farms					Owners	Tenants	For Sale		For Rent
Non-Profit					0-20M	\$ 0-150	0-20M	\$ 0-150	
ANSWER ALL QUESTIONS					20-40M	150-250	20-40M	150-250	
					YES NO		EXPLAIN ALL "YES" ANSWERS		40-70M
					70-100	400-600	70-100	400-600	
					100 UP	600 UP	100 UP	600 UP	
					TOTAL				
1. Will special relocation services be necessary					REMARKS (Respond by Number) NEGATIVE REPORT - NO DISPLACEDS.				
2. Will schools or churches be affected by displacement									
3. Will business services still be available after project									
4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.									
5. Will relocation cause a housing shortage									
6. Source for available housing (list)									
7. Will additional housing programs be needed									
8. Should Last Resort Housing be considered									
9. Are there large, disabled, elderly, etc. families									
<u>ANSWER THESE ALSO FOR DESIGN</u>									
10. Will public housing be needed for project									
11. Is public housing available									
12. Is it felt there will be adequate DDS housing available during relocation period									
13. Will there be a problem of housing within financial means									
14. Are suitable business sites available (list source)									
15. Number months estimated to complete RELOCATION									

S.E. Stalls N. Wilson
SUSAN STALLS & NANCY WILSON

JUNE 17, 1991
Date

[Signature]
Approved Date

RELOCATION REPORT

North Carolina Department of Transportation

X E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

EASTERN ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT E-2: from 2000'± North of I-85

I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A to Briarmeade Road (6.2 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,

Multi-Lane facility on new location.

ESTIMATED DISPLACED					INCOME LEVEL							
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Individuals												
Families	25	13	38	0	14	13	9	2				
Businesses	3	0	3	0	VALUE OF DWELLING			DSS DWELLINGS AVAILABLE				
Farms					Owners	Tenants	For Sale	For Rent				
Non-Profit					0-20M	\$ 0-150	10	0-20M	0 \$ 0-150			
ANSWER ALL QUESTIONS					20-40M	14	150-250	3	20-40M	78	150-250	348
					EXPLAIN ALL "YES" ANSWERS					40-70M	9	250-400
YES	NO	1. Will special relocation services be necessary 2. Will schools or churches be affected by displacement 3. Will business services still be available after project 4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc. 5. Will relocation cause a housing shortage 6. Source for available housing (list) 7. Will additional housing programs be needed 8. Should Last Resort Housing be considered 9. Are there large, disabled, elderly, etc. families ANSWER THESE ALSO FOR DESIGN 10. Will public housing be needed for project 11. Is public housing available 12. Is it felt there will be adequate DDS housing available during relocation period 13. Will there be a problem of housing within financial means 14. Are suitable business sites available (list source) 15. Number months estimated to complete RELOCATION			70-100	2	400-600		70-100	908	400-600	315
	X				100 UP		600 UP		100 UP	604	600 UP	115
X					TOTAL	25		13		2088		1348
X					REMARKS (Respond by Number)							
	X				All residential displacees counted as families.							
	X	3. Business services will be available after project since there are similar businesses unaffected by this project.										
X		4. (1) Game Room - pool tables and pinball machines - small - 3 employees. (2) White Meadows Gardens - greenhouse and nursery, wholesale and retail sales of annuals and perennials - small - 3 employees. (3) McLeansville Wildlife Club - hunting club - small - 5 employees.										
	X	6. Multiple Listing Services, realtors and classified ads.										
	X	8. As mandated by State Law.										
					NOTE: Storage buildings, warehouses, abandoned buildings, unoccupied houses and closed business are not counted in above figures.							

Susan Stalls
 SUSAN STALLS & NANCY WILSON
 Relocation Agent

JUNE 17, 1991
 Date

[Signature]
 Approved
 Date 6-27-91

RELOCATION REPORT

North Carolina Department of Transportation

E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

EASTERN ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT E-4: from proposed Elm Street
 I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A Extension to Lawndale Drive (2.0 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,
Multi-Lane facility on new location.

ESTIMATED DISPLACED					INCOME LEVEL							
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Individuals												
Families	30	212	242	55		5	64	173				
Businesses					VALUE OF DWELLING			DSS DWELLINGS AVAILABLE				
Farms					Owners	Tenants	For Sale		For Rent			
Non-Profit					0-20M	\$ 0-150	0-20M	0	\$ 0-150	0		
ANSWER ALL QUESTIONS YES NO EXPLAIN ALL "YES" ANSWERS					20-40M	150-250	20-40M	78	150-250	348		
					40-70M	12	250-400	4	40-70M	496	250-400	570
	X	1. Will special relocation services be necessary			70-100	18	400-600	208	70-100	908	400-600	315
	X	2. Will schools or churches be affected by displacement			100 UP		600 UP		100 UP	604	600 UP	115
X		3. Will business services still be available after project			TOTAL	30		212		2086		1348
	X	4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.			REMARKS (Respond by Number)							
	X	5. Will relocation cause a housing shortage			All residential displacees counted as families.							
X		6. Source for available housing (list)			3. No businesses are being displaced on this segment.							
	X	7. Will additional housing programs be needed			6. Multiple Listing Services, realtors and classified ads.							
X		8. Should Last Resort Housing be considered			8. As mandated by State Law.							
	X	9. Are there large, disabled, elderly, etc. families			NOTE: Storage buildings, warehouses, abandoned buildings, unoccupied houses and closed businesses are not counted in above figures.							
ANSWER THESE ALSO FOR DESIGN												
		10. Will public housing be needed for project										
		11. Is public housing available										
		12. Is it felt there will be adequate DDS housing available during relocation period										
		13. Will there be a problem of housing within financial means										
		14. Are suitable business sites available (list source)										
		15. Number months estimated to complete RELOCATION										

S E Stalls
 SUSAN STALLS & NANCY WILSON
 Relocation Agent
 Form 15.4 Revised 5/90

JUNE 17, 1991
 Date
[Signature]
 Approved
 Date 6-27-91
 Original & 1 Copy: State Relocation Agent
 2 Copy: Area Relocation File

RELOCATION REPORT

North Carolina Department of Transportation

X E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

MIDDLE ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT E-1: from I-85 to approximately
 I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A 2000' North of I-85 (0.5 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,
 Multi-Lane facility on new location

ESTIMATED DISPLACEDS					INCOME LEVEL				
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP
Individuals									
Families									
Businesses					VALUE OF DWELLING		DSS DWELLINGS AVAILABLE		
Farms					Owners	Tenants	For Sale	For Rent	
Non-Profit					0-20M	\$ 0-150	0-20M	\$ 0-150	
ANSWER ALL QUESTIONS YES NO EXPLAIN ALL "YES" ANSWERS					20-40M	150-250	20-40M	150-250	
					40-70M	250-400	40-70M	250-400	
					70-100	400-600	70-100	400-600	
					100 UP	600 UP	100 UP	600 UP	
					TOTAL				

REMARKS (Respond by Number)
 NEGATIVE REPORT - NO DISPLACEDS.

Susan Stalls *NW*
 SUSAN STALLS & NANCY WILSON
 Relocation Agent

JUNE 17, 1991
 Date

[Signature]
 Approved
 Date 6-27-91

RELOCATION REPORT

North Carolina Department of Transportation

X E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

EASTERN ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford

SEGMENT E-3: from Briarmeade Road to

I.D. NO.: U-2525, U-2526

F.A. PROJECT: N/A

Proposed Elm Street Extension (5.0 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,

Multi-Lane facility on new location.

ESTIMATED DISPLACED					INCOME LEVEL							
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Individuals												
Families	27	4	31	0	6	9	10	6				
Businesses	7	0	7	0	VALUE OF DWELLING			DSS DWELLINGS AVAILABLE				
Farms					Owners	Tenants	For Sale	For Rent				
Non-Profit					0-20M	\$ 0-150	3	0-20M	0 \$ 0-150			
ANSWER ALL QUESTIONS					20-40M	6	150-250	1	20-40M	78	150-250	348
					EXPLAIN ALL "YES" ANSWERS					40-70M	13	250-400
YES	NO	1. Will special relocation services be necessary 2. Will schools or churches be affected by displacement 3. Will business services still be available after project 4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc. 5. Will relocation cause a housing shortage 6. Source for available housing (list) 7. Will additional housing programs be needed 8. Should Last Resort Housing be considered 9. Are there large, disabled, elderly, etc. families ANSWER THESE ALSO FOR DESIGN			70-100	6	400-600	70-100	908	400-600	315	
	X				100 UP	2	600 UP	100 UP	604	600 UP	115	
X					TOTAL	27		4		2086		1348
X					REMARKS (Respond by Number)							
X					All residential displacees counted as families.							
	X	3. Business services will be available after project since there are similar businesses unaffected by this project.										
X		4. (1) Cardinal Chemicals, Inc. - retail agricultural chemical sales - small - 3 to 4 employees. (2) Racquet World - racquetball sports center (playing courts) - small - 1 employee. (3) Pete's Body Shop - car body repair and wrecker service - small - 2 employees. (4) Hicone Garage and Body Shop - auto repairs and body work - small - 5 employees. (5) C & C Interiors - retail sales of vinyl, tile, parquet flooring, furniture and crafts - small - 4 employees. (6) Bait & Tackle Sales - sells minnows, crickets, etc. - small - 1 employee. (7) Taylor's Nursery - retail sales of shrubs etc. - small - 4 employees.										
	X	6. Multiple Listing Services, realtors and classified ads.										
	X	8. As mandated by State Law.										
		10. Will public housing be needed for project										
		11. Is public housing available										
		12. Is it felt there will be adequate DDS housing available during relocation period										
		13. Will there be a problem of housing within financial means										
		14. Are suitable business sites available (list source)										
		15. Number months estimated to complete RELOCATION										

S.E. Stalls New
 SUSAN STALLS & NANCY WILSON
 Relocation Agent
 Form 15.4 Revised 5/90

[Signature]
 JUNE 17, 1991
 Date

[Signature]
 Approved
 Date
 Original & 1 Copy: State Relocation Agent
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6-27-91

RELOCATION REPORT

North Carolina Department of Transportation

E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

EASTERN ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT E-3: from Briarmeade Road to Proposed Elm Street Extension (5.0 miles)
 I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop, Multi-Lane facility on new location.

ESTIMATED DISPLACES					INCOME LEVEL							
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Individuals												
Families	27	4	31	0	6	9	10	6				
Businesses	7	0	7	0	VALUE OF DWELLING			DSS DWELLINGS AVAILABLE				
Farms					Owners	Tenants	For Sale		For Rent			
Non-Profit					0-20M	\$ 0-150	3	0-20M	0 \$ 0-150			
ANSWER ALL QUESTIONS					20-40M	6	150-250	1	20-40M	78	150-250	348
					40-70M	13	250-400		40-70M	496	250-400	570
YES	NO	EXPLAIN ALL "YES" ANSWERS			70-100	6	400-600		70-100	908	400-600	315
	X				100 UP	2	600 UP		100 UP	604	600 UP	115
	X	3. Will business services still be available after project			TOTAL	27		4		2086		1348
	X				4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.			REMARKS (Respond by Number)				
	X	5. Will relocation cause a housing shortage						NOTE: Storage buildings, warehouses, abandoned buildings, unoccupied houses and closed businesses are not counted in above figures.				
	X				6. Source for available housing (list)							
	X	7. Will additional housing programs be needed										
	X				8. Should Last Resort Housing be considered							
	X	9. Are there large, disabled, elderly, etc. families										
ANSWER THESE ALSO FOR DESIGN												
		10. Will public housing be needed for project										
					11. Is public housing available							
		12. Is it felt there will be adequate DDS housing available during relocation period										
					13. Will there be a problem of housing within financial means							
		14. Are suitable business sites available (list source)										
					15. Number months estimated to complete RELOCATION							

S E Stalls NEW
 SUSAN STALLS & NANCY WILSON
 Relocation Agent
 Form 15.4 Revised 5/90

JW
 JUNE 17, 1991
 Date

Approved _____ Date _____
 Original & 1 Copy: State Relocation Agent
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RELOCATION REPORT

North Carolina Department of Transportation

RELOCATION ASSISTANCE

E.I.S. CORRIDOR DESIGN

MIDDLE ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT M-1: from 2000'+ North of I-85

I.D. NO.: U-2525. U-2526 F.A. PROJECT: N/A to Camp Burton Road (4.1 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,

Multi-Lane facility on new location.

