CHAPTER 2

ALTERNATIVES

This chapter describes the No Build, Transportation System Management, Multi-Modal and Build alternatives examined for the subject project. The Build alternatives include both new location (Bypass) alternatives and an "improve existing facility" (Upgrade) alternative.

During the initial stages of development of the new location alternatives, numerous options were considered and evaluated. Those alternatives which did not meet the goals of the project, had excessive undesirable impacts, or were considered impractical or non-competitive were eliminated from further consideration. Those alternatives that were considered viable were evaluated and presented in the Draft Environmental Impact Statement (DEIS). This, the Final Environmental Impact Statement (FEIS), details all of the alternatives examined, including those eliminated from further consideration, those studied but not selected, and the Preferred Alternative and reasons for its selection. This chapter examines the study process used to evaluate the preliminary alternatives.

2.1 NO BUILD ALTERNATIVE

The No Build alternative assumes that in the year 2020, the existing transportation system would evolve as currently planned in the NCDOT State Transportation Improvement Program and other regional and local transportation plans, but without improvement of existing US 74 or the construction of a US 74 Bypass of Shelby within the study area. With the exception of routine maintenance, no other changes would take place to the existing US 74 facility by the year 2020. The No Build alternative is the baseline against which the Bypass and Upgrade alternatives were evaluated.

Under the No Build, existing US 74 through Shelby would be the major west-east conveyor of through traffic in the area. The characteristics of the facility in 2020 would be similar to those of the current highway (see Section 1.5.1 for a description of the existing facility).

By year 2020, US 74 traffic volumes would increase by as much as 260 percent over the baseline 1994 traffic volumes. The volume increases on US 74 for the No Build alternative can be seen by comparing Exhibits 1-3 and 1-4. West of Shelby, year 2020 volumes are anticipated to increase by approximately 200 to 250 percent (32,800 to 50,600 vehicles per day). Within Shelby (i.e., the portion of US 74 bypassing the US 74 Business route), year 2020 traffic volumes would be approximately double the 1994 volumes (43,500 to 62,000 vehicles per day); the US 74 Business route traffic volumes would increase by 190 to 270 percent, to between 7,600 and 28,100 vehicles per day. East of Shelby, traffic growth from 1994 to 2020 would range between approximately 180 and 260 percent (57,900 to 58,500 vehicles per day).

As a result of this traffic growth, the levels of service on US 74 would deteriorate substantially. All intersection levels of service along the route would be LOS F, a decrease of as many as three levels from the 1994 levels of service. These severely declined levels of service are indicative of breakdown conditions. For these reasons, the No Build alternative was eliminated from further consideration as a viable alternative.

2.2 TRANSPORTATION SYSTEM MANAGEMENT (TSM) ALTERNATIVE

Transportation System Management (TSM) consists of low-cost improvements to an existing transportation facility in place of or in addition to large-scale changes. TSM measures enhance the operations of a facility, while minimizing capital outlay. Often, implementation of such

measures causes little inconvenience to users of the facility. Table 2-1 shows examples of possible TSM improvements.

As shown in Table 2-1, there are two main types of improvements: physical changes and operational changes. Physical changes are usually more capital-intensive, requiring investment of both labor and materials.

Operational changes are largely administrative in nature and require commitment of labor only in most cases (e.g., increase in police patrols, design and implementation labor for signal timing changes, etc.).

The focus of potential TSM improvements for the study area was existing US 74, since this road currently serves many of the same traffic movements as would a facility on new location. This analysis examined intersections and street segments along the existing route.

TSM improvements are closely related to the measures taken to upgrade an existing facility. Several of the physical and operational improvements shown in Table 2-1 were included in the analysis of the US 74 Upgrade alternative. These are discussed in Section 2.4.4. The TSM alternative was determined not viable, and removed from further consideration for the following reasons:

- Since traffic signal delays currently contribute to the capacity problems on existing US 74, it is likely that additional signals would lead to additional congestion. Timing and/or coordination-type improvements might help to some extent, but such measures would not substantially improve highway capacity.

Table 2-1

TSM IMPROVEMENTS FOR THE STUDY AREA

PHYSICAL IMPROVEMENTS

Turn lanes

Striping modifications

Medians (1)

Warning devices

New lanes (1)

New segments paralleling or bypassing congested segments (1)

Intersection realignment

Improved warning and informational signs

Geometric and signalization improvements on access roads

New signals or stop signals

OPERATIONAL IMPROVEMENTS

Traffic law enforcement

Turn prohibitions

Speed restrictions

Flexible work hours to stagger peak traffic

Access control (1)

Signal coordination

Signal phasing or timing changes

(1) These TSM measures were examined as part of the US 74 Upgrade analysis.

Source: National Cooperative Highway Research Program Report 263, Simplified Procedures for Evaluating Low-Cost TSM Projects, Transportation Research Board, 1963.

- Turn prohibitions would be difficult to implement due to the large number of businesses which are currently accessed from US 74; there would be a general expectation that accessibility to these businesses would not decrease.

- Turn lanes might improve traffic service on isolated portions of existing US 74, but would not substantially improve highway LOS overall.

- There are numerous access points (driveways and side streets) on the facility, which would impair the feasibility of signalization or access road improvements.

- Since the facilities accessing US 74 generally do not interconnect at other proximate locations, turn prohibitions and access control would be unworkable.

- Warning devices, improved signing, striping modifications, law enforcement, and speed restrictions might help to reduce accidents on US 74, but would not address the capacity problems.

- Roadside development and limited right-of-way would generally preclude intersection realignments.

- Lack of concentrated centers of employment in the study area and a diversity of road users would preclude use of flexible work hours to improve overall level of service on US 74.

2.3 MULTI-MODAL ALTERNATIVES

2.3.1 Mass Transit

Currently, there is no mass transit system in operation within the study area for the subject project. This is most likely due to a combination of the high cost of transit, the relatively low population and population densities, and a diversity of trip origins and destinations. Typically, mass transit in North Carolina, when considered for implementation, is generally a fixed route, fixed schedule bus system.

Proposed Area Transit. The Transportation Administration of Cleveland County, Inc. (TACC) provides human service and general public transportation for Cleveland County. The service provides on-demand rides for various agencies and organizations in the area, as well as

maintaining Cleveland County Transit, a rural general public route that serves the City of Shelby. Although this service is planned for future expansion, it is not anticipated that the degree of expansion achievable within funding constraints would accommodate the majority of transportation needs to be addressed by the subject project.

Effectiveness/Probability of Success. The probability that mass transit would provide viable service within a designated area would be substantially greater if certain demographic characteristics existed in that area. The Federal Highway Administration Technical Advisory T6640.8A (Guidance for Preparing and Processing Environmental and Section 4(f) Documents, October 30, 1987) states that mass transit should be considered on major highway projects in urbanized areas over 200,000 population. Since the population for all of Cleveland County is projected to be only 115,000 by the year 2020 (see Table 1-1), this area is not a good candidate for mass transit.

Other factors that might potentially offer indications that mass transit would fail or succeed in a given area include housing density, automobile ownership, and concentration of employment centers; these factors do not suggest that mass transit would succeed in the Shelby vicinity:

Mass Transit as a Solution to the Needs of This Study. The issue of mass transit as a solution to area transportation needs can be considered in light of the groups anticipated to be served by this project. Besides area residents (who would not be served by a multi-modal system), other categories of potential usage of transportation improvements would include commercial transport (of goods and services), agricultural transport, and through travelers. None of these groups would be served by a mass transit alternative.

Mass transit was therefore eliminated from further consideration as a viable alternative, due to the timing of implementing it compared to the study area's more immediate needs, anticipated ineffectiveness and failure to respond to the transportation needs identified for this project.

2.3.2 Rideshare

Like mass transit, rideshare would require certain area characteristics, such as population density and concentrated employment centers, to provide a viable service to area residents. Furthermore, this solution would not serve the aforementioned commercial, agricultural and tourist traffic projected to move within or through the study area. Rideshare was therefore eliminated from further consideration as a viable alternative.

2.4 BUILD ALTERNATIVES

The Build alternatives considered for this project include the Bypass (new location) alternatives, established as a result of preliminary studies and public input, and the Upgrade (improve existing facility) alternative. The Bypass alternatives considered include improvement of one or more segments of existing US 74 as well as construction of a new location bypass around Shelby.

2.4.1 Logical Termini

In order to ensure a meaningful evaluation of alternatives and to avoid commitments to transportation improvements before they are fully evaluated, the action evaluated in an environmental impact statement shall:

- Connect logical termini and be of sufficient length to address environmental matters on a broad scope;

- Have independent utility or independent significance, i.e., be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made; and

- Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

The locations of the termini and other elements for this project were determined by several factors:

- The eastern project terminus was selected to allow for provision of a continuous full control of access highway, in accordance with the US 74 Priority Corridor concept; i.e., the eastern terminus links with the controlled access section of US 74 to the east. The western project terminus is at existing US 74, a four-lane divided facility. The common western and eastern project termini enable equivalent comparisons of the various alternatives.

- The new location Bypass alternative western and eastern termini at existing US 74 were selected using the following criteria:

    - Avoidance and minimization of impacts to human and natural environmental resources to the fullest extent practicable.

    - Engineering constraints and constructibility for an interchange with respect to the horizontal and vertical geometry of existing US 74.

    - Achievement of an economic balance between additional bypass length (for bypass termini which are further from Shelby) and greater impacts to existing development along upgraded segments of US 74 (for bypass termini which are closer to Shelby).

2.4.2 Design and Engineering Criteria

One important design consideration employed was minimization of the length (and potential cost) of the facility. Topography (minimization of earthwork) and hydraulic design were examined as part of the corridor location process for the Bypass alternatives. Corridor stream crossings were oriented to provide near perpendicular traversals wherever possible, with favorable topography for bridge locations. This is to allow minimization of bridge lengths, and a minimization of impacts to the streams.

An additional factor which dictated the location and future design of the facility was the requirement that the roadway provide improved transportation operations in the region. Elements of design affected by the need for optimization of traffic service included:

1) Controlled access for the facility and subsequent location and configuration of interchanges;

2) Number of lanes required, cross-section dimensions and resulting right-of-way needs;

3) Horizontal and vertical curvature; and

4) Design speed.

