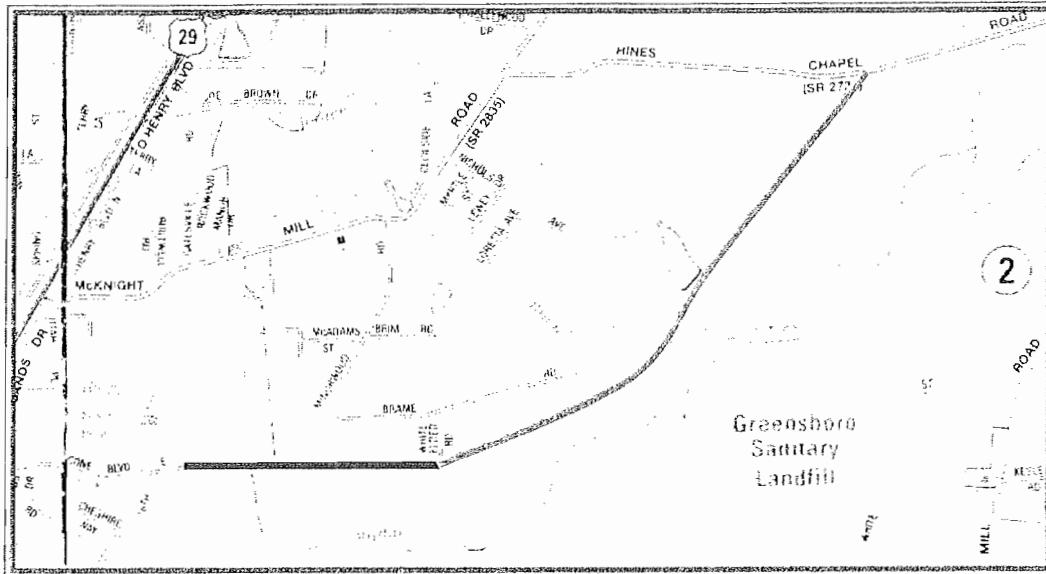


FINAL FEASIBILITY STUDY

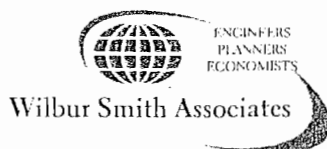
CONE BOULEVARD EXTENSION / EASTERN URBAN LOOP INTERCHANGE Guilford County-Division 7



Prepared For:

CITY OF GREENSBORO DEPARTMENT OF TRANSPORTATION
&
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

Prepared by:



August 17, 2004

FINAL FEASIBILITY STUDY

CONE BOULEVARD EXTENSION / EASTERN URBAN LOOP INTERCHANGE

Prepared For:

**City of Greensboro Department of Transportation
&
North Carolina Department of Transportation**

Prepared By:

Wilbur Smith Associates

August 17, 2004
(WSA Project No. 390650)

I. GENERAL DESCRIPTION

This Feasibility Study describes the proposed development of a future interchange at the proposed extension of Cone Boulevard to tie into Hines Chapel Road in northeast Greensboro, North Carolina. This would require the construction of a major east-west connector street and the construction of an interchange at the crossing of the Greensboro Eastern Urban Loop (North Carolina DOT TIP Project U-2525). The project location is shown in Figure 1.

The Greensboro Urban Area Thoroughfare Plan includes an interchange at this location. An interchange was not considered at this location as part of the U-2525 Environmental Impact Statement due to the lack of definitive plans to extend Cone Boulevard to Hines Chapel Road.

As part of this study, only one corridor was evaluated for the proposed extension of Cone Boulevard from Nealtown Road to Hines Chapel Road. This is due to the length of this proposed extension, the presence of the North Buffalo Creek, and the location of existing structures on the south side of Hines Chapel Road west of the proposed alignment of the Eastern Urban Loop.

Two construction alternatives were considered as follows the proposed Cone Boulevard Extension / Eastern Loop Interchange:

- **Alternative #1:** Construct a diamond interchange at this location with ramp terminal intersections located along the proposed Cone Boulevard Extension.
- **Alternative #2:** Construct a Single Point Urban Interchange (SPUI) with the ramp terminal intersections located along the proposed Cone Boulevard Extension. This alternative was considered due to the projected spacing between the northbound exit ramp on the Eastern Loop and Rankin Mill Road.

This feasibility study is the initial step in the planning and design process for this project. The Greensboro Department of Transportation (GDOT) commissioned this study to explore the possibility of entering this project into the North Carolina Department of Transportation (NCDOT) Transportation Improvement Program (TIP) process. The purpose of this feasibility study is to develop information that can be used in determining future priorities by the Greensboro Metropolitan Planning Organization (MPO) and information needed to move this project into a project implementation phase through the following items:

- Project Need
- Project Description
- Preliminary Environmental Screening Information
- Project Cost Estimate
- Identification of "project stopping concerns"