ESTIMATED DISPLACEDS					INCOME LEVEL							
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Individuals												
Families	18	11	29	0	7	16	3	3				
Businesses	1	1	2	0	VALUE OF DWELLING			DSS DWELLINGS AVAILABLE				
Farms					Owners	Tenants	For Sale	For Rent				
Non-Profit					0-20M	\$ 0-150	10	0-20M	0 \$ 0-150			
ANSWER ALL QUESTIONS					20-40M	4	150-250	1	20-40M	78	150-250	348
					40-70M	11	250-400		40-70M	496	250-400	570
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	1. Will special relocation services be necessary		70-100	3	400-600		70-100	908	400-600	315
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	2. Will schools or churches be affected by displacement		100 UP		600 UP		100 UP	604	600 UP	115
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. Will business services still be available after project		TOTAL	18		11		2086		1348
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.		REMARKS (Respond by Number)							
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	5. Will relocation cause a housing shortage		All residential displacees counted as families.							
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. Source for available housing (list)		3. Business services will be available after project since there are similar businesses unaffected by this project.							
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	7. Will additional housing programs be needed		4. (1) John's Place - beer and games recreation center - small - 3 employees.							
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. Should Last Resort Housing be considered		(2) Mr. Service Appliance Repair - retail home appliance service and parts - small - 1 employee.							
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	9. Are there large, disabled, elderly, etc. families		6. Multiple Listing Services, realtors and classified ads.							
ANSWER THESE ALSO FOR DESIGN					8. As mandated by State Law.							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10. Will public housing be needed for project		NOTE: Storage buildings, warehouses, abandoned buildings, unoccupied houses and closed businesses are not counted in above figures.							
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11. Is public housing available									
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12. Is it felt there will be adequate DDS housing available during relocation period									
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13. Will there be a problem of housing within financial means									
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14. Are suitable business sites available (list source)									
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15. Number months estimated to complete RELOCATION									

S E Stalls
 SUSAN STALLS & NANCY WILSON
 Relocation Agent

JUNE 17, 1991
 Date

S E Williams
 Approved
 Date

RELOCATION REPORT

North Carolina Department of Transportation

E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

MIDDLE ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT M-2: from Camp Burton Road to
 I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A Briarmeade Road (1.8 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,
Multi-Lane facility on new location.

ESTIMATED DISPLACED					INCOME LEVEL							
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Individuals												
Families	4	1	5	0		1		1	3			
Businesses					VALUE OF DWELLING			DSS DWELLINGS AVAILABLE				
Farms					Owners	Tenants	For Sale	For Rent				
Non-Profit					0-20M	\$ 0-150	0-20M	0 \$ 0-150	0			
ANSWER ALL QUESTIONS					20-40M	150-250	1	20-40M	78	150-250	348	
					EXPLAIN ALL "YES" ANSWERS					40-70M	250-400	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	1. Will special relocation services be necessary			70-100	1	400-600		70-100	908	400-600	315
<input type="checkbox"/>	<input checked="" type="checkbox"/>	2. Will schools or churches be affected by displacement			100 UP	3	600 UP		100 UP	604	600 UP	115
<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. Will business services still be available after project			TOTAL	4				2086		1348
<input type="checkbox"/>	<input checked="" type="checkbox"/>	4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.			REMARKS (Respond by Number)							
<input type="checkbox"/>	<input checked="" type="checkbox"/>	5. Will relocation cause a housing shortage			All residential displacees counted as families.							
<input checked="" type="checkbox"/>	<input type="checkbox"/>	6. Source for available housing (list)			3. No businesses are being displaced on this segment.							
<input type="checkbox"/>	<input checked="" type="checkbox"/>	7. Will additional housing programs be needed			6. Multiple Listing Services, realtors and classified ads.							
<input checked="" type="checkbox"/>	<input type="checkbox"/>	8. Should Last Resort Housing be considered			8. As mandated by State Law.							
<input type="checkbox"/>	<input checked="" type="checkbox"/>	9. Are there large, disabled, elderly, etc. families			NOTE: Storage buildings, warehouses, abandoned buildings, unoccupied houses and closed businesses are not counted in above figures.							
ANSWER THESE ALSO FOR DESIGN												
<input type="checkbox"/>	<input type="checkbox"/>	10. Will public housing be needed for project										
<input type="checkbox"/>	<input type="checkbox"/>	11. Is public housing available										
<input type="checkbox"/>	<input type="checkbox"/>	12. Is it felt there will be adequate DDS housing available during relocation period										
<input type="checkbox"/>	<input type="checkbox"/>	13. Will there be a problem of housing within financial means										
<input type="checkbox"/>	<input type="checkbox"/>	14. Are suitable business sites available (list source)										
<input type="checkbox"/>	<input type="checkbox"/>	15. Number months estimated to complete RELOCATION										

Susan Stalls *Nancy Wilson*
 SUSAN STALLS & NANCY WILSON
 Relocation Agent
 Form 15.4 Revised 5/90

JUNE 17, 1991
 Date

[Signature]
 Approved
 Date 6-27-91

Original & 1 Copy: State Relocation Agent
 2 Copy: Area Relocation File

RELOCATION REPORT

North Carolina Department of Transportation

E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

MIDDLE ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT E-3: from Briarmeade Road to
 I.D. NO.: U-2525. U-2526 F.A. PROJECT: N/A Proposed Elm Street Extension (5.0 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop.

Multi-Lane facility on new location.

ESTIMATED DISPLACED					INCOME LEVEL									
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP					
Individuals														
Families	27	4	31	0	6	9	10	6						
Businesses	7	0	7	0	VALUE OF DWELLING			DSS DWELLINGS AVAILABLE						
Farms					Owners	Tenants		For Sale	For Rent					
Non-Profit					0-20M	\$ 0-150	3	0-20M	0 \$ 0-150					
ANSWER ALL QUESTIONS					20-40M	6	150-250	1	20-40M	78	150-250	348		
					EXPLAIN ALL "YES" ANSWERS					40-70M	13	250-400		40-70M
YES	NO	1. Will special relocation services be necessary 2. Will schools or churches be affected by displacement 3. Will business services still be available after project 4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc. 5. Will relocation cause a housing shortage 6. Source for available housing (list) 7. Will additional housing programs be needed 8. Should Last Resort Housing be considered 9. Are there large, disabled, elderly, etc. families ANSWER THESE ALSO FOR DESIGN			70-100	6	400-600		70-100	908	400-600	315		
	X				100 UP	2	600 UP		100 UP	604	600 UP	115		
X					TOTAL	27		4		2086		1348		
X					REMARKS (Respond by Number)									
	X				All residential displacees counted as families.									
	X	3. Business services will be available after project since there are similar businesses unaffected by this project.												
	X	4. (1) Cardinal Chemicals, Inc. - retail agricultural chemical sales - small - 3 to 4 employees. (2) Racquet World - racquetball sports center (playing courts) - small - 1 employee. (3) Pete's Body Shop - car body repair and wrecker service - small - 2 employees. (4) Hicone Garage and Body Shop - auto repairs and body work - small - 5 employees. (5) C & C Interiors - retail sales of vinyl, tile, parquet flooring, furniture and crafts - small - 4 employees. (6) Bait & Tackle Sales - sells minnows, crickets, etc. - small - 1 employee. (7) Taylor's Nursery - retail sales of shrubs etc. - small - 4 employees.												
	X	6. Multiple Listing Services, realtors and classified ads.												
	X	8. As mandated by State Law.												
	X	10. Will public housing be needed for project												
		11. Is public housing available												
		12. Is it felt there will be adequate DDS housing available during relocation period												
		13. Will there be a problem of housing within financial means												
		14. Are suitable business sites available (list source)												
		15. Number months estimated to complete RELOCATION												

S E Stalls
 SUSAN STALLS & NANCY WILSON
 Relocation Agent
 Form 15.4 Revised 5/90

JUNE 17, 1991
 Date

[Signature]
 Approved
 Original & 1 Copy: State Relocation Agent
 2 Copy: Area Relocation File

6-27-91
 Date

RELOCATION REPORT

North Carolina Department of Transportation

E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

MIDDLE ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT E-3: from Briarmeade Road to I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A Proposed Elm Street Extension (5.0 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop, Multi-Lane facility on new location.

ESTIMATED DISPLACED					INCOME LEVEL								
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP				
Individuals													
Families	27	4	31	0	6	9	10	6					
Businesses	7	0	7	0	VALUE OF DWELLING				DSS DWELLINGS AVAILABLE				
Farms					Owners		Tenants		For Sale		For Rent		
Non-Profit					0-20M	\$ 0-150	3	0-20M	0	\$ 0-150	0		
ANSWER ALL QUESTIONS					20-40M	6	150-250	1	20-40M	78	150-250	348	
					40-70M	13	250-400		40-70M	496	250-400	570	
YES	NO	EXPLAIN ALL "YES" ANSWERS			70-100	6	400-600		70-100	908	400-600	315	
	X				100 UP	2	600 UP		100 UP	604	600 UP	115	
X		3. Will business services still be available after project			TOTAL	27		4		2086		1348	
X					4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.			REMARKS (Respond by Number)					
	X	5. Will relocation cause a housing shortage						NOTE: Storage buildings, warehouses, abandoned buildings, unoccupied houses and closed businesses are not counted in above figures.					
X					6. Source for available housing (list)								
	X	7. Will additional housing programs be needed											
X					8. Should Last Resort Housing be considered								
	X	9. Are there large, disabled, elderly, etc. families											
ANSWER THESE ALSO FOR DESIGN													
		10. Will public housing be needed for project											
		11. Is public housing available											
		12. Is it felt there will be adequate DDS housing available during relocation period											
		13. Will there be a problem of housing within financial means											
		14. Are suitable business sites available (list source)											
		15. Number months estimated to complete RELOCATION											

S E Stalls
 SUSAN STALLS & NANCY WILSON
 Relocation Agent
 Form 15.4 Revised 5/90

[Signature]
 JUNE 17, 1991
 Date

Approved _____ Date _____
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 2 Copy: Area Relocation File

RELOCATION REPORT

North Carolina Department of Transportation

E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

MIDDLE ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT E-4: from proposed Elm Street
 I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A Extension to Lawndale Drive (2.0 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,
Multi-Lane facility on new location.

ESTIMATED DISPLACEDS					INCOME LEVEL							
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Individuals												
Families	30	212	242	55		5	64	173				
Businesses					VALUE OF DWELLING			DSS DWELLINGS AVAILABLE				
Farms					Owners	Tenants		For Sale	For Rent			
Non-Profit					0-20M	\$ 0-150		0-20M	0 \$ 0-150	0		
ANSWER ALL QUESTIONS					20-40M	150-250		20-40M	78	150-250	348	
					40-70M	12	250-400	4	40-70M	496	250-400	570
YES	NO	EXPLAIN ALL "YES" ANSWERS			70-100	18	400-600	208	70-100	908	400-600	315
	X				100 UP		600 UP		100 UP	604	600 UP	115
	X	3. Will business services still be available after project			TOTAL	30		212		2086		1348
	X				4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.			REMARKS (Respond by Number)				
	X	5. Will relocation cause a housing shortage						All residential displaceds counted as families.				
	X				6. Source for available housing (list)			3. No businesses are being displaced on this segment.				
	X	7. Will additional housing programs be needed						6. Multiple Listing Services, realtors and classified ads.				
	X				8. Should Last Resort Housing be considered			8. As mandated by State Law.				
	X	9. Are there large, disabled, elderly, etc. families						NOTE: Storage buildings, warehouses, abandoned buildings, unoccupied houses and closed businesses are not counted in above figures.				
ANSWER THESE ALSO FOR DESIGN												
		10. Will public housing be needed for project										
		11. Is public housing available										
		12. Is it felt there will be adequate DDS housing available during relocation period										
		13. Will there be a problem of housing within financial means										
		14. Are suitable business sites available (list source)										
		15. Number months estimated to complete RELOCATION										

S.E. Stalls New
 SUSAN STALLS & NANCY WILSON
 Relocation Agent

JUNE 17, 1991 *[Signature]* 6-27-91
 Date Approved Date

RELOCATION REPORT

North Carolina Department of Transportation

E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

WESTERN ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT W-1: from McConnell Road to I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A 2500'± North of US 70 (2.6 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,
Multi-Lane facility on new location.

