

Revised

**ALTERNATIVES DEVELOPMENT AND ANALYSIS
REPORT**

For

**Monroe Connector/Bypass
Union and Mecklenburg Counties**

STIP Project Nos. R-3329 and R-2559



April 2008

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	
I-1 PROPOSED ACTION.....	I-1
I-1.1 Summary of Need for Proposed Action.....	I-1
I-1.2 Purpose of Proposed Action.....	I-3
I-2 REPORT PURPOSE AND ORGANIZATION	I-3
I-3 SUMMARY OF ALTERNATIVES ELIMINATED AND ALTERNATIVES RETAINED FOR DETAILED STUDY.....	I-4
I-3.1 Qualitative First Screening	I-4
I-3.2 Qualitative Second Screening	I-4
I-3.3 Quantitative Third Screening.....	I-4
1.0 QUALITATIVE FIRST SCREENING OF ALTERNATIVE CONCEPTS	1-1
1.1 SCREENING CRITERIA	1-1
1.1.1 Ability to Enhance Mobility and Provide Increased Capacity in US 74 Corridor	1-1
1.1.2 Consistency with Planning and Legislative Vision for the Corridor	1-2
1.1.2.1 Serves High-Speed Regional Travel.....	1-2
1.1.2.2 Consistency with the North Carolina Strategic Highway Corridor.....	1-2
1.1.2.3 Consistency with the North Carolina Intrastate System.....	1-3
1.1.3 Maintains Access to Properties Along Existing US 74	1-3
1.2 ALTERNATIVE CONCEPTS	1-4
1.2.1 No-Build Alternative Concept	1-5
1.2.1.1 Ability to Meet Project Purpose and Need.....	1-5
1.2.1.2 Decision on Whether to Retain for Qualitative Second Screening.....	1-5
1.2.2 Transportation Demand Management Alternative Concept.....	1-6
1.2.2.1 Ability to Meet Project Purpose and Need.....	1-6
1.2.2.2 Decision on Whether to Retain for Qualitative Second Screening.....	1-7
1.2.3 Transportation System Management Alternative Concept.....	1-7
1.2.3.1 Ability to Meet Project Purpose and Need.....	1-8
1.2.3.2 Decision on Whether to Retain for Qualitative Second Screening.....	1-9
1.2.4 Mass Transit / Multi-Modal Alternative Concept.....	1-9
1.2.4.1 Ability to Meet Project Purpose and Need.....	1-9
1.2.4.2 Decision on Whether to Retain for Qualitative Second Screening.....	1-10
1.2.5 Improve Existing US 74 (Standard Arterial Widening) Alternative Concept.....	1-11
1.2.5.1 Ability to Meet Project Purpose and Need.....	1-11
1.2.5.2 Decision on Whether to Retain for Qualitative Second Screening.....	1-11
1.2.6 Improve Existing US 74 (Superstreet) Alternative Concept	1-12
1.2.6.1 Ability to Meet Project Purpose and Need.....	1-12
1.2.6.2 Decision on Whether to Retain for Qualitative Second Screening.....	1-12
1.2.7 Improve Existing US 74 (Controlled-Access Highway) Alternative Concept.....	1-13
1.2.7.1 Ability to Meet Project Purpose and Need.....	1-13
1.2.7.2 Decision on Whether to Retain for Qualitative Second Screening.....	1-13
1.2.8 New Location Alternative Concept	1-13
1.2.8.1 Ability to Meet Project Purpose and Need.....	1-14
1.2.8.2 Decision on Whether to Retain for Qualitative Second Screening.....	1-14

TABLE OF CONTENTS (Continued)

1.2.9	New Location / Improve Existing Roadways Hybrid Alternative Concept	1-14
1.2.9.1	Ability to Meet Project Purpose and Need.....	1-15
1.2.9.2	Decision on Whether to Retain for Qualitative Second Screening.....	1-15
1.3	ALTERNATIVE CONCEPTS TO BE CARRIED FORWARD TO THE QUALITATIVE SECOND SCREENING..	1-15
2.0	DEVELOPMENT OF PRELIMINARY CORRIDOR SEGMENTS	2-1
2.1	PREVIOUS STUDIES.....	2-1
2.2	PROJECT STUDY AREA	2-1
2.3	ESTABLISHING BROAD AREAS FOR CORRIDOR LOCATIONS	2-2
2.3.1	Route Continuity and Project Termini.....	2-2
2.3.2	Natural and Human Environment Features.....	2-3
2.4	PRELIMINARY CORRIDOR SEGMENTS.....	2-4
2.4.1	Previously Studied Corridors	2-4
2.4.2	Public and Agency Input.....	2-4
2.4.3	Tolling	2-5
3.0	QUALITATIVE SECOND SCREENING OF CORRIDOR SEGMENTS.....	3-1
3.1	QUALITATIVE SECOND SCREENING METHODOLOGY	3-1
3.2	INDIVIDUAL SEGMENT ASSESSMENT	3-2
3.2.1	Corridors with No Similar Route	3-2
3.2.2	Corridors with No Similar Route and Substantial Potential Impacts	3-2
3.2.2.1	Corridor Segment 5	3-2
3.2.2.2	Corridor Segment 6	3-3
3.2.2.3	Corridor Segment 13 (from Willis Long Road (SR 1509) east to US 74).....	3-4
3.3	RELATIVE SEGMENT COMPARISON ASSESSMENT.....	3-5
3.3.1	AREA 1 - From I-485 to Indian Trail Fairview Road (SR 1520)	3-6
3.3.2	AREA 2 - From Faith Church Road (SR 1518) to East of Willis Long Road (SR 1509)	3-7
3.3.3	AREA 3 - From East of Olive Branch Road (SR 1006) to East of Austin Chaney Road (SR 1758).....	3-10
3.3.4	AREA 4 - From West of Forest Hills School Road (SR 1754) to Existing US 74....	3-11
3.4	CONSOLIDATION OF CORRIDOR SEGMENTS.....	3-12
3.4.1	Corridor Segments 16, 20, 21, 19, 12, and 21A.....	3-12
3.4.2	Corridor Segments 27, 25, and 29	3-12
3.4.3	Corridor Segments 7, 33A, 33B, and 36	3-12
3.4.4	Corridor Segments 38 and 39	3-12
3.5	QUALITATIVE SECOND SCREENING CONCLUSIONS	3-13
4.0	QUANTITATIVE THIRD SCREENING OF PRELIMINARY ALTERNATIVES	4-1
4.1	QUANTITATIVE THIRD SCREENING METHODOLOGY.....	4-1
4.1.1	Process.....	4-1
4.1.2	Design Criteria.....	4-1

TABLE OF CONTENTS (Continued)

	4.1.3 Quantitative Screening Criteria	4-2
	4.1.4 Impact Estimate Methodology	4-5
4.2	SUMMARY OF QUANTITATIVE THIRD SCREENING	4-5
	4.2.1 Impact Comparison	4-5
	4.2.2 Recommended Detailed Study Alternatives	4-8
5.0	AGENCY COORDINATION AND PUBLIC INVOLVEMENT	5-1
5.1	AGENCY COORDINATION	5-1
	5.1.1 Scoping	5-1
	5.1.2 Notice of Intent	5-1
	5.1.3 Turnpike Environmental Agency Coordination Meetings	5-1
5.2	PUBLIC INVOLVEMENT	5-2
	5.2.1 Citizens Informational Workshops	5-2
	5.2.2 Local Officials Meetings	5-2
	5.2.2.1 Local Officials Scoping Meeting	5-2
	5.2.2.1 Local Officials Meeting	5-2
	5.2.3 Small Group Meetings	5-3
	5.2.4 Other Outreach Efforts	5-3
	5.2.4.1 Newsletters	5-3
	5.2.4.2 Project Website	5-3
	5.2.4.3 Toll-Free Telephone Hotline / Email	5-3
6.0	CONCLUSION	6-1
6.1	REPORT REVIEW AND COMMENTS	6-1
	6.1.1 Agency Review	6-1
	6.1.2 Public Review	6-1
6.2	DETAILED STUDY ALTERNATIVES	6-1

TABLES

1-1	Desirable Average Travel Speeds During Peak Traffic Conditions	1-2
1-2	Average Travel Times and Speeds Through the US 74 Corridor	1-3
1-3	Qualitative First Screening – Ability of Alternative Concepts to Meet Purpose and Need	1-4
1-4	Alternative Concepts to be Carried Forward to Qualitative Second Screening	1-16
3-1	Preliminary Study Alternatives Summary	3-13
4-1	Quantitative Analysis Screening Criteria	4-3
4-2	Preliminary Study Alternative Quantitative Analysis Screening	4-6

TABLE OF CONTENTS (Continued)

FIGURES (follow text in corresponding section)

- I-1 US 74 Corridor in North Carolina
- I-2 Project Location Within Union and Mecklenburg Counties
- 2-1 Monroe Bypass Detailed Study Alternatives and Preferred Alternative
- 2-2 Monroe Connector Preliminary Corridors and Detailed Study Alternatives
- 2-3 Project Study Area
- 2-4 Preliminary Corridor Segments (June 2007)
- 2-5 Preliminary Corridor Segments (September 2007)
- 3-1 Individual Segment Assessment Corridor Segment 5
- 3-2 Individual Segment Assessment Corridor Segment 6
- 3-3 Individual Segment Assessment Corridor Segment 13 (Willis Long Road to US 74)
- 3-4 Preliminary Corridor Segments (Relative Segment Comparison Areas)
- 3-5 Relative Segment Comparison Area 1 (From I-485 to Indian Trail Fairview Road)
- 3-6 Relative Segment Comparison Area 2 (From Indian Trail Fairview Road to East of Willis Long Road)
- 3-7 Relative Segment Comparison Area 3 (From East of Olive Branch Road to East of Austin Chaney Road)
- 3-8 Relative Segment Comparison Area 4 (From West of Forest Hills School Road to Existing US 74)
- 3-9 Corridor Segments 16, 20, 21, 19, 12, 21A Study Area
- 3-10 Corridor Segments 27, 25, 29 Study Area
- 3-11 Corridor Segments 33A, 33B, 36 Study Area
- 3-12 Corridor Segments 38 and 39 Study Area
- 3-13 Preliminary Corridor Segments for Quantitative Third Screening
- 3-14a-d Preliminary Study Alternatives Key Sheets
- 4-1a-d Detailed Study Alternative Concept Plans
- 4-2 Typical Roadway Cross-Sections
- 4-3 Texas U-Turn Example
- 4-4 Typical Business Impacts Along US 74
- 4-5 Recommended Detailed Study Alternatives (November 2007)
- 4-6a-b Recommended Detailed Study Alternatives (November 2007)

APPENDIX

- A Section 6002 Project Coordination Plan
- B Citizens Informational Workshop
- C Newsletters
- D Agency Comments and Responses

INTRODUCTION

In October 2002, legislation was passed authorizing the creation of the North Carolina Turnpike Authority (NCTA) with the purpose to study, design, plan, construct, promote, own, finance and operate a system of toll roads, bridges, and/or tunnels supplementing the traditional non-toll transportation system serving the citizens of North Carolina (NC General Statute [GS] §136-89.182).

In order for a project to be considered for development as a toll facility, the legislation requires that the project be included in a locally adopted comprehensive transportation plan and be shown in the current North Carolina Department of Transportation (NCDOT) *State Transportation Improvement Program* (STIP) (GS§136-89.183[a][2]). Any toll road developed in the state must have a free alternate route (GS§136-89.197). All revenues from tolls are to be used to cover the cost of financing, operating and maintaining the road. Current legislation requires that when the roads are paid for, tolls will be removed (GS§136-89.196).

In August 2005 and August 2006, legislation was passed authorizing the NCTA to study, plan, develop, and undertake preliminary design work on up to nine toll projects. The Monroe Connector / Bypass is one of these toll candidate projects.

I-1 PROPOSED ACTION

The proposed action includes mobility and capacity improvements in the US 74 corridor from I-485 in Mecklenburg County to the area just west of the Town of Marshville in Union County, a distance of approximately 20 miles. The proposed action is included in the NCDOT's 2007-2013 STIP as project numbers R-3329 (Monroe Connector) and R-2559 (Monroe Bypass).

The Statement of Purpose and Need for this project was developed with input from federal and state environmental regulatory and resource agencies and the Mecklenburg-Union Metropolitan Planning Organization at the Turnpike Environmental Agency Coordination (TEAC) meetings over several meetings held in Spring 2007 as well as input solicited from the public at Citizens Informational Workshops held in June 2007. Details of this coordination can be found in **Section 5.0**.

I-1.1 Summary of Need for Proposed Action

US 74 in the project study area has statewide, regional, and local importance. US 74 is the major east-west route connecting the Charlotte region, a major population center and freight distribution point, to the North Carolina coast and the State port at Wilmington (the State's largest port). **Figure I-1** shows the location of US 74 through North Carolina. In addition, US 74 is the primary transportation connection between Union County and Mecklenburg County / City of Charlotte. According to the United States Census Bureau (<http://www.census.gov/popest/counties/CO-EST2006-08.html>), Union County is the fastest growing county in North Carolina based on percent growth from 2000 to 2006. Mecklenburg County and the City of Charlotte serve as the economic hub of the region. **Figure I-2** shows the project location in relation to Union and Mecklenburg Counties. Union County is the only county surrounding Mecklenburg County that does not have a controlled-access facility connecting it to Mecklenburg County.

US 74 also serves as an important commercial corridor for Union County residents and businesses, with many retail, commercial, and employment centers having direct access to/from US 74. In Union

County, most employment is concentrated in the City of Monroe and along existing US 74.

Currently, US 74 in the study area is a four-to-six lane arterial roadway with 26 at-grade signalized intersections, many unsignalized intersections, and numerous commercial and residential driveway connections. The posted speed limits within the study area range from 45 to 55 miles per hour (mph), except for those sections in Wingate and Marshville where the posted speed limit is 35 mph. The average travel speeds range from approximately 20 to 30 mph during the peak morning and evening hours, and are expected to decline to less than 20 mph by 2030. Congestion is high, with one-third of the intersections operating at an unacceptable level of service (LOS) (LOS E or F) during the peak morning and evening hours under existing conditions. LOS is a measure of how efficient a roadway is operating. Approximately two-thirds of the intersections are expected to operate at LOS E or F by 2030, with long queues at many intersections. Additional information on existing and projected operations of US 74 is detailed in the Final Statement of Purpose and Need (February 2008).

Because of its statewide and regional importance, US 74 has been designated as a Strategic Highway Corridor (SHC) by the NCDOT, and has also been identified in State law as part of the North Carolina Intrastate System (GS§136-178). Both designations specify that this corridor serve high-speed regional travel. The SHC designation specifically identifies the facility as a freeway. The Intrastate System legislation indicates that US 74 should be a multi-lane facility with access control and grade separations should be provided when warranted by traffic volumes. As explained above, existing US 74 currently does not allow for high-speed regional travel and does not include access control and grade separations, which are warranted by current and projected 2030 traffic volumes.

Therefore, existing US 74 is not consistent with the visions of the SHC and Intrastate System.

Locally, the Mecklenburg-Union Metropolitan Planning Organization's (MUMPO) Long Range Transportation Plan (LRTP) identifies improvements to the US 74 corridor in the study area as a high priority. The LRTP includes a new location freeway from US 74 at I-485 to US 74 west of Marshville with interchanges proposed at the following locations:

- Indian Trail Fairview Road (SR 1520)
- Unionville Indian Trail Road (SR 1537)
- Rocky River Road (SR 1514)
- US 601
- NC 200
- Secrest Avenue (SR 1941)
- Austin Chaney Road (SR 1758)
- Forest Hills School Road (SR 1754)

The project is also included in NCDOT's 2007-2013 STIP, which lists two projects in the corridor - the Monroe Bypass and Monroe Connector - as new location freeways. Projects included in the LRTP and STIP are also included in the region's air quality conformity determination (*2030 Long Range Transportation Plan & Air Quality Conformity*) that demonstrates the region will meet National Ambient Air Quality Standards in specified future horizon years.

Based on these conditions, there are two closely related needs in this 20-mile section of the US 74 corridor:

- **Existing and Projected Capacity Deficiencies**

Existing US 74 lacks sufficient capacity to handle existing and projected traffic volumes. There is a need to provide increased roadway capacity to accommodate existing and projected traffic volumes in this corridor.

- **Inconsistency with NC Strategic Highway Corridor and NC Intrastate System Standards**

Existing US 74 does not have the capacity nor the design features that are necessary to provide for high-speed regional travel, in a manner consistent with the designations of this corridor as a SHC and as part of the NC Intrastate System. There is a need to provide a facility that meets the requirements for a SHC and an Intrastate System route.

I-1.2 Purpose of Proposed Action

The purpose of the proposed action is to improve mobility and capacity within the US 74 corridor that allows for high-speed regional travel consistent with the designations of the NC Strategic Highway Corridor system and the NC Intrastate System, while maintaining access to properties along existing US 74.

I-2 REPORT PURPOSE AND ORGANIZATION

This report documents the alternatives development and analysis process resulting in the identification of the Detailed Study Alternatives to be studied in detail in the project's Draft Environmental Impact Statement (DEIS).

