S. SUMMARY

S.1 FEDERAL HIGHWAY ADMINISTRATION

(X) Draft ( ) Final

( ) Draft Section 4(f) Evaluation attached

S.2 LEAD AGENCIES

The following individuals may be contacted for additional information concerning this Draft Environmental Impact Statement (Draft EIS). Comments and questions may also be sent to the project's e-mail address: monroe@ncturnpike.org.

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S.3 PROPOSED ACTION

The North Carolina Turnpike Authority (NCTA), in cooperation with the Federal Highway Administration (FHWA) and the North Carolina Department of Transportation (NCDOT), proposes to construct a project known as the Monroe Connector/Bypass, which would be a controlled-access toll road extending from US 74 near I-485 in Mecklenburg County to US 74 between the towns of Wingate and Marshville in Union County, a distance of approximately 20 miles.

The proposed project must begin and end on existing US 74 in order to provide continuity for the US 74 corridor. On the western end, the project would begin at I-485, another controlled-access facility. On the eastern end, the proposed project would terminate on US 74 between the towns of Wingate and Marshville. This is where existing and projected traffic volumes decrease and the study area transitions to a more rural character.

The proposed action is included in the NCDOT's *2009–2015 State Transportation Improvement Program (STIP)* as Project R-3329 (Monroe Connector) and Project R-2559 (Monroe Bypass) as a toll facility. The project is known as the "Monroe Connector/Bypass."

North Carolina roads traditionally have been built with taxpayer funds, either through the state transportation budget or federal-aid highway funds allocated to the state. There are many other priority projects statewide and, due to funding constraints, there is not enough funding available from traditional sources in the foreseeable future to construct all priority projects. **Section 2.3.2.5** includes additional discussion of this issue.

Public comments on the Monroe Connector/Bypass project have indicated an overwhelming acceptance of tolls as a way to accelerate construction of the project and pay for operating and maintaining the facility (**Section 9.1.1**).

S.4 PURPOSE AND NEED FOR PROJECT

The purpose of the proposed action is to improve mobility and capacity within the project study area by providing a facility for the US 74 corridor from near I-485 in Mecklenburg County to between the towns of Wingate and Marshville in Union County that allows for high-speed regional travel consistent with the designations of the North Carolina Strategic Highway Corridor Program and the North Carolina Intrastate Highway System, while maintaining access to properties along existing US 74. The primary needs for the project are summarized below:

- **Existing and Projected Roadway Capacity Deficiencies**

  Currently, US 74 within the project study area is a four to six lane arterial roadway with 26 at-grade signalized intersections, many additional unsignalized intersections, and numerous commercial and residential driveway connections. Average travel speeds currently range from approximately 20 to 30 miles per hour (mph) during the peak hour, and are expected to decline to less than 20 mph by 2030. Congestion is high, with one-third of the intersections currently operating at an unacceptable Level of Service (LOS E or F) during the peak hour. Approximately two-thirds of the intersections are expected to operate at LOS E or F by 2030.

- **Inability to Serve High-Speed Regional Travel Consistent with the Designations and Goals of State and Local Transportation Plans**

  The Mecklenburg-Union Metropolitan Planning Organization (MUMPO) *2030 Long Range Transportation Plan (LRTP)* has identified improvements to the US 74 corridor in the project study area and considers them a high priority project. The MUMPO *2030 LRTP* proposes a new location controlled-access facility from I-485 near US 74 to between the towns of Wingate and Marshville.

  Because of its statewide and regional importance, US 74 has been designated as a Strategic Highway Corridor (SHC) by NCDOT and is part of the North Carolina

Intrastate Highway System. Both designations call for this corridor to serve high-speed regional travel. The SHC designation specifically calls for a freeway. The Intrastate Highway System designation calls for a multi-lane facility with access control and grade separations, if warranted by traffic volumes.

The existing and projected traffic and land use conditions along this segment of US 74 diminish its ability to function as part of the Intrastate Highway System and as a SHC. The facility type is also inconsistent with the SHC program vision of the US 74 corridor as a freeway.

The US 74 corridor is designated as part of the National Highway System's Strategic Highway Network (STRAHNET). Existing and projected poor LOS and lack of access control along the US 74 corridor diminish the roadway's ability to function as part of the STRAHNET.