Design criteria for the proposed facility were chosen to provide safe and efficient traffic operations. Many of these design standards are related to design speed and type of facility. The criteria used for this study, based on the 1990 American Association of State Highway and Transportation Officials (AASHTO) editions of A Policy on Geometric Design of Highways and Streets, are shown in Table 2-2.

Typical sections for the Bypass alternatives are shown in Exhibit 2-1; Upgrade alternative typical sections are shown in Exhibits 2-2 and 2-3.

Anticipated Design Exceptions. The "design exception" process is the procedure that documents the economic, physical, social or environmental restraints that prevent the application of a specific highway design criterion or standard. The use of a design exception does not constitute a hazardous or unsafe condition. Approval is not intended to forgive or endorse the use of a hazardous condition, but to acknowledge and concur that fulfilling a particular design standard requires an unreasonable expense or impact due to special or unusual conditions on the project.

Table 2-2
ROADWAY DESIGN CRITERIA

DESIGN FACTORS		RECOMMENDED STANDARDS
Design Speed	*	Freeway - 70 mph minimum
	*	Ramps - 50 mph minimum
	*	Loops - 30 mph minimum
	*	Cross Streets - varies according to functional classification
Pavement Width	*	Freeway - 12' standard lane width
	*	Ramps - Single lane 14'
	*	Loops - Single lane 18' maximum
	*	Cross streets - varies according to classification
Shoulder Width	*	Freeway roadway section - 12' outside shoulder (4' paved), 12' inside shoulder (4' paved)
	*	Bridge section - 10' outside, 4' inside (mainline); local and collector is dependent on ADT and lane configuration
	*	Ramps - 12' minimum (4' paved)
	*	Loops - curb and gutter inside w / 8' berm, 12' outside (4' paved)
Median Width	*	46' standard
Vertical Alignment	*	Rates of grade: 4% maximum (rolling terrain) Ramps - 5% maximum; Loops - 6% maximum (Steeper grades for ramps and loops may be acceptable in special circumstances)
	*	Minimum grade - as warranted by drainage
Horizontal Alignment	*	Maximum degree of curvature: Freeway - D = 3 -30' Ramps - D = 7 -30' Loops - R_{min} = 250 feet (desirable)
Vertical Clearances (minimum)	*	Over all local and collector streets - 15'-0"
	*	Over arterials and freeway - 16'-6" (minimum)
	*	Over railroads - 23'-0" (minimum)
Right-of-Way Width	*	320' new location (minimum)
	*	98' from ramp lines (minimum)
Level of Service	*	Freeway: Level of Service C (minimum)
Sight Distance	*	Freeway: K (minimum) for crest vertical curve - 190
	*	Freeway: K (minimum) for sag vertical curve - 120
Miscellaneous	*	Superelevation: 0.10 maximum (freeway) 0.08 maximum (ramps & loops)

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

Formal design exception approval is required when any of the following minimum AASHTO criteria are not met:

- Design speed
- Lane and shoulder widths
- Bridge widths
- Structural capacity
- Horizontal and vertical alignment
- Grades
- Stopping sight distances
- Cross slopes
- Superelevation
- Horizontal and vertical clearances

There are two anticipated design exceptions identified for this project, based on the preliminary design performed for the Preferred Alternative (see Section 2.4.7). These are as follows:

1) *Vertical Alignment on Existing US 74 at Western Project Terminus* – Based on the current preliminary design, the vertical grade along existing US 74 between the western project terminus and Peachtree Road (SR 1162) will be approximately five percent (the AASHTO design criterion is a maximum of four percent). The steeper grade is necessary in order to tie in with the adjacent alignment west of this project. There is a possibility that the grade can be reduced to the four-percent maximum if the bridges over Sandy Run Creek are reconstructed as a part of improvements planned for the adjacent segment of US 74 to the west.

2) *Vertical Alignment on Existing US 74 Along Eastern Portion of Project* – Based on the current preliminary design, the vertical grade along existing US 74 between Buffalo Creek and Bethlehem Road (SR 2245) will be approximately five percent (the AASHTO design criterion is a maximum of four percent). The steeper grade is necessary because this portion of the project utilizes the existing US 74 highway, and the grade is pre-existing. At the time this portion of US 74 was originally constructed, the five-percent

grade was within acceptable design parameters. To alter this portion of the highway to attain the four-percent standard would result in excessive disruption to adjacent development.

2.4.3 Preliminary Bypass Alternatives

The Bypass alternatives consist of improving existing US 74 to a freeway-level facility from the proposed western project terminus, 0.6 mile west of Peachtree Road (SR 1162), to the proposed western bypass terminus; construction of a four-lane divided full control of access facility on new location to bypass the City of Shelby (locations both to the north and south of Shelby were evaluated); and improvement of existing US 74 to a freeway-level facility from the proposed eastern bypass terminus to the existing full control of access section near Stony Point Road (SR 1001). Access to local crossing roads would be provided at a limited number of locations by interchanges. The remaining crossing roads would be separated from the new location highway by means of bridge structures (grade separations), or would be realigned or terminated in the vicinity of the new highway. An approximate right-of-way width of 320 feet would be used for both the upgrade and bypass portions of the facility.

During the corridor location stage of the highway planning process, the corridors for the bypass alternatives were 1,000 feet in width or wider. A preliminary centerline and a 320-foot right-of-way width were used to estimate impacts to the human and natural environments for the preliminary alternatives. The centerline for the detailed study alternatives was shifted within the corridors as needed to avoid and minimize impacts to the fullest extent practicable.

The selection of Bypass alternatives was a multi-tiered process. Land suitability mapping showing area constraints such as land use, floodplains, potential wetlands, stream crossings, community facilities, and known archaeological sites and historic architectural properties was compiled for use in developing preliminary corridors that avoided impacting these features as much as practicable without compromising traffic service or having unreasonably increased cost.

Corridor Location Criteria. A diversity of criteria was used during the early stages of the study to ensure that both the location and the design concept of the bypass alternatives would provide maximum benefit and minimum adverse impact for the local area and for the state transportation system. These criteria were employed during the preliminary corridor selection process: 1) to establish acceptable initial preliminary corridors; 2) to determine modifications to those corridors which would be satisfactory from an environmental and a design standpoint; and 3) to select corridors for detailed study. Exhibit 2-4 indicates the initial corridor segments established for the project. Preliminary corridor segments are identified by the letter designations of their nodes, or endpoints, representing the juncture of two or more segments.

Each segment was analyzed to determine which would best minimize impacts and provide favorable characteristics for a future highway and which should be eliminated from further consideration, based on the level of detail of information available at that stage in the process. The factors considered in the segmental analysis are shown in Table 2-3 and are discussed below.

Table 2-3

FACTORS CONSIDERED IN PRELIMINARY CORRIDOR ANALYSIS

ENVIRONMENTAL FACTORS

Natural Resources Criteria
Wetlands
Floodplains
Plant Communities/Forest Land
Number of Stream Crossings

Socioeconomic Criteria
Estimated Relocations
Number of Affected Community Facilities
Consistency with Land Use Plans

Cultural Resources Criteria
Number of Potentially Affected Historic Sites
Number of Potentially Affected Archaeological Sites
Number of Affected Parks/Recreational Facilities

ENGINEERING FACTORS

Traffic
Length
Topographical Considerations
Hydraulic Considerations
Potential Cost (low/medium/high)
Number of Interchanges
Number of Grade Separations

PUBLIC OPINION

Citizen Comments
Local Official Comments

Socioeconomic Criteria - Social factors involved in the selection of preliminary alternatives include displacement of residences and businesses, impacts to community facilities (e.g., churches and cemeteries), and potential impacts to minorities. Corridor locations contributing to excessive community disruption or isolation of one community from another were avoided if possible.

Public Opinion - An important consideration of this project is the public perception of the various alternatives. The public opinions submitted during the public involvement process were considered in the establishment and evaluation of preliminary alternatives.

Environmental Criteria - Several constraints were used to ensure that alternatives would cause minimal impact to the natural resources of the study area. Environmental factors considered in the preliminary corridor establishment and selection process include:

1) ***WETLANDS AVOIDANCE*** - Potential wetland locations to be avoided were initially established through use of U.S. Fish and Wildlife National Wetlands Inventory mapping. More detailed evaluation methods, including field investigations, were used in the project analysis of the detailed study alternatives.

2) ***MINIMIZATION OF STREAM AND FLOODPLAIN CROSSINGS*** - Streams were crossed as near to perpendicular as practicable and the number of crossings were limited. Floodplains, identified from Federal Emergency Management Agency (FEMA) maps, were traversed at the narrowest crossings, if possible.

3) ***MINIMIZATION OF FOREST LAND INVOLVEMENT*** - Aerial photography was used to identify plant community types including various categories of forest land.

4) ***PROTECTED SPECIES AVOIDANCE*** - The Natural Heritage Program and U.S. Fish and Wildlife Service were consulted for known study area sightings of endangered, threatened, and proposed endangered or threatened plant and animal species.

Cultural Resources Criteria - Known and potential historic architectural properties were identified through a windshield survey of the study area and through review of county and State Historic Preservation Office files and inventories. The identified properties were avoided whenever possible. Following selection of the detailed study alternatives, a detailed architectural survey was performed to determine property eligibility for the National Register of Historic Places and extent of property acreage included in the historic context of the structure. Known archaeological sites were identified and avoided whenever possible. Schools, and parks and recreational facilities were avoided as well.

Preliminary Alternatives Evaluation. Table 2-4 provides a list of the preliminary alternatives identified and evaluated for this project, as shown on Exhibit 2-4; the 28 alternatives represent all possible combinations of corridor segments. These alternatives included two routings to the south of existing US 74 and the City of Shelby. One of the two southern routings followed the 1991 Feasibility Study Southern Alternate; the second was located to minimize impacts as much as practicable based on the project land suitability mapping. Therefore, all logical southern routings were included in this study.

Table 2-5(a) provides the estimated impacts for each of these alternatives based on the information available at that point in the study process. Table 2-5(b) is a matrix representing the impacts in Table 2-5(a); the symbols make it possible in some cases to visually identify clearly flawed and/or obviously superior alternatives.