This report is divided into the following five sections:

- 1.0 Qualitative First Screening of Alternative Concepts
- 2.0 Development of Preliminary Corridor Segments
- 3.0 Qualitative Second Screening of Preliminary Study Corridors
- 4.0 Quantitative Third Screening of Preliminary Study Alternatives
- 5.0 Agency Coordination and Public Involvement
- 6.0 Report Review and Comments

Section 1.0 describes the Qualitative First Screening. In this step, several alternative concepts were identified and considered for their ability to meet the purpose and need of the project, as well as to determine whether they would be reasonable and practicable. They included:

- No-Build or No-Action Alternative
- Transportation Demand Management Alternatives (TDM)
- Transportation System Management Alternatives (TSM)
- Mass Transit/Multi-Modal Alternatives
- Build Alternatives, including Improve Existing Roadways and New Location Alternatives

Section 2.0 includes a discussion of how preliminary study corridors for the project were developed for the concepts remaining after the qualitative first screening.

Section 3.0 describes the Qualitative Second Screening. In this step, the features and potential impacts of the preliminary study corridors were qualitatively assessed and compared to identify those to include in the quantitative third screening.

Section 4.0 describes the Quantitative Third Screening. In this step, the preliminary study corridor segments remaining following the Qualitative Second Screening process were combined to form 25 preliminary study alternatives (from I-485/US 74 to west of Marshville). Conceptual designs were created within these preliminary study alternatives, and these were used to quantitatively estimate impacts to the human and natural environments. Estimated impacts for the preliminary study alternatives were compared, and 16 preliminary study alternatives were recommended for detailed consideration in the DEIS (Detailed Study Alternatives).

Section 5.0 summarizes the agency coordination and public involvement which contributed to the selection of Detailed Study Alternatives.

Section 6.0 outlines the public review process for the Draft Alternatives Development and Analysis Report and provides a summary of comments made on the draft report.

I-3 SUMMARY OF ALTERNATIVES ELIMINATED AND ALTERNATIVES RETAINED FOR DETAILED STUDY

Each of the basic alternative concepts was evaluated to determine whether it would meet the project's purpose and need, and whether it would be reasonable and practicable to implement. Through the three-step screening process, those alternatives that could not fulfill the purpose and need for the project, had excessive impacts compared to other alternatives, or were considered unreasonable, were recommended for elimination from further consideration.

I-3.1 Qualitative First Screening

The Qualitative First Screening considered the five alternative concepts noted in **Section I-2**. In addition, hybrid concepts consisting of constructing part of the corridor on new location roadway and improving existing roadways for the remaining part were examined. These concepts were screened against the Statement of Purpose and Need for the project. Those concepts not meeting the defined Statement of Purpose and Need were removed from further consideration. The results of the Qualitative First Screening indicated that only a freeway type facility, either on new location or an upgrade of existing roadways, or a combination of new location and upgrade of existing facilities,

would fulfill the identified needs and meet the purpose of the project.

I-3.2 Qualitative Second Screening

For the Qualitative Second Screening, more than forty 1,000-foot wide corridor segments on new location and on existing roadways were qualitatively discussed and compared with respect to potential impacts to the human and natural environments, as well as with respect to reasonableness and practicability. Corridor segments not eliminated by the second screening were combined to form 25 preliminary study alternatives (PSAs) beginning at I-485 and ending at US 74 west of Marshville.

I-3.3 Quantitative Third Screening

From the 25 PSAs, sixteen Detailed Study Alternatives (DSAs) were recommended for further study in the DEIS. The 16 alternatives recommended for further study are PSAs A, B, C, D, A1, B1, C1, D1, A2, B2, C2, D2, A3, B3, C3, and D3.

The nine PSAs recommended for elimination use all or a substantial length of existing US 74 (PSAs G, E, E1, E2, E3, F, F1, F2, and F3). The quantitative third screening showed that these alternatives would have high impacts compared to the other PSAs on the following screening factors and resources: business relocations, streams, minor road crossings, hazardous material sites, and construction costs.

CHAPTER 1

1.0 QUALITATIVE FIRST SCREENING OF ALTERNATIVE CONCEPTS

The Federal Highway Administration (FHWA) recommends that the basic alternative concepts listed below should be considered “when determining reasonable alternatives” (FHWA Technical Advisory T6640.8A, 1987):

- No-Build or No-Action Alternative
- Transportation Demand Management (TDM) Alternatives
The TDM Alternative includes measures and activities that change traveler behavior.
- Transportation System Management (TSM) Alternatives
The TSM Alternative includes those activities which maximize the efficiency of the present transportation system.
- Mass Transit/Multi-Modal Alternatives
- Build Alternatives
Build Alternatives include both Improve Existing Roadways and New Location Alternatives.

For the Monroe Connector/Bypass project, additional hybrid concepts have been considered, consisting of constructing part of the corridor on new location roadway and improving existing roadways for the remaining part.

The purpose of the qualitative first screening is to determine which of these alternative concepts could be developed to meet the project purpose and need. Those concepts that cannot be developed in to meet the defined Purpose and Need will be removed from further consideration.

1.1 SCREENING CRITERIA

Each alternative concept has been considered for its potential to meet the purpose and need for this project. The following screening criteria listed below have been applied. Background on these criteria is included in the following sections.

- Does the alternative address the need to enhance mobility and increase capacity in the US 74 corridor?
- Is the alternative consistent with the NC Strategic Highway Corridor program and NC Intrastate System?
- Does the alternative maintain access to properties along existing US 74?

A decision to carry an alternative forward in the first screening does not necessarily mean that the alternative will meet the purpose and need. Alternatives were carried forward in the first screening if, based on the information available, they appeared to have the potential to meet all elements of the purpose and need. Alternatives could also be eliminated later in the process if additional information and details made it clear that they could not meet the purpose and need.

1.1.1 Ability to Enhance Mobility and Provide Increased Capacity in US 74 Corridor

Overall, traffic volumes along the corridor are projected to increase about 30-35 percent from 2007 to 2030. Average daily traffic (ADT) volumes predicted in 2030 range from highs of about 84,000 ADT near I-485 in Mecklenburg County and about 72,000 ADT between NC 200 (Morgan Mill Road) and Boyte Street in Monroe, to a low of about 33,000 to 40,000 ADT on the eastern end of the project study area.

Anticipated increases in population and employment opportunities in the region will result in higher traffic volumes along US 74 and other major roads in the area. By 2030, most of the intersections analyzed along US 74 will be over capacity and long queues will form during peak hours. Delays at individual intersections can average up to several minutes. Eighteen intersections along the corridor are projected to operate above capacity (LOS E or F) by 2030. There will be congested conditions along US 74 from I-485 all the way to Walkup Avenue (SR 1751) near the center of Monroe.

1.1.2 Consistency with Planning and Legislative Vision for the Corridor

1.1.2.1 Serves High-Speed Regional Travel

As shown in **Table 1-1**, the desirable LOS in terms of average operating speeds during peak travel periods for a Primary Freeway is 50 to 55 mph in intermediate areas (areas between suburban areas and central business district areas) and 50 to 60 mph in suburban areas. Commuters, as well as longer distance travelers that would be traveling most or all of the length of the corridor through Union County, would benefit from a higher and more reliable travel speed than what is currently experienced on the congested existing route.

Table 1-2 lists the 2007 (existing) and 2030 (No-Build) estimated travel times on US 74 through the study area. As shown in the table, existing average speeds through the corridor are slow; at 24 to 29 mph in the peak direction. By 2030, peak direction average speeds are projected to decrease substantially to 17 to 21 mph, causing a trip along the full length of the corridor to take well over an hour. Travel times through the corridor are inhibited due to the presence of several signalized intersections, numerous driveways, heavy turning movements, and high volumes of traffic. The corridor also has a high percentage of truck traffic.

1.1.2.2 Consistency with North Carolina Strategic Highway Corridor

The North Carolina Board of Transportation has established a vision for the US 74 corridor that includes developing a freeway in this corridor to accommodate high-speed regional travel. The North Carolina Board of Transportation adopted a Vision Plan for this section of US 74 pursuant to North Carolina’s SHC initiative. The Vision Plan for US 74 identifies a freeway as the minimum preferred type of roadway for the corridor. As a freeway, the roadway to be developed in this corridor is to have a minimum of four travel lanes and full control of access.

The term “freeway” is defined in NCDOT’s publication, Facility Type & Control of

Table 1-1: Desirable Average Travel Speeds During Peak Traffic Conditions

Street Classification (Major Thoroughfare)	Suburban Areas (mph)	Intermediate Areas (mph)	Central Business Areas (mph)
Primary Freeway	50-60	50-55	45-55
Urban Freeway	45-55	45-55	45-50
Parkway	40-45	40	35
Expressway	45	35-45	30-35
Major Arterials	35-45	30-40	20-30

Source: NCDOT Policy on Desirable Levels of Service for State Highway System Streets and Highways in Urban Areas, October 29, 1997

Table 1-2: Average Travel Times and Speeds Through the US 74 Corridor

Scenario	2007 Existing		2030 No Build		% Change (minutes/mph)
	Travel Time (minutes)	Average Speed (mph)	Travel Time (minutes)	Average Speed (mph)	
Morning Peak Periods					
Westbound toward Charlotte (peak direction)	50	24	70	17	+40% / -29%
Evening Peak Periods					
Eastbound away from Charlotte (peak direction)	47	29	68	21	+45% / -28%

Source: *Final Monroe Connector / Bypass Traffic Technical Memorandum, March 2008*

Access Definitions (August 2005). A freeway is defined as follows:

- **Functional Purpose:** High Mobility, Low Access
- **AASHTO Design Classification:** Interstate or Freeway
(AASHTO – American Association of State Highway and Transportation Officials)
- **Posted Speed Limit:** 55 mph or greater
- **Control of Access:** Full
- **Traffic Signals:** Not Allowed
- **Driveways:** Not Allowed
- **Cross-Section:** Minimum 4 Lanes with a Median
- **Connections:** Provided only at interchanges; All cross-streets are grade-separated
- **Median Crossovers:** Public-use crossovers not allowed; U-turn median openings for use by authorized vehicles only when need is justified.

1.1.2.3 Consistency with North Carolina Intrastate System

The NC Intrastate System has been established by statute in North Carolina (GS § 136-178). The purpose of the Intrastate System is to provide “high-speed, safe travel

service throughout the State.” As defined in statute, the Intrastate System:

- “connects major population centers both inside and outside the State”;
- “provides safe, convenient, through-travel for motorists”;
- “is designed to support statewide growth and development objectives and to connect to major highways of adjoining states.”

The statute governing the development of the NC Intrastate System requires that the routes in the Intrastate System have at least four travel lanes unless traffic volume projections and environmental considerations dictate fewer lanes. The legislation also requires vertical separation or interchanges at crossings, more than four travel lanes, and bypasses “when warranted.” In other words, Intrastate System designation requires a four-lane, access-controlled roadway if such a facility is warranted by traffic volumes and is not precluded by environmental constraints.

1.1.3 Maintains Access to Properties Along Existing US 74

Existing US 74 in Union County is a critical commercial corridor for the economic vitality of the county. Industries, offices, retail businesses, and institutions are located

along the corridor, many of which have US 74 as their only access.

In 2004, Union County’s tax base was composed of approximately 80 percent residential properties and 20 percent business properties. For every dollar Union County receives from residential development, the county provides an average of \$1.31 in services. Commercial and industrial development, on the other hand, adds to the tax base. For every dollar commercial or industrial development pays to the county, the county spends only 45 cents (*Local Government Fiscal Impacts of Land Uses in Union County – Revenue and Expenditure Streams by Land Use Category*. Prepared by Dorfman Consulting for Union County, December 2004).

Businesses throughout the US 74 corridor provide a wide range of goods and services to local residents. Directly impacting or relocating businesses along US 74 would adversely impact not only the local residents, but the economy of Union County.

The purpose of maintaining access to these properties would not be met if substantial numbers of these businesses are forced to close or relocate away from this important commercial corridor.

1.2 ALTERNATIVE CONCEPTS

Each of the alternative concepts was evaluated according to the screening criteria listed above. **Table 1-3** presents the results of the Qualitative First Screening. It lists each alternative concept and whether each alternative concept meets or does not meet the screening criteria. The following subsections provide a discussion of the results listed in **Table 1-3**, and include:

- A description of the alternative concept.
- Ability to meet the screening criteria. If the concept meets or has the potential to meet a purpose and need element, there is a ✓ next to the text. If it would not meet purpose and need, then there is a ✗ next to the text. If

Table 1-3: Qualitative First Screening – Ability of Alternative Concepts to Meet Purpose and Need

Alternative Concepts	Enhances Mobility and Increases Capacity ¹	Consistency with Planning and Legislative Vision for the Corridor			Maintains Access to Properties Along US 74 ¹
		Serves High Speed Regional Travel ¹	SHC ¹	Intrastate System ¹	
Transportation Demand Management	✓	✗	✗	✗	✓
Transportation System Management	✓	✗	✗	✗	✓
Mass Transit/Multi-Modal	✓	✗	✗	✗	✓
Improve Existing US 74					
Widened Arterial	✓	✗	✗	✗	✓
Superstreet	✓	○	✗	○	✓
Controlled-Access Highway	✓	✓	✓	✓	✓
New Location Highway	✓	✓	✓	✓	✓
New Location/Improve Existing Roadways Hybrids	✓	✓	✓	✓	✓

1. ✗ - means the alternative concept cannot meet this element of purpose and need.
 ✓ - means the alternative concept does meet, or could be designed to meet, this element of purpose and need.
 ○ - means available data is not sufficient to make a determination regarding this element of purpose and need.

available data is not sufficient to make a determination regarding a criterion, then there is a **O**.

- Decision on whether the alternative concept should be carried forward to the qualitative second screening of alternatives.

1.2.1 No-Build Alternative Concept

The No-Build Alternative is the baseline comparative alternative for the design year (2030). The No-Build Alternative assumes that the transportation systems for Union and Mecklenburg Counties would evolve as currently planned in the LRTP, but without major improvements to the existing US 74 corridor from I-485 to Marshville. By definition, this alternative would not meet the project's purpose and need.

1.2.1.1 Ability to Meet Project Purpose and Need

✘ **Enhances Mobility and Increases Capacity.** Making no improvements to existing US 74, as would occur under the No-Build Alternative concept, would not enhance mobility nor increase capacity along the corridor or in areas surrounding the corridor.

✘ **Serves High-Speed Regional Travel.** The No-Build Alternative concept would not serve high-speed regional travel. Existing US 74 is not serving high-speed travel now, and increasing traffic volumes in the area will not allow US 74 to serve high-speed regional travel in the future.

Existing US 74 in the study area (between I-485 in Mecklenburg County and just west of the Town of Marshville) is a four-to-six lane arterial roadway with several at-grade signalized intersections, many unsignalized intersections, and numerous commercial and residential driveway connections.

The posted speed limits within the study area range from 45 to 55 mph except for those sections in Wingate and Marshville where the posted speed limit is 35 mph. The average travel speeds range from approximately 20 to 30 mph during the peak hour, and are expected to decline to less than 20 mph by 2030. Currently, ADT on existing US 74 range from 30,000 to more than 90,000 ADT, resulting in a high level of congestion during the peak hours. One-third of the intersections operate at an unacceptable LOS (LOS E or F) during the peak hour under existing conditions. Approximately two-thirds of the intersections are expected to operate at LOS E or F by 2030, with long queues at many intersections.

✘ **Consistency with the NC SHC.** The No-Build Alternative concept would not be consistent with the NC SHC program vision since existing US 74 is not a freeway.

✘ **Consistency with the NC Intrastate System.** The No-Build Alternative concept would not be consistent with the NC Intrastate System since existing US 74 does not currently accommodate high-speed travel.

✓ **Maintains Access to Properties Along US 74.** The No-Build Alternative concept would maintain access to properties along existing US 74 since that access currently exists.

1.2.1.2 Decision on Whether to Retain for Qualitative Second Screening

Decision: Retain the No-Build Alternative for comparison purposes.

Although the No-Build Alternative concept would preserve existing access to properties along the US 74 corridor, it would not provide for high-speed regional travel,

enhance mobility or increase capacity. It would not be consistent with the NC SHC program or the NC Intrastate System. However, in accordance with the National Environmental Policy Act (NEPA) (40 CFR 1502.14(d)) and FHWA guidance (FHWA Technical Advisory T 6640.8A, 1987), the No-Build Alternative will be given full consideration in the DEIS to provide a baseline for comparison with the Detailed Study Alternatives.

1.2.2 Transportation Demand Management Alternative Concept

Transportation Demand Management (TDM) Alternative concept includes measures and activities that change traveler behavior. Typically, they do not involve major capital improvements. The TDM Alternative would include demand management strategies currently implemented in Mecklenburg and Union Counties, such as staggered work hours and flex-time (employer focused) and ridesharing.

Ridesharing, such as carpools and vanpools, is generally viewed as more convenient than bus transit with regard to access, door-to-door travel times, and comfort. However, the ability of these voluntary programs to reduce traffic volumes on particular roadways is minimal.

Presently, the Charlotte Area Transit System (CATS) promotes ridesharing to employment destinations in the Charlotte area by providing a car rideshare matching service and a vanpool program. The CATS vanpool program currently has 78 vanpools (Charlotte-Mecklenburg website, accessed April 23, 2007: www.charmeck.org/Departments/CATS/Commuter+Options/Vanpool+List.htm). Two of these vanpools originate in Union County - one in Indian Trail and one in Waxhaw.