ESTIMATED DISPLACEES					INCOME LEVEL							
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Individuals												
Families	9	0	9	0	1	3	2	2	1			
Businesses	2	3	5	0	VALUE OF DWELLING			DSS DWELLINGS AVAILABLE				
Farms					Owners		Tenants		For Sale		For Rent	
Non-Profit					0-20M	\$ 0-150		0-20M	0	\$ 0-150	0	
ANSWER ALL QUESTIONS YES NO EXPLAIN ALL "YES" ANSWERS					20-40M	150-250		20-40M	78	150-250	348	
					40-70M	6	250-400	40-70M	496	250-400	570	
	X	1. Will special relocation services be necessary	70-100	2	400-600	70-100	908	400-600	315			
	X	2. Will schools or churches be affected by displacement	100 UP	1	600 UP	100 UP	604	600 UP	115			
X		3. Will business services still be available after project	TOTAL	9		0		2086	1348			
X		4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.	REMARKS (Respond by Number) All residential displacees counted as families.									
	X	5. Will relocation cause a housing shortage	3. Business services will be available after project since there are similar businesses unaffected by this project.									
X		6. Source for available housing (list)	4. (1) Bryant's True Value - retail lawn and garden center and hardware sales - medium - 10 to 12 employees.									
	X	7. Will additional housing programs be needed	(2) Shop-Rite Super Mart - grocery store and gasoline sales (six gas pumps) - medium - 8 employees.									
X		8. Should Last Resort Housing be considered	(3) Pro Sport Cards - buys, sells and trades sports cards - small - 2 employees.									
	X	9. Are there large, disabled, elderly, etc. families	(4) Hicone Cleaners - drycleaning business which also sells gift baskets - small - 1 employee.									
		10. Will public housing be needed for project	(5) L. D. Ring, Inc. - road grading business - small - 2 employees.									
		11. Is public housing available	6. Multiple Listing Services, realtors and classified ads.									
		12. Is it felt there will be adequate DDS housing available during relocation period	8. As mandated by State Law.									
		13. Will there be a problem of housing within financial means	NOTE: Storage buildings, warehouses, abandoned buildings, unoccupied houses and closed businesses are not counted in above figures.									
		14. Are suitable business sites available (list source)										
		15. Number months estimated to complete RELOCATION										

S. Stalls *N. Wilson*
 SUSAN STALLS & NANCY WILSON
 Relocation Agent
 Form 15.4 Revised 5/90

JUNE 17, 1991
 Date

J. Williams 6-27-91
 Approved
 Date

Original & 1 Copy: State Relocation Agent
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RELOCATION REPORT

North Carolina Department of Transportation

E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

WESTERN ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT W-2: from 2500' North of US 70
 I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A to Proposed Elm St. Extension (6.7 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,
Multi-Lane facility on new location.

ESTIMATED DISPLACED					INCOME LEVEL							
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Individuals												
Families	85	28	113	24	30	38	21	19	5			
Businesses	11	0	11	0	VALUE OF DWELLING			DSS DWELLINGS AVAILABLE				
Farms					Owners	Tenants		For Sale	For Rent			
Non-Profit					0-20M	\$ 0-150	14	0-20M	0 \$ 0-150	0		
ANSWER ALL QUESTIONS YES NO EXPLAIN ALL "YES" ANSWERS					20-40M	7	150-250	8	20-40M	78	150-250	348
					40-70M	55	250-400	6	40-70M	496	250-400	570
	X	1. Will special relocation services be necessary			70-100	20	400-600		70-100	908	400-600	315
	X	2. Will schools or churches be affected by displacement			100 UP	3	600 UP		100 UP	604	600 UP	115
	X	3. Will business services still be available after project			TOTAL	85		28		2086		1348
	X	4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.			REMARKS (Respond by Number) All residential displacees counted as families.							
	X	5. Will relocation cause a housing shortage			3. Business services will be available after project since there are similar businesses unaffected by this project.							
	X	6. Source for available housing (list)			4. (1) Longview Curb Market - convenient store, no gas pumps - small - 1 employee. (2) Raynor's Mill Outlet - retail sales of ladies apparel - small - 4 employees. (3) Exlon Extrusion, Inc. - manufactures plastic tubing - small - 8 to 10 employees. (4) Stephen's Pipe & Steel - wholesale pipe sales and fencing materials - small - 4 to 5 employees. (5) Able Fence Builders - fence builders, also retail sales of pool and spa supplies - small - 4 to 5 employees. (6) Greensboro Mulch Supply, Inc. - retail mulch sales - small - 2 employees. (7) Curtis Body Shop - auto body repair shop - small - 5 to 8 employees. (8) Kayleigh's Motel & Lounge - approximately 15 motel rooms and a lounge - small - 3 to 4 employees. (9) Baysinger Auto Sales - used car sales lot averaging 15 cars for sale - small - 2 employees.							
	X	7. Will additional housing programs be needed										
	X	8. Should Last Resort Housing be considered										
	X	9. Are there large, disabled, elderly, etc. families										
		ANSWER THESE ALSO FOR DESIGN										
		10. Will public housing be needed for project										
		11. Is public housing available										
		12. Is it felt there will be adequate DDS housing available during relocation period										
		13. Will there be a problem of housing within financial means										
		14. Are suitable business sites available (list source)										
		15. Number months estimated to complete RELOCATION										

S E Stalls
 SUSAN STALLS & NANCY WILSON
 Relocation Agent
 Form 15.4 Revised 5/90

Jim
 JUNE 17, 1991
 Date

Chas Williams
 Approved
 Date 6-27-91
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RELOCATION REPORT

North Carolina Department of Transportation

E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

WESTERN ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT W-2: from 2500'± North of US 70
 I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A to Proposed Elm St. Extension (6.7 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,
Multi-Lane facility on new location.

ESTIMATED DISPLACED					INCOME LEVEL							
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Individuals												
Families	85	28	113	24	30	38	21	19	5			
Businesses	11	0	11	0	VALUE OF DWELLING			DSS DWELLINGS AVAILABLE				
Farms					Owners	Tenants	For Sale		For Rent			
Non-Profit					0-20M	\$ 0-150	14	0-20M	0 \$ 0-150	0		
ANSWER ALL QUESTIONS					20-40M	7	150-250	8	20-40M	78	150-250	348
					EXPLAIN ALL "YES" ANSWERS					40-70M	55	250-400
YES	NO	1. Will special relocation services be necessary 2. Will schools or churches be affected by displacement 3. Will business services still be available after project 4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc. 5. Will relocation cause a housing shortage 6. Source for available housing (list) 7. Will additional housing programs be needed 8. Should Last Resort Housing be considered 9. Are there large, disabled, elderly, etc. families ANSWER THESE ALSO FOR DESIGN 10. Will public housing be needed for project 11. Is public housing available 12. Is it felt there will be adequate DDS housing available during relocation period 13. Will there be a problem of housing within financial means 14. Are suitable business sites available (list source) 15. Number months estimated to complete RELOCATION			70-100	20	400-600		70-100	908	400-600	315
	X				100 UP	3	600 UP		100 UP	604	600 UP	115
X					TOTAL	85		28		2086		1348
X					REMARKS (Respond by Number)							
	X				(10) Handy Kwik Stop - convenient store with 4 gas pumps - small - 3 employees.							
X					(11) Buffalo Park Store - hardware store and grocery store combined, with 3 gas pumps - small - 4 employees.							
	X				6. Multiple Listing Services, realtors and classified ads.							
X					8. As mandated by State Law.							
	X				NOTE: Storage buildings, warehouses, abandoned buildings, unoccupied houses and closed businesses are not counted in above figures.							

S.E. Stalls
 SUSAN STALLS & NANCY WILSON
 Relocation Agent
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JUNE 17, 1991
 Date

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RELOCATION REPORT

North Carolina Department of Transportation

RELOCATION ASSISTANCE

E.I.S. CORRIDOR DESIGN

WESTERN ALTERNATE

PROJECT: 6.498003T COUNTY: Gulford SEGMENT E-4: from proposed Elm Street

I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A Extension to Lawndale Drive (2.0 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,
Multi-Lane facility on new location.

ESTIMATED DISPLACEDS					INCOME LEVEL							
Type of Displacée	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Individuals												
Families	30	212	242	55		5	64	173				
Businesses					VALUE OF DWELLING			DSS DWELLINGS AVAILABLE				
Farms					Owners	Tenants		For Sale	For Rent			
Non-Profit					0-20M	\$ 0-150		0-20M	0 \$ 0-150			
ANSWER ALL QUESTIONS YES NO EXPLAIN ALL "YES" ANSWERS					20-40M	150-250		20-40M	78	150-250	348	
					40-70M	12	250-400	4	40-70M	496	250-400	570
	X	1. Will special relocation services be necessary			70-100	18	400-600	208	70-100	908	400-600	315
	X	2. Will schools or churches be affected by displacement			100 UP		600 UP		100 UP	604	600 UP	115
X		3. Will business services still be available after project			TOTAL	30		212		2086		1348
	X	4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.			REMARKS (Respond by Number) All residential displaceds counted as families.							
	X	5. Will relocation cause a housing shortage			3. No businesses are being displaced on this segment.							
X		6. Source for available housing (list)			6. Multiple Listing Services, realtors and classified ads.							
	X	7. Will additional housing programs be needed			8. As mandated by State Law.							
X		8. Should Last Resort Housing be considered			NOTE: Storage buildings, warehouses, abandoned buildings, unoccupied houses and closed businesses are not counted in above figures.							
	X	9. Are there large, disabled, elderly, etc. families										
ANSWER THESE ALSO FOR DESIGN												
		10. Will public housing be needed for project										
		11. Is public housing available										
		12. Is it felt there will be adequate DDS housing available during relocation period										
		13. Will there be a problem of housing within financial means										
		14. Are suitable business sites available (list source)										
		15. Number months estimated to complete RELOCATION										

S.E. Stalls
SUSAN STALLS & NANCY WILSON
Relocation Agent
Form 15.4 Revised 5/90

JUNE 17, 1991
Date

[Signature]
Approved
Date 6-27-91
Original & 1 Copy: State Relocation Agent
2 Copy: Area Relocation File

RELOCATION REPORT

North Carolina Department of Transportation

X E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

PROJECT: 6.498003T COUNTY: Guilford CROSSOVER 1 ALTERNATE
 I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A SEGMENT E-1: from I-85 to approximately
 2000' North of I-85 (0.5 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,
Multi-Lane facility on new location

ESTIMATED DISPLACED					INCOME LEVEL							
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Individuals												
Families												
Businesses					VALUE OF DWELLING		DSS DWELLINGS AVAILABLE					
Farms					Owners	Tenants	For Sale	For Rent				
Non-Profit					0-20M	\$ 0-150	0-20M	\$ 0-150				
ANSWER ALL QUESTIONS					20-40M	150-250	20-40M	150-250				
					EXPLAIN ALL "YES" ANSWERS					40-70M	250-400	40-70M
YES	NO	1. Will special relocation services be necessary 2. Will schools or churches be affected by displacement 3. Will business services still be available after project 4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc. 5. Will relocation cause a housing shortage 6. Source for available housing (list) 7. Will additional housing programs be needed 8. Should Last Resort Housing be considered 9. Are there large, disabled, elderly, etc. families ANSWER THESE ALSO FOR DESIGN 10. Will public housing be needed for project 11. Is public housing available 12. Is it felt there will be adequate DDS housing available during relocation period 13. Will there be a problem of housing within financial means 14. Are suitable business sites available (list source) 15. Number months estimated to complete RELOCATION			70-100	400-600	70-100	400-600				
					100 UP	600 UP	100 UP	600 UP				
					TOTAL							
					REMARKS (Respond by Number)							
					NEGATIVE REPORT - NO DISPLACEDS.							

S.E. Stalls *NW*
 SUSAN STALLS & NANCY WILSON JUNE 17, 1991 *J. Bullman* 6-27-91
 Relocation Agent Date Approved Date
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RELOCATION REPORT

North Carolina Department of Transportation

X E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

CROSSOVER 1 ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT CR-1: from 2000'± North of I-85
 I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A to 2500'± North of US 70 (2.9 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,
Multi-Lane facility on new location.