A detailed discussion of the project's purpose and need is included in **Section 1**.

S.5 OTHER MAJOR ACTIONS IN THE PROJECT AREA

Sixteen other roadway projects in the NCDOT's *2009–2015 STIP* are in the general vicinity of the proposed action. Three of these projects are rural projects (R-4441, R-211EC, and R-2616). Twelve projects are urban projects (U-3619, U-2509, U-4913, U-4713, U-4714, U-3825, U-3809, U-3412, U-2547, U-2549, U-4024, and U-5109). One project is a bridge replacement project (B-4651). These projects are described in **Section 1.7.1**, and their general locations are shown in **Figure 1-5**.

S.6 ALTERNATIVES CONSIDERED

S.6.1 ALTERNATIVES SCREENING PROCESS

A three step alternatives screening process was used to develop and evaluate a range of alternatives and ultimately determine the Detailed Study Alternatives (DSAs) that are considered in this Draft EIS.

In the Qualitative First Screening of Alternative Concepts (**Section 2.2**), five Alternative Concepts were identified and considered in relation to elements of the Statement of Purpose and Need (**Section 1.3**) to determine which of the concepts could be developed to meet all components of the project purpose and need. Those concepts that could not be developed to meet the defined 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. Therefore, the following four concepts were retained for evaluation in the Qualitative Second Screening. All build options will require tolling of those facilities.

- No-Build Alternative
- Improve Existing US 74 (Controlled-Access Tolled Freeway)
- New Location Roadway (Controlled-Access Tolled Freeway)
- New Location/Improve Existing Roadways Hybrid (Controlled-Access Tolled Freeway)

In the Qualitative Second Screening of Preliminary Corridor Segments (**Section 2.3**), Preliminary Corridor Segments were developed for the Alternative Concepts retained from the Qualitative First Screening. The Preliminary Corridor Segments included new location and existing roadway segments. More than forty 1,000-foot-wide Preliminary Corridor Segments were qualitatively assessed and compared with respect to potential impacts to the human and natural environment, as well as with respect to reasonableness and practicability. Preliminary Corridor Segments with high or relatively high impacts were eliminated from further consideration.

In the Quantitative Third Screening of Preliminary Study Alternatives (**Section 2.4**), those Preliminary Corridor Segments that remained under consideration following the Qualitative Second Screening process were combined to form 25 Preliminary Study Alternatives (from I-485 near US 74 to the area between the towns of Wingate and Marshville). Conceptual designs were created within these Preliminary Study Alternative Corridors, and these designs were used to quantitatively estimate impacts to the human and natural environments. Estimated impacts for the Preliminary Study Alternatives were compared, and 16 alternatives were selected as DSAs for detailed consideration in this Draft EIS.

S.6.2 DETAILED STUDY ALTERNATIVES

Sixteen endpoint-to-endpoint DSAs (**Figure 2-8 a–c**) were selected for further study based upon the outcome of the alternatives screening process, estimated impacts to the natural and human environments, and engineering design considerations. **Table S-1** shows the DSA segments comprising each DSA. Functional engineering designs were prepared for each DSA within the study corridors established during the alternatives screening process. These study corridors were at least 1,000-feet-wide. These designs and corridor boundaries are shown in **Figure 2-10 (a–cc),** along with the preliminary right-of-way limits. The study corridors are wider than 1,000 feet in areas where interchanges and/or service roads will be considered.

TABLE S-1: Detailed Study Alternatives

DSA	DSA Segments*	Length (miles)
A	18A, 21, 22A, 31, 36, 36A, 40	20.6
B	18A, 21, 30, 31, 36, 36A, 40	20.5
C	2, 21, 22A, 31, 36, 36A, 40	19.7
D	2, 21, 30, 31, 36, 36A, 40	19.7
A1	18A, 21, 22A, 31, 34, 34B, 40	20.5
B1	18A, 21, 30, 31, 34, 34B, 40	20.5
C1	2, 21, 22A, 31, 34, 34B, 40	19.6
D1	2, 21, 30, 31, 34, 34B, 40	19.6
A2	18A, 21, 22A, 31, 36, 36B, 41	20.6
B2	18A, 21, 30, 31, 36, 36B, 41	20.5
C2	2, 21, 22A, 31, 36, 36B, 41	19.7
D2	2, 21, 30, 31, 36, 36B. 41	19.6
A3	18A, 21, 22A, 31, 34, 34A, 41	20.5
B3	18A, 21, 30, 31, 34, 34A, 41	20.5
C3	2, 21, 22A, 31, 34, 34A, 41	19.6
D3	2, 21, 30, 31, 34, 34A, 41	19.6