Table 2-4
DESCRIPTION OF PRELIMINARY ALTERNATIVES EVALUATED

ALT.	SEGMENT COMBINATION	DESCRIPTION	DISPOSITION
A	A-B-L-N-O-S	New Northern Alternative	Retained / carried to next level
B	A-B-L-N-O-P-Q-R-S	New Northern Alternative	Retained / carried to next level
C	A-B-G-J-L-N-O-S	New Northern Alternative	Retained / carried to next level
D	A-B-G-J-L-N-O-P-Q-R-S	New Northern Alternative	Retained / carried to next level
E	A-B-G-J-K-M-N-O-S	New Northern Alternative	Retained / carried to next level
F	A-B-G-J-K-M-N-O-P-Q-R-S	New Northern Alternative	Retained / carried to next level
G	A-B-G-J-K-M-P-Q-R-S	New Northern Alternative	Retained / carried to next level
H	A-C-G-J-L-N-O-S	New Northern Alternative	Retained / carried to next level
I	A-C-G-J-L-N-O-P-Q-R-S	New Northern Alternative	Retained / carried to next level
J	A-C-G-J-K-M-N-O-S	1979 Thoroughfare Plan Alt.	Retained / carried to next level
K	A-C-G-J-K-M-N-O-P-Q-R-S	New Northern Alternative	Retained / carried to next level
L	A-C-G-J-K-M-P-Q-R-S	1994 Thoroughfare Plan – Alternate A	Retained / carried to next level
M	A-C-D-F-G-J-L-N-O-S	New Northern Alternative	Eliminated (Segment F-G)
N	A-C-D-F-G-J-L-N-O-P-Q-R-S	New Northern Alternative	Eliminated (Segment F-G)
O	A-C-D-F-G-J-K-M-N-O-S	New Northern Alternative	Eliminated (Segment F-G)
P	A-C-D-F-G-J-K-M-N-O-P-Q-R-S	New Northern Alternative	Eliminated (Segment F-G)
Q	A-C-D-F-G-J-K-M-P-Q-R-S	New Northern Alternative	Eliminated (Segment F-G)
R	A-C-D-F-I-K-M-N-O-S	New Northern Alternative	Retained / carried to next level
S	A-C-D-F-I-K-M-N-O-P-Q-R-S	New Northern Alternative	Retained / carried to next level
T	A-C-D-F-I-K-M-P-Q-R-S	New Northern Alternative	Retained / carried to next level
U	A-C-D-E-H-I-K-M-N-O-S	1994 Thoroughfare Plan – Alternate B	Eliminated (Segment H-I)
V	A-C-D-E-H-I-K-M-N-O-P-Q-R-S	New Northern Alternative	Eliminated (Segment H-I)
W	A-C-D-E-H-I-K-M-P-Q-R-S	New Northern Alternative	Eliminated (Segment H-I)
X	A-C-D-E-H-M-N-O-S	New Northern Alternative	Eliminated (Segment E-H-M)
Y	A-C-D-E-H-M-N-O-P-Q-R-S	1991 Feasibility Study Northern Alt.	Eliminated (Segment E-H-M)
Z	A-C-D-E-P-Q-R-S	Upgrade Alternative	Retained / carried to next level
AA	A-C-D-Q-R-S	1991 Feasibility Study Southern Alt.	Eliminated (Segment D-Q)
BB	A-R-S	New Southern Alternative	Eliminated (Segment A-R)

Notes: These alternatives were arbitrarily renamed in order to eliminate confusion with the later, numbered detailed study alternatives.

See Exhibit 2-4 for identification of the various corridor segments comprising each alternative.

Table 2-5(a)
PRELIMINARY ALTERNATIVES IMPACTS

ALT. #	IMPACT														
	Wetlands (Acres)	Floodplain Encroachment (lf)	# of Stream Crossings	Estimated Relocations	# Of Community Facilities Impacted	Consistency with Land Use	# of Historic Sites Impacted	# of Archaeological Sites Impacted	# of Parks/Rec. Facilities Impacted	Length (miles)	Topography	Hydraulic Considerations	Potential Cost	# of Interchanges	# of Grade Separations
A	4.2	5,151	31	37	1	Yes	0	0	0	21.4	Good	Poor	High	7	18
B	0.5	2,247	27	47	1	Yes	0	0	0	21.9	Fair	Fair	High	7	20
C	8.9	7,211	27	53	2	Yes	2	0	1	19.7	Fair	Poor	High	7	18
D	5.2	4,308	23	63	2	Yes	2	0	1	20.1	Fair	Fair	High	7	20
E	9.4	7,211	25	48	1	Yes	2	0	0	19.2	Fair	Poor	Med	7	16
F	5.7	4,308	21	58	1	Yes	2	0	0	19.6	Fair	Fair	Med	7	18
G	5.7	4,308	22	56	0	Yes	2	0	0	19.3	Fair	Good	Med	7	16
H	11.6	6,706	28	56	4	Yes	2	0	1	19.7	Fair	Poor	Med	7	15
I	8.2	3,802	24	66	4	Yes	2	0	1	20.1	Fair	Fair	High	7	17
J	12.1	6,706	26	51	3	Yes	2	0	0	19.2	Fair	Poor	Med	7	13
K	8.4	3,802	22	61	3	Yes	2	0	0	19.6	Fair	Fair	Med	7	15
L	8.4	3,802	23	59	2	Yes	2	0	0	19.3	Fair	Good	Low	7	13
M	16.3	7,812	29	77	2	Yes	2	0	1	20.1	Poor	Poor	Med	8	17
N	12.6	4,908	25	87	2	Yes	2	0	1	20.4	Poor	Fair	High	8	19
O	16.6	7,812	27	72	1	Yes	2	0	0	19.6	Poor	Poor	Med	8	15
P	13.1	4,908	23	82	1	Yes	2	0	0	19.9	Poor	Fair	Med	8	17
Q	13.1	4,908	24	80	0	Yes	2	0	0	19.8	Poor	Good	Low	8	15
R	6.4	6,640	28	74	1	Yes	0	0	0	19.0	Poor	Poor	Low	7	15
S	2.7	3,737	24	84	1	Yes	0	0	0	19.3	Poor	Poor	Low	7	17
T	2.7	3,737	25	82	0	Yes	0	0	0	19.1	Poor	Poor	Low	7	15
U	10.6	6,663	30	67	1	Yes	0	0	0	18.9	Poor	Poor	Low	8	16
V	6.9	3,760	26	77	1	Yes	0	0	0	19.3	Poor	Fair	Med	8	18
W	6.9	3,760	27	75	0	Yes	0	0	0	19.0	Poor	Fair	Low	8	16
X	7.7	7,858	26	69	1	Yes	1	0	1	18.0	Good	Poor	Low	7	14
Y	4.0	4,954	22	79	1	Yes	1	0	1	18.4	Good	Fair	Low	7	16
Z	0.7	4,767	12	58	3	No	2	0	0	16.2	Good	Good	Low	5	13
AA	1.7	4,721	16	54	3	No	0	2	0	16.0	Poor	Fair	Low	5	14
BB	2.7	2,444	19	51	0	No	0	0	0	17.1	Poor	Poor	Low	6	11

Notes: These alternatives were arbitrarily renamed in order to eliminate confusion with the later numbered detailed study alternatives.

Impacts for the preliminary alternatives will not necessarily be the same as the impacts for later study alternatives, because the preliminary alternatives were evaluated using less detailed data sources; and many of these alternatives were modified later in the study.

Table 2-5(b)
PRELIMINARY ALTERNATIVES EVALUATION MATRIX

ALT. #	DEGREE OF IMPACT														
	Wetlands	Floodplain Encroachment	# of Stream Crossings	Estimated Relocations	# Of Community Facilities	Consistency with Land Use	# of Historic Sites Impacted	# of Archaeological Sites	# of Parks/Rec. Facilities	Length	Topography	Hydraulic Considerations	Potential Cost	# of Interchanges	# of Grade Separations
A	○	◑	●	○	○	○	○	○	○	◑	○	●	●	◑	◑
B	○	○	◑	○	○	○	○	○	○	●	◑	◑	●	◑	○
C	◑	◑	◑	○	◑	○	●	○	●	◑	◑	●	●	◑	◑
D	○	◑	◑	◑	◑	○	●	○	●	◑	◑	◑	●	◑	○
E	◑	◑	◑	○	○	○	●	○	○	◑	◑	●	◑	◑	◑
F	○	◑	◑	◑	○	○	●	○	○	◑	◑	◑	◑	◑	◑
G	○	◑	◑	◑	○	○	●	○	○	◑	◑	○	◑	◑	◑
H	◑	◑	◑	◑	●	○	●	○	●	◑	◑	●	◑	◑	◑
I	◑	○	◑	◑	●	○	●	○	●	◑	◑	◑	●	◑	◑
J	◑	◑	◑	○	◑	○	●	○	○	◑	◑	●	◑	◑	●
K	◑	○	◑	◑	◑	○	●	○	○	◑	◑	◑	◑	◑	◑
L	◑	○	◑	◑	◑	○	●	○	○	◑	◑	○	○	◑	●
M	◑	◑	◑	◑	◑	○	●	○	●	◑	●	●	◑	○	◑
N	◑	◑	◑	●	◑	○	●	○	●	◑	●	◑	●	○	◑
O	●	◑	◑	◑	○	○	●	○	○	◑	●	●	◑	○	◑
P	◑	◑	◑	◑	○	○	●	○	○	◑	●	◑	◑	○	◑
Q	◑	◑	◑	◑	○	○	●	○	○	◑	●	○	○	○	◑
R	◑	◑	◑	◑	○	○	○	○	○	◑	●	●	○	◑	◑
S	○	○	◑	◑	○	○	○	○	○	◑	●	●	○	◑	◑
T	○	○	◑	◑	○	○	○	○	○	◑	●	●	○	◑	◑
U	◑	◑	◑	◑	○	○	○	○	○	◑	●	●	○	○	◑
V	◑	○	◑	◑	○	○	○	○	○	◑	●	◑	◑	○	◑
W	◑	○	◑	◑	○	○	○	○	○	◑	●	◑	○	○	◑
X	◑	●	◑	◑	○	○	●	○	●	◑	○	●	○	◑	●
Y	○	◑	◑	◑	○	○	●	○	●	◑	○	◑	○	◑	◑
Z	○	◑	○	◑	◑	●	●	○	○	○	○	○	○	●	●
AA	○	◑	○	◑	◑	●	○	●	○	○	●	◑	○	●	●
BB	○	○	◑	○	○	●	○	○	○	○	●	●	○	●	●

Notes: These alternatives were arbitrarily renamed in order to eliminate confusion with the later numbered detailed study alternatives.