ESTIMATED DISPLACED					INCOME LEVEL							
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Individuals												
Families	14	2	16	0	5	10		1				
Businesses	1	0	1	0	VALUE OF DWELLING			DSS DWELLINGS AVAILABLE				
Farms					Owners	Tenants	For Sale		For Rent			
Non-Profit					0-20M	\$ 0-150	0-20M	0	\$ 0-150	0		
ANSWER ALL QUESTIONS					20-40M	3	150-250	2	20-40M	78	150-250	348
					40-70M	10	250-400	40-70M	496	250-400	570	
YES	NO	EXPLAIN ALL "YES" ANSWERS			70-100	1	400-600	70-100	908	400-600	315	
	X				100 UP		600 UP	100 UP	604	600 UP	115	
	X	1. Will special relocation services be necessary			TOTAL	14		2		2086		1348
	X				2. Will schools or churches be affected by displacement			REMARKS (Respond by Number)				
X		3. Will business services still be available after project						All residential displacees counted as families.				
X					4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.			3. Business services will be available after project since there are similar businesses unaffected by this project.				
	X	5. Will relocation cause a housing shortage						4. Allen Boat Company - retail sales of boats, skis, jet skis, hoating accessories, boat motors, etc. - large - 15 employees.				
X					6. Source for available housing (list)			6. Multiple Listing Services, realtors and classified ads.				
	X	7. Will additional housing programs be needed						8. As mandated by State Law.				
X					8. Should Last Resort Housing be considered			NOTE: Storage buildings, warehouses, abandoned buildings, unoccupied houses and closed businesses are not counted in above figures.				
	X	9. Are there large, disabled, elderly, etc. families										
ANSWER THESE ALSO FOR DESIGN												
		10. Will public housing be needed for project										
					11. Is public housing available							
		12. Is it felt there will be adequate DDS housing available during relocation period										
					13. Will there be a problem of housing within financial means							
		14. Are suitable business sites available (list source)										
					15. Number months estimated to complete RELOCATION							

S.E. Stalls New
 SUSAN STALLS & NANCY WILSON
 Relocation Agent
 Form 15.4 Revised 5/90

[Signature]
 JUNE 17, 1991
 Date

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 Date 6-27-91

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RELOCATION REPORT

North Carolina Department of Transportation

X E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

CROSSOVER 1 ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT W-2: from 2500'± North of US 70
 I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A to Proposed Elm St. Extension (6.7 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,
 Multi-Lane facility on new location.

ESTIMATED DISPLACEDS					INCOME LEVEL							
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Individuals												
Families	85	28	113	24	30	38	21	19	5			
Businesses	11	0	11	0	VALUE OF DWELLING			DSS DWELLINGS AVAILABLE				
Farms					Owners	Tenants		For Sale	For Rent			
Non-Profit					0-20M	\$ 0-150	14	0-20M	0 \$ 0-150			
ANSWER ALL QUESTIONS					20-40M	7	150-250	8	20-40M	78	150-250	348
					EXPLAIN ALL "YES" ANSWERS					40-70M	55	250-400
YES	NO	1. Will special relocation services be necessary 2. Will schools or churches be affected by displacement 3. Will business services still be available after project 4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc. 5. Will relocation cause a housing shortage 6. Source for available housing (list) 7. Will additional housing programs be needed 8. Should Last Resort Housing be considered 9. Are there large, disabled, elderly, etc. families ANSWER THESE ALSO FOR DESIGN 10. Will public housing be needed for project 11. Is public housing available 12. Is it felt there will be adequate DDS housing available during relocation period 13. Will there be a problem of housing within financial means 14. Are suitable business sites available (list source) 15. Number months estimated to complete RELOCATION			70-100	20	400-600		70-100	908	400-600	315
	X				100 UP	3	600 UP		100 UP	604	600 UP	115
X					TOTAL	85		28		2086		1348
X					REMARKS (Respond by Number)							
	X				All residential displacees counted as families.							
X					3. Business services will be available after project since there are similar businesses unaffected by this project.							
	X				4. (1) Longview Curb Market - convenient store, no gas pumps - small - 1 employee. (2) Raynor's Mill Outlet - retail sales of ladies apparel - small - 4 employees. (3) Exlon Extrusion, Inc. - manufactures plastic tubing - small - 8 to 10 employees. (4) Stephen's Pipe & Steel - wholesale pipe sales and fencing materials - small - 4 to 5 employees. (5) Able Fence Builders - fence builders, also retail sales of pool and spa supplies - small - 4 to 5 employees. (6) Greensboro Mulch Supply, Inc. - retail mulch sales - small - 2 employees. (7) Curtis Body Shop - auto body repair shop - small - 5 to 8 employees. (8) Kayleigh's Motel & Lounge - approximately 15 motel rooms and a lounge - small - 3 to 4 employees. (9) Baysinger Auto Sales - used car sales lot averaging 15 cars for sale - small - 2 employees.							

D.E. Stalls
 SUSAN STALLS & NANCY WILSON
 Relocation Agent
 Form 15.4 Revised 5/90

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RELOCATION REPORT

North Carolina Department of Transportation

RELOCATION ASSISTANCE

X E.I.S. CORRIDOR DESIGN

CROSSOVER 1 ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT W-2: from 2500'+ North of US 70
 I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A to Proposed Elm St. Extension (8.7 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,
 Multi-Lane facility on new location.

ESTIMATED DISPLACED					INCOME LEVEL							
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Individuals												
Families	85	28	113	24	30	38	21	19	5			
Businesses	11	0	11	0	VALUE OF DWELLING			DSS DWELLINGS AVAILABLE				
Farms					Owners	Tenants		For Sale	For Rent			
Non-Profit					0-20M	\$ 0-150	14	0-20M	0 \$ 0-150	0		
ANSWER ALL QUESTIONS					20-40M	7	150-250	8	20-40M	78	150-250	348
					40-70M	55	250-400	6	40-70M	496	250-400	570
YES	NO	EXPLAIN ALL "YES" ANSWERS			70-100	20	400-600		70-100	908	400-600	315
	X				100 UP	3	600 UP		100 UP	604	600 UP	115
X		ANSWER THESE ALSO FOR DESIGN			TOTAL	85		28		2086		1348
X					REMARKS (Respond by Number)							
	X	(10) Handy Kwik Stop - convenient store with 4 gas pumps - small - 3 employees.										
	X	(11) Buffalo Park Store - hardware store and grocery store combined, with 3 gas pumps - small - 4 employees.										
X		6. Multiple Listing Services, realtors and classified ads.										
X		8. As mandated by State Law.										
	X	NOTE: Storage buildings, warehouses, abandoned buildings, unoccupied houses and closed businesses are not counted in above figures.										
		PAGE 2 OF 2										
		10. Will public housing be needed for project										
		11. Is public housing available										
		12. Is it felt there will be adequate DDS housing available during relocation period										
		13. Will there be a problem of housing within financial means										
		14. Are suitable business sites available (list source)										
		15. Number months estimated to complete RELOCATION										

S. E. Stalls
 SUSAN STALLS & NANCY WILSON
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RELOCATION REPORT

North Carolina Department of Transportation

E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

CROSSOVER 1 ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT E-4: from proposed Elm Street
 I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A Extension to Lawndale Drive (2.0 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,
Multi-Lane facility on new location.

ESTIMATED DISPLACEDS					INCOME LEVEL					
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP	
Individuals										
Families	30	212	242	55		5	64	173		
Businesses					VALUE OF DWELLING			DSS DWELLINGS AVAILABLE		
Farms					Owners	Tenants		For Sale	For Rent	
Non-Profit					0-20M	\$ 0-150		0-20M	0 \$ 0-150	
ANSWER ALL QUESTIONS					20-40M	150-250		20-40M	78 150-250	348
					40-70M	12 250-400	4	40-70M	496 250-400	570
YES	NO	EXPLAIN ALL "YES" ANSWERS			70-100	18 400-600	208	70-100	908 400-600	315
	X				100 UP		600 UP		100 UP	604 600 UP
X		3. Will business services still be available after project			TOTAL	30	212		2086	1348
	X				4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.			REMARKS (Respond by Number)		
	X	5. Will relocation cause a housing shortage						All residential displacees counted as families.		
X					6. Source for available housing (list)			3. No businesses are being displaced on this segment.		
	X	7. Will additional housing programs be needed						6. Multiple Listing Services, realtors and classified ads.		
X					8. Should Last Resort Housing be considered			8. As mandated by State Law.		
	X	9. Are there large, disabled, elderly, etc. families						NOTE: Storage buildings, warehouses, abandoned buildings, unoccupied houses and closed businesses are not counted in above figures.		
	X				ANSWER THESE ALSO FOR DESIGN					
		10. Will public housing be needed for project								
					11. Is public housing available					
		12. Is it felt there will be adequate DDS housing available during relocation period								
					13. Will there be a problem of housing within financial means					
		14. Are suitable business sites available (list source)								
					15. Number months estimated to complete RELOCATION					

S. S. Stalls
 SUSAN STALLS & NANCY WILSON
 Relocation Agent

JUNE 17, 1991
 Date

[Signature]
 Approved
 Date 6-27-91

RELOCATION REPORT

North Carolina Department of Transportation

E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

CROSSOVER 2 ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT W-1: from McConnell Road to
 I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A 2500'± North of US 70 (2.6 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,
Multi-Lane facility on new location.

ESTIMATED DISPLACED					INCOME LEVEL						
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP		
Individuals											
Families	9	0	9	0	1	3	2	2	1		
Businesses	2	3	5	0	VALUE OF DWELLING			DSS DWELLINGS AVAILABLE			
Farms					Owners	Tenants	For Sale	For Rent			
Non-Profit					0-20M	\$ 0-150	0-20M	0	\$ 0-150		
ANSWER ALL QUESTIONS					20-40M	150-250	20-40M	78	150-250	348	
					EXPLAIN ALL "YES" ANSWERS					40-70M	6
	X	1. Will special relocation services be necessary			70-100	2	400-600	70-100	908	400-600	315
	X	2. Will schools or churches be affected by displacement			100 UP	1	600 UP	100 UP	604	600 UP	115
X		3. Will business services still be available after project			TOTAL	9	0	2086		1348	
X		4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.			REMARKS (Respond by Number)						
	X	5. Will relocation cause a housing shortage			All residential displacees counted as families.						
X		6. Source for available housing (list)			3. Business services will be available after project since there are similar businesses unaffected by this project.						
	X	7. Will additional housing programs be needed			4. (1) Bryant's True Value - retail lawn and garden center and hardware sales - medium - 10 to 12 employees.						
X		8. Should Last Resort Housing be considered			(2) Shop-Rite Super Mart - grocery store and gasoline sales (six gas pumps) - medium - 8 employees.						
	X	9. Are there large, disabled, elderly, etc. families			(3) Pro Sport Cards - buys, sells and trades sports cards - small - 2 employees.						
		ANSWER THESE ALSO FOR DESIGN			(4) Hicone Cleaners - drycleaning business which also sells gift baskets - small - 1 employee.						
		10. Will public housing be needed for project			(5) L. D. Ring, Inc. - road grading business - small - 2 employees.						
		11. Is public housing available			6. Multiple Listing Services, realtors and classified ads.						
		12. Is it felt there will be adequate DDS housing available during relocation period			8. As mandated by State Law.						
		13. Will there be a problem of housing within financial means			NOTE: Storage buildings, warehouses, abandoned buildings, unoccupied houses and closed businesses are not counted in above figures.						
		14. Are suitable business sites available (list source)									
		15. Number months estimated to complete RELOCATION									

Susan Stalls & Nancy Wilson
 SUSAN STALLS & NANCY WILSON
 Relocation Agent

JUNE 17, 1991
 Date

John Williams
 Approved
 Date 6-27-91
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RELOCATION REPORT

North Carolina Department of Transportation

X E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

CROSSOVER 2 ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT CR-2: from 2500'± North of
 I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A US 70 to Camp Burton Road (2.0 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,
 Multi-Lane facility on new location.