*Preliminary Corridor Segments 0, 1, 1A, 42, and 43 were combined with other segments during development of the DSAs. DSA Segments 34A, 34B, 36A, and 36B were added within existing DSA Segment corridor limits during preparation of the functional design plans to allow combinations of all DSA Segments to form end-to-end alternatives.

Each DSA currently is proposed to have nine or ten interchanges as listed below from west to east.

- I-485 at US 74, with DSAs A, B, A1, B1, A2, B2, A3, and B3
- Stallings Road (SR 1365), with DSAs A, B, A1, B1, A2, B2, A3, and B3
- US 74 east of Stallings Road (SR 1365) – partial interchange, with DSAs C, D, C1, D1, C2, D2, C3, and D3
- Indian Trail - Fairview Road (SR 1520), all DSAs
- Unionville - Indian Trail Road (SR 1537), all DSAs
- Rocky River Road (SR 1514), all DSAs
- US 601, all DSAs
- NC 200, all DSAs
- Austin Chaney Road (SR 1758), all DSAs
- Forest Hills School Road (SR 1754) - partial interchange, all DSAs
- US 74 - partial interchange, all DSAs

In addition to the sixteen build DSAs on new location, the No-Build Alternative is being retained to provide a baseline for comparison with the DSAs, in accordance with NEPA regulations (40 CFR Part 1502.14(d)) and FHWA guidelines (Technical Advisory T 6640.8A; Section V.E.1). The No-Build Alternative assumes that the transportation systems for Union and Mecklenburg Counties would evolve as currently planned in the MUMPO *2030 LRTP*, but without major improvements to the existing US 74 corridor from near I-485 to between the towns of Wingate and Marshville. However, the No-Build Alternative would not meet the project's purpose and need.

Tolls will be collected by an electronic toll collection (ETC) system. There will be no cash toll booths. The primary means of ETC will involve setting up an account with NCTA and using a transponder/receiver system. The transponder is a small device usually mounted on the windshield of a vehicle. The receiver is typically mounted over the roadway, and it electronically collects tolls from a driver's account as the vehicle travels under it at highway speed. The NCTA will work with other toll authorities to enable, where possible, other systems' transponders to work on the Monroe Connector/Bypass. Toll road users also will have the option of acquiring transponders with prepaid tolls. For travelers who do not have a transponder, a video system will capture license plate information and NCTA will bill the vehicle's registrant. In addition, in accordance with State law (NCGS 136-89.213), NCTA will operate a facility in the immediate vicinity of the project that accepts cash payment for tolls, so establishing an account is not required. It is anticipated that this facility will operate from an existing commercial building within the project area.

S.7 RECOMMENDED ALTERNATIVE

Based on the information available to date, including this Draft EIS, the FHWA, NCTA and NCDOT have identified DSA D as the Recommended Alternative. This alternative is comprised of DSA Segments 2, 21, 30, 31, 36, 36A, and 40, as shown in **Figure 2-8a-c**.

It should be noted that the "Recommended Alternative" is only a recommendation; it is not a Preferred Alternative and it is not a final decision. The FHWA, NCTA and NCDOT have identified a Recommended Alternative as a way of giving readers of the Draft EIS an indication of the agencies' current thinking. After the Draft EIS comment period ends, the FHWA, NCTA and NCDOT will identify a Preferred Alternative based on consultation with local transportation planning agencies, and state and federal environmental resource and regulatory agencies, as well as consideration of agency and public comments received on this Draft EIS and at the public hearings.

The Preferred Alternative may be developed further in the Final EIS. The NEPA process will conclude with a Record of Decision (ROD), which will document the Selected Alternative to be constructed.

