

# FINAL FEASIBILITY STUDY

## FLEMING ROAD EXTENSION/WESTERN URBAN LOOP INTERCHANGE Guilford County-Division 7



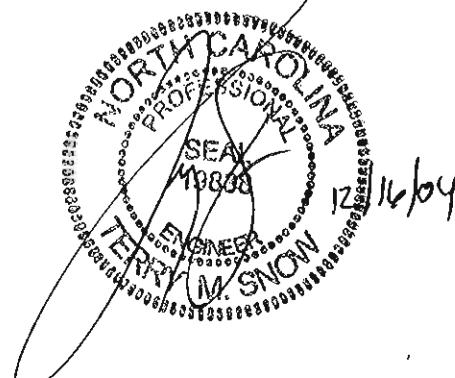
Prepared For:



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



Prepared by:



DECEMBER 16, 2004

**FINAL FEASIBILITY STUDY**

**FLEMING ROAD EXTENSION / WESTERN URBAN LOOP  
INTERCHANGE  
Guilford County – Division 7**

Prepared For:

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

Prepared By:

**Wilbur Smith Associates**

**Thursday, December 16, 2004**  
(WSA Project No. 390640)

## **I. GENERAL DESCRIPTION**

This feasibility study describes the proposed development of a future interchange at the proposed extension of Fleming Road to tie into Lewiston Road in northeast Greensboro, North Carolina. This project would include the construction of a major north-south connector street and the construction of an interchange at the crossing of the Greensboro Western Urban Loop (North Carolina Department of Transportation (NCDOT) Transportation Improvement Project (TIP) U-2524). 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 Environmental Impact Statement due to the lack of a definitive plan for the proposed Fleming-Lewiston Road Connector.

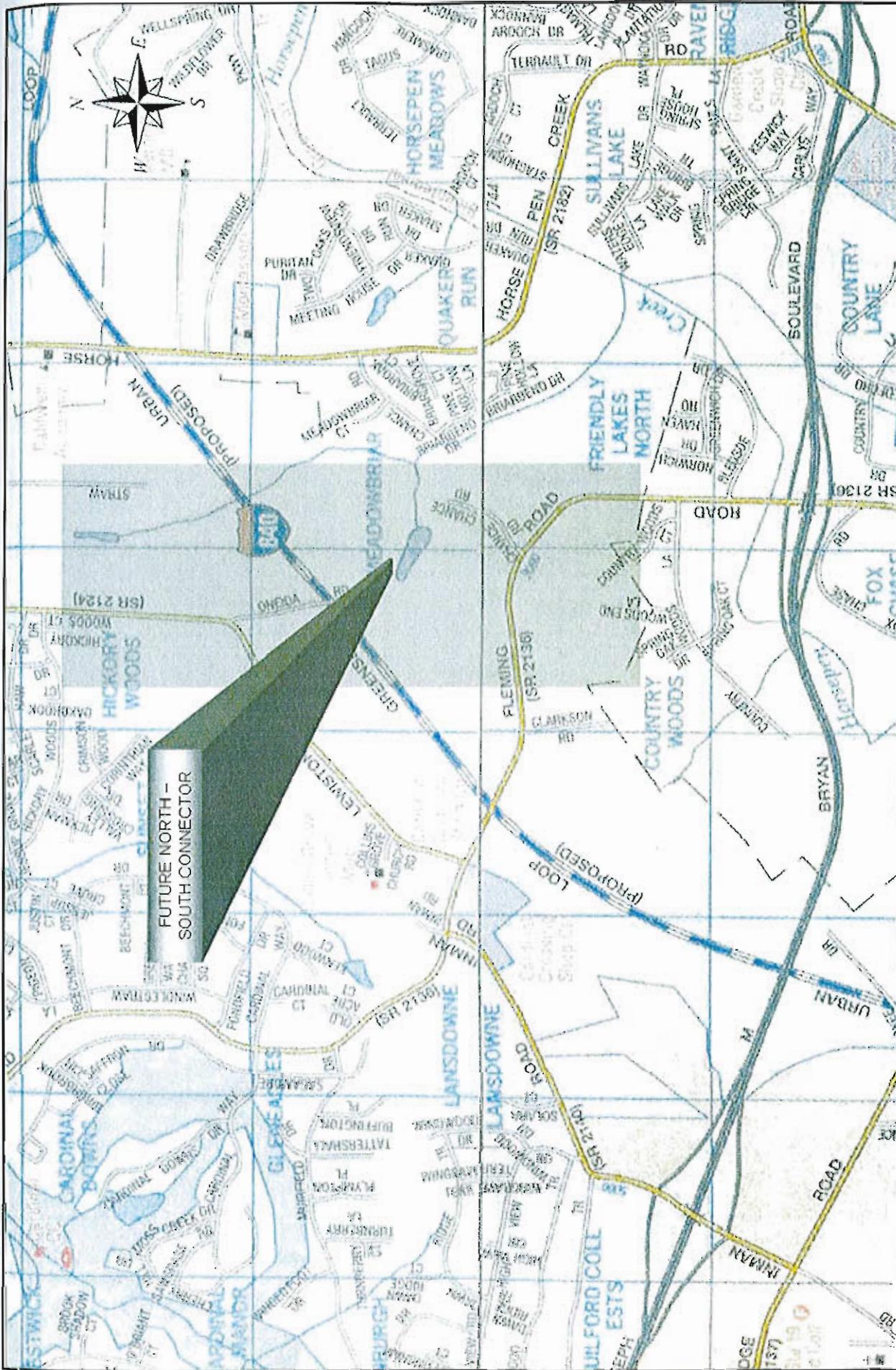
As part of this study, two alternative corridors for the proposed extension of Fleming Road were considered. Descriptions of these two corridors are as follows:

- Construct the proposed north-south connector as a divided four lane cross-section with median and follow the alignment as shown in red on the corridor map on Figure 2. Additionally, it is proposed to construct an interchange at the proposed Western Loop crossing.
- Construct the proposed north-south connector as a divided four lane cross-section and follow the alignment as shown in yellow on the corridor map on Figure 3. Additionally, it is proposed to construct an interchange at the Western Loop crossing.

In addition to evaluating the two corridors, the impacts of a no-build alternative were also considered.

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 process. The purpose of this feasibility study is to develop both information that can be used in determining future priorities by the Greensboro Metropolitan Planning Organization (MPO), and 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”



<p>FIGURE: 1</p>	<p>PROJECT LOCATION</p>	<p>FLEMING-LEWISTON FEASIBILITY STUDY 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><b>Wilbur Smith Associates</b></p> <p>ENGINEERS PLANNERS ECONOMISTS</p>
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## II. BACKGROUND INFORMATION

### General

This proposed interchange is included on the Greensboro Urban Area Thoroughfare Plan. However, the need for an interchange at the proposed location was not addressed by the Environmental Impact Statement (EIS) for the Greensboro Western Urban Loop because the proposed Fleming-Lewiston Road project was not programmed for construction at that time. This interchange would provide needed access however, as illustrated by the fact there is a distance of approximately 2.75 miles between the Bryan Boulevard (a freeway to freeway directional) interchange and the Battleground Avenue (US 220) interchange along the Greensboro Western Urban Loop.

In 2003 the General Assembly added an interchange with the Fleming Road Extension to the legal description of the Greensboro Urban Loop. This interchange is located generally between the proposed Bryan Boulevard and Battleground Avenue interchanges. The proposed Fleming Road Extension interchange is located approximately one mile from the proposed Bryan Boulevard interchange and approximately 1.75 miles from the proposed Battleground Avenue interchange.

### Greensboro Transportation Bond Referendum

In November 2000, the citizens of Greensboro passed a transportation bond referendum to fund roadway projects on selected corridors within the City. The bond referendum was put forward to address a range of community and transportation system needs, including the need to improve the safety and mobility of the northwest Greensboro and Guilford County roadway network. The construction of the link between Fleming Road and Lewiston Road was included in the list of candidate projects although it is not categorized as a bond project at this time.