CATS also promotes employer programs for managing travel demand. There are 36 companies currently participating in CATS' Employee Transportation Coordinator (ETC) Program (Charlotte-Mecklenburg website, accessed April 23, 2007: www.charmeck.org/Departments/CATS/Transit+Programs/Home.htm).

1.2.2.1 Ability to Meet Project Purpose and Need

✓ **Enhances Mobility and Increases Capacity.** The TDM Alternative would result in a nominal increase in capacity and incrementally enhance mobility for the small percentage of travelers that would use these opportunities. Staggered work hours, flex-time, or modified work weeks can be implemented on a corridor level by large employers along the corridor who experience congestion at their entrances and exits. Although the US 74 corridor does contain some large businesses, it is not expected that such adjustments to work schedules would significantly reduce peak hour traffic volumes within the project study area.

Historically, vehicle occupancy in the Charlotte area has remained approximately 1.2 persons per vehicle. A much higher participation rate, beyond that which can reasonably be expected, would be required for ridesharing, vanpooling, staggered work hours, and other transportation demand measures to provide a noticeable improvement in traffic conditions in the US 74 corridor.

✗ **Serves High-Speed Regional Travel.** The TDM Alternative concept would not serve high-speed regional travel. As described for the No-Build Alternative, existing US 74 is not serving high-speed travel now, and increasing traffic volumes in the area will not allow

US 74 to serve high-speed regional travel in the future.

- ✘ **Consistency with the NC SHC.** The TDM Alternative concept would not be consistent with the vision for the US 74 corridor defined in the NC SHC program since this alternative concept would not create a freeway facility in the US 74 corridor.
- ✘ **Consistency with the NC Intrastate System.** The TDM Alternative concept would not be consistent with the NC Intrastate System. The current facility does not accommodate high-speed travel, and this alternative concept would not involve capital improvements to the corridor to achieve high-speed travel.
- ✓ **Maintains Access to Properties Along US 74.** The TDM Alternative concept would maintain access to properties along existing US 74 since that access currently exists and the TDM Alternative would not involve any capital improvements to the corridor.

1.2.2.2 *Decision on Whether to Retain for Qualitative Second Screening*

Decision: Eliminate the TDM Alternative Concept from further consideration.

TDM measures would provide increased transportation choices in the area, however, it is likely that only a small percentage of travelers would take advantage of the TDM options. TDM measures would not provide for high-speed regional travel, enhanced mobility, nor increased capacity for the majority of travelers on US 74. The TDM Alternative would not be consistent with the NC SHC program or the NC Intrastate System program.

1.2.3 Transportation System Management Alternative Concept

Transportation System Management (TSM) Alternative concept measures typically consist of low-cost, minor transportation improvements to increase the capacity of an existing facility. There are two main types of TSM improvements: operational and physical. Examples of TSM operational improvements include:

- Traffic law enforcement
- Access control
- Signal coordination
- Turn prohibitions
- Speed restrictions
- Signal phasing or timing changes

Examples of TSM physical improvements include:

- Turn lanes
- Intersection realignment
- Improved warning and information signs
- New signals or stop signs
- Intersection geometric and signalization improvements

The TSM Alternative concept considered minor improvements along existing US 74 consisting of traffic signal coordination, access control measures (e.g. driveway consolidation, closing median breaks), and intersection improvements such as adding intersection turn lanes and extending turn lanes to hold longer queues. TSM measures such as traffic law enforcement, speed restrictions, intersection realignment, improved warning and information signs and the addition of new signals or stop signs were not considered as part of this analysis. As stated in the project need, US 74 lacks sufficient capacity to handle existing and projected traffic volumes. A need has been identified to provide increased roadway capacity to

accommodate existing and projected traffic volumes in this corridor. These TSM measures would not create any additional capacity along US 74 and were therefore not considered.

Traffic signals along US 74 between I-485 and Fowler Secret Road (SR 1754) are spaced 0.7 to 1.3 miles apart. From Fowler Secret Road (SR 1754) to the US 74 / US 601 split, the traffic signals are spaced about 0.25 to 0.5 miles apart. According to the *Highway Capacity Manual 2000*, the functional design for a high-speed facility would limit signal spacing to between 0.5 and two miles. This spacing is required in order to limit traffic disruptions and maintain a speed of 45 to 55 mph (*Highway Capacity Manual 2000, Table 10-4*). As the number of intersections per mile increases, the opportunity for crashes increases. The existence of too many intersections per mile also increases delay and congestion by disrupting the traffic flow through the area. Frequent stops also result in higher fuel consumption because of the stop and go nature of the traffic flow.

Coordinated traffic signals could result in some improvement in traffic flow, particularly where the traffic signals are more closely spaced. However, there would continue to be delays experienced at the intersections and slowed traffic due to motorists turning into and out of driveways and at median breaks and due to the presence of tractor-trailer trucks. Closing median breaks and some driveways would not be effective since limiting turning movements between signalized intersections would increase the turning movement volumes at signalized intersections.

1.2.3.1 Ability to Meet Project Purpose and Need

- ✓ **Enhances Mobility and Increases Capacity.** The TSM Alternative concept could enhance mobility

somewhat due to increased intersection capacities resulting from minor improvements and improved traffic progression with coordinated signals. However, the amount of traffic projected for 2030 along US 74 would overwhelm the effectiveness of minor TSM improvements.

- ✗ **Serves High-Speed Regional Travel.** A TSM Alternative concept would not serve high-speed regional travel. Coordinated signals might provide some improvement in traffic flow in the area between I-485 and Monroe, but the continued presence of these signals, together with the numerous driveways and unsignalized intersections, would not result in a high-speed facility.
- ✗ **Consistency with the NC SHC.** The TSM Alternative concept would not be consistent with the NC SHC program. The program's vision for the US 74 corridor is a freeway facility. Existing US 74 is experiencing congestion and is not functioning as a high-speed facility. The TSM Alternative concept would not result in a high-speed freeway facility.
- ✗ **Consistency with the NC Intrastate System.** The TSM Alternative concept would not be consistent with the NC Intrastate System since it would not accommodate high-speed travel.
- ✓ **Maintains Access to Properties Along US 74.** The TSM Alternative concept could maintain access to properties along existing US 74 since that access currently exists. However, driveway closure and consolidation opportunities that could provide some improvements would be limited by the goal of maintaining access.

1.2.3.2 Decision on Whether to Retain for Qualitative Second Screening

Decision: Eliminate the TSM Alternative Concept from further consideration.

In general, TSM improvements are low-cost measures that are effective in solving localized or site-specific capacity, safety, and operational problems in urban areas. Alone, they would not meet the project's more regional purposes and needs. Although signal coordination and intersection improvements along US 74 likely could modestly improve traffic flow, this alternative would not allow for high-speed regional travel nor be consistent with the NC SHC program and the NC Intrastate System.

1.2.4 Mass Transit/Multi-Modal Alternative Concept

The Mass Transit Alternative concept would include bus or rail passenger service. A major advantage of mass transit is that it can provide high-capacity, energy-efficient movement in densely traveled corridors. It also serves high density areas by offering an option for automobile owners who do not wish to drive, as well as service to those without access to an automobile. The Multi-Modal Alternative concept would combine mass transit with roadway improvements.

Separate studies of mass transit are being undertaken in Mecklenburg County by CATS. Plans and existing services in Union County and between Union County and Mecklenburg County are described below.

Neither Union County nor the City of Monroe operates a public transportation system, with the exception of on-demand paratransit services. There are no plans to begin other public services in the near future, nor is funding available for such service.

CATS operates an express bus service to and from Uptown Charlotte, stopping at two park and ride lots in Union County. Park and Ride Lot P51 is located at Union Town Shopping Center off US 74 in Indian Trail. Park and Ride Lot P54 is located at the K-Mart at 2120 West Roosevelt Boulevard (US 74) in Monroe. (CATS website, accessed April 23, 2007: www.charmeck.org/Departments/CATS/Riding+CATS/Park+%27N%27+Rides.htm)

CATS is planning a major expansion of its mass transit service throughout Mecklenburg County. In November 1998, Mecklenburg County citizens approved a local sales and use tax (one-half percent) to support implementation of the *2025 Integrated Transit/Land Use Plan*, which identified five major mass transit corridors. One of these corridors, the Southeast Corridor, has a study area that extends from Center City Charlotte southeast to South Piedmont Community College just east of I-485 in Union County. On September 27, 2006, the Metropolitan Transit Commission (the agency that oversees CATS rapid transit corridor projects) delayed planning for the Southeast Corridor Rapid Transit Project by at least five years, with project completion beyond the year 2020.

1.2.4.1 Ability to Meet Project Purpose and Need

- ✓ **Enhances Mobility and Increases Capacity.** The Mass Transit Alternative concept would enhance mobility by providing an alternative mode of transportation. If located on a dedicated separate right of way (ROW), the Mass Transit Alternative would increase capacity in the US 74 corridor.
- ✗ **Serves High-Speed Regional Travel.** A Mass Transit Alternative concept generally would not serve high-speed regional travel. A mass transit system

with a dedicated, separate ROW could provide high-speed service for some users, but it would serve much lower volumes than a roadway and would serve only individual passengers, not freight.

Mass transit would not be expected to divert substantial volumes of traffic off of US 74. According to the 2000 US Census, the percent of commuters that used transit in Mecklenburg County was only about 2.6 percent, even with a robust transit system in place such as the one in Mecklenburg County. A decrease in commuter traffic of 2 to 3 percent would not be enough to change projected congestion on US 74 in the project area. Long distance travelers, freight traffic, and some local traffic that could not use mass transit would not benefit, since US 74 would continue to have numerous signalized and unsignalized intersections, driveways, and median breaks that contribute to delay.

A mass transit system that used existing roadways (instead of a dedicated, separate ROW) would not provide for high-speed regional travel because of congestion and delays along existing routes, including US 74.

- ✘ **Consistency with the NC SHC.** The Mass Transit Alternative concept would not be consistent with the NC SHC program. It would not help fulfill the ultimate vision for the corridor as a freeway, nor result in a high-speed facility in the US 74 corridor.
- ✘ **Consistency with the NC Intrastate System.** The Mass Transit Alternative concept would not be consistent with the NC Intrastate System since it would not provide for high-speed travel on US 74.

- ✓ **Maintains Access to Properties Along US 74.** A Mass Transit Alternative concept that used existing roadways could maintain the existing access to properties along US 74. A Mass Transit Alternative on a dedicated, separate ROW likely could be designed to maintain access to properties along existing US 74. This need would influence the alignment and design of a mass transit line.

1.2.4.2 *Decision on Whether to Retain for Qualitative Second Screening*

Decision: Eliminate the Mass Transit / Multi-Modal Alternative Concept from further consideration.

Rapid transit service, particularly on a dedicated ROW, could provide increased mobility and capacity between Union County and Mecklenburg County by providing an alternative mode choice for commuters and other county-to-county and intracounty travelers. However, this alternative concept (either new rapid transit or expanded bus service) would not divert enough vehicular traffic to improve traffic flow on US 74 nor provide a high-speed facility that serves both individual travelers and freight trips. There is also no program currently in place in Union County to fund mass transit improvements.

The Mass Transit Alternative concept for this project would need to connect to the Southeast Corridor Rapid Transit Project in Mecklenburg County, and that project has been delayed until after 2020. Also, current land uses along US 74 likely would not support a rapid transit line. Combining a Mass Transit Alternative concept with other modes also would not be practicable. The mass transit element would add substantial costs to any alternative that includes road improvements, but would do very little to improve traffic flow on US 74.

1.2.5 Improve Existing US 74 (Standard Arterial Widening) Alternative Concept

The Improve Existing US 74 (Standard Arterial Widening) Alternative concept would improve existing US 74 from I-485 to just west of Marshville. Implementation of this alternative concept would include the addition of two to four lanes to create an eight-lane major arterial. The signalized intersections and driveways would remain. According to the Florida Generalized Planning Tables, based on the No-Build 2030 traffic volumes, eight lanes would not be sufficient to allow for an acceptable LOS through much of the project study area. However, even if a ten lane facility could provide an acceptable LOS, a facility of this size is not feasible. The Florida Generalized Planning Tables is a general planning LOS tool which is based upon the Highway Capacity Manual. There would be no new-location component to this alternative concept.

1.2.5.1 Ability to Meet Project Purpose and Need

- ✓ **Enhances Mobility and Increases Capacity.** Improving existing US 74 (widened arterial) would enhance mobility and increase capacity in the US 74 corridor.
- ✗ **Serves High-Speed Regional Travel.** A widened arterial, regardless of the number of lanes, would not provide for high-speed travel since traffic would continue to experience delay at the numerous signalized intersections along the existing corridor.
- ✗ **Consistency with the NC SHC.** Improving existing US 74 as a widened arterial would not be consistent with the NC SHC program's vision for the corridor as a freeway.

- ✗ **Consistency with the NC Intrastate System.** As discussed previously, the NC Intrastate System designation requires a four-lane, access-controlled roadway if such a facility is warranted by traffic volumes and is not precluded by environmental constraints.

Improving existing US 74 as a widened arterial would not be consistent with the NC Intrastate System because it would not provide for high-speed regional travel.

- ✓ **Maintains Access to Properties Along US 74.** Improving existing US 74 to an eight-lane widened arterial could maintain access to properties along existing US 74 since that access currently exists. However, some businesses and / or their parking would be impacted by this widening.

1.2.5.2 Decision on Whether to Retain for Qualitative Second Screening

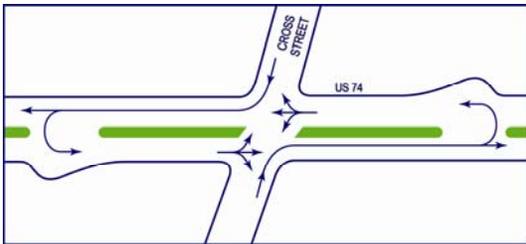
Decision: Eliminate the Improve Existing US 74 (Standard Arterial Widening) Alternative Concept from Further Consideration.

This alternative concept would not eliminate the numerous traffic signals present throughout the corridor nor would it provide for any access control along the existing corridor. Failure to accomplish either of these would not allow the corridor to provide for high-speed travel nor be consistent with the NC SHC program or the NC Intrastate System. Because it would not meet the purpose and need for this project, it is not a reasonable alternative concept and it is recommended to be eliminated from further analysis.

1.2.6 Improve Existing US 74 (Superstreet) Alternative Concept

The Improve Existing US 74 (Superstreet) Alternative concept would improve existing US 74 from I-485 to just west of Marshville as a superstreet. There would be no new location component to this alternative concept.

The superstreet configuration adds capacity at intersections by restricting left turns and through movements from cross-streets. The US 74 mainline would operate as a pair of one-way streets controlled, when necessary, by two-phase signals. The left turning and through movements from the cross-streets would be rerouted to make a right turn onto US 74, travel to a downstream U-turn location (typically located 1,000 feet downstream) and make a U-turn onto US 74 where they can continue on US 74 or make a right turn onto a cross-street. The U-turn locations on US 74 would operate as yield-controlled or signalized intersections depending on traffic volumes and geometric conditions. The roadway configuration of the superstreet concept is shown below.



1.2.6.1 Ability to Meet Project Purpose and Need

- ✓ **Enhances Mobility and Increases Capacity.** Improving existing US 74 to a superstreet would enhance mobility and increase capacity in the US 74 corridor.
- **Serves High-Speed Regional Travel.** A superstreet design may be able

provide for high-speed travel, depending on the projected traffic volumes and design. Additional traffic operations analyses would be needed in order to estimate the average travel speed that could be obtained under the projected 2030 traffic volumes.

- ✗ **Consistency with the NC SHC.** Improving existing US 74 as a superstreet would not be consistent with the NC SHC program's vision for the corridor as a freeway.

- **Consistency with the NC Intrastate System.** As discussed previously, the NC Intrastate System designation requires a four-lane, access-controlled roadway if such a facility is warranted by traffic volumes and is not precluded by environmental constraints.

More information and detail would be needed regarding the superstreet option to determine if it could provide for high-speed travel and could accommodate the projected traffic volumes.

- ✓ **Maintains Access to Properties Along US 74.** A superstreet would require consolidation of driveways. Although some existing driveways would be removed as part of this alternative concept, access from US 74 likely could be maintained.

1.2.6.2 Decision on Whether to Retain for Qualitative Second Screening

Decision: Eliminate the Improve Existing US 74 (Superstreet) Alternative Concept from Further Consideration.

While a superstreet concept would allow for partial access control, this concept would not fulfill the NC SHC program's vision for the corridor as a freeway facility. Failure to meet this vision would not allow this concept to meet the purpose and need and it

is recommended to be eliminated from further analysis.

1.2.7 Improve Existing US 74 (Controlled-Access Highway) Alternative Concept

The Improve Existing US 74 (Controlled-Access Highway) Alternative concept would improve existing US 74 from I-485 to just west of Marshville. Implementation of this alternative concept would include a controlled-access highway (freeway). There would be no new location component to this alternative concept.