ESTIMATED DISPLACED					INCOME LEVEL							
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Individuals												
Families	7	1	8	0	1		1	5	1			
Businesses					VALUE OF DWELLING			DSS DWELLINGS AVAILABLE				
Farms					Owners	Tenants	For Sale	For Rent				
Non-Profit					0-20M	\$ 0-150	1	0-20M	0 \$ 0-150			
ANSWER ALL QUESTIONS					20-40M	150-250		20-40M	78	150-250	348	
					40-70M	1	250-400		40-70M	496	250-400	570
YES	NO	EXPLAIN ALL "YES" ANSWERS			70-100	5	400-600		70-100	908	400-600	315
	X				100 UP	1	600 UP		100 UP	604	600 UP	115
X		3. Will business services still be available after project			TOTAL	7		1		2086		1348
	X				4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.			REMARKS (Respond by Number)				
	X	5. Will relocation cause a housing shortage						All residential displacees counted as families.				
X					6. Source for available housing (list)			3. No businesses are being displaced on this segment.				
	X	7. Will additional housing programs be needed						6. Multiple Listing Services, realtors and classified ads.				
X					8. Should Last Resort Housing be considered			8. As mandated by State Law.				
	X	9. Are there large, disabled, elderly, etc. families						NOTE: Storage buildings, warehouses, abandoned buildings, unoccupied houses and closed businesses are not counted in above figures.				
ANSWER THESE ALSO FOR DESIGN												
		10. Will public housing be needed for project										
		11. Is public housing available										
		12. Is it felt there will be adequate DDS housing available during relocation period										
		13. Will there be a problem of housing within financial means										
		14. Are suitable business sites available (list source)										
		15. Number months estimated to complete RELOCATION										

SUSAN STALLS & NANCY WILSON
 Relocation Agent
 Form 15.4 Revised 5/90

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RELOCATION REPORT

North Carolina Department of Transportation

E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

PROJECT: 6.498003T COUNTY: Guilford
 I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A

CROSSOVER 2 ALTERNATE
 SEGMENT M-2: from Camp Burton Road to
 Briarmeade Road (1.8 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,
Multi-Lane facility on new location.

ESTIMATED DISPLACED					INCOME LEVEL						
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP		
Individuals											
Families	4	1	5	0		1		1	3		
Businesses					VALUE OF DWELLING		DSS DWELLINGS AVAILABLE				
Farms					Owners	Tenants	For Sale	For Rent			
Non-Profit					0-20M	\$ 0-150	0-20M	0 \$ 0-150	0		
ANSWER ALL QUESTIONS YES NO EXPLAIN ALL "YES" ANSWERS					20-40M	150-250	1	20-40M	78	150-250	348
					40-70M	250-400		40-70M	496	250-400	570
	X	1. Will special relocation services be necessary			70-100	1	400-600	70-100	908	400-600	315
	X	2. Will schools or churches be affected by displacement			100 UP	3	600 UP	100 UP	604	600 UP	115
	X	3. Will business services still be available after project			TOTAL	4			2086		1348
	X	4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.			REMARKS (Respond by Number)						
	X	5. Will relocation cause a housing shortage			All residential displacees counted as families.						
	X	6. Source for available housing (list)			3. No businesses are being displaced on this segment.						
	X	7. Will additional housing programs be needed			6. Multiple Listing Services, realtors and classified ads.						
	X	8. Should Last Resort Housing be considered			8. As mandated by State Law.						
	X	9. Are there large, disabled, elderly, etc. families			NOTE: Storage buildings, warehouses, abandoned buildings, unoccupied houses and closed businesses are not counted in above figures.						
ANSWER THESE ALSO FOR DESIGN											
		10. Will public housing be needed for project									
		11. Is public housing available									
		12. Is it felt there will be adequate DDS housing available during relocation period									
		13. Will there be a problem of housing within financial means									
		14. Are suitable business sites available (list source)									
		15. Number months estimated to complete RELOCATION									

S.E. Stalls New
 SUSAN STALLS & NANCY WILSON
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RELOCATION REPORT

North Carolina Department of Transportation

E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

CROSSOVER 2 ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT E-3: from Briarmeade Road to I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A Proposed Elm Street Extension (5.0 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop, Multi-Lane facility on new location.

ESTIMATED DISPLACED					INCOME LEVEL									
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP					
Individuals														
Families	27	4	31	0	6	9	10	6						
Businesses	7	0	7	0	VALUE OF DWELLING			DSS DWELLINGS AVAILABLE						
Farms					Owners	Tenants	For Sale		For Rent					
Non-Profit					0-20M	\$ 0-150	3	0-20M	0 \$ 0-150					
ANSWER ALL QUESTIONS					20-40M	6	150-250	1	20-40M	78	150-250	348		
					40-70M	13	250-400		40-70M	496	250-400	570		
YES	NO	EXPLAIN ALL "YES" ANSWERS			70-100	6	400-600		70-100	908	400-600	315		
	X				1. Will special relocation services be necessary	100 UP	2	600 UP		100 UP	604	600 UP	115	
X		2. Will schools or churches be affected by displacement	TOTAL			27		4		2086		1348		
X		3. Will business services still be available after project	REMARKS (Respond by Number)											
X		4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.	All residential displacees counted as families.											
	X	5. Will relocation cause a housing shortage	3. Business services will be available after project since there are similar businesses unaffected by this project.											
X		6. Source for available housing (list)	4. (1) Cardinal Chemicals, Inc. - retail agricultural chemical sales - small - 3 to 4 employees.											
	X	7. Will additional housing programs be needed	(2) Racquet World - racquetball sports center (playing courts) - small - 1 employee.											
X		8. Should Last Resort Housing be considered	(3) Pete's Body Shop - car body repair and wrecker service - small - 2 employees.											
	X	9. Are there large, disabled, elderly, etc. families	(4) Hicone Garage and Body Shop - auto repairs and body work - small - 5 employees.											
ANSWER THESE ALSO FOR DESIGN					(5) C & C Interiors - retail sales of vinyl, tile, parquet flooring, furniture and crafts - small - 4 employees.									
		10. Will public housing be needed for project	(6) Bait & Tackle Sales - sells minnows, crickets, etc. - small - 1 employee.											
		11. Is public housing available	(7) Taylor's Nursery - retail sales of shrubs etc. - small - 4 employees.											
		12. Is it felt there will be adequate DDS housing available during relocation period	6. Multiple Listing Services, realtors and classified ads.											
		13. Will there be a problem of housing within financial means	8. As mandated by State Law.											
		14. Are suitable business sites available (list source)												
		15. Number months estimated to complete RELOCATION												

S.E. Stalls
 SUSAN STALLS & NANCY WILSON
 Relocation Agent
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RELOCATION REPORT

North Carolina Department of Transportation

E.I.S. CORRIDOR DESIGN

RELOCATION ASSISTANCE

CROSSOVER 2 ALTERNATE

PROJECT: 6.498003T COUNTY: Guilford SEGMENT E-3: from Briarmeade Road to
 I.D. NO.: U-2525, U-2526 F.A. PROJECT: N/A Proposed Elm Street Extension (5.0 miles)

DESCRIPTION OF PROJECT: Greensboro Eastern and Northern Urban Loop,
Multi-Lane facility on new location.

ESTIMATED DISPLACED					INCOME LEVEL							
Type of Displacee	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Individuals												
Families	27	4	31	0	6	9	10	6				
Businesses	7	0	7	0	VALUE OF DWELLING			DSS DWELLINGS AVAILABLE				
Farms					Owners	Tenants	For Sale		For Rent			
Non-Profit					0-20M	\$ 0-150	3	0-20M	0 \$ 0-150			
ANSWER ALL QUESTIONS					20-40M	6	150-250	1	20-40M	78	150-250	348
					40-70M	13	250-400		40-70M	496	250-400	570
YES	NO	EXPLAIN ALL "YES" ANSWERS			70-100	6	400-600		70-100	908	400-600	315
	X				100 UP	2	600 UP		100 UP	604	600 UP	115
X		3. Will business services still be available after project			TOTAL	27		4		2086		1348
X					4. Will any business be displaced. If so, indicate size type, estimated number of employees, minorities, etc.			REMARKS (Respond by Number)				
	X	5. Will relocation cause a housing shortage						NOTE: Storage buildings, warehouses, abandoned buildings, unoccupied houses and closed businesses are not counted in above figures.				
X					6. Source for available housing (list)							
	X	7. Will additional housing programs be needed										
X					8. Should Last Resort Housing be considered							
	X	9. Are there large, disabled, elderly, etc. families										
					10. Will public housing be needed for project							
		11. Is public housing available										
					12. Is it felt there will be adequate DDS housing available during relocation period							
		13. Will there be a problem of housing within financial means										
					14. Are suitable business sites available (list source)							
		15. Number months estimated to complete RELOCATION										

SE Stalls
 SUSAN STALLS & NANCY WILSON
 Relocation Agent
 Form 15.4 Revised 5/90

[Signature]
 JUNE 17, 1991
 Date

Approved _____ Date _____
 Original & 1 Copy: State Relocation Agent
 2 Copy: Area Relocation File

APPENDIX C

PUBLIC INVOLVEMENT

- C-1 Newsletters
- C-2 Meetings with Public

GREENSBORO EASTERN/NORTHERN URBAN LOOP

First in a
series of public
information
newsletters.

September 1990

Issue No. 1

Greensboro Eastern/Northern Urban Loop Study Begins

For approximately the next two years, the North Carolina Department of Transportation, in cooperation with the City of Greensboro and Guilford County, will be studying alternative routes for the eastern and northern section of the Greensboro Urban Loop facility. The Eastern/Northern Urban Loop will extend between the proposed I-85 Bypass and Lawndale Drive (see map inside), a distance of approximately 13 miles. The proposed multi-lane facility joins I-85 in the south at the proposed I-85 Greensboro Bypass and ends at Lawndale Drive between Lake Jeanette Road and Lake Brandt Road.

Several alternative corridors for the Eastern/Northern Urban Loop are being identified, including a "do-nothing" (project not built) alternative. These alternatives will be evaluated in the study to determine their environmental, social, economic, and traffic impact on the surrounding area. The study area for the Eastern/Northern Urban Loop is located generally east and north of Greensboro as shown on the map.

The study will include data collection, public involvement, traffic and environmental analyses, engineering studies, and coordination with state, local, and federal agencies. A project location planning report/environmental impact statement will be published as part of the study. Ultimately, one alternative will be recommended based on the results of the study.

Kimley-Horn and Associates To Perform Study

The North Carolina Department of Transportation selected Kimley-Horn and Associates, Inc., a consulting engineering, planning, and surveying firm, to study several possible routes for the proposed Greensboro Eastern/Northern Urban Loop. Kimley-Horn will develop and evaluate alternatives to determine which ones are technically feasible, environmentally sound, and acceptable to the community. Barton J. Barham is Kimley-Horn's designated project manager. Project coordinator for the North Carolina Department of Transportation is Richard Davis.

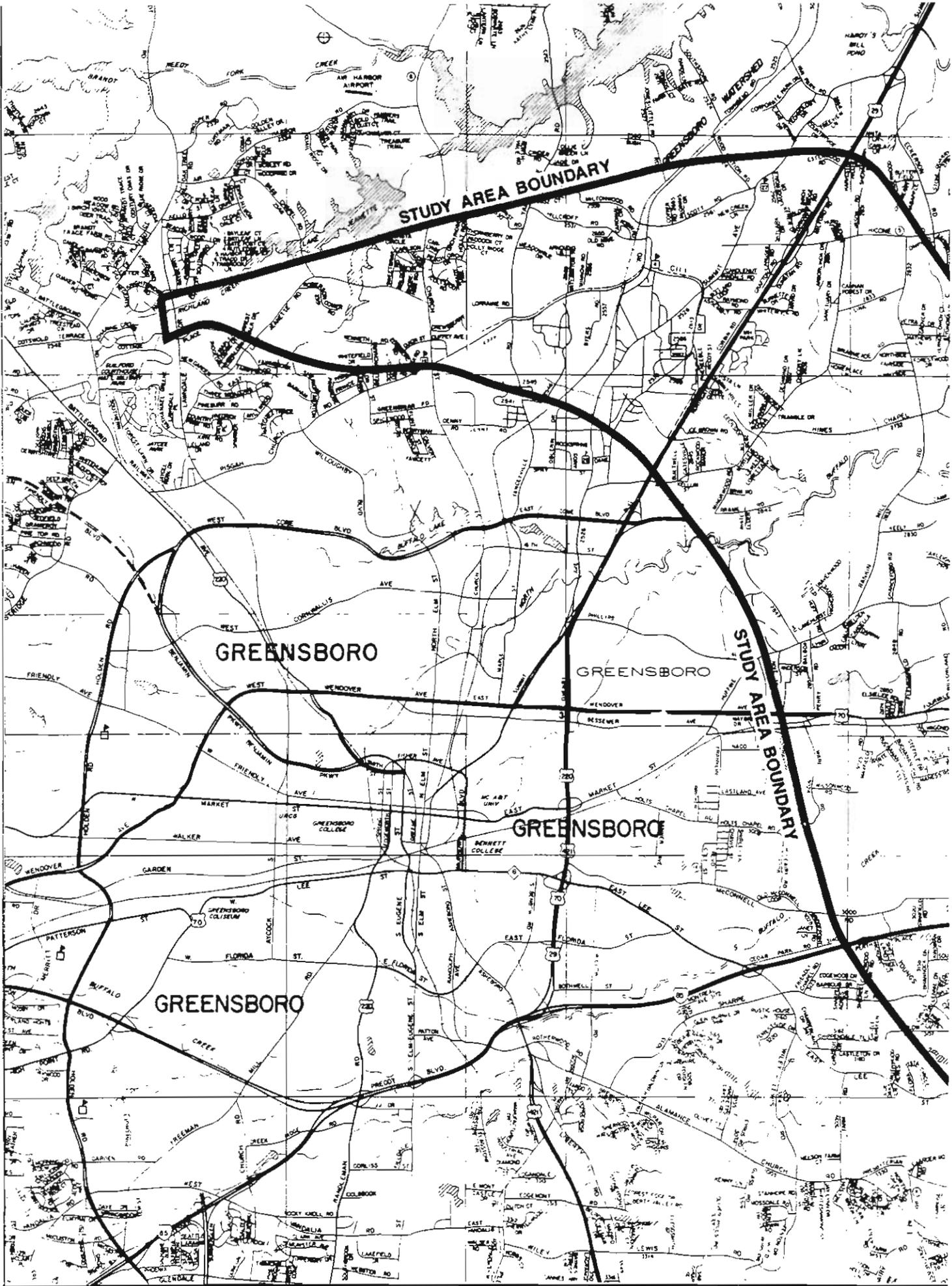
Study Includes Extensive Public Involvement Program