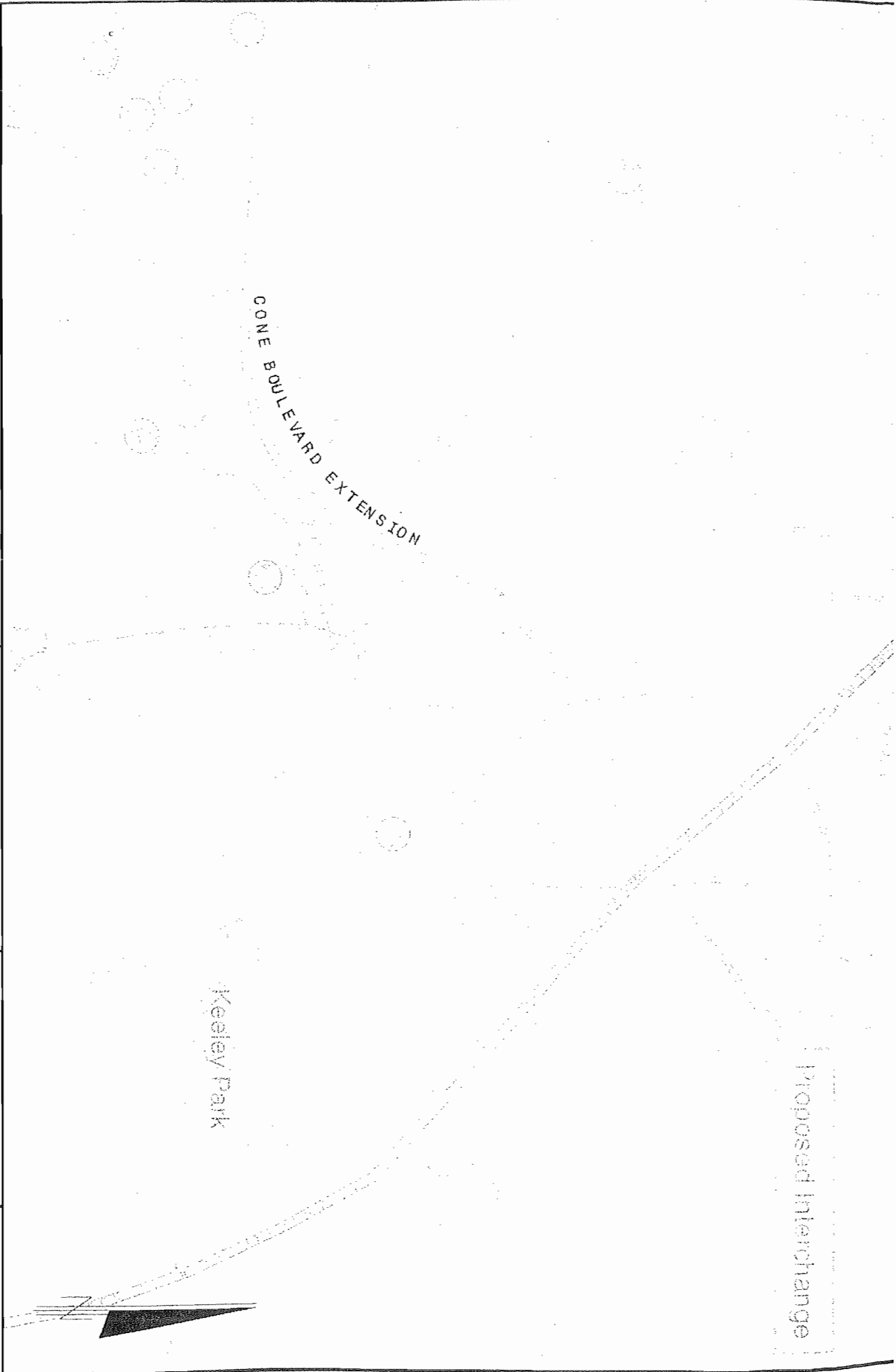
Wilbur Smith Associates
 ENGINEERS
 PLANNERS
 ECONOMISTS

7015 ALBERT PICK ROAD, SUITE H
 GREENSBORO, NORTH CAROLINA 27419
 TELE : (336) 668-4227
 FAX : (336) 668-4258

PROPOSED PROJECT
 CONE BOULEVARD EXTENSION
 GREENSBORO, NORTH CAROLINA

PROJECT LOCATION

FIGURE: 1
 SCALE: NONE



II. BACKGROUND INFORMATION

General

This interchange is included on the Greensboro Urban Area Thoroughfare Plan. As part of the Environmental Impact Statement (EIS) for the Greensboro Eastern Urban Loop, the need for an interchange at the proposed location was not considered. This is due to the fact that the Cone Boulevard Extension project was not programmed for construction at that time. There is a distance of approximately 3.25 miles between the Huffine Mill Road and the US 29 interchanges along the Eastern Urban Loop. The proposed Cone Boulevard Extension interchange is located approximately midway between the proposed interchanges at US 29 and Huffine Mill Road.

A significant amount of commercial development is currently in the planning process on Cone Boulevard east of US 29. Additionally, land use planners anticipate additional commercial development in the immediate vicinity of this proposed interchange. The City of Greensboro has expressed concerns with the lack of access to the Eastern Urban Loop from Cone Boulevard. In 2003 the General Assembly added an interchange with the Cone Boulevard Extension to the legal description of the Greensboro Urban Loop.

The City of Greensboro has approved the funding of extending Cone Boulevard from 16th Street to Nealtown Road and extending Nealtown Road from White Street to Cone Boulevard. This represents a major step in the City's long range plans to extend Cone Boulevard to Hines Chapel Road.

Greensboro Connections 2025 Comprehensive Plan

In March 2003, the City of Greensboro adopted a comprehensive plan following extensive public involvement and a thorough assessment of community issues, and their inter-relationships, including transportation, land use, and environmental quality. The Plan serves as a guide for future growth and development. The area in the vicinity of the proposed extension of Cone Boulevard to Hines Chapel Road is included on the future land use map in the second growth tier; ie between 10 and 20 years in the future. A key theme of the plan as well as recent City Council policy is the promotion of economic development in the eastern areas of Greensboro and a balancing of future development around the City of Greensboro.