1.2.7.1 Ability to Meet Project Purpose and Need

- ✓ **Enhances Mobility and Increases Capacity.** Improving existing US 74 (controlled-access highway) would enhance mobility and increase capacity in the US 74 corridor.
- ✓ **Serves High-Speed Regional Travel.** A controlled-access highway option for improving existing US 74 would provide for high-speed regional travel.
- ✓ **Consistency with the NC SHC.** Improving existing US 74 as a controlled-access highway (freeway) would fulfill the ultimate vision for the corridor. In order to accommodate a controlled access toll facility approximately 350 of ROW is required. However, when improving the existing roadway corridor, a free alternative route is required (GS § 136-89.197 and 136-89.197). To accommodate this, constructing the project along an existing roadway corridor would require frontage roads to provide the free alternative route, which would increase the ROW needed for the project by an additional 228 feet.

- ✓ **Consistency with the NC Intrastate System.** Improving existing US 74 as a freeway facility would be consistent with the NC Intrastate System.
- ✓ **Maintains Access to Properties Along US 74.** As shown in previous studies conducted by NCDOT for the Monroe Connector, improvements to existing US 74 to upgrade the route to a controlled-access highway can be designed to maintain access to properties along US 74. In the previous studies, an alternative was developed that included improvements to existing US 74 from I-485 to Rocky River Road (SR 1514). This alternative involved a six-lane freeway section with two-lane frontage roads on either side to provide access to adjacent properties.

1.2.7.2 Decision on Whether to Retain for Qualitative Second Screening

Decision: Retain the Improve Existing US 74 Alternative Concept (Controlled-Access Highway) for the qualitative second screening.

The controlled-access highway option will be considered in the qualitative second screening.

1.2.8 New Location Alternative Concept

A New Location Alternative concept would involve construction of a roadway on new location from US 74 at I-485 to US 74 just west of Marshville. This screening does not differentiate between alternative corridor locations.

The facility type for this alternative would be a freeway, as the highest level facility warranted by traffic projections should be constructed when the alignment is on new location. Union County is the fastest growing county in North Carolina, and a freeway option would best preserve the

capacity of the new location road, and is consistent with the NC SHC designation and the Intrastate System designation.

1.2.8.1 *Ability to Meet Project Purpose and Need*

- ✓ **Enhances Mobility and Increases Capacity.** Providing a controlled-access freeway on new location would enhance mobility in the project study area by providing a higher capacity, more efficient route for the movement of goods and people. Trucks and other through-traffic likely would use the new location freeway, which would separate through-traffic from local traffic accessing businesses along existing US 74.
- ✓ **Serves High-Speed Regional Travel.** A new location controlled-access freeway would provide for high-speed regional travel.
- ✓ **Consistency with the NC SHC.** A new location controlled-access freeway would fulfill the SHC vision for the corridor and, therefore, would be consistent with the NC SHC program.
- ✓ **Consistency with the NC Intrastate System.** A new location controlled-access freeway would provide for high-speed regional travel. The New Location Alternative concept would be consistent with the NC Intrastate System designation for this proposed roadway.
- ✓ **Maintains Access to Properties Along US 74.** Since the New Location Alternative concept would construct a new facility, access to properties along existing US 74 would be maintained.

1.2.8.2 *Decision on Whether to Retain for Qualitative Second Screening*

Decision: Retain the New Location Alternative Concept for the qualitative second screening.

The controlled-access freeway New Location Alternative concept will be considered in the qualitative second screening. Several preliminary corridors on new location will be developed and qualitatively screened to identify those that should be carried forward for the quantitative third screening.

1.2.9 **New Location / Improve Existing Roadways Hybrid Alternative Concept**

This alternative concept would involve building a portion of the project on new location and improving some combination of existing roadways (US 74 or other roadways) for the remainder of the project. Potential hybrid alternatives could include improvements to Secret Shortcut Road (SR 1501) or Old Monroe Road/Old Charlotte Highway, two roads that generally parallel US 74 west of US 601. If carried forward, preliminary study corridors would be developed for evaluation in the qualitative second screening.

As with the New Location Alternative concept, the facility type for the new location portion of the hybrid alternative concepts would be a controlled-access freeway. The facility type for the improve existing roadway portion also would be a freeway to provide a consistent facility type the length of the project and to be consistent with the NC Strategic Highway Corridor program and the NC Intrastate System. Union County is the fastest growing county in North Carolina, and a freeway option would maximize the capacity of the new/upgraded road.

1.2.9.1 *Ability to Meet Project Purpose and Need*

- ✓ **Enhances Mobility and Increases Capacity.** A New Location/Improve Existing Roadways Hybrid Alternative concept could enhance mobility in the project study area by providing a more efficient route for the movement of goods and people and could increase capacity of the US 74 corridor by providing additional lanes.
- ✓ **Serves High-Speed Regional Travel.** A New Location/Improve Existing Roadways Hybrid Alternative concept could be designed to provide for high-speed regional travel.
- ✓ **Consistency with the NC SHC.** A New Location/Improve Existing Roadway Hybrid Alternative concept would be consistent with the NC SHC program if high-speed travel is provided and a controlled-access freeway typical section is used.
- ✓ **Consistency with the NC Intrastate System.** A New Location/Improve Existing Roadways Hybrid Alternative concept could be designed to provide for high-speed regional travel and could be consistent with the NC Intrastate System.
- ✓ **Maintains Access to Properties Along US 74.** A New Location/Improve Existing Roadways Hybrid Alternative could be designed to maintain access to properties along US 74.

1.2.9.2 *Decision on Whether to Retain for Qualitative Second Screening*

Decision: Retain the New Location / Improve Existing Roadways Hybrid Alternative Concept for the qualitative second screening.

The New Location/Improve Existing Roadways Hybrid Alternative concept will be considered in the qualitative second screening. Several preliminary corridors will be developed using combinations of new location and existing routes, including US 74, Secret Shortcut Road (SR 1501), and Old Monroe Road/Old Charlotte Highway. These corridors and combinations will be qualitatively evaluated in the second screening to identify those that should be carried forward for the quantitative third screening.

1.3 ALTERNATIVE CONCEPTS TO BE CARRIED FORWARD TO THE QUALITATIVE SECOND SCREENING

Table 1-4 lists the alternative concepts retained for the qualitative second screening, and those eliminated from further consideration based on the qualitative first screening.

Table 1-4: Alternative Concepts to be Carried Forward to Qualitative Second Screening

Alternative Concepts Retained for Qualitative Second Screening	Alternative Concepts Eliminated from Further Consideration
No-Build	Transportation Demand Management
Improve Existing US 74 (Controlled-Access Highway)	Transportation System Management
New Location Roadway (Controlled-Access Highway)	Mass Transit/Multi-Modal
New Location/Improve Existing Roadways Hybrids (Controlled-Access Highway)	Improve Existing US 74 (Standard Arterial Widening)
	Improve Existing US 74 (Superstreet)

CHAPTER 2

2.0 DEVELOPMENT OF PRELIMINARY CORRIDOR SEGMENTS

Preliminary corridor segments 1,000 feet wide were developed based upon a range of factors, including the corridors previously studied by NCDOT for the Monroe Connector and Monroe Bypass projects, constraints identified on the land suitability mapping, basic design criteria, route continuity, and ability to be tolled. Based on the results of the qualitative first screening, it is assumed that a controlled-access toll facility would be constructed within the 1,000-foot wide corridors represented by the corridor segments.

2.1 PREVIOUS STUDIES

Previous separate studies under the National Environmental Policy Act (NEPA) were conducted by the NCDOT for the Monroe Connector (STIP Project R-3329) and the Monroe Bypass (STIP Project R-2559). Information from these studies was used to facilitate the development of the project study area and preliminary study corridors for the current study for the Monroe Connector/Bypass project.

The NCDOT completed the original planning and environmental studies for the Monroe Bypass in project in 1997. As part of those studies, an Environmental Assessment (EA) was issued on March 14, 1996 and a Finding of No Significant Impact (FONSI) was issued on June 20, 1997.

Figure 2-1 shows the previous Monroe Bypass Detailed Study Alternatives and the Preferred Alternative identified in the previous NCDOT studies.

The NCDOT began the planning process for the Monroe Connector in 1999. A DEIS for the Monroe Connector was released in November 2003. This 2003

DEIS was rescinded on January 30, 2006 by notice in the Federal Register (Vol. 71, No 19, page 4958). **Figure 2-2** shows the previous Monroe Connector study area, preliminary study corridors, and Detailed Study Alternatives.

2.2 PROJECT STUDY AREA

As shown in **Figure 2-3**, a project study area for the Monroe Connector/Bypass project was identified for use in the development of possible build alternative corridors. The study areas of the previous Monroe Connector (**Figure 2-2**) and Monroe Bypass (**Figure 2-1**) studies were used as an initial guide in the development of the project study area for this project. Current conditions and comments received as part of those studies were also considered.

Overall. The project study area is centered on the US 74 corridor because the purposes of the project are to improve mobility and capacity and to serve high-speed regional travel within the US 74 corridor.

Western Boundary. To the west, the study area boundary is in the vicinity of NC 51 (just west of I-485) at US 74. I-485, the only controlled-access facility in the area, is a logical terminus for the proposed project, which is also proposed as a controlled-access facility.

Eastern Boundary. The eastern project study area boundary is along US 74 just west of the Town of Marshville. In this area, the US 74 corridor becomes rural and there are few existing or projected congestion issues in this area. Farther west along US 74, west of Wingate, traffic volumes begin to increase.

Northern Boundary. To the north, the boundary does not encroach on the Goose Creek watershed nor on Lake Twitty (a water supply). Previous studies included these areas, but because of concerns

surrounding the presence of the federally protected Carolina Heelsplitter mussel in Goose Creek and because Lake Twitty is a critical watershed, these areas were eliminated from the current project study area. Previously identified corridors for the Monroe Connector and Monroe Bypass that would result in direct impacts to the Goose Creek watershed or Lake Twitty are not included in this analysis.

Southern Boundary. At the request of federal and state environmental regulatory and resource agencies, the southern boundary of the project study area extends to just south of Old Monroe Road/Old Charlotte Highway to allow for consideration of alternative corridors south of existing US 74. The project study area does not extend farther south because identifying corridors that begin south of US 74 and remain south of US 74 would create a substantially longer route than routes north of US 74 due to the alignment of existing US 74. In addition, a more southerly alignment would need to avoid impacts to Monroe Country Club, a regional hospital, and multiple residential areas, as well as the Lake Lee critical watershed. A corridor south of the Lake Lee critical watershed would not be practical due to substantially greater length and potential impacts to the Waxhaw Creek watershed, which is also a known Carolina Heelsplitter habitat.

2.3 ESTABLISHING BROAD AREAS FOR CORRIDOR LOCATIONS

This section describes the general constraints considered in developing the preliminary corridor segments.

2.3.1 Route Continuity and Project Termini

The proposed project is intended to improve mobility and capacity in the US 74 corridor and to provide a facility that serves high-speed regional travel consistent with US

74's designation as a NC Strategic Highway Corridor and consistent with the NC Intrastate Corridor System. Therefore, the proposed project will provide a controlled-access facility. In addition, the proposed project must begin and end on existing US 74 in order to provide continuity for the US 74 corridor. With this in mind, potential locations for project termini were evaluated, as described below.

On the eastern end, the proposed project would terminate on US 74 between Wingate and Marshville. As described in **Section 2.2**, this is where existing and projected traffic volumes decrease and the study area transitions to a more rural character.

On the western end, several connections to I-485 were evaluated between the I-485/Idlewild Road (SR 1501) interchange to the north and the I-485/Old Monroe Road-John Street interchange to the south. However, as described below, the only reasonable location for the project to terminate is along existing US 74 or at the existing US 74/I-485 interchange.

Linking the proposed project to I-485 (not directly at US 74) would create a discontinuity in US 74 by forcing travelers on the new US 74 to access another facility (I-485) before continuing on US 74. Motorists traveling on US 74 between Monroe and Charlotte would be required to exit US 74 at I-485, travel south on I-485 for approximately two miles and exit I-485 onto existing US 74 (Independence Boulevard).

To accommodate the projected traffic volumes, longer entrance ramps would be needed on I-485 to allow traffic from Idlewild Road and the proposed US 74 Monroe Connector to merge before merging with traffic on I-485. Consequently, a collector-distributor roadway system would be needed between Idlewild Road (SR 1521) and Independence Boulevard to

accommodate weaving movements along I-485. In addition, the loop ramp for the eastbound to northbound traffic movements from Independence Boulevard to I-485 may not provide sufficient capacity for the anticipated traffic volumes and could require reconstruction.

US 74 is a road of local, regional, and statewide importance. In this urban area, creating a discontinuity to US 74 and routing it along a segment of I-485, where existing traffic volumes also are heavy, would result in greater potential for congestion and delays.

The I-485/Idlewild Road (SR 1501) interchange is not within the project study area for the Monroe Connector/Bypass. The project study area for the Monroe Connector/Bypass project was developed to avoid direct impacts to the Goose Creek watershed. Improvements needed to accommodate a highway-to-highway connection at this location would encroach on the Goose Creek watershed, which is known habitat of the federally protected Carolina Heelsplitter mussel.

The addition of a new interchange between the existing I-485/Idlewild Road (SR 1501) interchange and the existing I-485/US 74 was considered. However, a new interchange centrally located between the two existing interchanges would result in operational issues due to insufficient spacing (less than one mile) between the three interchanges on heavily traveled I-485, and the need to route through traffic from the proposed project onto I-485 to continue on existing US 74. Further, a new interchange in this area would have major unavoidable impacts to several densely developed residential areas, including Madison Ridge, Independence Village, and Woodbridge subdivisions. It is also likely that improvements would be required at the I-485/Idlewild Road (SR 1501) interchange to allow for efficient operations at the new

interchange and on I-485, which could encroach on the Goose Creek watershed.

Preliminary corridors that would connect to I-485 south of the I-485/US 74 interchange, either at the existing I-485/ Old Monroe Road-John Street interchange or a new intermediate interchange, were also considered but eliminated. There is insufficient spacing (about one mile) between the I-485/US 74 interchange and the I-485/ Old Monroe Road-John Street interchange for a new interchange. At the I-485/ Old Monroe Road-John Street interchange, necessary improvements to accommodate the new facility, as well as the alignment of new corridors to tie to this interchange, would have substantial impacts on downtown Stallings and Central Piedmont Community College. There would also be operational and continuity issues with traffic being routed north on I-485 to continue west on US 74.

2.3.2 Natural and Human Environment Features

Land suitability mapping shows the natural and human environment features in the project study area. These features include wetlands, streams, floodplains, known endangered species locations, water supply watersheds, hazardous wastes/materials locations, historic resources, churches, schools, businesses, community facilities, and neighborhoods/subdivisions.

The land suitability mapping for the project study area was developed using data layers obtained from a variety of Geographic Information System (GIS) databases (NCDOT, Union County, Mecklenburg County, US Geological Survey, and US Fish and Wildlife Service), state resource agency files, aerial photography, and field visits.

Examples of major natural features in the study area include numerous wetlands and streams. Named streams include, from west

to east; North Fork Crooked Creek, South Fork Crooked Creek, Stewarts Creek, and Richardson Creek.

The downtowns of several municipalities are within the study area, including Stallings, Indian Trail, Lake Park, Monroe and Wingate. In addition, the area is developing rapidly, and neighborhoods are located throughout the study area. Some examples of larger neighborhoods include Hamilton Place, Fairhaven, Village of Lake Park, Bonterra Village, Suburban Estates, and many other subdivisions. Central Piedmont Community College is located to the southeast of the I-485/US 74 interchange. Wingate University is located north of US 74 in the Town of Wingate. There are also numerous churches and several known historic resources in the project study area. Existing US 74 is a relatively densely developed commercial corridor important to the economy of Union County, and land uses adjacent to this roadway are primarily commercial and industrial.

2.4 PRELIMINARY CORRIDOR SEGMENTS

Preliminary corridor segments were developed taking into consideration the previously studied corridors, route continuity issues described in **Section 2.3.1**, the known natural and human environment features in the study area, public input, and the ability to toll the preliminary corridor segment. The preliminary corridor segments are shown in **Figures 2-4 and 2-5**. **Figure 2-4** depicts the preliminary corridor segments presented at the June Citizens Informational Workshops, and **Figure 2-5** includes the addition of corridor segments 18A and 22A which were added as a result of additional analysis and public input. The segment lines on the map represent the center of 1,000-foot wide study corridors. The forty-five preliminary corridor segments can be combined to form 164 preliminary

alternative routes from I-485 to US 74 near Marshville.

2.4.1 Previously Studied Corridors

All corridors identified for NCDOT's Monroe Connector and Monroe Bypass studies, both preliminary study corridors and detailed study alternatives, were reevaluated to determine if they should be considered as part of the Monroe Connector/Bypass project. In some cases, corridors considered in the previous studies are no longer viable options due to changes in the project area since the corridor's development; while in other instances, corridors eliminated from consideration in the previous studies now appear to be viable or with slight modifications could be made viable.

As noted above, the project study area for the Monroe Connector/Bypass project differs from the project study areas for the previous studies; therefore, preliminary corridors that extended beyond the limits of the current study area were considered no longer viable and were removed from consideration. This included several corridors that terminated at the I-485/Idlewild Road (SR 1501) interchange and several corridors east of US 601 that extended into the Lake Twitty critical watershed.

Some corridors identified during previous studies but eliminated during those studies, were found to be viable options either as previously identified or as previously identified with minor modifications for the Monroe Connector/Bypass project due to changes in the project area. These corridors were evaluated in the qualitative second screening.