Matrix is based on the impacts shown in Table 2-5(a).

LEGEND:

○ Least Impact or Greatest Benefit

◑ Average Impact or Benefit

● Greatest Impact or Least Benefit

The evaluation of the preliminary alternatives and decisions to retain or eliminate those alternatives were approached in a number of ways. In some cases, specific corridor segments were identified which did not compare favorably to other segment(s) providing alternate routing(s); as a result, all alternatives which included that segment were eliminated. In other cases, alternatives which were conceptually very different (for example, the alternatives to the south of Shelby) were considered in their entirety because of the broader ramifications of transportation and land use plan consistency. Exhibit 2-5 shows the deletions made to the preliminary corridor segments as a result of these decisions, which were made at the April 21, 1995 steering committee meeting (see Section 6.1.2). The revised corridor segments were subsequently presented at a Citizens Informational Workshop held in May 1995. These changes included:

Segment F-G - Eliminated due to extensive wetlands impacts; this segment was projected to include 9.4 acres of wetlands, substantially higher than for segments providing alternate routings to this segment. It is unlikely a permit would be issued for this alternative given the existence of alternates which are less damaging from a wetlands perspective.

Segment E-H-M - Eliminated due to potential impacts to the Shelby water intake critical watershed area and to the intake itself. This segment would disturb waste ponds and would be in an area of heavy development.

Segment H-I - Eliminated as a result of the elimination of Segment E-H-M.

Segment D-Q This portion of Alternative AA was eliminated for the following reasons:

1) A southern bypass of Shelby would not fulfill the purpose of the project as a conveyor of both through and local traffic (i.e., a northern arterial might still be required).

2) Construction of a southern bypass would not preclude the need for a northern bypass. The major industrial and commercial areas of Shelby are located north of existing US 74, in the vicinity of the Norfolk Southern and CSX railroads. Traffic from this area is currently required to travel through the central business district (CBD) of Shelby to access US 74; this would continue to occur if the US 74 Shelby Bypass was to the south of town.

3) Residential growth is anticipated primarily to the north of town and a southern bypass would not provide highway access for this anticipated growth.

4) The removal of traffic from the CBD (see items 2 and 3), which includes large volumes of trucks, would benefit air quality and noise levels within town.

5) The southern bypass concept would not be consistent with the approved 1994 Shelby Thoroughfare Plan, which shows a northern bypass.

6) Segment D-Q would extensively impact existing development south of town.

7) Data presented in Tables 2-5(a) and 2-5(b) indicate that although a southern alternative would be shorter in length than other alternatives, the expected impacts (based on the then available information) would not always be lower than for other alternatives; i.e., this alternative is not clearly superior in terms of wetlands, floodplain encroachments, relocations, impacts to community facilities, archaeological sites, topography, hydraulics, or accessibility (interchanges/grade separations). Since this alternative does not fulfill the project need, is not anticipated to provide the desired traffic service to the northern portions of town, does not conform to the Shelby Thoroughfare Plan or land use plans, and does not provide a routing that is environmentally superior, there would be no reason to carry it forward for further consideration.

Segment A-R This portion of Alternative BB was eliminated for the following reasons:

1) A southern bypass of Shelby would not fulfill the purpose of the project as a conveyor of both through and local traffic (i.e., a northern arterial might still be required).

2) Construction of a southern bypass would not preclude the need for a northern bypass. The major industrial and commercial areas of Shelby are located north of existing US 74, in the vicinity of the Norfolk Southern and CSX railroads. Traffic from this area is currently

required to travel through the central business district (CBD) of Shelby to access US 74; this would continue to occur if the US 74 Shelby Bypass was to the south of town.

3) Residential growth is anticipated primarily to the north of town, and a southern bypass would not provide highway access for this anticipated growth.

4) The removal of traffic from the CBD (see items 2 and 3), which includes large volumes of trucks, would benefit air quality and noise levels within town.

5) The southern bypass concept would not be consistent with the approved 1994 Shelby Thoroughfare Plan, which shows a northern bypass.

6) Segment A-R could potentially impact the planned extension of the Shelby Airport runway, or the adjacent airspace requirements.

7) Data presented in Tables 2-5(a) and 2-5(b) indicate that although a southern alternative would be shorter in length than most other alternatives, the expected impacts (based on the then available information) would not consequently always be lower than for other alternatives; i.e., this alternative is not clearly superior in terms of wetlands, relocations, topography, hydraulics, or accessibility (interchanges/grade separations). Since this alternative does not fulfill the project need, is not anticipated to provide the desired traffic service to the northern portions of town, does not conform to the Shelby Thoroughfare Plan or land use plans, and does not provide a routing that is environmentally superior, there would be no reason to carry it forward for further consideration.

Preliminary Alternatives Revisions. Revisions made to preliminary corridor segments following the Citizens Informational Workshop in May 1995 are shown in Exhibit 2-6. These changes, which were a result of discussions at the earlier steering committee meeting, comments from citizens at the first workshop, and subsequent further investigations of study area conditions, were approved by the steering committee at a second meeting on September 22, 1995. These revisions included:

Segment C'-K' - Added to increase flexibility in circumventing the heavily developed portion of Segment D-K at existing US 74 (the alternate C-C'-K'-K routing would retain the most favorable portion of Segment D-K).

Segment G-J - Widened to provide additional flexibility in minimizing impacts to Williams Creek Subdivision.

Segment A-C - Widened at Node C to accommodate bypassing of existing development on US 74.

Segment B-L - Widened in the vicinity of Washburn Switch Road (SR 1313) to provide adequate width to accommodate an interchange at this road, given the presence of railroad tracks at this location.

Segment A'-B - Added to provide an alternate location for the Node A interchange at existing US 74.

Segment L-N-O - Shifted west to avoid encroachment on the Moss Lake Water Quality Critical Area.

Exhibit 2-7 indicates the final revisions made to the preliminary corridor segments, resulting from September 22, 1995 steering committee meeting discussions (see Section 6.1.2) and additional environmental studies; these are described below:

Segment C'-G - Widened to the east in the vicinity of SR 1313 to allow possible avoidance of impacts to Eskridge Grove Church in the vicinity of Washburn Switch Road (SR 1313).

Segment B-G - (1) Widened to the north in the vicinity of SR 1322 to provide a means of minimizing impacts to a wetland area identified during the preliminary corridor field investigations.

(2) Shifted to the north along the eastern portion of the segment to avoid the Coleman Blanton Farm, a.k.a. Brushy Creek Dairy Farm (which was determined eligible for the National Register of Historic Places; see Section 3.3.1); this resulted in the elimination of the eastern portion of Segment B-G, and the creation of new Segment B-J and consolidated Segment C'-J.

Segment B-L - (1) Eliminated due to the greater anticipated natural resource impacts resulting from the added length of this alternative:

- 583 acres agricultural land, vs. 38 acres average
- 556 acres forest land, vs. 161 acres average
- 10.9 acres wetlands/surface waters, vs. 2.5 acres average

(2) Eliminated due to traffic projections which indicated this alternative would carry less traffic than the other alternatives because of its distance from Shelby.

Segment G-J - The southernmost portion of this segment was eliminated in order to avoid direct impacts to Williams Creek Subdivision.

2.4.4 Upgrade Alternative

The Upgrade alternative considered for this project (see Exhibit 2-8) would consist of improvement of existing US 74 to a full control of access facility, from approximately 0.6 mile west of Peachtree Road (SR 1162) to Stony Point Road (SR 1001) east of Shelby (a distance of approximately 16.2 miles). In conjunction with the access control-related improvements, US 74 would be widened to six lanes between the western junction of US 74 Business and the eastern project terminus (a distance of approximately 10.0 miles).

In order to provide full control of access along the subject section of US 74, interchanges and grade separations would be needed to separate crossing road traffic from US 74 traffic. Service

roads would be constructed as needed to provide local property access. Interchanges are proposed at the following locations; proposed configurations are indicated:

SR 1162 [diamond]

SR 1313/SR 1151 [diamond]

US 74 Business (west junction) [split diamond]

NC 180 [diamond]

US 74 Business (east junction) [partial cloverleaf]

SR 2245 [diamond]

In addition, the existing NC 150/ NC 18 interchange would be upgraded by the construction of a new bridge and the reconfiguration of the interchange with new ramps to create a half clover interchange.

2.4.5 Tier 1 Detailed Study Alternatives

This study included two levels of detailed study alternatives: Tier 1 and Tier 2. These two levels represent decisions made as a result of the increasingly accurate information available in terms of alternatives locations and impacts. The Tier 1 detailed study alternatives are shown in Exhibit 2-9. (Note: The DEIS used different nomenclature to distinguish between levels of detailed study alternatives. What are termed as "Tier 1 detailed study alternatives" in this document were referenced in the DEIS as simply "detailed study alternatives." The Tier 2 detailed study alternatives in this document (see below) were previously described in the DEIS as "reasonable and feasible alternatives.")

Selection of Detailed Study Alternatives. The corridor segments retained for detailed study were considered to have fewer natural, social or cultural impacts and to be more practicable from a design standpoint than the segments eliminated from further consideration. These segments were combined to create the detailed study alternatives.

Portions of some of the corridors were widened to encompass possible right-of-way impacts, which might be expected along local roads that will pass over or under the proposed freeway or as a result of anticipated service roads, interchanges, and other features (see Exhibit 2-9).

Although the actual altered area might be in the immediate vicinity of the crossing road only, in many cases corridor boundary transitions were made gradual for a smoother appearance and to allow a degree of flexibility during the design phase of the project. Therefore, it is understood that the actual highway location will not affect some area features (for example, National Register-eligible historic sites), even though such features are within the corridor boundaries.

Description of Tier 1 Detailed Study Alternatives. The Tier 1 detailed study alternatives consisted of the Bypass alternatives, which included a northern corridor, a southern corridor, and five crossovers; and the Upgrade alternative (described in Section 2.4.4). A total of 24 possible alternatives were created from the various Bypass corridor and crossover combinations. It should be noted that the 24 Bypass segment combinations included some widening portions along existing US 74 that were similar to portions of the Upgrade alternative.