The Connections 2025 Comprehensive Plan recommended the creation of improved roadway networks in under-served and under-connected areas like northeast Greensboro as well as strategic widenings and extensions of existing roadways, primarily to reduce bottlenecks and eliminate gaps in the system such as this one. Furthermore, this plan recommended that the City target specific roadway improvements which would provide better access for areas such as East Greensboro. The findings of this feasibility study are fully consistent with Greensboro's Comprehensive Plan.

Carolina Circle Mall Area Redevelopment

The GDOT staff has been contacted by the development community to provide information regarding projects on both sides of Cone Boulevard in the vicinity of the Carolina Circle Mall. Specifically, it is proposed that two "big box" developments could be constructed on the present mall site. Future access to the Eastern Urban Loop is critical to the success of these projects. Information provided by GDOT and the transportation modeling consultant indicates the proposed development could generate as many as 31,000 trips per day onto Cone Boulevard generally between US 29 and 16th Street.

Planned Projects

There are two planned transportation improvement projects in the general vicinity of this proposed interchange as follows:

- Greensboro Eastern Urban Loop (Wendover Avenue to US 29, NCDOT Transportation Improvement Project U-2525)
Current plans for this project include a interchange with Huffine Mill Road, grade separations at Hines Chapel Road and McKnight Mill Road, and an interchange at US 29. This project is currently scheduled to begin in 2009.
- Cone Boulevard / Nealtown Road Project
The City of Greensboro plans to extend Cone Boulevard from 16th Street to Nealtown Road. Additionally, Nealtown Road will be extended from White Street to Cone Boulevard. This project is considered the next phase in extending Cone Boulevard to the Eastern Urban Loop. It is scheduled for construction in 2005.

III. PURPOSE AND NEED

Based on discussions with the City of Greensboro Department of Transportation, our assessment of projected traffic and land uses in this area, our understanding of the City's economic development goals, and the need for extending Cone Boulevard to Hines Chapel Road and providing an interchange at the proposed crossing of Cone Boulevard - Hines Chapel Road at the Eastern Urban Loop is as follows:

- Improve traffic safety along streets in the study area by providing alternative accesses to major transportation facilities.
- Improve mobility and access in this area of Greensboro by providing access to the Eastern Urban Loop via the proposed Cone Boulevard-Hines Chapel Road Connector.
- Provide opportunities for promoting economic development in eastern Greensboro by providing major transportation infrastructure improvements.
- Provide access to services planned in the vicinity of the US 29 / Cone Boulevard interchange.
- Improve pedestrian and bicycle safety by including the provision for sidewalks and bike lanes or separate bike paths along Buffalo Creek.
- Improve aesthetics along the Cone Boulevard corridor by providing a median and opportunities for landscaping along the section of roadway.

IV. PROJECTED TRAFFIC VOLUMES / LEVEL OF SERVICE

To provide an estimate of the projected 2030 traffic volumes, the City of Greensboro DOT contracted the firm of Martin / Alexiou / Bryson (MAB) to prepare a technical memorandum and traffic forecasts for the proposed Cone Boulevard Extension project and interchange at this location. The technical memorandum is included in the Appendix and summarizes the assumptions, methodology, and results of the traffic forecasts.

The traffic forecasts for this project are derived from the Piedmont Triad Regional Travel Demand Model (PTRTDM). The PTRTDM was updated in 2003 to reflect revised socio-economic estimates and forecasts. Models are available for 2000 (base year) and 2030

(LRTP/"Air Quality"). In addition, a 2004 base year network and a 2030 "Existing + Committed" (E+C) network have been prepared as part of the 2030 LRTP update.

It is estimated that the Cone Boulevard Extension will carry approximately 19,600 vehicles per day (east of Nealtown Road) and 20,200 vehicles per day (east of Eastern Urban Loop) in 2030.

The following projects were assumed completed and are included in the future year network:

- Greensboro Urban Loop
- Extension of Nealtown Road to Cone Boulevard

In addition to projecting the 2030 daily traffic volumes for the proposed extension of Cone Boulevard, MAB projected the AM and PM peak hour traffic volumes at key locations along the proposed Cone Boulevard-Hines Chapel Road project. These volumes were used in performing a projected Peak Hour Synchro analysis which assumed a peak hour factor of 0.10 and a directional split of 0.60. The result of our analysis for Alternative A is as follows:

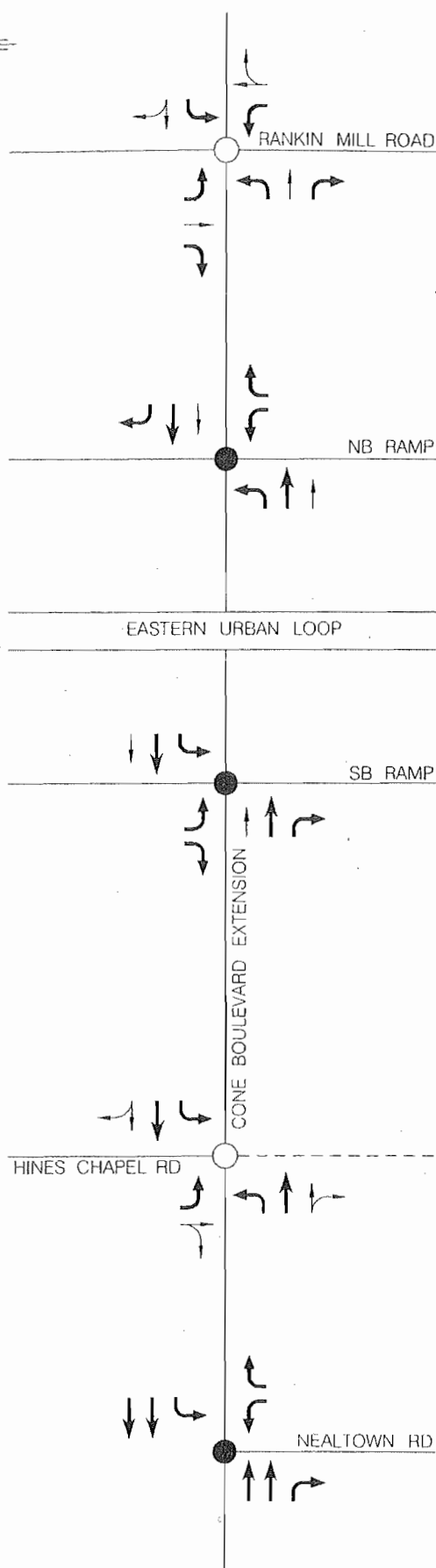
Level-of-Service Summary (Delay in sec)		
Intersection	2030 AM Peak Hour LOS (Delay)	2030 PM Peak Hour LOS (Delay)
Cone Boulevard / Nealtown Road	C (24.7)	B (18.5)
Cone Boulevard / Hines Chapel Road	B (18.3)	C (24.5)
Hines Chapel Road / Eastern Loop Ramp-SB	B (13.8)	B (19.3)
Hines Chapel Road / Eastern Loop Ramp-NB	B (17.2)	B (10.9)
Cone Boulevard / Rankin Mill Road	C (20.6)	C (21.2)

A review of the Synchro analysis indicates the cross-section of Cone Boulevard under the Eastern Urban Loop should provide two lanes in each direction plus a left turn lane in each direction at the ramp terminals. Additionally, the recommended alternative includes the construction of a median. Recommended lane configurations at each intersection along the proposed extension of Cone Boulevard are shown in Figure 2.

V. BENEFITS OF PROVIDING INTERCHANGE

In addition to providing the transportation infrastructure which supports the project's purpose and need, the proposed Cone Boulevard Extension project and interchange at the Eastern Urban Loop represents a strategic transportation investment in northeast Greensboro. As previously noted, the proposed project is fully compatible with the Greensboro *Connections 2025 Comprehensive Plan*. In fact, the plan includes provisions for the proposed roadway extension and interchange. The plan reflects widespread public interest in enhanced economic development in eastern Greensboro and Guilford County, and the desire to create a more balanced development pattern around the City. This project is critical to promoting economic development in this area in the future.

PEN 3



LEGEND

- ↓ PROPOSED TRAVEL LANE
- ⇄ EXISTING TRAVEL LANE
- STOP SIGN CONTROLLED
- TRAFFIC SIGNAL

<p>RECOMMENDED LANE CONFIGURATIONS & TRAFFIC CONTROL</p>	<p>FIGURE: 2</p>
	<p>SCALE: NONE</p>
<p>PROPOSED PROJECT CONE BOULEVARD EXTENSION GREENSBORO, NORTH CAROLINA</p>	
<p>7015 ALBERT PICK ROAD, SUITE H GREENSBORO, NORTH CAROLINA 27419 TELE : (336) 668-4227 FAX : (336) 668-4258</p>	
<p> ENGINEERS PLANNERS ECONOMISTS Wilbur Smith Associates</p>	

Based on a review of the traffic forecasts for the Cone Boulevard Extension which were developed by MAB and meetings with senior staff with NCDOT and GDOT, other benefits of providing this interchange include:

- Provides opportunities for significantly reducing vehicles miles on a combination of local and major collector streets in this area for ingress / egress to developments such as the Villages of Reedy Fork Project, Hicone Shopping Center, Burlwood, King Zane, Northwoods, and Lakewood. Motorists would be required to travel additional distances along facilities such as Eckerson Road, Hicone Road, Hines Chapel Road, and Rankin Mill Road for access to / from the Eastern Urban Loop.
- Provides significantly improved access to both the Eastern Urban Loop and proposed development in the Cone Boulevard / US 29 interchange area from the McLeansville area.
- Provides opportunities for serving potential future mixed use development in the immediate vicinity of the proposed interchange.
- The four ramps at the proposed interchange are projected to serve a significant number of vehicles, with an average of 3550 vehicles per day on each ramp. The traffic forecasts on each of the four ramps range from 2600 vehicles per day to 4500 vehicles per day
- The combination of the construction of the Cone Boulevard Extension and construction of an interchange at the Eastern Urban Loop would reduce vehicles per miles of travel (VMT), improve air quality, and improve mobility in this area. These results are projected as result of providing improved access to the Eastern Urban Loop, US 29, and to proposed economic development in northeast Greensboro.

ICI
(Indirect
Cumulative
Impacts)

^ PAN ?

VI. PRELIMINARY ENVIRONMENTAL INFORMATION

A preliminary review of environmental issues that may have a potential impact on the proposed project was performed. The purpose of the environmental screening is to identify potential environmental issues early in the process. For purposes of this study, potential environmental issues were identified within approximately one-half mile buffer of the proposed alignment.

The environmental screening data process involved researching available information from the US Environmental Protection Agency (EPA), North Carolina State Historic Preservation Office (SHPO), National Wetland Inventory (NWI) Maps, and Federal Emergency Management Administration (FEMA) Mapping. A Geographic Information System (GIS) with the associated development of a limited database allowed for a preliminary examination of potential environmental issues. The areas examined included:

- EPA Regulated Hazardous Material Sites
- Historic Places
- Stream Crossings / Flood Plains
- Wetlands
- Parks and other Section 4F Properties
- Endangered Species
- Archaeological Sites

Based on a review of known or documented environmental issues, no known project stopping environmental impacts were identified. A more detailed study of potential environmental impacts will need to be addressed in conjunction with the project planning phase of this project.