2.4.2 Public and Agency Input

Of the preliminary corridor segments shown on **Figure 2-5**, some were developed as a result of comments from federal and state

environmental regulatory and resource and regulatory agencies and/or public input as described in **Section 5.0**. This includes additional corridors that utilize existing roadways (Old Monroe Road/Old Charlotte Highway [Corridor Segments 5 and 6] and Secrest Shortcut Road (SR 1501) [Corridor Segment 13]).

Mapping showing preliminary corridor segments were presented to the public in a project newsletter distributed in early June 2007 and at Citizens Informational Workshops on June 25 and 26, 2007 (see **Section 5.2** for additional information on public involvement efforts). Public input received following the workshops resulted in development of two additional preliminary corridor segments, 18A and 22A, in the areas around the subdivisions of Fairhaven (located east of Stevens Mill Road (SR 1524)) and Bonterra Village (located north of Secrest Shortcut Road (SR 1501) and west of Wesley Chapel Stouts Road (SR 1377)). These corridor segments were developed to minimize direct impacts to residential areas and community facilities.

2.4.3 Tolling

The funding source for the Monroe Connector/Bypass has been identified by MUMPO as tolls; therefore, the ability to design an alternative as being a toll facility was a requirement in the development of the preliminary corridors. Toll collection for this project is assumed to be all electronic (no booths for on-site payment), and new location corridors were assumed to be able to accommodate a toll facility within the standard ROW for the controlled-access facility (about 350 feet).

Existing roadway corridors had additional considerations when incorporating tolls into the corridor segment. State law prohibits tolling of existing roadways and requires a free alternate route (GS § 136-89.197). To accommodate this, constructing the project

along an existing roadway corridor would require frontage roads to provide the free alternative route, which would increase the ROW needed for the project by approximately an additional 160 feet. Existing corridors under consideration for upgrading are US 74 (in its entirety or in part), Old Monroe Road/Old Charlotte Highway, and Secrest Shortcut Road.

CHAPTER 3

3.0 QUALITATIVE SECOND SCREENING OF CORRIDOR SEGMENTS

The goal of this second screening is to qualitatively evaluate preliminary corridor segments with respect to potential impacts and to identify those corridors to include in the quantitative third screening.

3.1 QUALITATIVE SECOND SCREENING METHODOLOGY

Approximately 45 preliminary corridor segments were evaluated in the qualitative second screening using these strategies:

- **Individual Segment Assessment** - In instances when a preliminary corridor segment provided a route where there were no other similar options and additional information and evaluation would be helpful in demonstrating whether a preliminary study corridor segment was viable and reasonable, the segment was carried forward into the quantitative third screening.

Preliminary corridor segments for which there were no other similar options, but that did appear to have substantial potential impacts to the natural or human environment, were qualitatively evaluated on an individual basis to determine if the impacts would make the segment impractical or unreasonable to implement.

- **Relative Segment Comparison** - For preliminary corridor segments in areas where several options exist to provide the same route, a relative segment comparison method was used to evaluate the corridor segments. Those corridor segments that had greater impacts to natural or human environment features compared to other

corridor segments providing a similar impact were recommended for elimination from further study.

Although no specific alignments or designs were developed within these preliminary corridors at this stage of the evaluation process, the potential footprint of a highway within a particular corridor was taken into account when considering the potential impacts that could occur within the 1,000-foot wide corridors. Conceptual alignments and ROW limits were developed and used for the quantitative third screening.

Segments shown on **Figure 2-5** are not sequential and do not include all segments 0 – 44. Those numbers were used for identification purposes only as segments were developed and evaluated. Several corridor segments (4, 10, 11, 15, 17, 23, 28, 32 and 38) were originally developed but then “absorbed” into other corridor segments and are no longer listed.

Consolidate Remaining Preliminary Corridor Segments. In some areas, several preliminary corridor segments were close enough to one another to be consolidated into one corridor segment, which resulted in a corridor wider than 1,000 feet to include the original corridor areas. Multiple conceptual alignments within these larger corridors could be considered for the quantitative third screening or as part of the detailed study alternatives.

Define End-to-End Alternatives to Carry Forward to Quantitative Third Screening.

The preliminary corridor segments remaining after the qualitative second screening process were connected to form endpoint-to-endpoint corridors from US 74 at I-485 to US 74 just west of Marshville.

3.2 INDIVIDUAL SEGMENT ASSESSMENT

3.2.1 Corridors with No Similar Route

Corridor Segments 2, 24+26, and 7 as well as the segments comprising the existing US 74 corridor (0, 1, 9, 8, 44, 42, and 43) have no similar segments. These corridors will therefore be carried forward for further evaluation in the quantitative third screening.

3.2.2 Corridors with No Similar Route and Substantial Potential Impacts

This section examines those corridor segments that have no similar route and would clearly have the potential for substantial impacts to the natural and human environments. The potential impacts of these individual corridor segments were qualitatively evaluated and are discussed below. Based on this evaluation, Corridor Segments 5, 6, and 13 (from Willis Long Road (SR 1509) east to US 74) are recommended for elimination from further study based on their individual impacts, which would make them unreasonable to implement.

3.2.2.1 Corridor Segment 5

As shown in **Figure 3-1**, Corridor Segment 5 (dark purple) would construct a freeway along existing Old Monroe Road/Old Charlotte Highway. Old Monroe Road/Old Charlotte Highway is a two-lane roadway in this area with no access control and numerous driveways and cross-streets connecting to the road.

Natural Environment Features

Old Monroe Road/Old Charlotte Highway generally follows a ridgeline in the area of Corridor Segment 5, although four creeks cross the roadway.

Human Environment Features

Land uses along Corridor Segment 5 include residential subdivisions, industrial sites, schools, and other uses along the roadway. The area is urbanizing, and there are scattered undeveloped parcels among the industrial and residential subdivisions. Sun Valley High School is located at the southeast corner of the intersection of Old Monroe Road/Old Charlotte Highway and Wesley Chapel Stouts Road (SR 1377). South Piedmont Community College is located across from a large industrial site between Rogers Road and Airport Road (SR 1349). A large power substation is located at the intersection with Hayes Road. Corridor Segment 5 also crosses the railroad tracks near its eastern end, and would have to cross the tracks again to reach existing US 74. The Monroe Regional Airport is located just south of the corridor, west of Rocky River Road (SR 1514).

Several residential subdivisions, listed below from west to east, are located within Corridor Segment 5. Many of them (those denoted by an asterisk below) have access only to Old Monroe Road/Old Charlotte Highway. The approximate number of lots within each subdivision is provided in parentheses.

- *Indian Trail Park (63)
- *Midway Park (41)
- *Valley Estates (57)
- *Sandalwood (278)
- Helms Park (93)
- Dogwood Acres (44)
- Carobilt Court (32)
- *The Pines (13)
- *Olde Towne Estates (33)
- Club View Acres (6)
- *Hasty Woods (32)

Evaluation

Because Corridor Segment 5 follows an existing roadway, potential impacts to

natural resources such as wetlands, streams, and floodplains, would likely be lower than for a new location facility. However, as discussed in **Section 2.4.2**, upgrading an existing roadway to a controlled-access toll facility would require construction not only of the new freeway facility, but also frontage roads parallel to the freeway to provide a free alternative route and allow access to adjacent properties, including the multiple residential neighborhoods that only have access to Old Monroe Road/Old Charlotte Highway. This would result in an approximate ROW width of 360 feet. The existing roadway has a ROW of 60 feet. Therefore, impacts to resources and properties along the existing road would include:

- Impacts to large loading docks, warehouses and entrance to Charlotte Pipe and Foundry or to the main academic building and entrance of South Piedmont Community College, located across the road.
- Two crossings of the CSX rail line with grade separations.
- Impacts to numerous subdivisions (listed above) and other uses along the road that have access only to Old Monroe Road/Old Charlotte Highway. These would include direct impacts to residences and neighborhood entrances. Seven subdivisions containing approximately 517 lots have access only along Old Monroe Road/Old Charlotte Highway. Providing a frontage road system would have additional impacts to these land uses.
- Impacts to the entrance, academic building, and parking lot of Sun Valley High School as well as other business impacts at the intersection with Wesley Chapel Stouts Road (SR 1377).

In addition, an interchange at Rocky River Road (SR 1514) would be difficult to

construct due to the presence of the CSX rail line and a fire station on Rocky River Road (SR 1514).

Recommendation

Corridor Segment 5 would construct a freeway along the existing two-lane Old Monroe Road/Old Charlotte Highway. Because natural resources along this route have been previously impacted by construction of the existing road, upgrading Old Monroe Road/Old Charlotte Highway would have less natural resources impacts than a new location corridor. However, the introduction of a multilane freeway with frontage roads would have substantial impacts to human environment features, including community facilities, businesses, and residences. These impacts provide justification for eliminating Corridor Segment 5 from further consideration as the alternative would be unreasonable to implement.

3.2.2.2 Corridor Segment 6

Corridor Segment 6 would construct a freeway along existing Old Charlotte Highway through downtown Monroe, a densely developed urban area. As illustrated in **Figure 3-2**, the Corridor Segment 6 (light purple) area includes various land uses associated with an urbanized area. Old Charlotte Highway is a two-lane major thoroughfare with no control of access.

Natural Environment Features

There is one named stream along the segment. Bearskin Creek is a tributary to Richardson Creek and runs east-west just north of downtown Monroe. Belk Tonawanda Park is located around this creek.

Human Environment Features

Densely developed land uses along the corridor include residential development, schools, churches, medical facilities, infrastructure, a small rail yard, government

buildings, and historic sites and districts including the Malcolm K. Lee house (located at 1003 E. Franklin Street), the John C. Sikes house (located 1301 E. Franklin Street), and the Monroe residential historic district.

Evaluation

As with Corridor Segment 5 above, the existing facility would be upgraded to a multilane freeway with frontage roads, requiring additional ROW and impacting an established densely developed urban area. The following impacts likely would occur with Corridor Segment 6:

- Adjacent properties are heavily developed and include businesses and neighborhoods (including Benton Heights and Eastover). Many of these properties will require acquisition because of ROW requirements.
- Acquisition or access changes to the Union County Courthouse in downtown Monroe.
- Acquisition and Section 4(f) issues related to Belk Tonawanda Park (located just north of the rail line and west of NC 200).
- A long structure would need to be constructed to span the rail line and Bearskin Creek, which would increase costs.
- Impacts to historic resources and Section 4(f) properties directly adjacent to the existing roadway; including the Malcolm K. Lee house, John C. Sikes house, and Monroe residential historic district.
- Impacts to parking at Carolina's Medical Center - Union.
- Impacts to academic buildings and entrance of Monroe High School and land acquisition at East Elementary School.

Recommendation

Corridor Segment 6 passes through the densely developed urban area of downtown

Monroe with residences, businesses, infrastructure, and historic resources (**Figure 3-2**). Converting the two-lane Old Charlotte Highway to a multilane freeway would have a substantial impact to residences and businesses within and adjacent to the corridor, as well as high potential of Section 4(f) impacts associated with Belk Tonawanda Park and historic resources, making it unreasonable to implement. Therefore, it is recommended that Corridor Segment 6 be eliminated from further study.

3.2.2.3 Corridor Segment 13 (from Willis Long Road (SR 1509) east to US 74)

This section discusses constructing a freeway facility with frontage roads along existing Secrest Shortcut Road (SR 1501), from Willis Long Road (SR 1509) to its eastern terminus at US 74, which is the eastern portion of Corridor Segment 13. The western portion of Corridor Segment 13, from its western end at Faith Church Road (SR 1518) to east of Willis Long Road (SR 1509), is evaluated in the Relative Segment Comparison in **Section 3.3.2**. As illustrated in **Figure 3-3**, Corridor Segment 13 (drawn in yellow along Secrest Shortcut Road (SR 1501)) includes various land uses associated with a suburban area.

Natural Environment Features

The east end of Corridor Segment 13 crosses Stewarts Creek (a 303(d) listed stream) and Lick Branch, a tributary to Stewarts Creek. Both of these creeks have associated floodplains and other smaller tributaries.

Human Environment Features

Nine subdivisions, one church (Grace Methodist Church), one cemetery (Abram Secrest Cemetery), and agriculture facilities are adjacent to Secrest Shortcut Road (SR 1501).

The subdivisions are listed below from west to east, with the approximate number of lots in parentheses. All of these subdivisions have access only to Secrest Shortcut Road (SR 1501). There are also additional individual residential parcels that front Secrest Shortcut Road (SR 1501) (approximately 40-45 residences).

Little Park (10)
 Stoneybrook (25)
 Hilton Meadows (54)
 Avondale Park (63)
 Yorkshire (109)
 Shirley (15)
 Barbee Farms (190)
 Bradford Estates (14)
 Kimberly Court (19)

In addition, the terminus of Secrest Shortcut Road (SR 1501) at existing US 74 is only about 1,500 feet from the Concord Avenue (US 601) interchange and about 3,000 feet from the US 601 interchange. Constructing an interchange in this area to connect Corridor Segment 13 to existing US 74 would have traffic operations issues due to the close spacing between Secrest Shortcut Road (SR 1501) and the other major roads.

Evaluation

Upgrading Corridor Segment 13 (from Willis Long Road (SR 1509) east to US 74) to a freeway facility with frontage roads would likely have impacts to the natural and human environments on this established residential corridor as follows:

- Impacts to nine subdivisions, which have access only to/from Secrest Shortcut Road (SR 1501) and contain a total of 499 residences.
- Acquisition of approximately 45 homes which are adjacent to the existing roadway.
- Potential impact to Grace United Methodist Church, which is

approximately 350 feet from the existing roadway.

- Impacts to Stewarts Creek (a 303(d) listed stream) and Lick Branch and associated floodplains.

Recommendation

Corridor Segment 13 passes through a suburban area, and improvement of Secrest Shortcut Road (SR 1501) to a controlled-access highway with frontage roads would result in relocations of many homes and modifications to entrances to at least nine subdivisions affecting more than 500 residences. These impacts to the human environment are considered substantial enough to warrant elimination of Corridor Segment 13 from further consideration.

3.3 RELATIVE SEGMENT COMPARISON ASSESSMENT

This screening discussion focuses on four areas where several route options exist to get from one point to another within the same area. Based on the results of this relative comparison, some options are recommended for elimination from further study, while others are carried forward for additional consideration in the quantitative third screening. These areas are shown in **Figure 3-4** and are as follows (from west to east):

- AREA 1 – from I-485 to west of Indian Trail Fairview Road
- AREA 2 – from Faith Church Road (SR 1518) to east of Willis Long Road (SR 1509)
- AREA 3 – from east of Olive Branch Road (SR 1006) to east of Austin Chaney Road (SR 1758)
- AREA 4 – from west of Forest Hills School Road (SR 1754) to existing US 74

3.3.1 AREA 1 - From I-485 to Indian Trail Fairview Road (SR 1520)

In Area 1, there are two comparable options between I-485 and Indian Trail Fairview Road (SR 1520) (**Figure 3-5**):

- Corridor Segment 18 (New location freeway)
- Corridor Segment 18A (New location freeway)

Corridor Segment 18 is similar to a preliminary study corridor developed for NCDOT's previous Monroe Connector studies. Corridor Segment 18A was developed in response to changes to the study area since the previous study and comments received as a result of the project public involvement process. Comments regarding Segment 18 revolved around direct impacts to the Fairhaven community, direct impacts to the future Stallings Elementary School and air quality concerns raised by the public. Please see **Section 5.0** for a summary of public involvement for the project.

Natural Environment Features

Within Area 1, natural environment features include the North Fork Crooked Creek (a 303(d) listed stream) and its associated floodplain. There also is a known high quality wetland (delineated during the NCDOT's previous studies for the Monroe Connector) located northwest of the intersection of Stallings Road (SR 1365) and North Ridge Church Road. The Fox Hill Mine, an abandoned gold mine, is located in the vicinity of Corridor Segment 18.

Human Environment Features

Notable human environment features include a Union County School System school site, Stallings Elementary School, which is currently under construction. This site is shown on **Figure 3-5** and is located northwest of the intersection of Stallings Road (SR 1365) and Stevens Mill Road (SR

1524). The Fairhaven subdivision, which is not yet fully built out, is also located in this area, as are several other subdivisions including Blackberry Ridge, Eaglecrest, Independence Village and Madison Ridge. There is also an older residential neighborhood of approximately 24 homes along the north end of Stinson Hartis Road (SR 1522).

Comparison

Natural Environment Features

- Potential impacts to streams and floodplains would be similar for Corridor Segments 18 and 18A. In the area west of Stallings Road (SR 1365), Corridor Segment 18A could have greater floodplain impacts and parallel stream impacts to North Fork Crooked Creek than Corridor Segment 18. However, the actual alignment in Corridor Segment 18A probably could be adjusted to result in impacts similar to an alignment in Corridor Segment 18.
- Impacts to wetlands would be similar for Corridor Segment 18 and 18A. Each of the three aquatic systems present are relatively similar in nature (i.e. where each system crosses Alternative 18 and 18A). Impacts at either alternative would be to similar types of streams and wetlands. However, the area of impact may differ depending on the actual location the proposed ROW.
- Corridor Segment 18 may impact the Fox Hill Mine. Available GIS data indicates that Corridor Segment 18A is not likely to impact this mine. However, it is important to note that gold mine locations are approximate and it is possible that there are other abandoned gold mines in the area that are not known.