DSA D has been identified as the Recommended Alternative based on the following considerations. Please note this list is not in order of importance, but is organized by issues as they are presented in the Draft EIS. Also, this list does not represent all benefits or impacts of DSA D, just those elements that differentiated DSA D when compared to the other DSAs.

Cost and Design Considerations

- DSA D is one of the shortest alternatives at 19.7 miles (all alternatives range from 19.6 to 20.6 miles).
- DSA D is one of the eight alternatives that would not require the relocation of Rocky River Road and the associated wetland impacts. The relocation of Rocky River Road is required for the eight alternatives that include DSA Segment 22A.
- DSA D is higher in the range of median total project costs with a median cost of $777.4 million (the median costs of the DSAs range from $752.5 million for DSA A2 to $785.3 million for DSA D1). The higher cost of the Recommended Alternative is offset by lower impacts in several other areas as described below.

Human Environment Considerations

- DSA D is one of the four DSAs with the fewest numbers of residential relocations at 107 residential relocations (the range being 94 to 149 residential relocations).
- Although DSA D is higher in the range of business relocations at 45 (the range being 14 to 48 business relocations), this number has been substantially reduced from preliminary estimates through design refinements, and there remains potential for further reduction through continued design innovation. Most of the impacted businesses are located along existing US 74 at the western end of the project. The relocation of these businesses is in exchange for the other positive factors associated with DSA D, including having the roadway located farther away from densely developed residential subdivisions and farther from Stallings Elementary School.
- DSA D would have no direct impacts to schools and would avoid any indirect impacts to Stallings Elementary School. DSA D is one of eight alternatives that would have no impacts to schools. The other eight alternatives would have a direct impact to Central Piedmont Community College and would be adjacent to Stallings Elementary School.
- DSA D is one of the four alternatives that would impact only three church properties (other DSAs impact four or five church properties). There would be no impacts to church buildings.

- DSA D is one of the eight alternatives that would avoid impacts to the proposed Matthews Sportsplex property, a public park to be developed by the Mecklenburg County Park and Recreation Department. Also see Cultural Resource Considerations below.

Physical Environment Considerations

- While none of the alternatives are subject to the Farmland Protection Policy Act, DSA D is one of the alternatives that has the least impacts to prime and statewide important farmland soils. About 27 percent of the acreage within the right of way of DSA D is classified as prime or important farmland soils (all DSAs range from about 27 percent to 39 percent).
- DSA D is one of eight DSAs (DSAs C, D, C1, D1, C2, D2, C3, and D3) that would potentially impact the most hazardous materials sites (11-12 sites impacted, with the lowest impacts being 6-7 sites). However, the anticipated impact severity is "low" for all potentially impacted sites.

Cultural Resources Considerations

- DSA D is one of eight alternatives that would not have impacts on the proposed Matthews Sportsplex property, a future public park and Section 4(f) resource. The other eight alternatives would affect this proposed park, and NCTA would seek a Section 4(f) *de minimis* finding from FHWA if any of these alternatives are selected as the Preferred Alternative.

Natural Resources Considerations

- DSA D is lower in the range of impacts to agricultural land at 499 acres (all alternatives range from 494 to 627 acres).
- DSA D is in the middle range of impacts to upland forest at 450 acres (all alternatives range from 365 to 514 acres).
- DSA D is lower in the range of impacts to ponds at 2.6 acres (all alternatives range from 2.5 to 3.8 acres).
- DSA D is in the middle range of impacts to wetlands at 8.1 acres (all alternatives range from 6.2 to 11.0 acres).
- DSA D would have the least impacts to perennial streams with 9,794 linear feet of impact (all alternatives range from 9,794 to 12,383 linear feet).
- DSA D is lower in the range of impacts to intermittent streams at 11,915 linear feet (all alternatives range from 10,767 to 13,020 linear feet).
- DSA D would have the least linear feet of streams requiring mitigation at 12,550 linear feet (all alternatives range from 12,550 to 16,387 linear feet). While final decisions with respect to mitigation requirements have not been made by the regulatory agencies, for estimation purposes, streams were considered to require mitigation if they were perennial or if they were intermittent and had a stream rating issued by the North Carolina Department of Environment and Natural Resources-Division of Water Quality (NCDENR-DWQ) of greater than or equal to 26. This implies that streams impacted by DSA D are of lower quality than those impacted by other DSAs.
- DSA D is one of eight alternatives that would cross only two 303(d)-listed streams, while the other eight alternatives would cross four.