The Northern corridor would be approximately 19.3 miles in length. It would begin at existing US 74 west of Shelby approximately 0.6 mile west of Peachtree Road (SR 1162) and would pass approximately 3.1 miles north of the Shelby town center at its northernmost point; and would terminate at existing US 74 at Stony Point Road (SR 1001). The Northern Alternative would cross (from west to east): SR 1162, West Lee Street (SR 1161), Artee Road (SR 1314), McSwain Road (SR 1322), Plato Lee Road (SR 1315), a CSX rail line, Washburn Switch Road (SR 1313), a Norfolk Southern rail line, Cabaniss Road (SR 1341), Brushy Creek, Chatfield Road (SR 1343), Polkville Road (NC 226), Barbee Road (SR 1344), Metcalf Road (SR 1850), the First Broad River, North Lafayette Street (SR 1005), McBrayer Springs Road (SR 1827), Fallston Road (NC 18), North Post Road (NC 180), New Prospect Church Road (SR 1908), a CSX rail line, Cherryville Road (NC 150), Elizabeth Avenue (SR 2052), Oak Grove Road (SR 2033), Buffalo Creek, Muddy Fork, and the west end of US 74 Business (Kings Mountain). In addition to interchanges at the bypass termini with existing US 74, there would also be interchanges at SR 1322, NC 226, NC 18, and NC 150.

The Southern corridor would be approximately 18.8 miles in length. It would include improvement of existing US 74 to a freeway facility from the western project terminus approximately 0.6 mile west of SR 1162 to east of SR 1161; this portion would cross SR 1162, Sandy Run, and SR 1161. The bypass portion of the Southern Alternative would extend from east of SR 1161 to west of Buffalo Creek, where it ties back into existing US 74; it passes approximately 2.2 miles north of the Shelby town center at its northernmost point. The bypass portion of the Southern Alternative would cross (from west to east): Beaverdam Creek, SR 1315, SR 1313, a Norfolk Southern rail line, Brushy Creek, NC 226, the First Broad River, SR 1850, SR 1005, SR 1827, NC 18, Carter Road (SR 1927), a CSX rail line, NC 150, and SR 2033.

Existing US 74 from west of Buffalo Creek to the eastern project terminus at SR 1001 would be improved to a freeway facility; this portion of the project would cross Buffalo Creek and Bethlehem Road (SR 2245). In addition to interchanges at the bypass termini with existing US 74, there would also be interchanges at SR 1162, SR 1313, NC 226, NC 18, NC 150, and SR 2245.

Crossover A-A'-B would be approximately 2.4 miles in length and would begin at existing US 74 0.6 mile west of SR 1162. It would extend (from west to east) from the Southern corridor to the Northern corridor, first east-southeast and then northeast, to cross SR 1162, a cross-country electric transmission line in two locations, Sandy Run, existing US 74, and SR 1161, to join the Northern corridor southeast of Lattimore. There would be an interchange at the bypass terminus at US 74.

Crossover D-K' would be approximately 2.3 miles in length and would begin at existing US 74 just west of SR 1315. It would extend (from west to east) from the Southern corridor to the Northern corridor, first east-northeast, then north-northeast and finally east to cross SR 1315, SR 1313, SR 1314, and the CSX and Norfolk Southern rail lines, to join the Northern corridor approximately midway between SR 1313 and NC 226. There would be an interchange at the bypass terminus at US 74.

Crossover C'-J would be approximately 4.6 miles in length and would begin at the Southern corridor just south of SR 1314. It would extend (from west to east) from the Southern corridor to the Northern corridor, first northeast, then east and finally east-northeast to cross SR 1314, SR 1313, Brushy Creek, SR 1343, a major tributary, NC 226/cross country electric transmission line,

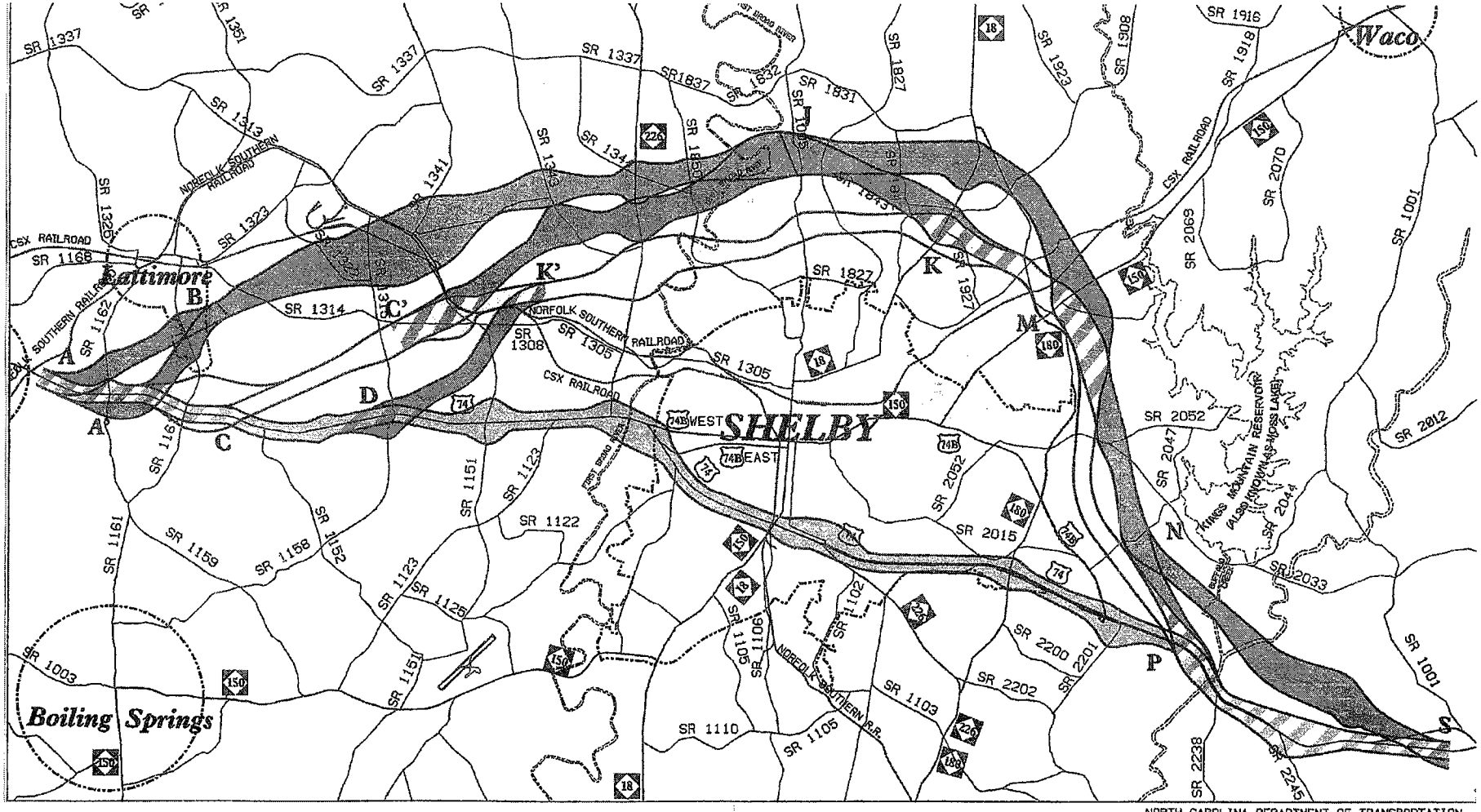
SR 1850, and the First Broad River to join the Northern corridor at SR 1005. There would be interchanges at SR 1313 and NC 226.

Crossover J-K would be approximately 2.9 miles in length, and would begin at the Northern corridor at SR 1005. It would extend (from west to east) from the Northern corridor to the Southern corridor in an east-southeastward direction to cross NC 18 and join the Southern corridor west of the CSX rail line. There would be an interchange at NC 18.

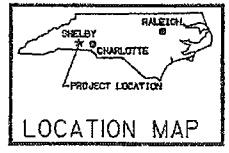
Crossover N-P would be approximately 1.8 miles in length and would begin at the Northern corridor just north of Borders Road (SR 2047). It would extend (from west to east) from the Northern corridor to the Southern corridor in a south-southeastward direction to cross SR 2047 and join the Southern corridor at existing US 74 at Buffalo Creek. There would be an interchange at the bypass terminus at US 74.

The 25 Tier 1 detailed study alternatives are shown in Exhibit 2-9 and on the page following. A description of the Upgrade alternative is provided in Section 2.4.4.

Table 2-6 shows the results of the detailed studies for the 25 Tier 1 detailed study alternatives and indicates the segment combinations that comprised each alternative.



1,000 0 1,000
SCALE IN METERS



LOCATION MAP

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL IMPACT STUDY
US 74 SHELBY BYPASS (R-2707)
CLEVELAND COUNTY, NORTH CAROLINA