A copy of the entire Cone Boulevard Feasibility Study Environmental Screening report is included in the Appendix.

↑ Not included in Document

VII. DESCRIPTION OF ALTERNATIVES

It is proposed that Cone Boulevard be extended generally eastward from the proposed Cone Boulevard / Nealtown Road Intersection to tie into Hines Chapel Road and extend to the Hines Chapel Road / Rankin Mill Road intersection, a distance of approximately 2.0 miles. Additionally, it is proposed that an interchange be constructed at the crossing of Cone Boulevard / Hines Chapel Road with the Greensboro Eastern Urban Loop.

The conceptual alternative of the proposed extension of Cone Boulevard to Rankin Mill Road is shown in figure 3A, 3B and 4.

Two construction alternative typical sections were previously identified for consideration as follows:

- **Alternative #1:** Construct the proposed Cone Boulevard Extension as a divided four lane cross-section with median. Construct a diamond interchange with ramp termini onto Hines Chapel Road. The proposed right-of-way for the proposed extension of Cone Boulevard would be 120 feet. A review of the functional plans prepared in this feasibility study indicates that no homes or businesses would be taken as result of this project. Construction of sidewalks along both sides of the roadway was included in this alternative.

The projected cost estimate of this alternative is as follows:

Construction	\$ 8,500,000
Right-of-way	\$ 2,215,000
Project Cost Estimate	\$10,715,000

This estimate assumes that NCDOT will widen the proposed bridge over Hines Chapel Road as part of TIP Project U-2525. It includes the construction of Cone Boulevard to Hines Chapel Road and the widening of Hines Chapel Road to Rankin Mill Road. Additionally, it includes the construction of the additional ramps at this proposed interchange.

A copy of the preferred conceptual for this alternative is shown in Figure 4.

- **Alternative #2:** Construct the proposed Cone Boulevard Extension as a divided four-lane cross-section with median. Construct a Single Point Urban Interchange (SPUI) with ramp termini onto Hines Chapel Road. The proposed right-of-way for the proposed extension of Cone Boulevard would be 120 feet. A review of the functional plans prepared in this feasibility study indicates that no homes or businesses would be taken as result of this project. Construction of sidewalks along both sides of the roadway was included in this alternative.