The suggestions and concerns of the citizens of Greensboro are important to the study. The public involvement program offers many opportunities to gather your views and ideas and to keep you aware of progress on the Greensboro Eastern/Northern Urban Loop study. The public involvement program includes newsletters, public meetings, small group meetings, and an INFOLINE phone line.

Newsletter

Throughout the study, Kimley-Horn will issue periodic newsletters such as this one to keep the public informed on the study's progress and to announce public meetings. You or a neighbor can be added to the newsletter mailing list by filling out the enclosed response form or simply by calling the project INFOLINE at 333-2520.

Continued on back



STUDY AREA BOUNDARY

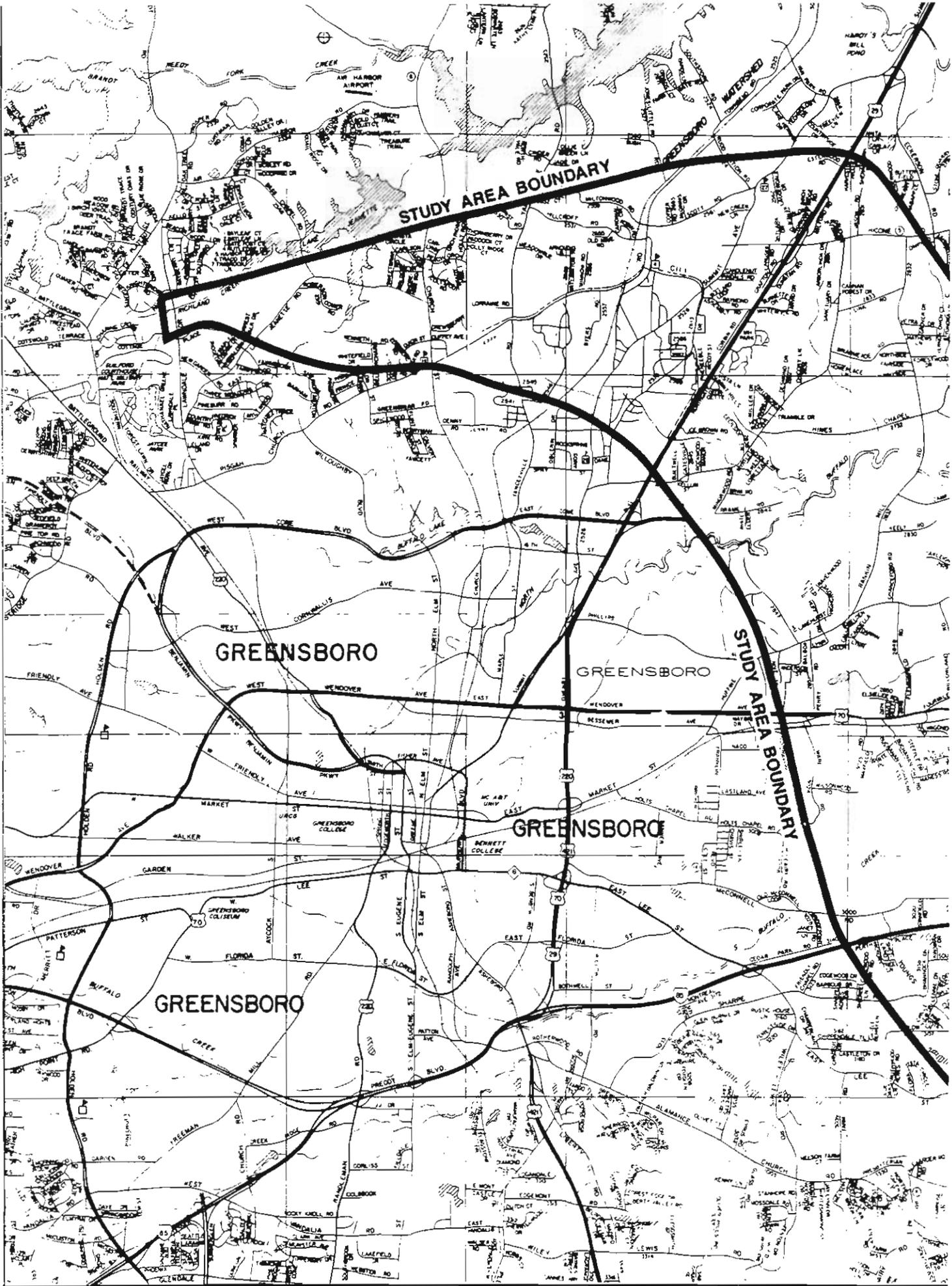
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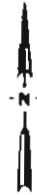
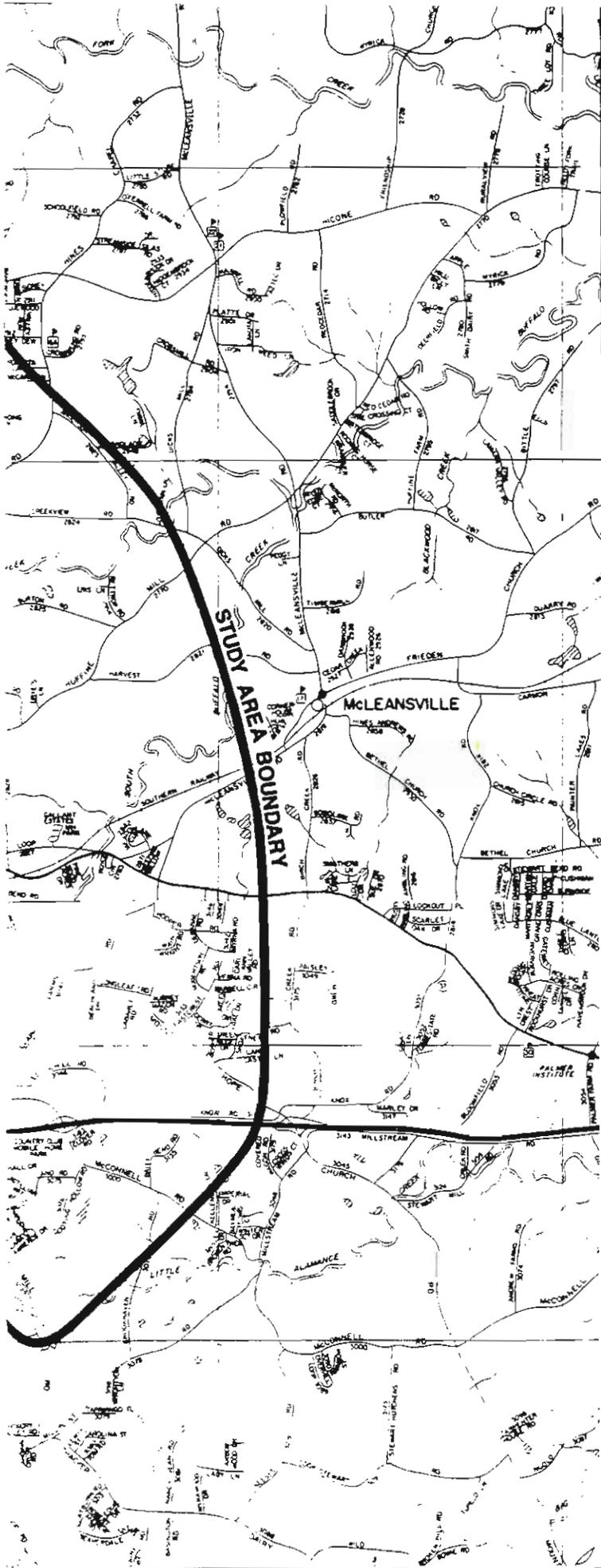
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STUDY AREA BOUNDARY



GREENSBORO EASTERN/NORTHERN URBAN LOOP

STUDY AREA



September 1990

Kimley-Horn

Public Events

You are strongly encouraged to attend these meetings to share your ideas and offer valuable suggestions about the project.

- **Area-wide public meetings.** Two public meetings will take place during the study. The first one will be in the early stage of the project while the second one will be after alternatives have been refined and evaluated. At both meetings engineers and planners will be available to answer questions and address public concerns.
- **Small group meetings.** Throughout the study, Kimley-Horn engineers will be available to meet with local citizen groups to discuss the issues. Concerned groups can arrange a meeting by calling the project INFOLINE. Please allow at least ten days for the meeting to be arranged. Groups will be responsible for providing a meeting place.
- **Public workshop/hearing.** Kimley-Horn will publish an environmental impact statement (EIS) that will discuss the impact that each alternative route would have on the environment, including the "do-nothing" alternative. Following the completion of the Draft EIS in mid-1991 the consultant will sponsor a public workshop where you may review the Draft EIS and detailed maps of the alternatives. Public input will be invited at the subsequent formal public hearing.

INFOLINE Offers Speedy Answers

Information is just a phone call away. You can call Kimley-Horn's local "INFOLINE" Monday through Friday, from 8:00 AM to 5:00 PM. An engineer will be available to discuss the project or accept comments. The INFOLINE number is 333-2520.

You can also mail letters and written comments to:

Mr. Barton J. Barham, P.E.
Kimley-Horn and Associates, Inc.
Post Office Box 33068
Raleigh, NC 27636-3068

or

Mr. Richard Davis, P.E.
North Carolina Department of Transportation
Planning and Environmental Branch
P.O. Box 25201
Raleigh, NC 27611

First Public Meeting Set

The first public meeting on this project will be held on September 18 from 4:00 PM to 8:00 PM in the Brightwood Elementary School Multipurpose Room, located at 2500 Lee's Chapel Road.

Members of the project team and City and County staff will be on hand to explain the study, answer questions, and listen to your comments. You are welcome to stop by any time during the scheduled hours. The peak times tend to be right after supper from 6:30 PM to 7:30 PM so consider visiting later or earlier in the day to ensure one-on-one attention.

GREENSBORO EASTERN/ NORTHERN URBAN LOOP

Second in a
series of public
information
newsletters.

February 1991

Issue No. 2

Alternatives Selected for Detailed Study

After six months of studying possible routes for the Greensboro Eastern/Northern Urban Loop, Kimley-Horn and Associates, Inc. has begun a detailed study of three principal alternatives as well as a no-build alternative. These three alternatives are described below and illustrated on the map inside this newsletter.

Common North Segment

The north segment, common to all three alternatives, begins at Lawndale Drive near Richland Creek. This segment proceeds to the east, crossing Lake Jeanette Road and then Church Street between Lees Chapel Road and Lake Jeanette Road.