TIER 1 DETAILED STUDY
ALTERNATIVE CORRIDORS

Table 2-6
SUMMARY OF IMPACTS FOR 25 TIER 1 DETAILED STUDY ALTERNATIVES

	ALTERNATIVE																							
	Build Alternatives																							Upgrade
IMPACT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Community Facilities Potentially Affected (1)	9	9	6	8	8	5	10	10	7	9	9	6	9	9	6	10	10	7	9	9	6	9	9	6	12
Residences Relocated	273	290	243	295	312	265	237	254	207	259	276	229	354	371	324	318	335	288	317	334	287	398	415	368	373
Businesses Relocated	10	25	24	11	26	25	18	33	32	19	34	33	25	40	39	33	48	47	35	50	49	39	54	53	154
Churches Relocated	4	4	3	3	3	2	5	5	4	4	4	3	4	4	3	5	5	4	5	5	4	5	5	4	4
Total Relocations	287	319	270	309	341	292	260	292	243	282	314	265	383	415	366	356	388	339	357	389	340	442	474	425	531
Parks and Recreational Sites Affected (2)	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0
Historic Sites Adversely Affected (3)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Noise Receptors with 10 or 15 dBA Minimum Increase	150	136	100	151	137	101	149	135	99	150	136	100	141	127	91	140	126	90	131	117	81	125	111	75	0
Noise Receptors Equal to or Exceeding 67/72 dBA Criterion	74	75	63	74	75	63	68	69	57	68	69	57	99	100	88	93	94	82	95	96	84	102	103	91	65
Total Impacted Noise Receptors Without Barriers	188	177	141	189	178	142	184	173	137	185	174	138	205	194	158	201	190	154	194	183	147	193	182	146	65
Total Impacted Noise Receptors With Barriers	112	109	105	113	110	106	109	106	102	110	107	103	116	113	109	113	110	106	117	114	110	129	126	122	65
Hazardous Materials Sites Potentially Affected	6	6	6	7	7	7	5	5	5	6	6	6	6	6	6	5	5	5	5	5	5	8	8	8	22
Prime Farmland (4): Acres	414	371	395	404	361	385	401	358	382	391	348	372	356	313	337	343	300	324	317	274	298	302	259	283	109
State and Locally Important Farmland (4): Acres	326	327	322	336	337	332	305	306	301	315	316	311	273	274	269	252	253	248	272	273	268	245	246	241	43
Stream Crossings (5)	37	34	36	39	36	38	35	32	34	37	34	36	39	36	38	37	34	36	38	35	37	36	33	35	20
Floodplain Encroachments	8	4	4	8	4	4	8	4	4	8	4	4	11	7	7	11	7	7	10	6	6	12	8	8	8
Forest Land (4): Acres	351	301	303	347	296	298	343	293	295	338	288	290	318	268	270	310	260	261	326	275	277	311	261	263	43
Acres	313	305.2	315.5	310.6	302.8	313.1	302.4	294.6	304.9	300	292.2	302.5	277.4	269.6	279.9	266.8	259	269.3	255.2	247.4	257.7	195.6	187.8	198.1	41.4
Wetlands (4): Acres	0.85	0.32	0.32	0.85	0.32	0.32	0.85	0.32	0.32	0.85	0.32	0.32	3.03	2.5	2.5	3.03	2.5	2.5	3.03	2.5	2.5	0.53	0	0	0.05
Palustrine Open Water (4): Acres	2.44	2.11	1.71	2.62	2.29	1.89	2.37	2.04	1.64	2.55	2.22	1.82	2.09	1.76	1.36	2.02	1.69	1.29	2.04	1.71	1.31	2.04	1.71	1.31	0
Surface Waters (4): Acres	5.222	3.942	3.791	5.246	3.966	3.815	4.563	3.283	3.132	4.587	3.307	3.156	5.271	3.991	3.84	4.612	3.332	3.181	4.637	3.357	3.206	4.37	3.09	2.939	1.446
Right-of-Way Cost: Millions	$38.112	$43.053	$40.588	$39.062	$44.003	$41.538	$33.267	$38.208	$35.743	$34.217	$39.158	$36.693	$47.166	$52.107	$49.642	$42.321	$47.262	$44.797	$46.101	$51.042	$48.577	$51.064	$56.005	$53.540	$110.145
Construction Cost: Millions	$162.095	$161.713	$156.232	$161.634	$161.252	$155.771	$160.044	$159.662	$154.181	$159.583	$159.201	$153.720	$157.249	$156.867	$151.386	$155.198	$154.816	$149.335	$151.607	$151.225	$145.744	$153.479	$153.097	$147.616	$127.157
Total Cost: Millions	$200.207	$204.766	$196.820	$200.696	$205.255	$197.309	$193.311	$197.870	$189.924	$193.800	$198.359	$190.413	$204.415	$208.974	$201.028	$197.519	$202.078	$194.132	$197.708	$202.267	$194.321	$204.543	$209.102	$201.156	$237.302

ALTERNATIVE IDENTIFICATION LEGEND
1: A-B-J-M-N-S
2: A-B-J-M-N-P-S
3: A-B-J-M-P-S
4: A-A'-B-J-M-N-S
5: A-A'-B-J-M-N-P-S
6: A-A'-B-J-M-P-S
7: A-B-J-K-M-N-S
8: A-B-J-K-M-N-P-S
9: A-B-J-K-M-P-S
10: A-A'-B-J-K-M-N-S
11: A-A'-B-J-K-M-N-P-S
12: A-A'-B-J-K-M-P-S
13: A-C-C'-J-M-N-S
14: A-C-C'-J-M-N-P-S
15: A-C-C'-J-M-P-S
16: A-C-C'-J-K-M-N-S
17: A-C-C'-J-K-M-N-P-S
18: A-C-C'-J-K-M-P-S
19: A-C-C'-K'-K-M-N-S
20: A-C-C'-K'-K-M-N-P-S
21: A-C-C'-K'-K-M-P-S
22: A-C-D-K'-K-M-N-S
23: A-C-D-K'-K-M-N-P-S
24: A-C-D-K'-K-M-P-S
25: A-C-D-P-S

Notes: (a) Alternative 1 equals the Northern Alternative
(b) Alternative 21 equals the Southern Alternative Upgrade

Notes: (1) "Community Facilities Potentially Affected" include all facilities which fall within the corridors; these are not necessarily all relocatees. There were no schools within the corridors, so there are no schools included in these totals, although schools may sustain other impacts from highway proximity. A total of 22 churches, 4 cemeteries, and 1 fire station were identified within the various corridors.
(2) The one recreational facilitiy identified is a privately owned golf facility and is not a Section 4(f) parkland property.
(3) The three historic sites identified on the Upgrade alternative are the Burwell Blanton House, Cleveland County Bridge 79, and the Charles C. Hamrick House.
(4) This quantity is prorated from corridor-wide data to represent a typical average right-of-way width impact.
(5) Quatified number of stream crossings accepted procedure for the determination of impacts at the time of the study of the initial 25 detailed study alternatives.

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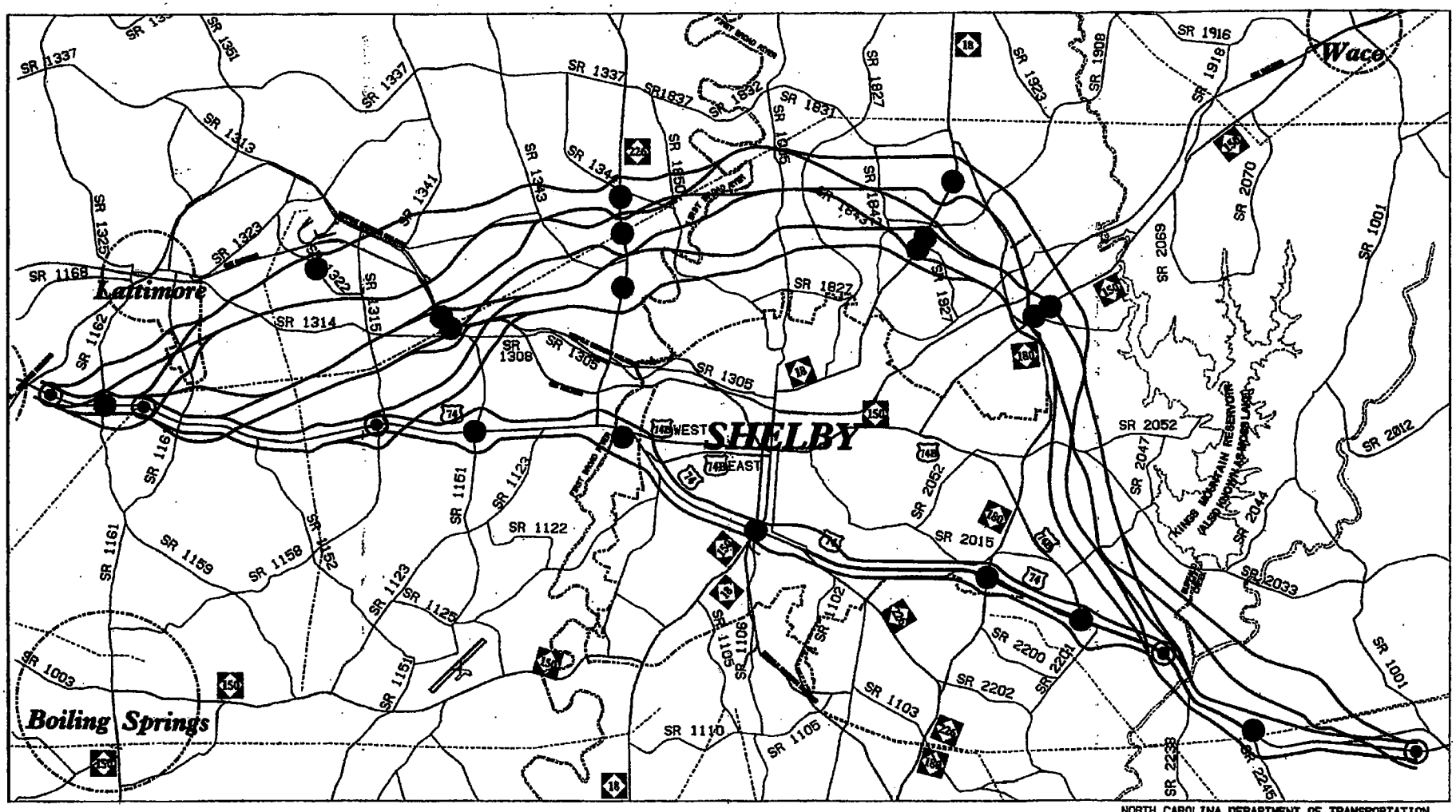
Bypass Alternative Interchange Locations. Exhibit 2-10 and the page following indicate the proposed interchange locations for the Bypass alternatives. The bypass termini interchanges would be three-legged directional interchanges; the remaining Bypass interchanges are projected to be of diamond or partial cloverleaf configuration (the latter would be considered at locations where one or more interchange quadrants contained features which could be avoided through use of loop ramps in the other quadrants). Upgrade alternative interchange locations are shown on Exhibit 2-8 and discussed in Section 2.4.4.

Cost Estimate. Table 2-6 indicates the estimated cost of each Tier 1 detailed study alternative. The right-of-way costs include land and damages, relocations, utilities, and acquisition. Construction costs include clearing and grubbing, signing, earthwork, drainage, pavement, subgrade stabilization, guardrail, bridges and major culverts. These costs are approximate due to the fact that the actual alignment and right-of-way requirements had not been established for any of the Build alternatives when the estimates were performed.

Year 2020 Traffic Projections and Levels of Service. Traffic models were developed to examine the effect of constructing a new location US 74 Bypass facility, and of constructing an upgrade of existing US 74.



LEGEND

- INTERCHANGE LOCATION
- INTERCHANGE FOR BYPASS TERMINUS ONLY

NOTE: ALTHOUGH SOME PORTIONS OF THE TIER 2 DETAILED STUDY ALTERNATIVES WERE MODIFIED SUBSEQUENT TO THIS, THE INTERCAHNGE LOCATIONS WOULD STILL BE VALID.