Public Involvement

- Substantial public input regarding the DSAs, particularly at the western end of the project (DSA Segment 2 versus DSA Segment 18A), was received throughout the alternatives screening process. Much of this public input has been generated by Citizens Against Route Eighteen (C.A.R.E), a community-based group focused on informing and mobilizing residents against DSA Segment 18A of the Monroe Connector/Bypass (included in DSAs A, B, A1, B1, A2, B2, A3, and B3). To date, C.A.R.E. has submitted more than 2,000 signatures in opposition to DSA Segment 18A. Specifically, the group is concerned about noise, visual, and air quality impacts to the new Stallings Elementary School and adjacent neighborhoods, as well as impacts to North Fork Crooked Creek, which is a 303(d)-listed stream. While this input was a factor in the decision to recommend DSA D, the recommendation was based on a wide range of factors included in the comprehensive review and analysis of the potential impacts of all DSAs, as described above.

The above information will be considered in addition to public and agency comments received on this Draft EIS and at public hearings. In addition, based on public comments received on the functional engineering designs to date, the following areas may be reevaluated during the final design phase:

- The DSA Segment 2 typical section will be evaluated to minimize right of way required along existing US 74 and to explore options to make the design more aesthetically pleasing.
- The entrance to the Forest Park neighborhood and service road to Union West Industrial Park may be revised to allow for separate access points for the Forest Park neighborhood and the industrial park.
- The Beverly Drive grade separation will be reconsidered. NCTA may consider severing Beverly Drive.
- The Bonterra neighborhood entrance at Secrest Shortcut Road will be evaluated to address concerns with bridging the Monroe Connector/Bypass over the Bonterra neighborhood entrance, including visual and noise impacts to the neighborhood. NCTA will evaluate other design options for this crossing.
- The Poplin Road realignment will be reevaluated and redesigned.
- The Secrest Shortcut Road realignment will be reevaluated and additional design options considered.

S.8 SUMMARY OF ENVIRONMENTAL IMPACTS

Table S-2, found at the end of this section is a summary of the estimated direct and indirect impacts to the human, physical, cultural, and natural environments for each DSA, and proposed mitigation. A brief narrative summary is provided below.

S.8.1 NO-BUILD ALTERNATIVE

The impacts from choosing the No-Build Alternative occur from the continuation of existing conditions. Development patterns, land use changes, and neighborhood conditions would continue to develop as they have in the past. Traffic conditions would worsen, creating traffic impacts that could affect the reliability of the transportation system and further reduce mobility

and capacity along the US 74 corridor between I-485 near US 74 in Mecklenburg County and US 74 between the towns of Wingate and Marshville in Union County. These traffic impacts would be inconsistent with the corridor's designation for high-speed regional travel by the North Carolina Strategic Highway Corridor Program and the North Carolina Intrastate Highway System. There would be no permanent or temporary impacts to resources from construction activities.

S.8.2 IMPACTS TO THE HUMAN ENVIRONMENT

S.8.2.1 Land Use and Planning

Since the DSAs are on new location, direct land use changes from any of the DSAs include converting the land needed for right of way from its existing use to transportation use. This land includes a wide variety of uses, such as industrial, commercial, residential, recreational, agricultural, and undeveloped. The proposed project would be generally consistent with local land use plans and regional, state, and local transportation plans (**Section 3.3.4**).

In addition to the changes that would occur due to right-of-way acquisition, other land use changes are likely due to the nature of the facility. Since this new roadway would enhance access to eastern Union County, it would provide opportunities for increased intensity of development. For example, the interchange locations may be developed with commercial uses (e.g., gas stations and convenience stores) to serve travelers. With the potential access improvements, there is also the possibility of increased residential suburbanization. However, this will be limited by the existing water and sewer availability within the counties and municipalities (which is discussed in more detail in **Section 7**).

S.8.2.2 Relocations

All DSAs would require the relocation of residences and businesses. The total number of residential relocations estimated for each DSA ranges from 94 residences (DSA A) to 149 residences (DSA D3). All DSAs would include three farm relocations. Business relocations are concentrated along US 74 (associated with DSA Segments 18A and 2). Business relocations would range from fourteen (DSAs A, A1, B, and B1) to 49 (DSAs C2, D2, C3, and D3). The NCTA will follow the NCDOT's policies for right-of-way acquisition and relocation.