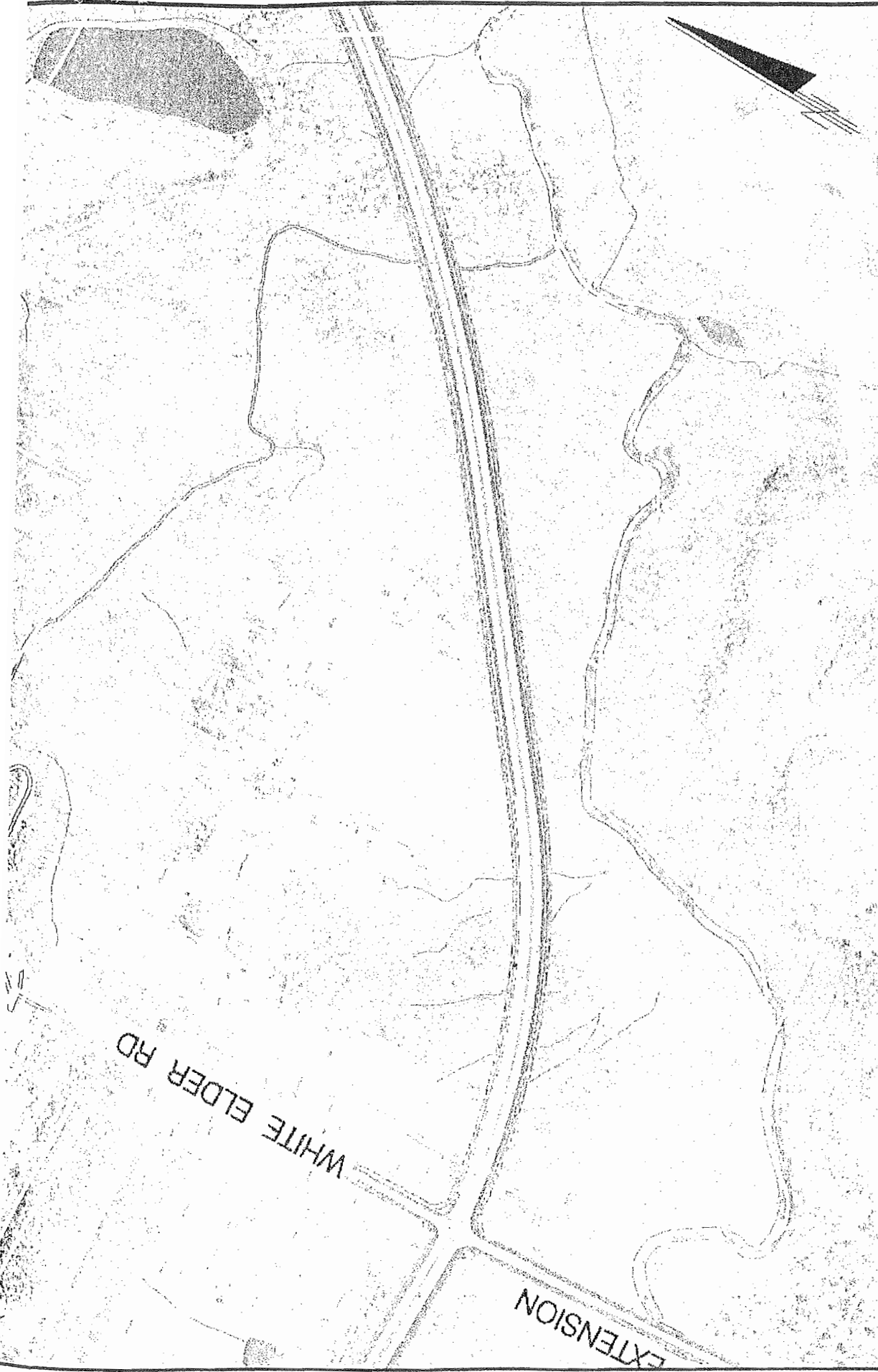


FIGURE 3A	PREFERRED CONCEPTUAL ALTERNATIVE	PROPOSED PROJECT CONE BOULEVARD EXTENSION GREENSBORO NORTH CAROLINA	<div data-bbox="1236 1564 1380 1833" data-label="Image"> </div> <p> Wilbur Smith Associates 7015 ALBERT PICK ROAD, SUITE H GREENSBORO, NORTH CAROLINA 27419 TELE : (336) 688-4227 FAX : (336) 688-4258 </p>
--------------	-------------------------------------	---	---