### East-West Connector Project

An east-west connector road between Fleming Road and Horse Pen Creek Road was included in the 2000 transportation bond package. In August 2003, a feasibility study was completed for the construction of an east-west connector road between Fleming Road and Horse Pen Creek Road. It was recommended that a four-lane divided facility be constructed. This roadway project is planned to be constructed in 2005 as part of a development project by Portrait Homes.

### Greensboro Connections 2025 Comprehensive Plan

In May 2003, the City of Greensboro adopted the *Greensboro Connections 2025 Comprehensive Plan*. Based on a review of this plan and discussions with city staff, it is anticipated that a combination of single family homes and some mixed use corporate park land uses would be anticipated in the vicinity of the proposed interchange.

The future provision of an interchange at this location is an important element in the *Greensboro Connections 2025 Comprehensive Plan*. This plan also provides for strategic widenings and roadway extensions primarily to remove bottlenecks and fill gaps in the system. The proposed project would meet that criteria. Access to the Western Urban Loop at this location is a key element in providing the transportation infrastructure needed to serve the proposed land uses and provide reasonable access to the Loop without having an excessive number of vehicle miles of travel on other collector streets and thoroughfares in the study area.

### **Planned Projects**

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

- Greensboro Western Loop Urban Loop from Bryan Boulevard to Battleground Avenue (NCDOT TIP Project U-2524). Current plans for this project include an interchange with Bryan Boulevard and Battleground Avenue (US 220). This project is currently scheduled to begin in 2008. Preliminary construction plans indicate a significant cut-section east of Oneida Road that appears to be suitable for the future interchange location.
- The proposed east-west connector street between Fleming Road and Horse Pen Creek Road is planned for construction in 2005.

### **III. PURPOSE AND NEED**

The purpose and need for the Fleming-Lewiston Connector and interchange at the Western Urban Loop is described below. This was developed in consultation with City, County, and NCDOT Division 7 staff and reflects our assessment of projected traffic volumes and land use in this area.

- Improve traffic safety in this area of northwest Greensboro.
- Improve mobility in this area of northwest Greensboro by providing a more direct connection to the Western Urban Loop. The traffic forecasts indicate significant traffic benefits on US 220 and Horse Pen Creek Road.
- Improve air quality by providing connectivity and efficiency of the street network in the study area. This will result in a substantial reduction in vehicle miles of travel in this study area.
- Provide the network of streets and roadways needed to support and implement the *Greensboro Connections 2025 Comprehensive Plan*.
- Improve pedestrian and bicycle safety by including the provision for sidewalks and bike lanes along the proposed connector street.
- Improve aesthetics along the Fleming-Lewiston Connector by providing a median and opportunities for landscaping along the section of roadway.

### **IV. PROJECTED TRAFFIC VOLUMES / LEVEL OF SERVICE**

The City of Greensboro DOT contracted with the firm of Martin / Alexiou / Bryson (MAB) to prepare a traffic forecast and technical memorandum for the proposed Fleming-Lewiston Road Connector and interchange at this location. This technical memorandum is included in the Appendix and summarizes the assumptions, methodology, and results of the traffic forecasts.

MAB forecasts that the Fleming Road-Lewiston Road Connector will carry approximately 10,400 vehicles per day (south of the Fleming-Horse Pen Creek Connector) and 20,200 vehicles per day (north of Lewiston Road) in 2030. This estimate was derived primarily from the Piedmont Triad Regional Travel Model, and assumes the following projects were completed in the future year network:

- Entire Greensboro Urban Loop
- Fleming-Horse Pen Creek Road Connector
- Widened US 220 (Horse Pen Creek Road-NC 68/220 Connector)

- NC 68 / US 220 Connector
- Horse Pen Creek Road
- Lewiston / Pleasant Ridge Roads
- Bryan Boulevard Relocation