S.8.2.3 Neighborhoods

All DSAs would impact nine neighborhoods. The majority of these impacts would involve minor right-of-way encroachment and/or changes in access. Two neighborhoods, Acorn Woods and Poplin Farms, would experience the relocation of homes in the midst of their neighborhoods, regardless of which DSA is selected. DSAs C, D, C1, D1, C2, D2, C3, and D3 would involve relocations in a total of three neighborhoods, while the remaining DSAs (A, B, A1, B1. A2, B2, A3, and B3) would require relocations in only two neighborhoods. None of the DSAs would result in the total displacement of a neighborhood.

Indirect effects could occur to neighborhoods under any of the DSAs. The project could accelerate land use changes and the growth of non-residential uses, causing changes in the character of neighborhoods locally.

S.8.2.4 Environmental Justice

Direct and indirect impacts to low-income and/or minority populations resulting from implementing the Monroe Connector/Bypass as a toll facility are not anticipated to be "disproportionately high and adverse."

S.8.2.5 Community Services and Facilities

Churches and Cemeteries. All of the DSAs would require the acquisition of right of way from three to five church properties, and in some instances, changes in access. None of the DSAs would require the taking of any church buildings. DSAs A, A1, A2, and A3 would result in the most impacts to churches (five). DSAs D, D1, D2, and D3 would impact the least number of churches (three). None of the DSAs would impact known cemeteries.

Schools. Implementation of DSAs A, B, A1, B1, A2, B2, A3, or B3 would result in a minimal direct impact to the Central Piedmont Community College property within the southeast quadrant of the existing I-485/US 74 interchange to accommodate improvements to that interchange. In addition, for all DSAs, CPCC Lane (SR 3453), which provides access to the campus from US 74, would be closed to allow for control of access within the vicinity of the I-485 interchange. New access would be provided from US 74 via the proposed McKee Road.

Stallings Elementary School is just north of the functional design alignment in DSA Segment 18A (DSAs A, B, A1, B1, A2, B2, A3, and B3). There would be no direct impacts to the school property under these alternatives, although traffic patterns would be changed around the proposed interchange with Stallings Road (SR 1365). Alternatives that use DSA Segment 2 (DSAs C, D, C1, D1, C2, D2, C3, and D3) avoid this school.

Forest Hills High School is located just south of DSA Segments 40 and 41. Implementation of the project would not result in direct impacts to Forest Hills High School, although traffic patterns on US 74 and Forest Hills School Road within the vicinity of the high school could be altered by implementation of any of the DSAs.

There would not be impacts to any school facilities, including sports fields or recreational areas.

Parks and Recreation Areas. The only recreational facility that may be impacted by the proposed DSAs is the proposed Matthews Sportsplex, which would be located on property owned by Mecklenburg County in the southwest quadrant of the existing I-485/US 74 interchange. The DSAs that use DSA Segment 18A (DSAs A, B, A1, B1, A2, B2, A3, and B3) would acquire approximately 2.25 acres on the northwest corner of the property, adjacent to the existing I-485/US 74 interchange, in order to accommodate interchange improvements. These minor encroachments on the edges of the parcel are not anticipated to impact access or any future use of the property for park purposes. Alternatives that use DSA Segment 2 (DSAs C, D, C1, D1, C2, D2, C3, and D3) avoid this property.

There would be no impacts to sports fields or recreational areas associated with schools in the project study area.

Community Centers/Libraries. No impacts to community centers or libraries are anticipated as a result of this project.

S.8.3 IMPACTS TO THE PHYSICAL ENVIRONMENT

S.8.3.1 Traffic Noise

Traffic noise from the DSAs was evaluated based upon FHWA and NCDOT criteria. The numbers of Category B receptors estimated to be impacted by year 2035 traffic noise from the project range from 108 impacted receptors for DSA B2, to 130 impacted receptors for DSA C1. Category B receptors within the project study area are mostly residential, with some churches. Category C receptors (businesses) would be impacted by noise along the DSAs, with the numbers of impacts ranging from 9 businesses for DSAs B and B2 to 31 businesses for DSA C3.