Human Environment Features

- Corridor Segment 18 and an associated interchange at Stallings Road (SR 1365) would impact Stallings Elementary School. Direct impacts from Corridor Segment 18 on the school property would be unavoidable; however, Corridor Segment 18A is farther from the school site and impacts to the school could be avoided or mitigated.
- Construction in the Fairhaven community is ongoing and the subdivision would be completed prior to construction of this project. Currently, the community has about 100 homes; more than 400 are planned. Corridor Segment 18 would bisect the Fairhaven subdivision. Corridor Segment 18A would avoid direct impacts to the Fairhaven subdivision.
- East of the North Fork Crooked Creek, Corridor Segment 18 closely follows the existing Stinson Hartis Road (SR 1522) alignment. As such, it is likely that Corridor Segment 18 would either relocate residences adjacent to Stinson Hartis Road (SR 1522) or be located directly behind the residences (with noise impacts). Corridor Segment 18A avoids the Stinson Hartis Road (SR 1522) area and minimizes impacts to those residences.

Recommendation

Corridor Segment 18 follows an alignment developed as part of NCDOT's Monroe Connector study. Since that study, new development has occurred in the area that makes this corridor segment unreasonable to implement. Because other natural resources impacts are anticipated to be similar for Corridor Segments 18 and 18A, it is recommended that Corridor Segment 18A be carried forward for further evaluation and

Corridor Segment 18 be eliminated from consideration.

3.3.2 AREA 2 – From Faith Church Road (SR 1518) to East of Willis Long Road (SR 1509)

In Area 2, there are five options that provide a route from Faith Church Road (SR 1518) to east of Willis Long Road (SR 1509). The corridor segments are shown in **Figure 3-6**:

- Corridor Segment 22 (New location freeway)
- Corridor Segment 22A (New location freeway)
- Corridor Segment 30 (New location freeway)
- Corridor Segment 13 (Freeway with frontage roads along existing Secrest Shortcut Road (SR 1501))
- Corridor Segments 14+26 (New location freeway)

Natural Environment Features

Natural features in this area include South Fork Crooked Creek and its associated floodway and floodplains, a tributary to North Fork Crooked Creek and its 100-year floodplain, a tributary to Stewarts Creek with a defined floodplain, and a tributary to East Fork Stewarts Creek with a defined floodplain. In addition, a North Carolina Natural Heritage Program (NHP) site has been designated along the length of the South Fork Crooked Creek in the area.

Two populations of Schweinitz Sunflowers are also present within this corridor. The first population contains approximately 11 individuals and is located within a power line easement on the southwest side of Secrest Shortcut Road about 0.25 mile north from its intersection with Unionville Indian Trail Road. The second population contains approximately six individuals and is located within a power line easement on the northeast side of Secrest Shortcut Road

about 0.2 mile south from its intersection with Unionville Indian Trail Road.

Wetlands are scattered throughout Area 2, with one large area identified between the Suburban Estates and Oakstone communities. This medium quality wetland was delineated as part of NCDOT's previous studies for the Monroe Connector.

Human Environment Features

Communities in the general vicinity of these corridor segments from west to east, along with their general locations, are listed below:

- Lake Park (Faith Church Road (SR 1518))
- Bonterra Village (west of Poplin Road (SR 1508), north of Secrest Shortcut Road (SR 1501))
- Arbor Glen (Hunters Trail Drive south of Secrest Shortcut Road (SR 1501))
- Suburban Estates (south side of Secrest Shortcut Road (SR 1501))
- Laurel Creek and Oakstone (Haywood Road (SR 1613))
- Hamilton Place (Rocky River Road (SR 1514))
- Little Park and Poplin Farm (Poplin Road (SR 1508))

Several community facilities, such as schools and churches, are also located in this area:

- Sardis Elementary School (Sardis Church Road (SR 1516))
- Cross Roads Baptist Church (Rocky River Road (SR 1514))
- Watts Grove Baptist Church (North Rocky River Road (SR 1514))
- Morning Star Methodist Church (Secrest Shortcut Road (SR 1501))

An automotive repair facility and warehouses are located on the corner of Rocky River Road (SR 1514) and Secrest Shortcut Road (SR 1501).

Two known historic resources are located on Fowler Secrest Road (SR 1754) in this area: Secrest Farms and the Hiram Secrest House. These resources were determined to be eligible for the National Register of Historic Places during NCDOT's previous studies for the Monroe Connector. The two properties are separated by less than 600 feet.

Comparison

Natural Environment Features

- All five corridor segments cross South Fork Crooked Creek and its associated floodway and floodplains, and a tributary to North Fork Crooked Creek and its 100-year floodplain.
- Corridor Segment 14+26 crosses a tributary to Stewarts Creek and its floodplain.
- Corridor Segments 22, 22A, and 30 cross a tributary to East Fork Stewarts Creek and its floodplain.
- At the North Fork Crooked Creek tributary, Corridor Segment 22 would cross at a location where the floodplain is wider than where the other corridor segments cross.
- Corridor Segment 14+26 would impact a large medium quality wetland near a tributary to Stewarts Creek.
- Overall, Corridor Segment 13, along Secrest Shortcut Road (SR 1501), and Corridor Segment 30 likely would have the fewest impacts to streams, based on a review of the GIS data.

Human Environment Features

- Constructing a freeway with frontage roads along existing Secrest Shortcut Road (SR 1501) in Corridor Segment 13 would result in a much wider footprint than currently exists, and

would impact numerous residences (approximately 14) with frontage along the existing road, neighborhoods (including Bonterra Village, Suburban Estates, and Arbor Glen), and businesses along the existing road.

- Corridor Segment 13 would potentially impact the Morning Star Methodist Church and/or the historic Secrest Farm. Due to their proximity, shifting the new freeway to avoid impacts to one resource would mean impacting the other resource.
- Corridor Segment 14+26 passes between two known historic resources (Secrest Farm and the Hiram Secrest House). An alignment could be developed within the study corridor to avoid direct impacts to these two Section 4(f) resources; however, indirect impacts including noise and viewshed impacts could not be avoided.
- Corridor Segment 14+26 would have the greatest direct impact on communities. This corridor segment would unavoidably bisect Hamilton Place, Oakstone, and Laurel Creek. In addition, this segment would impact approximately 19 homes along the edge of Suburban Estates (a mobile home neighborhood). Also, since Corridor Segment 14+26 passes near more densely developed subdivisions, it likely would have more noise impacts.
- Corridor Segment 22 would bisect Bonterra Village and relocate numerous existing residences within Bonterra Village. Corridor Segment 22A is a modification of Corridor Segment 22 that minimizes direct impacts on this subdivision. Corridor Segment 22A was developed in response to changes to the study area

since the previous study and comments received as a result of the project public involvement process. Comments regarding Segment 22 revolved around direct impacts to the Bonterra Village community.

- Corridor Segments 30 and 22A would likely have the least direct impact to neighborhoods.

Recommendation

Due to higher potential for impacts to human environment features (relocations) and natural environment features (wetland, streams and floodplains), Corridor Segments 22, 13, and 14+26 are recommended to be eliminated from further study. Corridor Segments 30 and 22A would be retained for the quantitative third screening.

Since the development of Corridor Segment 22 during NCDOT's previous Monroe Connector studies, a large residential development has been constructed in the corridor – Bonterra Village. Corridor Segment 22A is a modification of Corridor Segment 22 that would minimize direct impacts to this subdivision and to floodplains in the area. Since Corridor Segment 22A provides a similar route while minimizing impacts, it is recommended to eliminate Corridor Segment 22 and retain Corridor Segment 22A.

In order to allow for tolling while maintaining access to existing properties and providing a free alternate route, improvements to Secrest Shortcut Road (SR 1501) in Corridor Segment 13 would require frontage roads in addition to the multilane freeway facility. This would result in substantial impacts to the human environment, including residences, churches, historic properties, and Section 4(f) resources. Shifting the alignment to the south within the study corridor would have substantial direct impacts to the historic

Secrest Farm and Suburban Estates neighborhood. Shifting the alignment to the north within the study corridor would result in an alignment similar to Corridor Segment 30. Because of the level of potential impacts, Corridor Segment 13 is considered unreasonable and is recommended for elimination from further study.

In comparison to other corridors under consideration in Area 2, Corridor Segment 14+26 would have high potential impacts to both the human and natural environments and is recommended for elimination.

3.3.3 AREA 3 - From East of Olive Branch Road (SR 1006) to East of Austin Chaney Road (SR 1758)

In Area 3, there are three options that provide a route from east of Olive Branch Road (SR 1006) to east of Austin Chaney Road (SR 1758) (**Figure 3-7**):

- Corridor Segment 34+37 (New location freeway)
- Corridor Segment 35+37 (New location freeway)
- Corridor Segment 36 (New location freeway)

Natural Environment Features

Richardson Creek, a 303(d) listed stream and its tributaries, Rays Fork and Meadow Branch, are located in Area 3. All three named streams have associated floodplains. These streams run primarily north–south. There are several small wetlands also present in this area. The water supply watershed boundary and critical watershed boundary for Lake Twitty are located to the northwest of these segments.

Human Environment Features

This area is rural, with agricultural pasture, wooded areas and scattered residences (approximately 50 in the vicinity). There are five subdivisions located within area,

Greenbrook, Edgewood Farms, Timberhills, Windward Oaks, and College Park. There is one small cemetery present, the Williams Griffin Cemetery, located on Monroe Ansonville Road (SR 1002), and one known historic resource eligible for the National Register of Historic Places. The William Bivens House, a historic resource, is at the corner of North Bivens Road (SR 1763) and Walkup Avenue (SR 1751).

Comparison

Natural Environment Features

Overall, impacts to the natural environment features appear to be roughly equivalent for the three corridor segments. Below is a comparison summary.

- Corridor Segments 34+37 and 35+37 have two to three floodplain crossings (dependent on actual alignment), while Corridor Segment 36 has three crossings.
- Corridor Segment 34+37 would have more potential for parallel stream impacts than Corridor Segments 35+37 or 36.
- Around the Austin Chaney Road (SR 1758) interchange and just east, all three options would have similar impacts to a floodplain, two wetlands, and three streams.
- Corridor Segment 36 is farthest from the Lake Twitty water supply watershed boundaries.

Human Environment Features

- Corridor Segments 34+37 and 35+37 cross Farmwood Road (SR 1765) twice. Farmwood Road (SR 1765) provides a loop-type connection from Helms Pond Road (SR 1764) to Olive Branch Road (SR 1006) (Figure 2-11). Corridor Segments 35+37 would bisect the loop. Corridor Segment 34+37 cross the lower end of the loop.

Both corridor segments likely would require bridges over Farmwood Road (SR 1765), or Farmwood Road (SR 1765) would be cul-de-saced on both ends. Landlocked residential and agricultural parcels would result since there are no nearby roads to connect to south of Farmwood Road (SR 1765). However, Corridor Segment 34+37, located at the southern end of the loop, would cause less disruption to Farmwood Road (SR 1765) than Corridor Segment 35+37. Corridor Segment 36 avoids severing Farmwood Road (SR 1765).

- Corridor Segments 35+37 would have more residential impacts than Corridor 34+37. Corridor Segment 36 would have the least residential impacts.
- Corridor Segments 34+37 and 35+37 would impact more agricultural land than Corridor Segment 36.

Recommendation

Corridor Segment 36 would require the fewest acquisitions of, and therefore have the least impacts to, residences and agricultural lands. In addition, Corridor Segment 36 avoids severing Farmwood Road (SR 1765). Corridor Segment 34+37 has a lower potential for residential relocations than Corridor Segment 35+37 and would have less disruption to Farmwood Road (SR 1765). As a result, it is recommended to eliminate Corridor Segment 35+37 from further study. Corridor Segments 36 and 34+37 will be evaluated in the quantitative third screening. Corridor Segment 34+37 will be called Corridor Segment 34 from this point forward.

3.3.4 AREA 4 - From West of Forest Hills School Road (SR 1754) to Existing US 74

In Area 4, there are two options that provide a route from west of Forest Hills School Road (SR 1754) to existing US 74 (**Figure 3-8**):

- Corridor Segment 40 (New location freeway)
- Corridor Segment 41 (New location freeway)

Natural Environment Features

The topography of Area 4 is relatively flat. The natural environment features include Negro Head Creek and its associated floodplain, as well as several small streams and ponds. There also are two known high quality wetlands (delineated during NCDOT's previous studies for the Monroe Bypass).

Human Environment Features

The development within this area is sparse, with very little development within the immediate corridors. Both corridor segments pass through a mix of residential and agricultural parcels, and some industrial properties on existing US 74. Two agricultural industries (Bakery Feeds and Pilgrim's Pride Poultry) are located on US 74.

Comparison

Natural Environment Features

From a natural environment standpoint, these corridors are relatively equivalent.

- Corridor Segment 41 would impact a pond and require two stream crossings and one 100-year floodplain crossing.
- Corridor Segment 40 would potentially impact wetlands and require two stream crossings.

Human Environment Features

The potential for impacts to the human environment are roughly equivalent for Corridor Segments 40 and 41.

- Two agricultural industries (Bakery Feeds and Pilgrim's Pride Poultry), which are important industries in Union County, are located at the terminus of Corridor 41 at US 74. However, an alignment that would avoid these industries can be developed within this 1000-foot wide study corridor. More study is needed to determine whether impacts to the two industries can be avoided.

Recommendation

Corridor Segments 40 and 41 exhibit similar potential impacts. It is recommended to carry both corridors forward into the quantitative third screening.

3.4 CONSOLIDATION OF CORRIDOR SEGMENTS

This section discusses four areas where several corridor segments are in proximity with one another and were consolidated into a single study corridor. Connections to adjacent corridor segments can be made within the consolidated corridor segment during the development of conceptual alignments for the quantitative third screening. The consolidated corridor segment will be made wide enough to encompass the previous corridor segments and may be greater than 1,000 feet.

3.4.1 Corridor Segments 16, 20, 21, 19, 12, and 21A

As shown in **Figure 3-9**, Corridor Segments 16, 20, 21, 19, 12, and 21A generally are located within the same 1,000-foot corridor between Indian Trail Fairview Road (SR 1520) and Faith Church Road (SR 1518). Therefore, it is recommended to consolidate these six corridor segments into one segment

to represent the study corridor in this area. These consolidated segments will be known as Corridor Segment 21 as part of the future analysis.

3.4.2 Corridor Segments 27, 25, and 29

As shown in **Figure 3-10**, Corridor Segments 27, 25, and 29 generally are located within the same 1,000-foot corridor between the area east of Willis Long Road (SR 1509) and east of Roanoke Church Road (SR 1514). It is recommended to consolidate these three corridor segments into one corridor segment to represent the study corridor in this area. These consolidated segments will now be known as Corridor Segment 29 as part of the future analysis.

3.4.3 Corridor Segments 33A, 33, and 36

As shown in **Figure 3-11**, Corridor Segments 33A, 33, and 36 generally are located within the same 1,000-foot corridor between US 601 and Olive Branch Road (SR 1006) and are recommended for consolidation into one corridor segment. These consolidated segments will now be known as Corridor Segment 36 as part of the future analysis.

3.4.4 Corridor Segments 38 and 39

As shown in **Figure 3-12**, Corridor Segments 38 and 39 generally are located within the same 1,000-foot corridor between the area west of Ansonville Road to west of Phifer Road (SR 1753) and are recommended for consolidation into a single corridor segment. Impacts within these consolidated segments will now be included with impacts associated with Corridor Segment 40 and 41.

3.5 QUALITATIVE SECOND SCREENING CONCLUSIONS

The results of the qualitative second screening are summarized below.

- Corridor segments recommended for elimination: 5, 6, 18, 13, 14, 22, and 35+37
- Corridor segments recommended for further study: 0, 1, 2, 7, 8, 9, 18A, 21 (consolidation of 16, 20, 21, 19, 12, 21A), 22A, 24+26, 29 (consolidation of 25, 27, 29), 30, 31, 34 (formerly 34+37), 36 (including 33A, 33, 36 and 36A), 40, 41, 42, 43, and 44

The elimination of the seven corridor segments listed above results in the elimination of three additional corridor segments that only provide connections to these segments. They are:

- Corridor Segment 3 (connects to Corridor Segment 5)
- Corridor Segment 19 (connects to Corridor Segment 22)
- Corridor Segment 20 (connects to Corridor Segment 22)

In conclusion, this qualitative second screening results in the elimination of ten corridor segments and consolidation of several others. The remaining corridor segments that will be studied further in the quantitative third screening are shown in **Figure 3-13**. Combining these corridor segments into end-to-end alternatives results in twenty-five Preliminary Study Alternatives (PSAs) to be evaluated in the quantitative third screening (**Table 3-1**). **Figures 3-14a through 3-14d** illustrate the 25 PSAs.