In addition to projecting the 2030 daily traffic volumes on the Fleming Road-Lewiston Road Connector, MAB projected the 2030 AM and PM peak hour traffic volumes along Fleming Road (E-W Connector-Lewiston Road), assuming the construction of an interchange at the Western Urban Loop (WUL). These volumes are part of the technical memorandum in the Appendix of this study and were used in performing a Synchro analysis at three major intersections along the proposed Fleming Road-Lewiston Road Connector. The results of this analysis are as follows:

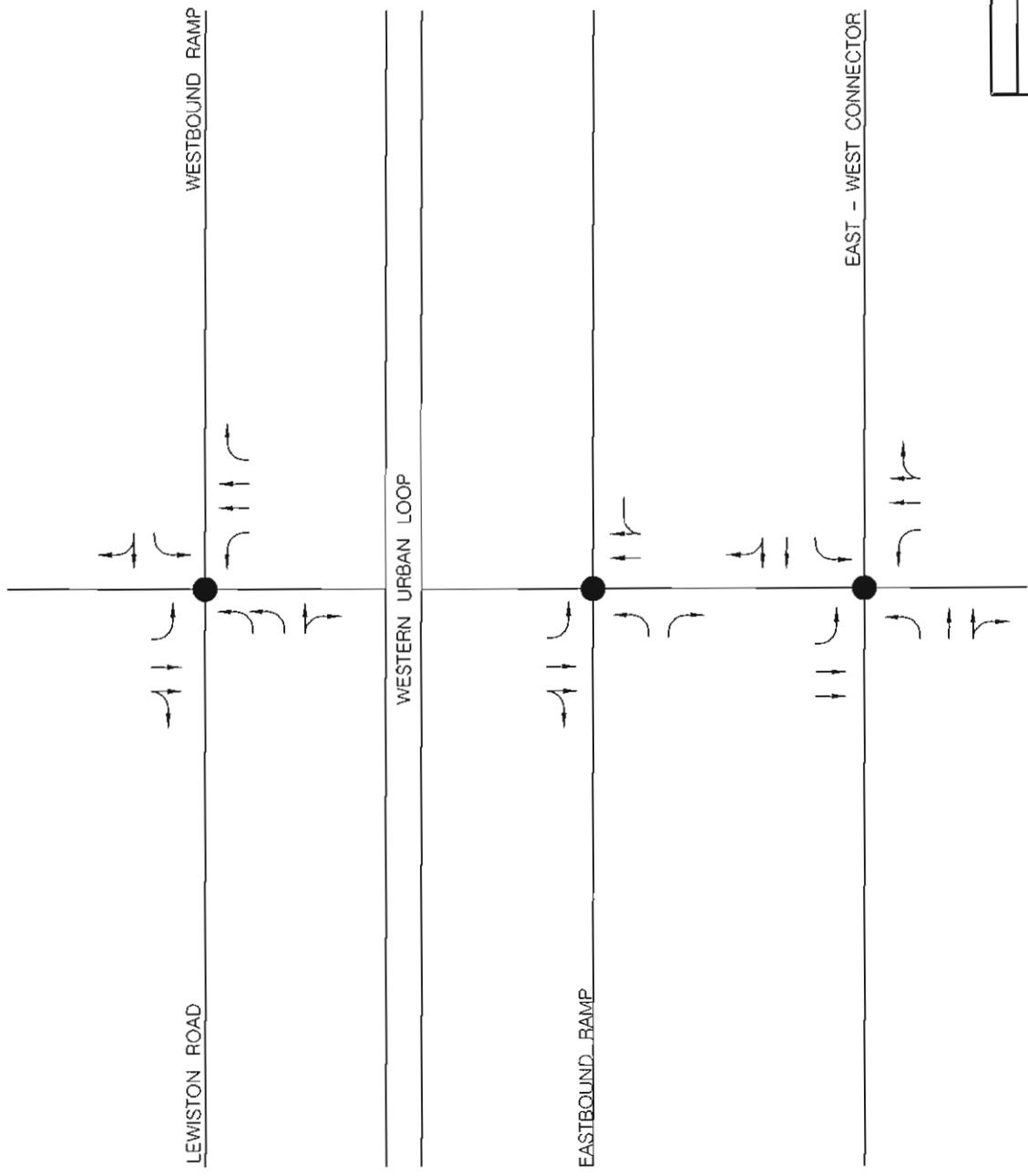
<b>Level of Service Summary (Delay in sec)</b>		
<b>Intersection</b>	<b>2030 AM LOS</b>	<b>2030 PM LOS</b>
Fleming Extension-E/W Connector	C (28.2)	C (25.3)
Fleming Extension / WUL Ramp (WB)	D (41.5)	D (43.9)
Fleming Extension / WUL Ramp (EB)	C (20.8)	C (27.0)