Western Alternative

The western alternative continues from the common north segment roughly paralleling Lees Chapel Road. The alignment turns to the southeast as it passes to the south of Brightwood Elementary School. The western alternative then crosses Summit Avenue, US 29 near Lakeview Memorial Park, and McKnight Mill Road. After crossing Rankin Mill Road near its intersection with Huffine Mill Road, the western alternative proceeds south, crossing Wendover Avenue (US 70) near Buchanan Church Road. The western alternative terminates at an interchange on I-85 near the Youngs Mill Road crossing of I-85.

Middle Alternative

The middle alternative splits from the common north segment at Yanceyville Road and passes to the north of Brightwood Elementary School. Continuing in a southeast direction, the middle alignment crosses Summit Avenue, US 29 near Assembly Road, McKnight Mill Road, Hines Chapel Road, and Rankin Mill Road between Hines Chapel Road and Camp Burton Road. After crossing Camp Burton Road in the vicinity of the State Prison Camp, the middle alternative continues south, crossing Huffine Mill Road and Wendover Avenue (US 70) along Four Mile Loop Road. Proceeding south, the middle alternative intersects between

the McConnell Road interchange and the Hope Church Road interchange.

Eastern Alternative

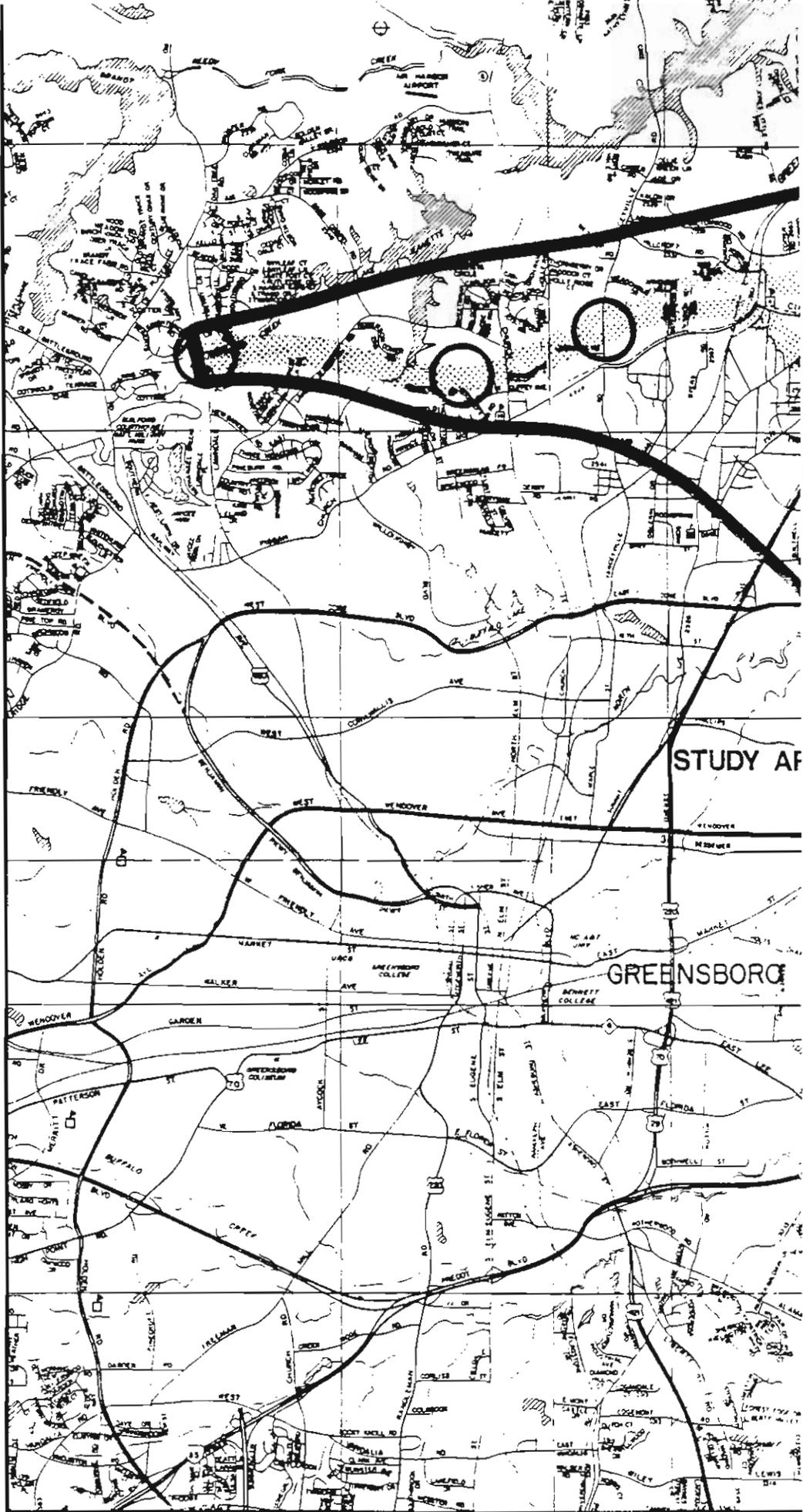
The eastern alternative follows the same alignment as the middle alternative until it turns to the east between McKnight Mill Road and Hines Chapel Road. After crossing Hines Chapel Road, this alternative angles to the south, crossing Creekview Road and Camp Burton Road. The eastern alternative then turns to the southeast and crosses Huffine Mill Road, the Southern Railway line, and McLeansville Road. This alternative proceeds south after crossing Wendover Avenue (US 70) east of McCleansville Road and intersects I-85 at an interchange between the McConnell Road and Hope Church Road interchanges.

Crossovers

Several crossovers are included in the routes to be studied. One crossover provides a transition from the middle alternative to the western interchange with I-85. This northern crossover splits from the middle alternative near Camp Burton Road and proceeds south intersecting the western alternative just north of Wendover Avenue (US 70). The second crossover serves as a transition from the western alternative to the eastern interchange with I-85. This crossover crosses Wendover Avenue (US 70) near Buchanan Church Road and continues southeast, crossing Clapp Farm Road. The southern crossover intersects I-85 between the McConnell Road interchange and the Hope Church Road interchange.

Further Study

As the next step in this study, Kimley-Horn will analyze, in detail, the impacts of each of the alternatives on the natural and human environment. Among the factors to be considered are traffic, noise, air quality, wetlands, farmland, relocations, archaeology, historic sites, and economic impact. Further study may necessitate adjusting or refining the corridor alignments. The draft environmental impact statement (DEIS) will present the analysis of the alternatives studied. Following the corridor public hearing, one alternative will be selected. The final environmental impact statement (FEIS) will discuss the impacts of the selected alternative.

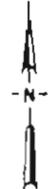


**GREENSBORO
EASTERN/NORTHERN
URBAN LOOP**

PRELIMINARY

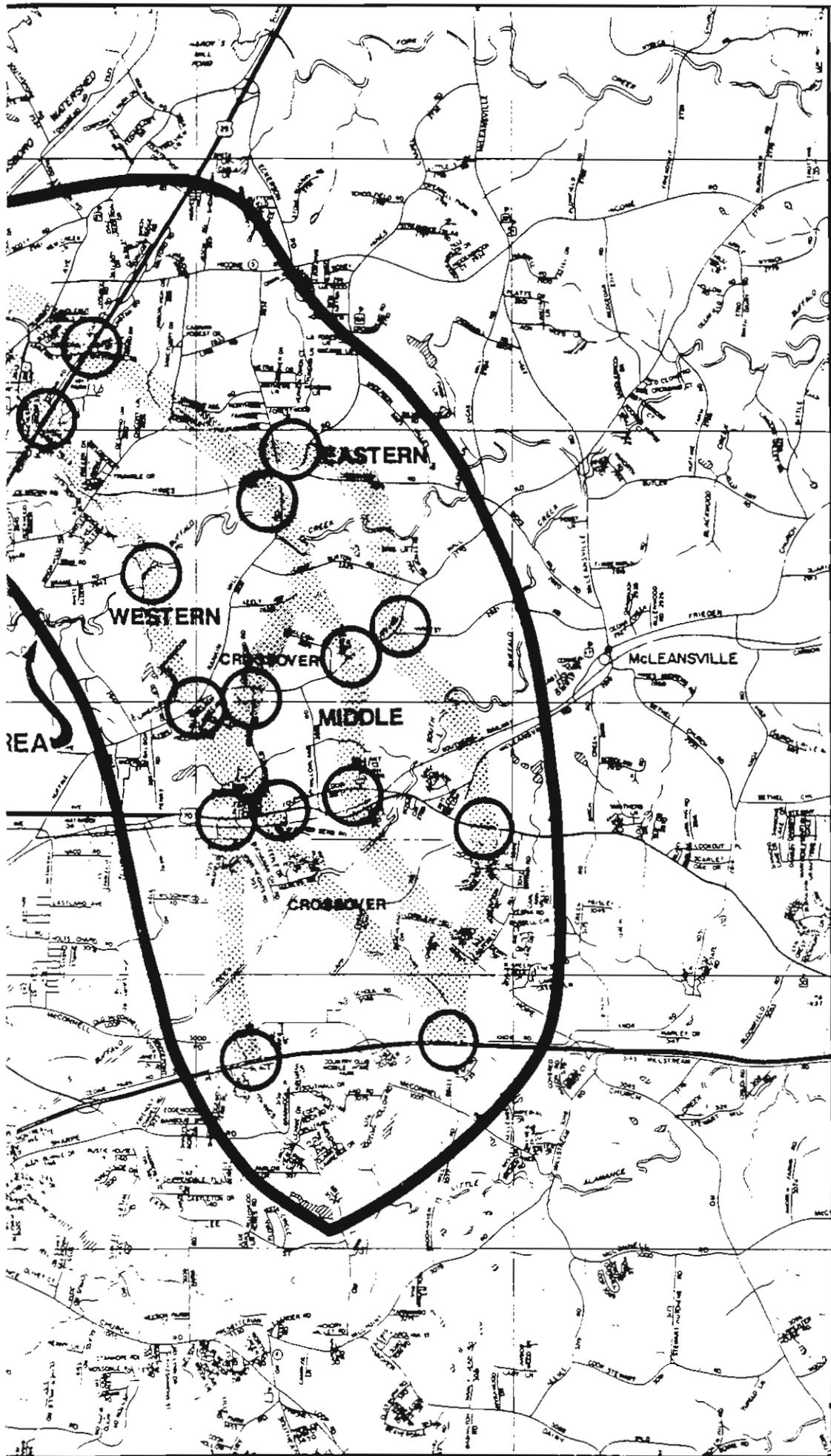
**SUBJECT TO
CHANGE
WITHOUT NOTICE**

 - INTERCHANGE



Kimley-Horn

FEBRUARY 91



Public Involvement Encouraged

An extensive public information program is planned to keep citizens aware of progress on the Greensboro Eastern/Northern Urban Loop study. Citizens will have numerous opportunities to attend public information meetings and express their concerns and offer suggestions. The following public information events are planned:

- **Second public meeting schedule.** The second public meeting for the Greensboro Eastern/Northern Urban Loop Study has been scheduled for March 6, 1991. The meeting will be held at the Brightwood Elementary School, located at 2500 Lees Chapel Road. The public is invited to drop in between 4:00 PM and 8:00 PM. Engineers, planners, and NCDOT representatives will be available to answer questions and address public concerns.
- **Small group meetings.** Throughout the study, Kimley-Horn engineers and planners will be available to meet with groups to discuss the issues. Concerned groups can arrange a meeting by calling the project hotline: 333-2520. Please call at least ten days in advance and provide a meeting place.
- **Public workshop/hearing.** Kimley-Horn will publish an environmental impact statement that will discuss the impact that each alternative route would have on the environment. Following the completion of a draft of this report, a public workshop will be held to discuss in detail the consultant's findings. Public comments will be received at the subsequent public hearing.

Dates for these and all other public information events will be published in future newsletters. Citizens can get on the newsletter mailing list by calling the project hotline -- 333-2520.

Hotline Offers Speedy Answers

Information is just a phone call away. Citizens can call Kimley-Horn's local "hotline" Monday through Friday, from 8:00 AM to 5:00 PM. An engineer will be available to discuss the project or accept comments. The hotline number is 333-2520.