Table 3-1 Preliminary Study Alternatives Summary

PSA	Corridor Segments	Length (miles)
A	0 18A 21 22A 31 36 40 42 43	21.82
B	0 18A 21 30 31 36 40 42 43	21.77
C	0 1 2 21 22A 31 36 42 43	21.87
D	0 1 2 21 30 31 36 40 42 43	21.81
E	0 1 1A 9 24 29 31 36 40 42 43	22.00
F	0 1 1A 9 9A 8 7 36 40 42 43	21.81
G	0 1 1A 9 9A 8 8A 44 42 43	22.54
A1	0 18A 21 22A 31 34 40 42 43	21.77
B1	0 18A 21 30 31 34 40 42 43	21.71
C1	0 1 2 21 22A 31 34 40 42 43	21.81
D1	0 1 2 21 30 31 34 40 42 43	21.75
E1	0 1 1A 9 24 29 31 34 40 42 43	21.94
F1	0 1 1A 9 9A 8 7 34 40 42 43	21.75
A2	0 18A 21 22A 31 36 41 43	21.65
B2	0 18A 21 30 31 36 41 43	21.59
C2	0 1 2 21 22A 31 36 41 43	21.69
D2	0 1 2 21 30 31 36 41 43	21.63
E2	0 1 1A 9 24 29 31 36 41 43	21.82
F2	0 1 1A 9 9A 8 7 36 41 43	21.63
A3	0 18A 21 22A 31 34 41 43	21.59
B3	0 18A 21 30 31 34 41 43	21.53
C3	0 1 2 21 22A 31 34 41 43	21.63
D3	0 1 2 21 30 31 34 41 43	21.57
E3	0 1 1A 9 24 29 31 34 41 43	21.76
F3	0 1 1A 9 9A 8 7 34 41 43	21.57

Twenty-five PSAs provide a range of reasonable alternatives to be evaluated in the quantitative third screening; including sixteen new location PSAs, an improve existing US 74 alternative (PSA G), and eight PSAs that combine new location with segments along existing US 74 (PSAs E, F, E1, F1, E2, F2, E3, and F3). Corridor segments 1A, 9A and 8A are listed in **Table 3-1**, but are not unique corridors. These three segments are used only to account for impacts along US 74 if Segments 18, 2 or 7 are not used.

CHAPTER 4

4.0 QUANTITATIVE THIRD SCREENING OF PRELIMINARY ALTERNATIVES

This section describes how the PSAs were evaluated to identify those that should be carried forward as Detailed Study Alternatives (DSAs) in the Draft Environmental Impact Statement (DEIS).

4.1 QUANTITATIVE THIRD SCREENING METHODOLOGY

4.1.1 Process

Connect Segments to Form Endpoint-to-Endpoint Corridors. The preliminary corridor segments remaining after the qualitative second screening were connected to form endpoint-to-endpoint corridors (Section 3.5).

Develop Conceptual Designs. Conceptual designs were prepared within these corridors, taking into consideration engineering design constraints and the locations of known sensitive resources. These are referred to as the conceptual design alignments, and are shown in **Figures 4-1a through 4-1d**. Conceptual designs include a horizontal alignment for the roadway, ROW limits, and a basic horizontal design of the interchanges. Vertical profiles and construction limits are not prepared for conceptual designs. Based on designs prepared for previous studies, construction limits generally were able to be contained within the standard ROW of approximately 350-feet. Conceptual designs may change (and likely will change) when studied in detail and updated for the Detailed Study Alternatives. The alignments could be relocated anywhere within the 1,000-foot detailed study corridors as more detailed information is gathered and analyses are conducted.

Quantify Impacts. Impacts to the natural and human environments based on the conceptual designs within study corridors were estimated and tabulated based on available GIS data, information from previous studies, and recent site visits.

Recommend Detailed Study Alternatives. From the sets of conceptual design alignments, Detailed Study Alternatives were recommended based on the estimated impacts to the natural and human environments, engineering design considerations, and input from resource agencies.

4.1.2 Design Criteria

The design criteria used to develop the conceptual designs are based on the project's location, function, classification, and design speed. The design criteria conform to the standards established by the American Association of State Highway and Transportation Officials (AASHTO) (2004).

The design criteria and typical roadway cross-section (**Figure 4-2**) are influenced by the type of facility required to fulfill the project's purpose and need. For the alignments on new location, a four-lane, median-divided, controlled-access highway was assumed. The proposed design speed is 70 mph for the main lines of the new location alternatives. Two 12-foot lanes are proposed for each direction of travel, separated by a 70-foot median. This median width would allow for a future widening to provide three 12-foot travel lanes in each direction without having to purchase and additional ROW. The total ROW is proposed to be a minimum of 350 feet but would be greater around interchanges.

For the alignments on existing US 74, a frontage road system would be needed in addition to the main travel lanes to provide access to adjacent properties and to serve as the free alternate route to the toll facility.

Major cross-streets would be bridged over the controlled-access travel lanes. These major cross-streets would have a signalized intersection with each frontage road direction. A dedicated U-turn lane (sometimes referred to as a Texas U-Turn) would be provided for alignments on existing US 74 at each major cross-street to allow frontage road traffic to change direction without traveling through the signalized intersection. No additional ROW would be required to provide these U-turn lanes. A diagram of this can be found in **Figure 4-3**.

For all alignments on existing US 74, the improvements were assumed to include six lanes for the toll facility and two-lane, one-way frontage roads on either side, for a total of ten lanes. Six lanes were assumed to be needed for the toll facility on existing US 74 (as opposed to four lanes for the new location toll alternatives) based on the fact that a facility constructed along existing US 74 would be carrying through traffic and some local traffic.

Toll collections will be made using an open road tolling technology. Open road tolling allows for tolls to be collected at highway speeds and eliminates the need for conventional toll plazas. Different electronic tolling options are currently being evaluated. This technology is evolving rapidly. Technologies utilized by other states are being examined to identify possible interoperability alliances. See **Section 2.4.3** for additional information.

4.1.3 Quantitative Screening Criteria

The factors listed in **Table 4-1** were considered in the evaluation and screening of PSAs. These factors were first presented to the study team, including representatives of federal and state environmental regulatory and resource agencies and MUMPO, on April 18, 2007 and were finalized on May 17, 2007. Data on these

factors were obtained from GIS databases (NCDOT, Union County, Mecklenburg County, US Geological Survey, US Fish and Wildlife Service), state resource agency files, aerial photography, and field visits.

The ability to meet the project's Purpose and Need was considered as part of the qualitative screening and was considered in developing the conceptual designs for the preliminary study alternatives. It was assumed that all alternatives considered in the third screening meet the requirements of Purpose and Need. Therefore, Purpose and Need is not included as a screening criteria in the third screening.

The criteria listed in **Table 4-1** are discussed below:

Length and Construction Cost. Length, number of interchanges, number of minor road crossings, and number of power line easement crossings affect the design and construction costs of an alternative. Longer corridors with greater numbers of interchanges, grade-separated road crossings, and easement crossings generally have higher costs.

Socioeconomic Criteria. Socioeconomic criteria include residential and business relocations and impacts to community facilities (churches, libraries, parks, etc.). Corridor locations contributing to excessive community disruption or isolation were avoided where possible. A higher number of minor road crossings can indicate more disruptions to neighborhoods. Relocations of residences and businesses, and associated social or economic impacts, are often of greatest concern to the public and local officials. A higher number of residential and business relocations also represent increases in ROW costs.

Low-income and Minority block groups were determined based on a review of

Table 4-1 Quantitative GIS Analysis Screening Criteria

Screening Factor	Impact Estimate Method	Data Source
Number of Interchanges	Number along Corridor	Based on proposed project and design constraints
Construction Cost (Millions \$)	Calculated	Based on per mile costs
Number of Minor Road Crossings	Number counted along corridors	GIS databases
Number of Major Power Easement Crossings	Number counted along corridors	GIS databases, aerial photography
Number of Railroad Line Crossings	Number counted along corridors	GIS databases, aerial photography
Residential Relocations	Number counted within proposed alignment ROW (with larger areas around interchanges)	GIS databases, tax parcel mapping, aerial photography
Business Relocations	Number counted within proposed alignment ROW (with larger areas around interchanges)	GIS databases, tax parcel mapping, aerial photography
Low-Income or Minority Populations	Presence within corridors	Census data
Parks/Recreation Sites	Number counted within proposed alignment ROW (with larger areas around interchanges)	GIS databases, Alexandria Drafting Company (ADC) Mapping, aerial photography, and site visits
Schools/Libraries/ Fire Stations	Number counted within proposed alignment ROW (with larger areas around interchanges)	GIS databases, ADC Mapping, aerial photography, and site visits
Churches	Number counted within proposed alignment ROW (with larger areas around interchanges)	GIS databases, ADC Mapping, aerial photography, and site visits
Cemeteries	Number counted within proposed alignment ROW (with larger areas around interchanges)	GIS databases and ADC Mapping
Properties on or eligible for the National Historic Register of Historic Sites	Number counted within proposed alignment ROW (with larger areas around interchanges)	NC State Historic Preservation Office, GIS databases, previous studies for Monroe Connector and Monroe Bypass
Hazardous Materials and Superfund Sites	Number counted within corridors	GIS databases, NC Dept. of Environment and Natural Resources
Streams	Linear feet within proposed alignment ROW (with larger areas around interchanges)	GIS databases and previous surveys
Intermittent and perennial	Number of crossings based on the corridor centerline	GIS databases and previous surveys
Wetlands & Ponds	Acres counted within proposed alignment ROW (with larger areas around interchanges)	USFWS National Wetland Inventory Maps and previous surveys
Floodplains	Acres crossed by corridor centerline	GIS databases
Natural Heritage Program Occurrences/Sites	Number counted within corridors	NC Natural Heritage Program
Protected Species	Known locations	NC Natural Heritage Program, USFWS, previous surveys
Water Supply Watersheds	Number and type counted within corridors	GIS databases, NC Division of Water Quality
303(d) Listed Streams	Number counted within proposed alignment ROW (with larger areas around interchanges)	NC Division of Water Quality

Census 2000 data sets. The information was tabulated for block groups through which alternatives traverse. Block groups that had relatively high percentages of minority populations and/or low-income populations (in comparison to the counties and state) were given a closer look with respect to residential impacts. In addition, county tax parcel information was used to query home values, as this was deemed a good indicator of income. In addition, the segment's location in the block group was used to determine whether impacts are likely to be disproportionate.

Historic Resource Criteria. Known historic architectural sites and districts were identified through a review of county and State Historic Preservation Office files and inventories and NCDOT's GIS database. A Historic Architectural Resources Reconnaissance Report (NCDOT, September 2007) was prepared to identify properties potentially eligible for the National Register of Historic Places.

Known and potential historic properties were avoided to the extent possible in the development of preliminary corridor segments and conceptual designs.

Hazardous Materials Sites. Known sites of hazardous materials or waste were obtained from NCDOT's GIS database. Remediation and acquisition activities associated with hazardous materials/waste sites can increase project costs and delay construction schedules. In the preliminary study corridors, the known sites are underground storage tanks (USTs). These types of sites were avoided in the development of preliminary corridor segments and conceptual designs whenever practicable.

Natural Resource Criteria. Natural resource criteria include number of stream crossings, length of stream, areas of wetlands and floodplains, known protected

species and natural heritage occurrence sites, and locations of watersheds and public water resources.

There is one area included in the Natural Heritage Program database. This is the South Fork Crooked Creek, which designated as aquatic habitat. The significance of the South Fork Crooked Creek habitat was rated a "B" in the 2005 "North Carolina Natural Heritage Program Biennial Protection Plan: List of Significant Natural Heritage Places" prepared by the North Carolina Department of Environment and Natural Resources (NCDENR), Office of Conservation and Community Affairs. A significance of B designates the area as a statewide significant natural area containing similar ecological resources that are among the highest quality occurrences in North Carolina. There may be better quality representations or larger populations elsewhere in the nation, including possibly a few within the state.

Construction in jurisdictional resources (wetlands and streams that would require mitigation if impacted) requires a permit from the US Army Corps of Engineers (USACE) pursuant to Section 404 of the Clean Water Act (CWA), and a water quality certification from the NCDENR - Division of Water Quality (NCDENR-DWQ) pursuant to Section 401 of the Clean Water Act. The USACE and the NCDENR-DWQ requires an applicant to demonstrate that all practical measures have been taken to avoid and minimize wetland impacts. Under Section 401 of the CWA, the NCDENR-DWQ also requires mitigation for all stream impacts greater than 150 linear feet. Wetlands and streams are located throughout the study area.

Impacts to floodplains and streams indicate areas where culverts or bridges may be required, which represent increases in construction costs. Higher values for total areas of streams and floodplains within a

corridor can indicate there will be less flexibility in designing roadway alignments within these corridors that avoid or minimize impacts to streams and floodplains.

4.1.4 Impact Estimate Methodology

Impacts to the natural and human environment features were based on the estimated ROW width determined from conceptual designs.

The estimates are for comparison purposes only to aid in deciding between PSAs, but they are relatively representative of what the actual impact of a roadway may be for a PSA. The quantities generated in this screening evaluation were considered, together with other qualitative factors, in identifying the Detailed Study Alternatives.

4.2 SUMMARY OF QUANTITATIVE THIRD SCREENING

4.2.1 Impact Comparison

Twenty-five PSAs, as described in **Section 3.5**, were quantitatively screened. The results of this screening are shown in **Table 4-2**. The table is color-coded to show the impacts that are most (yellow) and least (green) for each resource when compared among the PSAs. The comparisons are discussed below.

PSAs that use a substantial length of existing US 74 include PSA G, which is entirely along existing US 74, and PSAs E, E1, E2, E3, F, F1, F2, and F3. PSAs that do not use a substantial length of existing US 74 (the other sixteen PSAs) are referred to as new location alternatives in the discussion below.

None of the PSAs would directly impact properties on or eligible for the National Register of Historic Places, or other properties eligible for Section 4(f)

protection, or impact known locations of endangered species. All would cross the railroad track once and all would cross the Lake Twitty drainage basin boundary. They all have a potential to relocate minority residents.

Stream Impacts. A review of **Table 4-2** for stream impacts shows that the alternatives along existing US 74 have the most impacts to perennial streams and, with the exception of PSA G, the most linear feet of impact to intermittent streams compared to other PSAs. PSA G actually has the fewest linear feet of impact to intermittent streams (25,493 linear feet). The higher levels of perennial stream impact are primarily due to a parallel perennial stream that runs along the south side of US 74 for about 2,600 feet from just west of Unionville – Indian Trail Road (SR 1537) to just west of Technology Drive. Impacts to this stream are unavoidable. PSAs E, E1, E2, E3, F, F1, F2 and F3 would have the most perennial stream impacts (6,397 to 8,415 linear feet) and the new location alternatives would have the least (2,305 to 3,373 linear feet). PSA G would impact 5,018 linear feet of perennial stream.

Floodplains and Natural Heritage Program Sites. The alternatives that would improve the longest length of US 74 (PSAs G, F, F1, and F2) would impact floodplains the least. They are also the only PSAs that would avoid crossing the South Fork of Crooked Creek Natural Heritage Program site. PSAs E, E1, and E2 have moderate floodplain impacts.

Wetlands. PSA G would impact the fewest wetland acres (National Wetland Inventory wetlands). The range of wetland impacts of the other alternatives is 8 to 14 acres. This amount of wetland impacts is relatively small for a project of this size (20 to 22 miles), particularly compared to the amount of stream impacts.

CHAPTER 4

Table 4-2 – Quantitative Screening of Preliminary Study Alternatives

Screening Factor	A	B	C	D	E	F	G	A1	B1	C1	D1	E1	F1	A2	B2	C2	D2	E2	F2	A3	B3	C3	D3	E3	F3	
Interchanges	9	10	9	10	8	7	0 ¹	9	10	9	10	8	7	9	10	9	10	8	7	9	10	9	10	8	7	
Construction Cost (\$ millions, 2007 dollars)	292.4	309.5	297.2	314.4	349.2	403.8	387.0	292.0	309.2	296.9	314.1	348.9	403.5	289.3	290.6	294.1	311.3	346.2	400.8	289.0	306.1	298.3	311.0	345.8	400.4	
Minor Road Crossings	21	21	25	25	38	43	63	23	23	27	27	40	45	21	21	25	25	38	43	23	23	27	27	40	45	
Major Power Easement Crossings	5	4	5	4	3	1	1	5	4	5	4	3	1	5	4	5	4	3	1	5	4	5	4	3	1	
Railroad Line Crossings	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
Residential Relocations	67	99	47	79	98	58	12	88	120	68	100	119	79	68	100	48	80	99	59	89	121	69	101	120	80	
Business Relocations	70	39	141	110	209	317	499	70	39	141	110	209	317	68	37	139	108	207	315	68	37	139	108	207	315	
Low-Income Populations	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Minority Populations	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Parks/Recreation Sites ²	0	0	0	0	1	2	2	0	0	0	0	1	2	0	0	0	0	1	2	0	0	0	0	1	2	
Schools/Libraries/ Fire Stations	0	0	0	0	0	1 (fire)	0	0	0	0	0	0	1 (fire)	0	0	0	0	0	1 (fire)	0	0	0	0	0	1 (fire)	
Churches	0	0	0	0	2	2	0	0	0	0	0	2	2	0	0	0	0	2	2	0	0	0	0	2	2	
Cemeteries	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Properties on or eligible for the National Register of Historic Places	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hazardous Materials and Superfund Sites	0	0	6	6	17	17	17	0	0	6	6	17	17	0	0	6	6	17	17	0	0	6	6	17	17	
Streams (# of crossings)	83	84	81	82	77	79	62	82	83	80	81	76	78	78	79	76	77	72	74	77	78	75	76	71	73	
Perennial Streams (linear feet within ROW)	3,167	3,373	3,074	3,281	8,415	6,397	5,018	3,048	3,255	2,956	3,162	8,297	6,279	2,516	2,722	2,423	2,629	7,764	5,746	2,397	2,604	2,305	2,511	7,646	5,628	
Intermittent Streams(linear feet within ROW)	31,940	35,088	33,623	36,771	38,324	36,804	25,493	32,703	35,851	34,386	37,534	39,087	37,567	30,474	33,622	32,157	35,305	36,858	35,338	31,237	34,385	32,920	36,068	37,621	36,101	
Total Streams (linear feet within ROW)	35,102	38,461	36,697	40,052	46,739	43,201	30,511	35,751	39,106	37,342	40,696	47,384	43,846	32,990	36,344	34,580	37,934	44,622	41,084	33,237	36,989	35,225	38,579	45,267	41,729	
NWI Wetlands (acres)	12.4	14.1	11.3	13.0	14.2	9.5	2.6	11.2	12.9	10.1	11.8	12.9	8.3	12.2	13.9	11.1	12.8	14.0	9.3	11.0	12.7	9.9	11.6	12.7	8.1	
Ponds (acres)	6.6	8.6	6.9	9.0	5.7	6.0	2.4	7.4	9.4	7.8	9.8	6.5	6.9	6.6	8.6	6.9	9.0	5.7	6.0	7.4	9.4	7.8	9.8	6.5	6.9	
Floodplains (acres)	0.16	0.17	0.13	0.14	0.14	0.10	0.10	0.16	0.17	0.13	0.14	0.14	0.10	0.16	0.17	0.13	0.14	0.14	0.10	0.16	0.17	0.13	0.14	0.14	0.10	
Natural Heritage Program Occurrences/Sites	1	1	1	1	1	0	0	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	0	
Protected Species	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Watersheds (Lake Twitty)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
303(d) Listed Streams (# within ROW)	4	4	2	2	2	2	2	4	4	2	2	2	2	4	4	2	2	2	2	4	4	2	2	2	2	

Legend:

Proposed for Elimination

Denotes highest relative impact

Denotes least relative impact

¹ Alternative G will not include full interchanges. Access to and from the frontage roads will be via slip ramps.