The recommended number of lanes on each approach of these three intersections is shown in Figure 4.

#### **V. BENEFITS OF PROVIDING INTERCHANGE**

In addition to addressing critical elements of the project's purpose and need as stated earlier in this feasibility study, the proposed Fleming-Lewiston Road Connector and provision for an interchange at the Western Urban Loop impacts other streets, intersections, and interchanges in the study area in a significant manner as follows:

- Proposed interchange diverts 5,000-10,000 vehicles per day off of US 220 between Westridge Road and NC 150, especially in combination with the proposed widening of Lewiston Road north to Summerfield.
- The reduction in trips on US 220 significantly reduces AM and PM peak hour turning movements in the Western Urban Loop / US 220 interchange. This will result in an improved Level of Service at this interchange during these peak traffic hours.
- This project would remove several thousand daily trips off Jessup Grove Road, Carlson Dairy Road, and the northern portion of Horse Pen Creek Road.
- The combination of the construction of the Fleming-Lewiston Road Connector, the proposed interchange, the construction of the Fleming-Horse Pen Creek Road Connector,



LEGEND	
	TRAVEL LANE
	SIGNALIZED INTERSECTION

	7015 ALBERT PICK ROAD, SUITE H GREENSBORO, NORTH CAROLINA 27419 TELE : (336) 668-4227 FAX : (336) 668-4258	FLEMING-LEWISTON FEASIBILITY STUDY GREENSBORO, NORTH CAROLINA	RECOMMENDED LANE CONFIGURATIONS & TRAFFIC CONTROL	FIGURE: 4 SCALE: NONE
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and the widening of Pleasant Ridge and Lewiston Roads substantially reduces the projected vehicles miles of travel (VMT) in this area.

- The four ramps at the proposed Fleming-Lewiston Connector / Western Urban Loop are projected to have an average of approximately 5000 vehicles per day on each ramp. This represents a significant amount of traffic on and off the Western Urban Loop.

## **VI. PRELIMINARY ENVIRONMENTAL INFORMATION**

Efforts were made to identify any known or documented environmental constraints that may adversely impact the ability of the North Carolina Department of Transportation to move forward with this project. This involved researching available information from the Guilford Department of Environmental Health, the North Carolina Department of Environment and Natural Resources (DENR), National Wetland Inventory Maps, Federal Emergency Management (FEMA) mapping, and information involving historic structures. Results of the environmental screening are shown below:

### Wetlands

A review of the National Wetlands Inventory identified potential wetlands which were located primarily within the banks of the streams. Numerous unnamed streams and creeks are located within the project study area. These streams and creeks flow southeastwardly toward Horse Pen Creek Road.

### Floodplains

A review of FEMA mapping identified 100-year floodplains in the immediate vicinity of the project. These floodplains generally run in a north-south direction.

### Historic Properties

Structures which were 50 years or older were identified within the project study area. However, this project would not require the relocation or acquisition of any residential structure. Therefore, this project will not adversely impact any identified architectural historic properties.

### Contaminated Properties

A review of NCDENR records revealed no known contaminated properties or hazardous material sites are located within the study area.