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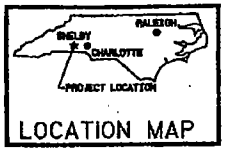
SCALE IN METERS



LOCATION MAP

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL IMPACT STUDY
US 74 SHELBY BYPASS (R-2707)
CLEVELAND COUNTY, NORTH CAROLINA

INTERCHANGE LOCATIONS FOR DETAILED STUDY ALTERNATIVES

Bypass Alternatives - Average Daily Traffic volumes for the year 2020 (per January 6, 1995 memorandum), are projected to be between 16,400 and 33,300 vehicles per day for the proposed bypass (see Exhibit 2-11). Existing US 74 would correspondingly carry between 16,800 and 35,700 vehicles per day. The combined traffic carried by existing US 74, US 74 Business (where applicable), and the proposed Bypass alternative is approximately 11,000 vehicles per day greater than the traffic projected to be carried by existing US 74 and US 74 Business under the No Build alternative; this indicates that some of the bypass traffic is local in nature, and that the proposed bypass will function as a northern arterial for local Shelby traffic as well as a bypass for through traffic.

The addition of a northern bypass of US 74 would result in levels of service C or better at the proposed interchanges (see Exhibit 2-11), with the exception of the westbound bypass to SR 1313 (Washburn Switch Road) movement, which would be LOS D. Signalization would be required at the NC 18 and NC 150 interchange ramp termini to keep both interchanges at LOS C.

Upgrade Alternative - Traffic volumes for the Upgrade alternative (see Exhibit 2-12) would be similar to those for the No Build alternative, ranging from 32,800 to 62,000 vehicles per day on US 74. However, levels of service with the Upgrade alternative would improve over those of the No Build alternative due to the elimination of at-grade crossing traffic, and the addition of interchanges and signals at several of the interchanges. Many intersection levels of service would improve up to LOS C. In terms of individual movements, the westbound US 74 to Washburn Switch Road (SR 1313) movement would remain at LOS F and the eastbound US 74 to Lafayette Street (NC 150/18) movement would be LOS D.

Potential Effect of Build Alternatives on Safety. Safety is expected to improve on both the rural and urban roadway sections with the construction of any of the Build alternatives. Types of accidents likely to be substantially reduced by either a Bypass or Upgrade alternative are indicated on Table 1-7 (see Chapter 1). The Upgrade alternative could potentially reduce accidents by preventing interaction with other travel modes, including pedestrians; reducing the frequency of slowing vehicles; separating crossings and opposing vehicular traffic movements; and providing a facility specifically designed to accommodate higher traffic volumes. With a Bypass alternative, the existing US 74 Bypass would continue as it currently exists, and would potentially still have occurrences of accidents, fatal or otherwise; however, the anticipated reduction in traffic on this facility would reduce the likelihood of accidents associated with congested conditions. This could reduce the numbers of "rear end", "turn", and "angle" accidents, which represented three-quarters of the accidents reported.

There are potential safety-related economic benefits associated with the construction a new location four-lane divided controlled access freeway. Total accidents and total injury accidents would likely decrease for the Build alternative; subsequently, the following accident-related costs could decrease:

1) Property damage costs;
2) Personal medical expense costs;
3) Automobile insurance costs;
4) Community emergency services costs.

By eliminating sudden stops and potentially dangerous conflicts with crossing traffic along existing US 74, the Upgrade alternative would offer the greatest potential reduction in actual numbers of accidents and accident costs. However, the Bypass alternative would be a marked improvement over the No Build alternative, and would conceivably lower the overall accident

rate to a level comparable with that of the Upgrade while offering a greater expansion in traffic capacity. Constraints imposed by the geometry of existing US 74 and by adjacent development would require that the Upgrade be designed to a somewhat lesser standard of performance than the Bypass; the new location roadway would therefore be safer at higher speeds and be able to carry greater numbers of vehicles per day.

2.4.6 Tier 2 Detailed Study Alternatives

Following the Tier 1 detailed studies of the alternatives, several modifications were made to the Southern corridor in order to reduce the potential for relocations along the western portion of US 74 and to minimize impacts to a subdivision and the Light Oak minority community west of Moss Lake (see Exhibit 2-13). The modifications west of Moss Lake served to reduce the potential relocations along the Northern corridor, which was modified as well. Table 2-7 indicates the potential reduction in relocations as a result of these revisions.

The modifications west of Moss Lake resulted in the merge of the Northern and Southern corridor into a single corridor through this area and the incorporation of Crossover N-P into the revised corridors. The merger of the Northern and Southern corridors with Crossover N-P reduces the total number of possible corridor/crossover combinations from 25 to 17 alternatives.

During the detailed studies of the Tier 1 alternatives, several other changes were also made (see Exhibit 2-13). The Upgrade alternative and the Bypass alternatives using Crossovers A-A'-B and D-K' were eliminated from further consideration, for the following reasons:

Table 2-7

POTENTIAL RELOCATION REDUCTION RESULTING FROM SOUTHERN CORRIDOR MODIFICATIONS

CORRIDOR	RELOCATIONS*		
	Original	Modified	Reduction
Western Portion of US 74			
Southern	116	80	36
West of Moss Lake			
Northern	105	32	73
Southern	59	36	23

* For portions of the corridor only; does not represent total project relocations.

Upgrade Alternative (Note: US 74 upgrade segments included as a part of the various Bypass alternatives were included as portions of the Tier 2 detailed study alternatives.)

- Higher construction and right-of-way costs.
- Higher residential and business relocation impacts.
- Adverse effect on three National Register-eligible historic architectural properties.
- Greater impacts to existing roadway network, resulting in less efficient traffic functioning.
- Higher impacts to hazardous materials sites.

Crossover A-A'-B (Any Alternative Utilizing Crossover A-A'-B)

- Impacts to existing residential and business development in the vicinity of Peachtree Road (SR 1162).
- Impacts to the Sandy Run tributary floodplain.
- Higher construction costs.

Crossover D-K' (Any Alternative Utilizing Crossover D-K')

- Higher construction and right-of-way costs.
- Higher business relocation impacts.

The Northern and Southern corridors and Crossovers C'-J and J-K were determined to be viable and were retained for further consideration as Tier 2 detailed study alternatives. These corridors and crossovers were combined to form a total of 10 possible Tier 2 detailed study alternatives; these are defined in Table 2-8, and are shown in Exhibit 2-14. Impacts for the 10 Tier 2 detailed study alternatives are shown in Table 4-30.

2.4.7 Preferred Alternative

The ten (10) Tier 2 detailed study alternatives were evaluated in the Draft Environmental Impact Statement (DEIS). Following the publication and distribution of the DEIS to Federal, state and local agencies and organizations having an interest in the proposed project, a Corridor Public Hearing was held to provide the public an opportunity to comment on the alternatives. Parallel to this process, the NCDOT submitted a Section 404 Permit application to the U.S. Army Corps of Engineers (COE) on March 3, 1999 and the COE issued a Public Notice on April 22, 1999 (see Appendix A.2 for copies of both documents).

Table 2-8
DEFINITION OF 10 TIER 2 DETAILED STUDY ALTERNATIVES

ALTERNATIVE DESIGNATION	SEGMENT COMBINATION	NOTES
1 (Northern)	A-J-M-N-S	a, b
3	A-J-M-N-P-S	b, c
7	A-J-K-M-N-S	a, b
9	A-J-K-M-N-P-S	b, c
13	A-C'-J-M-N-S	a, d
15	A-C'-J-M-N-P-S	c, d
16	A-C'-J-K-M-N-S	a, d
18	A-C'-J-K-M-N-P-S	c, d
19	A-C'-K-M-N-S	a, d, e
21 (Southern)	A-C'-K-M-N-P-S	c, d, e

(a) Segment M-N was shifted and is somewhat different from the Segment M-N shown on Exhibit 2-9 (in Alternatives 1, 2, 4, 5, 7, 8, 10, 11, 13, 14, 16, 17, 19, 20, 22, and 23 of the 25 detailed study alternatives).

(b) Segments A-B and B-J from the original alternatives were consolidated into a single Segment A-J .

(c) Due to shifts in the Tier 1 detailed study alternative segments, former Segment M-P became a combination of revised Segment M-N (as described in footnote (a)) and revised Segment N-P (which is not the same as the detailed study alternative Crossover N-P).

(d) Segments A-C and C-C' from the Tier 1 detailed study alternatives were consolidated into a single Segment A-C'.

(e) Segments C'-K' and K'-K from the Tier 1 detailed study alternatives were consolidated into a single Segment C'-K.

In accordance with An Interagency Agreement Integrating Section 404/NEPA, a Merger team was assembled to consider the comments received on the DEIS and the Tier 2 detailed study alternatives and to identify the "least environmentally damaging practicable alternative" or LEDPA. Agencies on the Merger team who attended the May 5, 1999 LEDPA selection meeting included the Corps of Engineers; the US Fish and Wildlife Service; the NC Department of

Environment and Natural Resources Division of Water Quality; FHWA; NCDOT Division 12; NCDOT Project Development and Environmental Analysis Branch and NCDOT Roadway Design Unit. Additionally, a May 25, 1999 letter from the Wilmington District Army Corps of Engineers notes that verbal coordination was orchestrated with the NC Wildlife Resources Commission, the Environmental Protection Agency (EPA) and the State Historic Preservation Office (SHPO). This Merger team selected Alternative 21 as the Preferred Alternative, or LEDPA for the following reasons:

- Fewer prime farmland impacts.
- Fewer wetland impacts.
- Fewer noise impacts.
- Lesser construction cost.
- Consistency with town and county land use plans and policies.

Table 2-9 provides a summary of the quantitative data from the DEIS used in support of the LEDPA decision.

The LEDPA was submitted to the NCDOT Corridor Selection Committee for recommendation to the Secretary of Transportation, who endorsed it as the LEDPA or Preferred Alternative. The LEDPA is shown in Exhibit 2-15.

The selection of the Preferred Alternative was announced via newsletters and notices in the Shelby local newspaper. Intensive environmental studies, including wetland delineations, wetland mitigation planning, stream mitigation planning, preliminary engineering designs, and archaeological surveys were undertaken for the Preferred Alternative. These additional environmental studies and updated cost estimates for Alternative 21 are presented in this Final Environmental Impact Statement.