² Impacts are to privately-owned golf courses.

CHAPTER 4

Community Facilities. A review of **Table 4-2** for community facility impacts shows that the alternatives along existing US 74 could impact some community facilities, while the new location alternatives would not impact any community facilities. PSAs F, F1, and F2 could impact a fire station located at 105 Maple Hill Road (SR 1502). One to two parks/recreation sites (privately-owned golf courses) and one to two churches/cemeteries would be impacted by PSAs G, E, E1, E2, E3, F, F1, F2, and F3.

Power Easement Crossings. Major power easement crossings range from one for PSAs G, F, F1, F2, and F3 to three to five crossings for the remaining PSAs. Towers within these easements will need to be avoided when possible due to the costs of relocating large towers.

Hazardous Materials. PSAs that include improving US 74 for a substantial length also have the most potential to impact hazardous materials sites. In the study area, there are no known Superfund sites, but there are numerous underground storage tanks, primarily located along existing US 74.

Road Crossings. PSA G would have the highest number of minor road crossings (63), followed by the other alternatives that use existing US 74, which would cross 38 to 43 minor roads. The new location alternatives would cross 21 to 27 minor roads. These roads will need to be grade-separated with the new toll facility, connected to a road that is grade-separated, or cul-de-sac'd. The number of crossings adds to the cost of an alternative and also can be an indication of potential disruption to community travel patterns.

Residential Relocations. Residential relocations would range from twelve to 121 relocations. PSA G has the fewest residential relocations at twelve. PSAs B1,

E1, B3, and E3 would have the most residential relocations (119 to 121). The remaining PSAs have residential relocations ranging from 47 to 100.

Business Relocations. According to US Census, there were approximately 3,650 business establishments in Union County in 2005, the latest date data is available (US Census, Table 2: Selected Statistics by Economic Sector and Sub-Sector: 2005). According to the latest data from the Union County Finance Department, the 2005 tax base of Union County was approximately 80 percent residential properties and 20 percent business properties, which is consistent with the findings of the 2004 *Local Government Fiscal Impacts of Land Uses in Union County – Revenue and Expenditure Streams by Land Use Category* which was prepared by Dorfman Consulting for Union County in December 2004.

As mentioned in **Section 1.1.3**, for every dollar Union County receives from residential development, the county provides an average of \$1.31 in services. In contrast, for every dollar commercial or industrial development brings in, the county spends only 45 cents, which demonstrates the importance of commercial and industrial development.

Many of Union County's businesses are located along existing US 74, the most economically important corridor in the County. Many of these businesses only have access to/from US 74. Many businesses also have parking between their structure and US 74. The conversion of the existing corridor to a freeway facility with frontage roads, while not impacting the structure in every case, may result in the acquisition of all parking, which in effect would require the closing of the business. Many of these businesses are located on single lots, and there is no opportunity to provide additional parking elsewhere. For any businesses that remain or redevelop, the

frontage road system would provide only right-in-right-out access, with U-turns only available at major cross-streets. Examples of these types of impacts are shown in **Figure 4-4**.

The PSAs that would improve all or a substantial length of existing US 74 (PSAs G, E, E1, E2, E3, F, F1, F2, and F3) would have a significant adverse impact on businesses and the economy of Union County. PSA G, which would improve the entire length of existing US 74 in the study area, would result in total relocations of approximately 499 individual businesses along existing US 74, which is about 14 percent of all businesses in Union County. These relocations are a result of either significant impact to business operations or the loss of parking for the businesses. PSAs F, F1, F2, and F3 would impact 315 to 317 businesses, which is about 9 percent of Union County's businesses. These alternatives would widen existing US 74 from NC 51 to just west of the Marshville town limit, a distance of 22.5 miles.

PSAs E, E1, E2, and E3 would impact 207 to 209 businesses, which is 6 percent of Union County's businesses. These alternatives would widen existing US 74 from NC 51 to just west of Wesley Chapel - Stouts Road, a distance of about 6 miles.

It would be difficult for Union County to recover economically from this magnitude of impacts, particularly since access to/from and along US 74, one of the main commercial corridors where businesses locate, would be drastically altered under these alternatives. The magnitude of the potential structure impacts can be seen in **Figure 4-4** which depicts typical business impacts along US 74 if it is improved to a freeway facility.

The next highest impacts to businesses would occur under PSAs C, C1, C2, C3, D, D1, D2, and D3, about 108 to 141

businesses, or 3 to 4 percent of the businesses in Union County. These alternatives would widen a shorter stretch of existing US 74, about 2.6 miles, leaving most of existing US 74 in the study area available for business relocation.

PSAs A, A1, A2, A3, B, B1, B2, and B3 would be on new location just east of the I-485 interchange area. These alternatives would relocate approximately 37 to 70 businesses.

4.2.2 Recommended Detailed Study Alternatives

From the set of 25 endpoint-to-endpoint PSAs, sixteen endpoint-to-endpoint Detailed Study Alternatives (DSAs) are recommended for further study based on the estimated impacts to the natural and human environments and engineering design considerations (**Figures 4-5, 4-6a and 4-6b**).

The preliminary study alternatives that use all or a substantial length of existing US 74 (PSAs G, E, E1, E2, E3, F, F1, F2, and F3) are recommended for elimination from further study. These alternatives have comparatively greater impacts to the following screening criteria: business relocations, streams, minor road crossings, hazardous material sites, and construction costs.

It would be difficult for Union County to recover economically from the magnitude of business impacts resulting from PSAs G, E, E1, E2, E3, F1, F2, and F3, particularly since access to/from and along US 74, one of the main commercial corridors where businesses locate, would be drastically altered under these alternatives.

CHAPTER 5

5.0 AGENCY COORDINATION AND PUBLIC INVOLVEMENT

In compliance with the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) Section 6002 (23 U.S.C § 139), a Section 6002 Project Coordination Plan has been prepared for the Monroe Connector/Bypass project. This plan describes the process for agency coordination and public involvement in the project development process. A copy of this document is included in **Appendix A**.

5.1 AGENCY COORDINATION

5.1.1 Scoping

A formal scoping letter, as required by NEPA, was sent by NCTA to state and federal agencies on January 5, 2007. A separate letter was sent to local agencies and officials on February 14, 2007. The purpose of the letter was to solicit comments and collect pertinent project information early in the alternatives development process. Coordination between NCTA, NCDOT, FHWA, and the agencies has assisted with the development of the Detailed Study Alternatives.

5.1.2 Notice of Intent

Pursuant to Title 23, Code of Federal Regulations (CFR), Part 771, Environmental and Related Procedures, the FHWA published a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) for the proposed Monroe Connector/Bypass project. The NOI was published in Federal Register on January 19, 2007 (Vol. 72, No. 12). A copy of the NOI is included with the Section 6002 Project Coordination Plan in **Appendix A**.

5.1.3 Turnpike Environmental Agency Coordination Meetings

The principal method for agency coordination on NCTA projects are the Turnpike Environmental Agency Coordination (TEAC) meetings, which are hosted monthly by NCTA. These meetings are being used as a forum for discussing all NCTA projects.

Agencies participating in the TEAC process are:

Lead Agency:

- Federal Highway Administration

Cooperating Agency

- US Army Corps of Engineers

Participating Agencies

- US Army Corps of Engineers
- US Environmental Protection Agency
- US Fish and Wildlife Service
- NC Department of Cultural Resources – Historic Preservation Office
- NC Department of Environment & Natural Resources
- Division of Water Quality
- Wildlife Resources Commission
- Mecklenburg-Union Metropolitan Planning Organization

Designation as a Cooperating Agency signifies a somewhat higher level of involvement and responsibility in the environmental review process. A cooperating agency can also be a participating

Participating agencies include any Federal, State, or local agencies that may have an interest in the project.

5.2 PUBLIC INVOLVEMENT

The public involvement process is integral to the entire project development and decision-making process. Public involvement activities described below are related to the creation of the project's purpose and need and the development and evaluation of alternatives.

5.2.1 Citizens Informational Workshop

Two Citizens Informational Workshops (CIWs) took place in June 2007. The purpose of these workshops was to solicit public input on the project including the project's purpose and need and alternatives. Displays at the workshop included maps of the project study area and preliminary corridor segments, as well as information on transportation planning process and the preliminary purpose and need for this project. Comment sheets were distributed to obtain public input on the project study area, identified project needs, purposes, and range of alternatives. Summaries of the comments received at these workshops are included in **Appendix B**.

The first CIW was held on June 25, 2007 between 4:00 pm and 8:00 pm at the South Piedmont Community College located at 4209 Old Charlotte Highway in Monroe and was attended by 247 individuals. The second CIW was held on June 26, 2007 during the same time period. This CIW was held at the North Carolina Cooperative Extension Office, Union County Center, located at 3230-D Presson Road in Monroe and was attended by 151 individuals.

Approximately 500 comment forms were received as a result of the CIWs. A list of the questions and a summary of the public's comments are included in **Appendix B**.

5.2.2 Local Officials Meetings

Two Local Officials Meetings (LOM) were held for the Monroe Connector/Bypass project.

5.2.2.1 Local Officials Scoping Meeting

The first LOM was held on February 9, 2007. The purpose of the meeting was for the local government staff and officials to review the preliminary project study area and Preliminary Draft Purpose and Need Statement and provide comments on these items or any other local issues.

After introductions, the project history was reviewed. A map of the proposed study area was provided for discussion. The group was informed of the primary differences between the new study area and the area studied in the previous Monroe Connector and Monroe Bypass studies: the Goose Creek Basin and Lake Twitty have now been excluded from the study area. The study area is also extended southward to include Old US 74.

The Preliminary Draft Purpose and Need along with the previous Statements of Purpose and Need prepared for the original Monroe Connector and Monroe Bypass studies were distributed to the attendees. The previous Statements of Purpose and Need were similar to one another in that they each stressed the need to improve travel along US 74 in Union County to serve as an important route between the western and eastern parts of the state. US 74 is also identified as a Strategic Highway Corridor where the vision for the roadway is a freeway facility, a North Carolina Intrastate Highway and part of the Strategic Highway Network or STRAHNET. STRAHNET are roadways identified by the Department of Defense as important corridors linking important military installations and ports.

The Draft Section 6002 Project Coordination Plan was presented and discussed. This plan outlines how NCTA will coordinate with federal and state environmental regulatory and resource agencies and local governments. A copy of the draft plan was provided to the attendees.

5.2.2.2 Local Officials Meeting

The second LOM took place on June 25, 2007, between 10:00 am and 11:55 am, at Monroe City Hall. The purpose of the meeting was to update local officials on the status of the Monroe Connector / Bypass project and present materials to be displayed at the CIWs scheduled for the evenings of June 25 and 26, 2007.

5.2.3 Small Group Meetings

Throughout the study process, the project team met with local organizations and citizens groups to discuss the project. Several meetings were held during the development of preliminary alternatives in the project study area. Meetings were requested by and held with the following groups:

- Fairhaven Homeowners (Aug 2, 2007)
- Bonterra Village Homeowners (Sep 6, 2007)
- Rocky River Rural Planning Organization (Sep 20, 2007)
- City of Monroe (Aug 21, 2007)
- Union County Board of Commissioners (Aug 20, 2007)
- Town of Indian Trail (Sep 11, 2007)
- Town of Stallings (March 26, 2007)

Meetings were also requested by local land developers to identify and discuss any potential impacts the Monroe Connector / Bypass may have with their ongoing projects. Developers that met with project team members are:

- Hendricks Automotive Group (July 27, 2007)

- Lennar (Aug 21, 2007)
- Bonterra Properties (Sep 6, 2007)

5.2.4 Other Outreach Efforts

Other methods employed for communicating project information and announcements of public meetings are described below.

5.2.4.1 Newsletters

A project newsletter was distributed in early June 2007 to approximately 27000 people on the project mailing list to announce the June Citizens Informational Workshops. A project newsletter will be distributed to approximately 23000 people on the project mailing list in early November 2007 to announce NCTA's completion of this report, recommended DSAs and to solicit input from the public and agencies on this information. Copies of these newsletters are included in **Appendix C**.

5.2.4.2 Project Website

The project website (www.ncturnpike.org/projects/monroe) includes project information, documents, previous newsletters, project maps, other project documents and an online comment form. The online comment form enables users to provide comments and ask questions. Also available on the project website are materials presented at the June 2007 Citizens Informational Workshops.

5.2.4.3 Toll-Free Telephone Hotline / Email

A toll free telephone line (1-800-475-6402) is available for the public to call in with comments or request information regarding the project. In addition, the public can email the project team with comments or questions. The project email address is monroe@ncturnpike.org.

CHAPTER 6

6.0 CONCLUSION

6.1 REPORT REVIEW AND COMMENTS

6.1.1 Agency Review

At the October 17, 2007 Turnpike Environmental Agency Coordination (TEAC) meeting, NCTA presented its recommended alternatives to be studied in detail in the Draft Environmental Impact Statement (DEIS). The NCTA distributed the Draft Alternatives Development and Analysis Report to the agencies on November 5, 2007 and requested written comments. Six agencies provided written comments. Complete copies of these comments and responses thereto can be found in **Appendix D**. The majority of the comments pertained to potential indirect and cumulative effects of a new location alternative and the desire to further consider improving existing US 74 (Alternative G).

6.1.2 Public Review

In accordance with the Section 6002 Project Coordination Plan for this project, NCTA also solicited public comment on the draft report. A project newsletter announcing the availability of the report on the NCTA website and requesting comments was distributed in early November 2007 to the project mailing list of more than 25,000 citizens.

The following is a summary of the public comments received:

- Twenty-two inquiries about impacts to individual properties.
- Two comments regarding improvements needed on US 601 between US 74 and the North Carolina/South Carolina border.
- One comment to use NC 218 as the route for the Connector/Bypass.
- Two emails supporting alternatives that include Corridor Segment 18A.

- Sixty-seven emails opposing alternatives that include Corridor Segment 18A.
- Village of Lake Park opposed alternatives that include upgrading existing US 74, including alternatives that include Corridor Segment 2.
- The Town of Indian Trail indicated that Corridor Segments 2 and 22A are inconsistent with local land use plans and expresses concern that Corridor Segment 2 would impact the Old Hickory Industrial Park.
- The Town of Stallings, Town of Matthews, and City of Monroe commented in support of routes that do not include Corridor Segment 18A.

In addition, 1,693 signed petitions and 609 copies of form letters opposing alternatives that include Corridor Segment 18A were received.

6.2 DETAILED STUDY ALTERNATIVES

Based on comments received, NCTA has concluded that the 16 recommended detailed study alternatives will be evaluated in the DEIS. The detailed study alternatives are: A, B, C, D, A1, B1, C1, D1, A2, B2, C2, D2, A3, B3, C3, and D3.

Additionally, in light of agency comments requesting further consideration of Alternative G (improving US 74), NCTA will carry forward Alternative G on an interim basis until such time as additional information can be developed and evaluated. This information will include traffic forecasts, community impacts, and potential indirect and cumulative impacts. It is anticipated that additional information will confirm that this alternative should be eliminated from consideration, and as such, Alternative G is not being considered a detailed study alternative for evaluation in the DEIS.