### Archaeological Site

Due to a goal to preserve archaeological sites across North Carolina, obtaining information about known sites is difficult at the environmental screening stage. However, records reveal that no known preservation sites-in-place sites are located within the area. Since the Greensboro area has a history of Revolutionary War battles, it is possible that archaeological artifacts may be located within the study area.

Based on a review of known resources or documented environmental elements, no known project stopping environmental impacts have been identified.

A copy of our preliminary environmental screening study is included in the Appendix.

### VIII. DESCRIPTION OF ALTERNATIVES STUDIED

It is proposed that Fleming Road be extended generally northward from the current city limits to tie into Lewiston Road, a distance of approximately 1.0 mile. The east-west connector street is planned to extend into Fleming Road. (See figure 2). Additionally, it is proposed that an interchange be constructed at the proposed crossing of the Fleming-Lewiston Connector with the Greensboro Western Urban Loop.

A conceptual functional sketch plan of the recommended alignment is shown in figure 3.

Two alternative cross-sections are proposed for consideration by the City of Greensboro and the North Carolina Department of Transportation as follows (note these are not the same alternatives #1 and #2 referred to on page 1 and in figures 2 and 3):

- **Alternative #1:** Construct the proposed north-south connector as a divided four-lane cross-section with median. The proposed right-of-way would be 100 feet. A review of the corridor plans prepared in this feasibility study indicates that only one additional residence 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 Cost (Connector Project)	\$3,800,000
Construction Cost (Interchange Ramps)	\$1,600,000
Right-of Way (Connector Project)	\$ 860,000
<u>Right-of-Way (Ramps in 3 Quadrants)</u>	<u>\$ 1,300,000</u>
Project Cost Estimate	\$ 7,560,000

This estimate assumes that the cost of the bridge over the Western Urban Loop would be constructed as part of the Greensboro Western Urban Loop project.

- **Alternative #2:** Construct the proposed north-south connector as an un-divided two lane facility and construct the ramps at a later date. Under this alternative, it is proposed to purchase a 100 foot right-of-way, grade the entire section, and construct only two lanes prior to the construction of the Western Urban Loop from Bryan Boulevard to Old Battleground Road.

The projected cost estimate of this alternative is as follows:

Construction Cost (Connector)	\$1,700,000
<u>Right-of-Way Cost (Connector)</u>	<u>\$ 860,000</u>
Project Cost Estimate	\$2,560,000

This estimate takes into account that NCDOT will construct the bridge over the Western Urban Loop, per NCDOT TIP Project U-2524E.

- **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 which addresses the future projected traffic volumes, planned land uses,

and other community needs in the study area. This alternative is not recommended for consideration by the Greensboro MPO at this time.

## **IX. RECOMMENDATIONS**

The results of this study support our recommendation that the City of Greensboro pursue the construction of the Fleming-Lewiston Road Connector and the future provision for an interchange at this location. The yellow alignment shown in figure 3 is the preferred corridor and Alternative #1 has been identified as the preferred construction alternative. This alternative addresses all elements of the purpose and need for this project and is a critical project in providing mobility and safety in the general vicinity of this project. Alternative #2 offers a potentially viable short-range alternative if resource considerations and/or a lack of significant area land development activity ultimately preclude construction of the ultimate cross section in advance of Western Urban Loop construction.

A copy of the recommended functional concept plan for this proposed interchange is shown in Figure 5. Figure 5A shows the recommended functional concept plan from the original report dated on August 17, 2004. Additionally, a copy of the recommended long term cross-section for the Fleming-Lewiston Road Connector is shown in Figure 6.