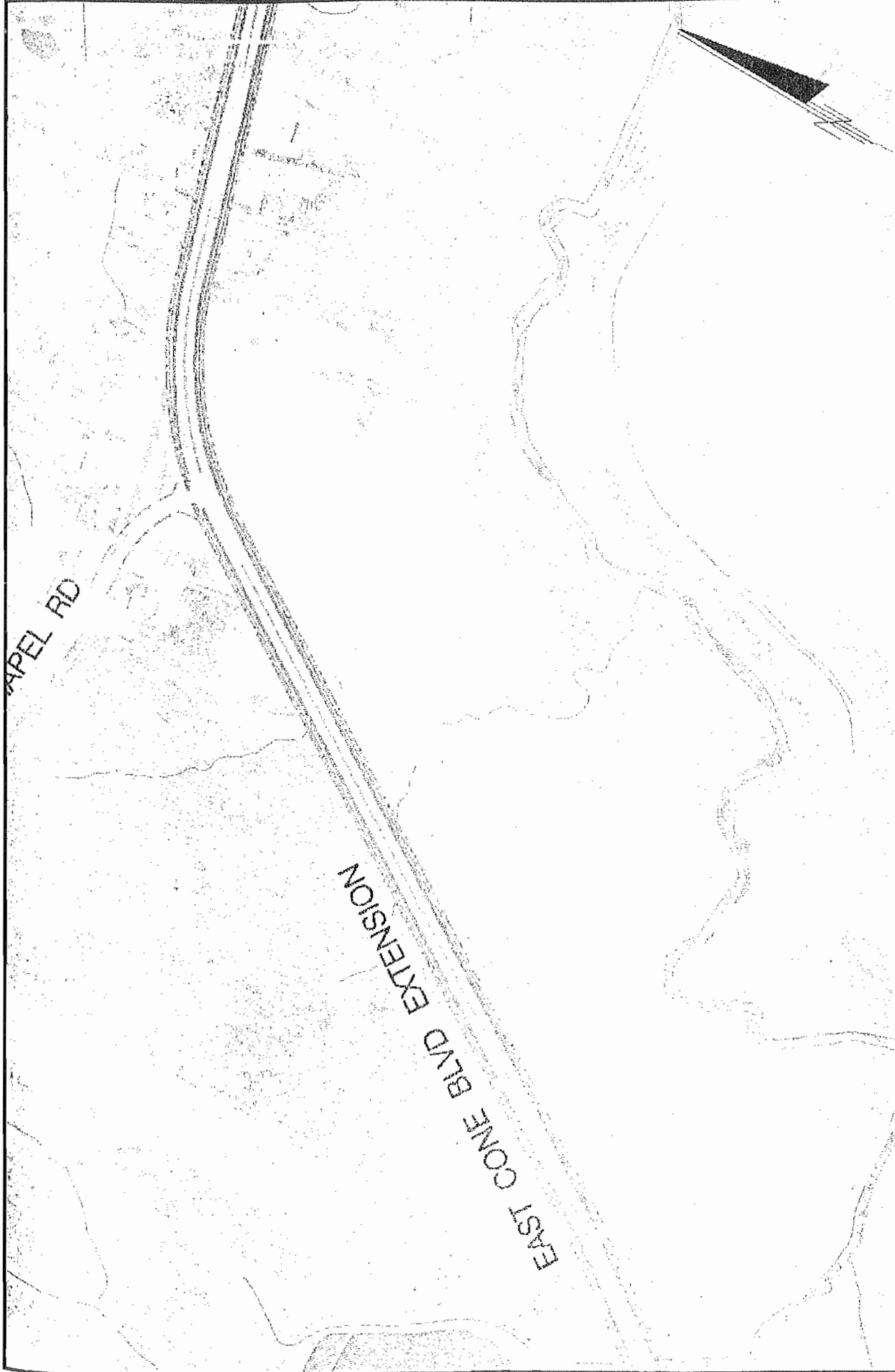



FIGURE: 3B

SCALE: NONE

PREFERRED CONCEPTUAL
ALTERNATIVE

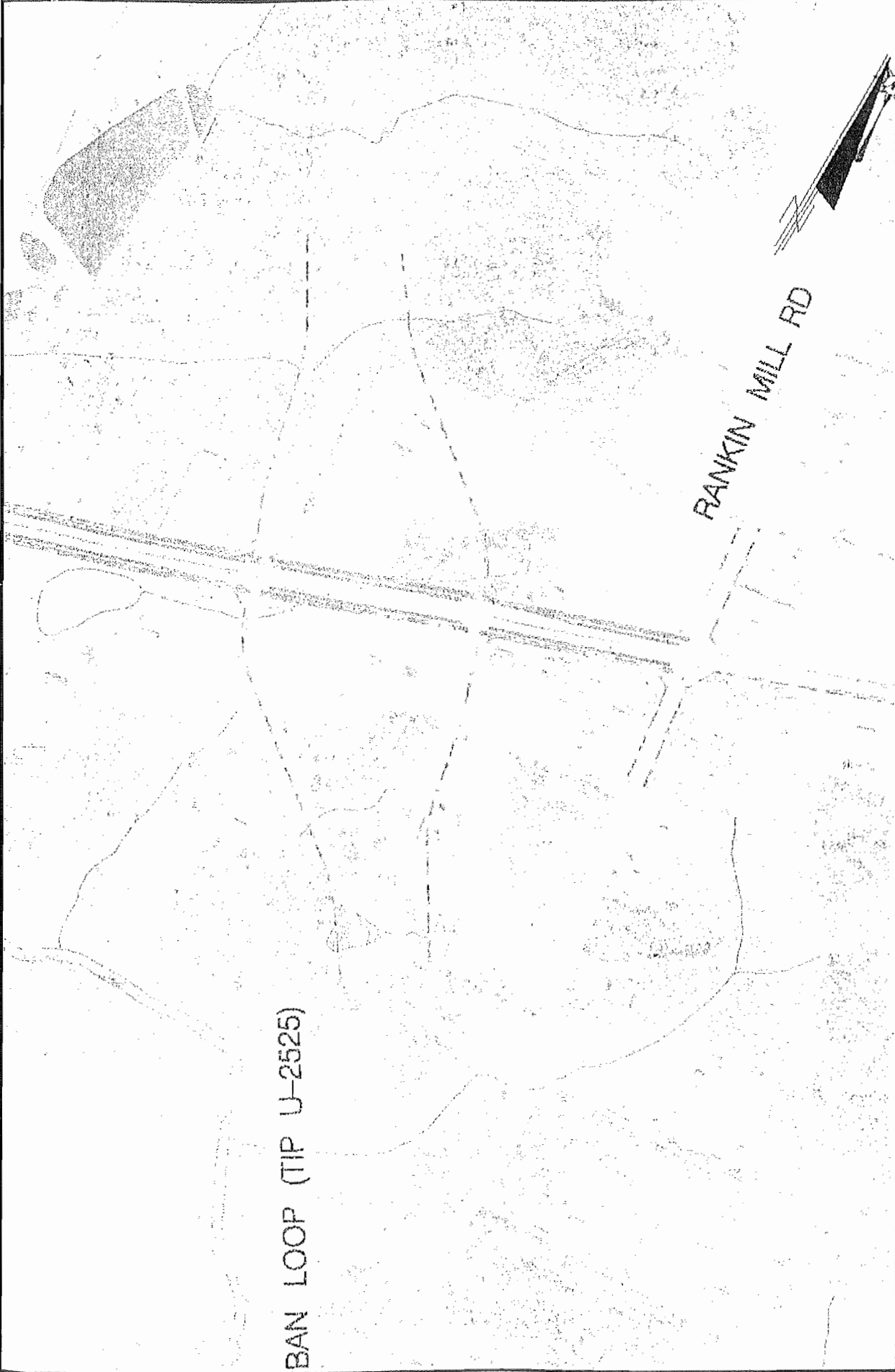
PROPOSED PROJECT
CONE BOULEVARD EXTENSION
GREENSBORO, NORTH CAROLINA

7015 ALBERT PICK ROAD, SUITE H
GREENSBORO, NORTH CAROLINA 27419
TELE : (336) 668-4227
FAX : (336) 668-4258



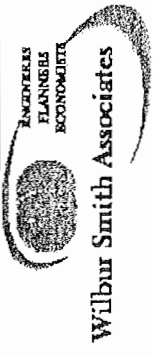
ENGINEERS
PLANNERS
ECOLOGISTS

Wilbur Smith Associates



BAN LOOP (TIP U-2525)

RANKIN MILL RD



ENGINEERS
PLANNERS
ECOLOGISTS

Willbur Smith Associates

7015 ALBERT PICK ROAD, SUITE H
GREENSBORO, NORTH CAROLINA 27419
TELE : (336) 668-4227
FAX : (336) 668-4268

PROPOSED PROJECT
CONE BOULEVARD EXTENSION
GREENSBORO, NORTH CAROLINA

PROPOSED INTERCHANGE

FIGURE: 4

SCALE: NONE

The SPUI interchange was initially chosen as an alternative due to the distance between the proposed ramps on the east side of the proposed interchange and Rankin Mill Road, which is estimated to be approximately 700 feet. Forecasted traffic volumes provided by MAB indicate that the provision of a SPUI interchange at this location would be cost prohibitive. Therefore this alternative was eliminated from consideration at this time.