Letters and written comments can be mailed to:

Mr. Barton J. Barham, P.E.
Kimley-Horn and Associates, Inc.
Post Office Box 33068
Raleigh, North Carolina 27636-3068

or
Mr. Richard Davis
Planning and Environmental Branch
North Carolina Department of Transportation
Post Office Box 25201
Raleigh, North Carolina 27611

Key Dates

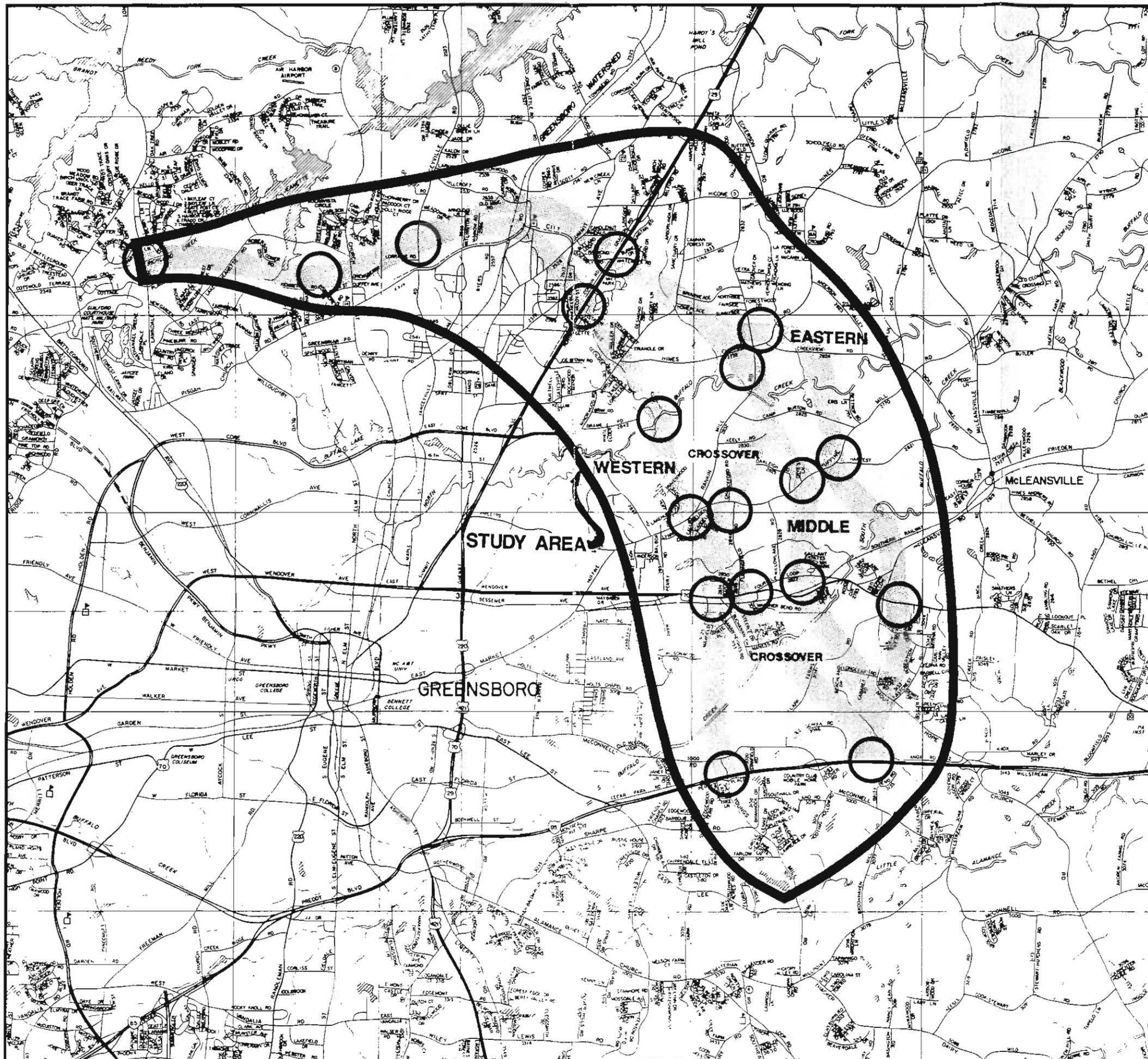
Second Public Meeting	March 6, 1991
Draft EIS Complete	July 1991
Public Workshops	August 1991
Public Hearing	September 1991
Final EIS Complete	May 1992

How Can You be Involved?

- Call the hotline at 333-2520
- Attend the meetings/workshops and offer your suggestions
- Attend the public hearing
- Get your name on the mailing list to receive the newsletters

Greensboro Eastern/Northern Urban Loop
Kimley-Horn and Associates, Inc.
Post Office Box 33068
Raleigh, NC 27636-3068

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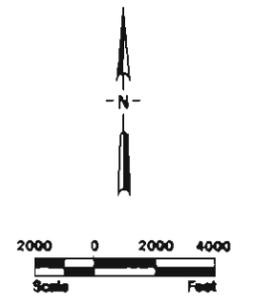


**GREENSBORO
EASTERN/NORTHERN
URBAN LOOP**

PRELIMINARY

**SUBJECT TO CHANGE
WITHOUT NOTICE**

 **INTERCHANGE**



Kimley-Horn

FEBRUARY 1991

C-2 Meetings with Public

GREENSBORO EASTERN/NORTHERN URBAN LOOP

A General Overview of the Process and How You Can Be Involved

An extensive public involvement plan has been developed to keep citizens involved in the study process. This program consists of public meetings, small group meetings, elected officials meetings, periodic newsletters, and a telephone hotline. A formal public hearing will also be held.

The first public meeting will be held while study lines are being developed. A "draw your own line" map will be available to allow citizens an opportunity to show their own corridor location. At all public meetings, comment sheets will be available for citizens to provide any suggestions, comments, or information. By adding your name and address to the public comment form, you will automatically be added to the newsletter mailing list to receive information on the project. You can also get on the newsletter mailing list by calling the study hotline number at 333-2520.

After the first public meeting, Kimley-Horn engineers will be evaluating the suggested study lines and developing up to three alternatives most feasible and prudent for detailed analysis. A "no-build" alternative will also be studied.

The detailed analysis will consist of evaluation of factors such as the location of parks, recreation areas, schools, and churches; community, business, residential, and other displacements; neighborhood cohesion; archaeological and historical resources; wetlands, floodways, floodplains; hazardous materials sites; threatened and endangered species; flora and fauna, water quality, air quality, noise, land use, constructability, traffic service, and cost. A second public meeting (to be announced at a later date) will be held when these analyses are near completion.

At this second public meeting, citizens will again have a chance to provide comments and ask questions in an informal, workshop atmosphere. Several months after the public meeting, a Draft Environmental Impact Statement (DEIS) will be available for review at various locations. Watch your local newspaper and the newsletter for specific dates, times, and places.

After approval of the DEIS, a corridor public hearing will be held. This will provide an opportunity for citizens to officially comment on the corridors. Approximately one to two weeks before the formal hearing, a public workshop meeting will be held to allow citizens a chance to view the corridor hearing map and ask questions.

The Final Environmental Impact Statement will then be prepared and one recommendation made for the preferred alignment.

Throughout the anticipated two-year study period, Kimley-Horn engineers will be available to make presentations to groups. These groups will need to contact Kimley-Horn at least ten days in advance of the meeting and arrange a location for the group presentations.

A hotline telephone number is set up to put you in touch with Kimley-Horn engineers. This number is 333-2520.

PROJECT SCHEDULE

First Public Meeting	September 18, 1990
Second Public Meeting	February 1991
Draft EIS Complete	July 1991
Public Workshop	August 1991
Public Hearing	September 1991
Final EIS Complete	May 1992

HELP PLAN THE EASTERN/NORTHERN URBAN LOOP

You can help in the planning process by asking questions, providing information, and stating your concerns. Please complete this sheet, fold, stamp, and tape the form, then send it to Kimley-Horn.

1. What general comments do you have? _____

2. Are you aware of any significant environmental constraint that might affect this project if it were to be constructed in the study area that has been identified? _____

3. Are you a member of a community or neighborhood organization? If yes, which one? (Include mailing address if known.) _____

4. Do you have suggestions for future newsletter articles?

5. Do you have friends or neighbors who would like to be added to the study mailing list? If so, please fill out this section for them. If you received this newsletter in the mail, you are already on our mailing list.

APPENDIX D
GLOSSARY OF TECHNICAL TERMS

APPENDIX D

GLOSSARY OF TECHNICAL TERMS

abatement	to lessen negative impacts on noise, air, etc.
access-controlled	allowing vehicles to enter a roadway only at certain interchanges, with no access to adjacent land
adverse impact	negative effect
alignment	a possible road location within a corridor
arterial	major road with some access to adjacent land
circuitous	curvy, indirect
circumferential	bypassing, encircling
confluence	point where two or more streams meet
displacement	process by which a business or residence is relocated because its existing location is needed for a transportation project
effluent	discharge, normally from water/sewage treatment plants
expressway	high-speed, multi-lane road with access partially or fully controlled
floodplain	area that floods an average of once during a 100-year period
freeway	multi-lane road designed for through movement with access limited to interchanges (fully-controlled access)
level-of-service	<p>Six levels of service are defined for each type of facility for which analysis procedures are available. They are given letter designations, from A to F, with level-of-service A representing the best operating conditions and level-of-service F the worst.</p> <p>1. <i>Level-of-service definitions</i> - In general, the various levels of service are defined as follows for uninterrupted flow facilities:</p> <p><i>Level-of-service A</i> represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to maneuver within the traffic stream is extremely high. The general level of comfort and convenience provided to the motorist, passenger, or pedestrian is excellent.</p> <p><i>Level-of-service B</i> is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver within the traffic</p>

stream from LOS A. The level of comfort and convenience provided is somewhat less than at LOS A, because the presence of others in the traffic stream begins to affect individual behavior.

Level-of-service C is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. The selection of speed is now affected by the presence of others, and maneuvering within the traffic stream requires substantial vigilance on the part of the user. The general level of comfort and convenience declines noticeably at this level.

Level-of-service D represents high-density, but stable, flow. Speed and freedom to maneuver are severely restricted, and the driver or pedestrian experiences a generally poor level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level.

Level-of-service E represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Freedom to maneuver within the traffic stream is extremely difficult, and it is generally accomplished by forcing a vehicle or pedestrian to "give way" to accommodate such maneuvers. Comfort and convenience levels are extremely poor, and driver or pedestrian frustration is generally high. Operations at this level are usually unstable, because small increases in flow or minor perturbations within the traffic stream will cause breakdowns.

Level-of-service F is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations. Operations within the queue are characterized by stop-and-go waves, and they are extremely unstable. Vehicles may progress at reasonable speeds for several hundred feet or more, then be required to stop in a cyclic fashion. Level-of-service F is used to describe the operating conditions within the queue, as well as the point of the breakdown. It should be noted, however, that in many cases operating conditions of vehicles or pedestrians discharged from the queue may be quite good. Nevertheless, it is the point at which arrival flow exceeds discharge flow which causes the queue to form, and level-of-service F is an appropriate designation for such points.

mainline volume	volume of through traffic on a main road
master plan	general long-range plan for growth in a certain area, covering land use, transportation needs, and other elements
merge	to combine two traffic lanes into one
mitigation	measures taken to reduce negative effects of construction and constructed facilities
multi-modal	combination of transportation types such as air, rail, bus, auto, etc. a new layer of pavement

pavement milling	process of grinding off the top layer of pavement, treating it, and reapplying it as an alternative to adding new pavement
plat	registration with authorities of a parcel of land designated for development
radial	direct route to and from a central location
ridgeline	highest point between two watersheds where runoff water could head either direction
runoff	rainwater that is not absorbed and runs across the surface, carrying particles with it
siltation	process by which sediment from erosion is deposited and accumulates in a watershed (such as a lake), reducing the volume of water that can be stored
terminus (termini)	end point(s)
thoroughfare plan	a comprehensive system of existing and proposed roads designed to collectively meet the current and future travel demands of an area in a safe and efficient manner
transportation system management (TSM)	system of low-cost techniques to maximize the capacity of existing transportation facilities (such as adding turn lanes or high occupancy vehicle lanes, improvements to signals, etc.)
watershed	the entire area of land that drains runoff into a tributary or stream
weaving	crossing of two or more traffic streams travelling in the same general direction
wetlands	areas saturated with ground or surface water often enough and long enough to maintain certain vegetation which is adapted to saturated soil conditions (such as swamp, marsh, or bog)