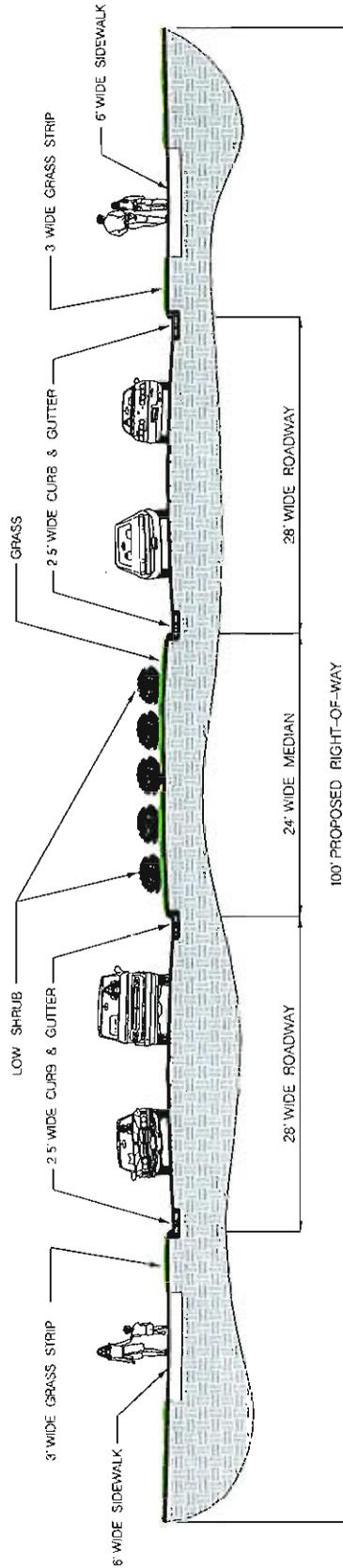
The Program Development Branch has recommended against initiating any new environmental assessment / preliminary design project development activities for any new projects within the Western Urban Loop corridor until this project is let to contract. This is a result of concerns raised to NCDOT by environmental review agencies. Due to the projected increase in traffic growth in the immediate vicinity of this project, it is recommended that the City of Greensboro pursue alternative #1 as a near term project, with alternative #2 being suitable for implementation instead in the short range if conditions warrant as noted above. Either action would significantly enhance the probability of providing an interchange project and improved connector roadway as described in Alternative #1 in future years. Specific actions recommended include:

- Prepare preliminary roadway plans for constructing the proposed Fleming-Lewiston Road Connector. This will allow both the City of Greensboro and the North Carolina Department of Transportation to coordinate the construction of the Western Urban Loop and the proposed north-south connector street.
- Construct either an interim two-lane roadway for the proposed Fleming-Lewiston Road Connector project or the full recommended ultimate cross section prior to the construction of the next section of the Greensboro Western Urban Loop. This action would allow NCDOT to include the provision of a bridge at this location as part of NCDOT TIP Project U-2524.
- Schedule a meeting with the NCDOT Division 7 Board Member, NCDOT Division 7 Engineer, and other key senior staff to discuss financing strategies for getting this section of roadway constructed as needed.
- Request NCDOT to incorporate appropriate geometric design features in the design of this section of the Western Urban Loop to facilitate the future provision of a Fleming-Lewiston Connector bridge and interchange at this location.





# ILLUSTRATIVE TYPICAL SECTION FLEMING - LEWISTON ROAD FEASIBILITY STUDY



TYPICAL SECTION ALTERNATIVE 2 - FOUR LANE DIVIDED ROADWAY WITH MEDIAN (VARIES)  
NOT TO SCALE

**X. ADDITIONAL COMMENTS**

It is important that citizens living in the general vicinity of the proposed interchange have future access to the proposed Fleming-Lewiston Connector / Western Urban Loop interchange. Based on the current plans for this project, there are three existing thoroughfares (Old Oak Ridge Road, Fleming Road, Horse Pen Creek Road) and one planned thoroughfare (Fleming-Lewiston Road Connector) which cross the Western Urban Loop between the Friendly Avenue / Western Urban Loop interchange and Battleground Avenue / US 220 interchange that do not have access to this facility.

The quality of life of many citizens in northwest Greensboro will be significantly impacted in a negative manner should facilities such as Horse Pen Creek Road, Jessup Grove Road, Fleming Road, and Lewiston Road have to accommodate the additional traffic volumes in providing access to / from the Western Urban Loop in northwest Greensboro. This impacts the safety, air quality, and mobility goals of the community.