Table 2-9
QUANTITATIVE DATA SUPPORTING SELECTION OF THE LEDPA

CATEGORY OF IMPACT	LEDPA SELECTION (DEIS) DATA *		Preferred Alternative**
	Range for All Tier 2 Detailed Study Alternatives	Preferred Alternative (LEDPA)	
Prime farmland	298 - 414 acres	298 acres	N/A
Wetlands (unbridged)	0 - 0.526 acres	0 acres	3.070 acres †
Noise receptors with substantial (10 or 15 dBA)min. increase ††	81 - 150	81	14
Total affected noise receptors (w/o barriers)	137 - 205	147	21
Construction cost	$155.9 million - $167.0 million	$155.9 million	$196.6 million ‡

* Based on functional design roadway plans.

** Based on preliminary design roadway plans and detailed environmental analysis methods.

† This is the total right-of-way impact calculated for the Preferred Alternative based on preliminary design. The construction limit impact (which is considered to be the mitigable impact) is 2.373 acres.

†† Based on the criterion in effect at the time of the noise analyses.

Existing (Leq[h])	Increase
Less than or equal to 50 dBA	Greater than or equal to 15 dBA
Greater than 50 dBA	Greater than or equal to 10 dBA

‡ Construction cost includes the following costs (note: all of these costs were generated by NCDOT):
$ 195.3 million – December 5, 2000 NCDOT cost estimate
$ 1.1 million – Stream mitigation for *major* stream culvert crossings
$ 0.7 million – Cost of bridging Beaverdam Creek
$ - 0.5 million – Cost of culvert replaced by bridge at Beaverdam Creek
$ 196.6 million - TOTAL

The project planning process will conclude with the issuance of a Record of Decision (ROD) by the FHWA. The adoption of the ROD will constitute location approval of the Preferred Alternative.

It should be noted that the comparative impacts reported in the DEIS for the 10 Tier 2 detailed study alternatives were based on functional designs rather than preliminary designs. This was the established procedure at the time that the DEIS documentation was prepared in 1998. Following

the selection of the Preferred Alternative, a more detailed preliminary design was prepared, and new impacts were computed for relocations, streams, wetlands, dwarf-flowered heartleaf plants, and noise. The preliminary design-based impacts for the Preferred Alternative are described in detail in this, the FEIS. However, the basis for selection of the Preferred Alternative continues to be the impacts estimated from the functional designs for the 10 Tier 2 detailed study alternatives, since preliminary designs were never prepared for the nine Tier 2 detailed study alternatives not selected as the LEDPA. The following discussion supports the selection of the Preferred Alternative based on the impacts presented in the DEIS and shown in Table 2-9. The more detailed data generated for the Preferred Alternative corresponding to those impact categories are also shown in Table 2-9. In some instances, the more detailed studies performed for the LEDPA produced different results; those data cannot be directly compared to the impacts data for the other Tier 2 detailed study alternatives because the methodologies used to produce the DEIS data were different.

Despite the changes in impacts and costs identified for Alternative 21 (LEDPA) resulting from preliminary design plans and detailed environmental analysis methods, the basis for the selection of Alternative 21 as the Preferred Alternative remains valid, verified by the following:

Prime Farmland – The prime farmland impacts evaluated for the Tier 2 detailed study alternatives were based on corridor-wide impacts prorated to approximate right-of-way impacts. Since the impacts are not based on exact right-of-way locations within the corridors, these impacts were not reevaluated for the Preferred Alternative. It is anticipated that the impacts would be relatively the same, and the Preferred Alternative would still have overall low prime farmland impacts.

Wetlands – The wetlands for the Preferred Alternative were identified in the field using strict delineation methods and preliminary design plans, in lieu of the generalized determination method and prorating of corridor-wide impacts to approximate right-of-way width used for the ten Tier 2 detailed study alternatives. Therefore, the Preferred Alternative delineation yielded different results than the determination; the delineation yielded 3.070 acres within the proposed project right-of-way limits rather than zero acres (see Exhibit 4-3). It is understood that delineation, being the more detailed approach, often results in the identification of a greater amount of wetlands than does a determination. Evaluation of the wetlands for the other nine Tier 2 detailed study alternatives using detailed delineation would most likely result in increased wetland takings for those Tier 2 detailed study alternatives as well, but the hierarchy should remain roughly the same. The Section 404/NEPA Merger Team supports the Preferred Alternative. The team concurred on the avoidance and minimization of impacts in June 2001. Since the overall corridor-wide delineation total was 14.216 acres, only 22 percent of the wetlands within the corridor are actually impacted, although the minimum required right-of-way width would occupy at least one-third of the corridor. This relatively low wetland taking is indicative of successful avoidance and minimization techniques, and the Preferred Alternative remains competitive in terms of wetlands takings.

Noise – The original noise analysis for the ten Tier 2 detailed study alternatives was performed using functional design in conjunction with year 2020 traffic data and the FHWA STAMINA/OPTIMA noise program. The Preferred Alternative noise analysis performed with the TNM noise program used the preliminary design and took both horizontal and vertical alignment into account. The TNM analysis used year 2025 traffic that was generated specifically for the Preferred Alternative. The decrease in number of impacted receptors resulting from the

TNM modeling of the Preferred Alternative is presumably due to the accuracy of the preliminary design and the fact that preliminary design is aimed at avoiding development to the greatest extent possible. Modeling of the other nine Tier 2 detailed study alternatives using TNM and preliminary design plans would result in reductions in noise impacts for all of the Tier 2 detailed study alternatives, but the hierarchy should remain roughly the same. Therefore, the Preferred Alternative would be expected to remain competitive in terms of noise impacts.

Construction Cost – The increase in construction cost from the pre-LEDPA estimate is most likely a result of several factors. The most obvious would be the application of inflation, since there is a lag between the original functional design-based cost estimates for the Tier 2 detailed study alternatives and the preliminary design-based cost estimate for the Preferred Alternative. There is a difference in the level of design detail between the two estimates; the preliminary design cost estimate for the Preferred Alternative includes more design details than its functional design counterpart, adding to the cost. The Preferred Alternative cost estimate includes the major stream mitigation costs. Cost reevaluations for any of the other Tier 2 detailed study alternatives would: a) include inflation; b) be based on preliminary design; and c) include major natural resource mitigation costs. Since this alternative is the shortest it would still probably be the least expensive. Considering all of these factors, it is reasonable to assume that the Preferred Alternative would still compare favorably to the other Tier 2 detailed study alternatives in terms of construction costs if all ten alternatives were estimated to a commensurate level of detail.

One modification relating to the functional design of the Preferred Alternative was made following the Corridor Public Hearing and the selection of Alternative 21 as the Preferred Alternative. Comments received during the post-hearing phase of the project indicated that

relocation of the Spake Concrete Products plant on North Post Road, which might potentially result along this alternative, could have substantial negative ramifications in terms of area employment, the local economy, and added right-of-way cost. Therefore, the corridor width was expanded approximately 200 feet to the south in the vicinity of Airport Road (SR 1926) in order to provide sufficient width for avoidance of the concrete plant. This addition is shown on Exhibit 2-13. Design changes during the preliminary design phase for the Preferred Alternative include modifications to avoid the concrete plant.

Preferred Alternative Interchange Locations. Interchanges for the Preferred Alternative will be at the following locations (see Exhibit 2-16):

- SR 1162
- US 74 Western Bypass Terminus
- SR 1313
- NC 226
- NC 18
- NC 150
- US 74 Eastern Bypass Terminus
- SR 2245

As noted in Section 2.4.5 (Tier 1 Detailed Study Alternatives), Build Alternative Interchange Locations), the bypass termini interchanges would be three-legged directional interchanges. The preliminary design plans for the Preferred Alternative show the remaining interchanges as diamond or partial cloverleaf configuration. These interchange configurations are subject to change during final design.

Preferred Alternative (Year 2025) Traffic Data. The Tier 2 detailed study alternatives traffic analysis utilized traffic data projected for the year 2020. Following selection of the Preferred Alternative, traffic projections were generated for the year 2025 for use in the preliminary design

of this alternative (per July 31, 2000 memorandum); these projections included updates on the anticipated interchange locations. The 2025 traffic data for the Preferred Alternative are shown in Exhibit 2-16.

As expected, most of the traffic volumes are projected to increase during the five-year period from 2020 to 2025. The only exception would be the proposed bypass segment from NC 150 to the eastern bypass terminus, which would decrease from a 33,300 year 2020 ADT to an ADT of 30,900 in 2025. This decrease is probably the result of updates to current and anticipated land use information in the traffic model for the study area.

Project Phasing. The Preferred Alternative is divided into five segments for the purposes of right-of-way acquisition and construction scheduling. Each of these segments has a tentative schedule for beginning right-of-way acquisition and construction, as shown below in Table 2-10.

These dates are based on the NCDOT State Transportation Improvement Program 2007-2013.

Table 2-10

PROJECT PHASING FOR PREFERRED ALTERNATIVE

Segment Designation	Approximate Segment Limits	Approximate Length	TENTATIVE DATE	
			ROW Acquisition	Construction Letting
R-2707 A	West of SR 1162 to west of SR 1314	3.9 miles	FY 2008	FY 2012
R-2707 B	West of SR 1314 to west of NC 226	2.6 miles	FY 2008	FY 2011
R-2707 C	West of NC 226 to west of NC 150	5.2 miles	FY 2012	PY
R-2707 D	West of NC 150 to existing US 74 west of SR 2238	3.8 miles	PY	PY
R-2707 E	Existing US 74 west of SR 2238 to west of SR 1001	2.7 miles	PY	PY

FY = Fiscal Year (for NCDOT, this is from October 1 to September 30; e.g., FY 2006 is from October 1, 2005 to September 30, 2006)
PY = Post Year (after FY 2013)

Cost Estimates. The following are the project costs, as estimated from the preliminary roadway design plans for the Preferred Alternative:

Right-of-Way Cost - $ 51,600,000 *
Construction Cost - $196,600,000 **
TOTAL COST - $248,200,000

* "Right-of-Way Cost" is January 16, 2001 NCDOT estimate.

** "Construction Cost" includes the following costs:
$ 195.3 million – December 5, 2000 NCDOT cost estimate
$ 1.1 million – Stream mitigation for *major* stream culvert crossings
$ 0.7 million – Cost of bridging Beaverdam Creek
$ - 0.5 million – Cost of culvert replaced by bridge at Beaverdam Creek
$ 196.6 million - TOTAL