- **Alternative #3 (No-Build):** In addition to the two construction alternatives previously described, there is a No Build or Do Nothing alternative. This alternative does not provide a transportation system in this area of Greensboro which addresses the future projected traffic volumes, planned land uses, community economic development goals, and other community needs. Access to the Greensboro Eastern Urban Loop is critical to the future success of northeast Greensboro.

This alternative does not meet the future transportation needs of this area of the City.

VIII. RECOMMENDATIONS

The results of this feasibility study indicate that the extension of Cone Boulevard to the Hines Chapel Road / Rankin Mill Road intersection and construction of an interchange at the crossing of the Eastern Urban Loop is needed to accommodate future projected traffic. Alternative #1 is recommended as the preferred alternative at this time. The diamond interchange can accommodate the projected traffic volumes with a significant cost savings in project cost. This alternative addresses all elements of the purpose and need for this project, including mobility, safety, and opportunities for promoting economic development in the general vicinity of this project.

The North Carolina Department of Transportation Project Development and Environmental Analysis (PD&EA) Branch is in the process of working through the Merger 404 Process in order to obtain State and Federal agency approvals of the required permits. Based on preliminary discussions with NCDOT officials, it appears NCDOT is not willing to incorporate the proposed East Cone Boulevard/Eastern Urban Loop interchange into the design phase since a total update of the previously approved Environmental Impact Statement (EIS) would be required. This action would delay the construction of the Eastern Urban Loop significantly.

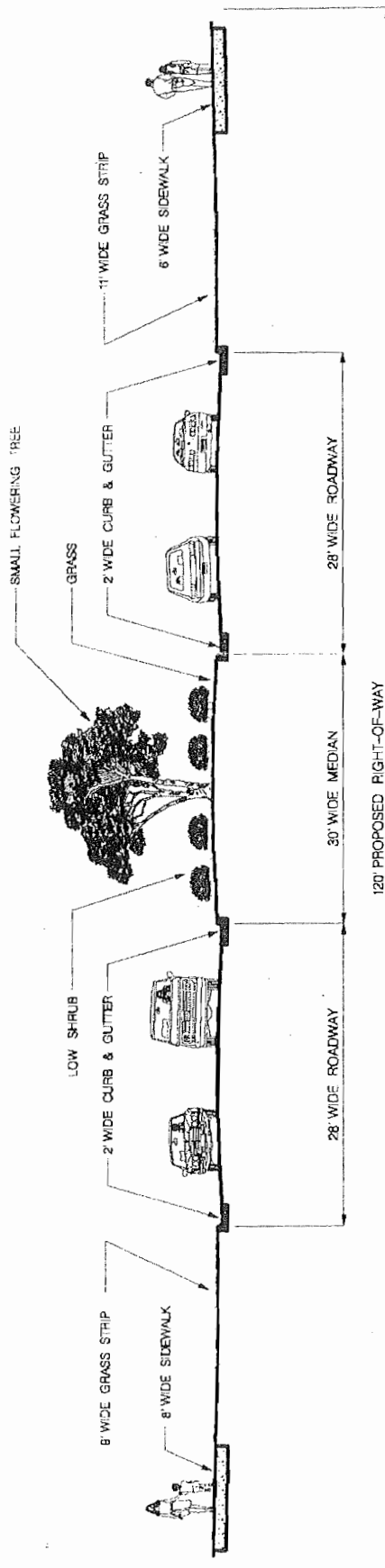
Based on our preliminary discussions with NCDOT, the proposed East Cone Boulevard / Eastern Urban Loop interchange should be pursued as a separate project and incorporated into the normal TIP process at a later date.

Yes

The following actions are recommended by GDOT:

- Request the extension of East Cone Boulevard to the Hines Chapel Road / Rankin Mill Road be funded as a NCDOT Transportation Improvement Project. If this becomes a priority project, it is recommended that preliminary design plans be prepared of the magnitude to develop a detailed project cost estimate using the NCDOT cost model.
- Request NCDOT to consider pro-active access management practices along East Cone Boulevard as this project develops.

ILLUSTRATIVE TYPICAL SECTION CONE BOULEVARD EXTENSION IMPROVEMENTS



PREFERRED TYPICAL SECTION ALTERNATIVE - FOUR LANE DIVIDED ROADWAY WITH MEDIAN (VARIES)
NOT TO SCALE



7015 ALBERT PICK ROAD, SUITE H
GREENSBORO, NORTH CAROLINA 27419
TELE : (336) 668-4227
FAX : (336) 668-4258

Wilbur Smith Associates

PROPOSED PROJECT
CONE BOULEVARD EXTENSION
GREENSBORO, NORTH CAROLINA

PROPOSED TYPICAL SECTION

FIGURE 5

SCALE: NONE

- Make the Local NCDOT Division staff aware of the need to widen Hines Chapel Road under the Eastern Urban Loop bridge in conjunction with NCDOT TIP project U-2525. The proposed typical section of this segment of roadway is shown in Figure 5.

IX. ADDITIONAL COMMENTS

The 2030 traffic projections provided by MAB assumes that Cone Boulevard is extended to the Hines Chapel Road / Rankin Mill Road intersection by the time this section of the Eastern Urban Loop is constructed. More than likely, this would require that the extension of Cone Boulevard from Nealtown Road be funded as a NCDOT TIP project, a City of Greensboro project, or some type partnership effort possibly involving NCDOT, the City of Greensboro, and other economic development partners. Without this extension, the construction of an interchange at this location is not feasible.

It is further recommended that GDOT meet with NCDOT to discuss options for advancing the construction of Cone Boulevard to Hines Chapel Road. To accelerate this project, it is likely the development of an environmental assessment / preliminary design planning document will be needed.