Overall, ambient noise levels would be expected to increase within the vicinity of the DSAs due to the cumulative effects of the proposed project, together with increases in population and land development.

Barriers were evaluated to mitigate the impacts of traffic noise. Three locations were identified where preliminary noise barriers were determined to be potentially reasonable and feasible. The barriers are located adjacent to the following neighborhoods: Acorn Woods/Gold Hill (all DSAs), Avondale Park (all DSAs), and Glencroft (DSAs A, B, C, D, A1, B1, C1, and D1). The determination of feasibility and reasonableness is preliminary and subject to change based upon final design, building permits issued as of the Date of Public Knowledge, and the completion of the public involvement process.

A Design Noise Study will be prepared during final design of the Preferred Alternative using updated traffic forecasts and more refined engineering.

S.8.3.2 Air Quality

The project study area is located within the Charlotte-Gastonia-Rock Hill air quality region (which includes Mecklenburg County and Union County), which is a moderate non-attainment region for ozone. Mecklenburg County is a maintenance area for carbon monoxide.

Compliance of an individual project with the ozone and carbon monoxide National Ambient Air Quality Standards (NAAQS) is demonstrated if the project is included in a conforming transportation plan, which considers the urban area as a whole. The proposed project (STIP Projects R-3329 and R-2559) is included in the MUMPO *2030 LRTP*, which is a conforming transportation plan.

The DSAs for the project are generally consistent with the project descriptions (freeway) and project lengths (approximately 20 miles total) included in the *2030 LRTP*. The only inconsistency in the *2030 LRTP* is that the Monroe Bypass portion of the project (R-2559) is shown as a non-toll facility. The Monroe Connector/Bypass project is currently being studied only as a toll facility.

The conformity determination for the region will need to be updated prior to the completion of the ROD to change the Monroe Bypass portion of the project to a toll facility if a Build Alternative is selected. The selection of the No-Build Alternative would require the MUMPO *2030 LRTP* to be updated to remove the proposed Monroe Connector and Monroe Bypass, and would need to seek other means to meet the region's emissions budget for conformance with the SIP. Additional information can be found in **Section 4.2.2**.

Compliance of a project with the carbon monoxide (CO) NAAQS also is considered at the localized

(hot-spot) level. It is concluded that the project would not cause or contribute to any new localized CO violations or increase the frequency or severity of any existing CO violations since none of the DSAs fit the criteria requiring a quantitative CO hot-spot analysis.

Mobile Source Air Toxics (MSATs) were qualitatively addressed (**Section 4.2.5.2** and **Appendix E**). However, analysis of MSATs is a continuing area of research and the tools and techniques for assessing project-specific health impacts from MSATs are limited. These limitations impede FHWA's ability to evaluate how mobile source health risks should factor into project-level decision making under NEPA.

S.8.3.3 Farmland

All proposed DSAs would involve the use of prime and statewide important farmland soils. However, the impacts of the DSAs to prime and important farmland soils do not meet the threshold of protection based upon the evaluation under the Farmland Protection Policy Act (FPPA).

All DSAs would require the relocation of three farms. None of the DSAs would impact parcels currently participating in Union County's Voluntary Agricultural District (VAD) program.

Future induced growth within the project study area has the potential to convert farmlands to other uses. These effects are projected to occur with or without the construction of the Monroe Connector/Bypass, but at a higher rate if the project is implemented.

S.8.3.4 Utilities

All DSAs have the potential to impact water, sewer, natural gas, power, and telecommunications lines. All DSAs would cross the 2-inch gas lines running parallel to US 601, NC 200, and Olive Branch Road (SR 1006). All DSAs also cross the high-voltage Duke Energy Corporation power-line easement that runs between Faith Church Road (SR 1518) and Sardis Church Road (SR 1515). There are no electrical substations or towers located within the DSAs, but there may be vertical clearance issues associated with power lines in areas where the elevation of the proposed roadway is higher than the existing ground.

CSX Transportation owns and operates a main line freight-only railroad located near the southern boundary of the project study area on the western side of the project. The rail line parallels existing US 74, approximately halfway between US 74 and Old Charlotte Highway (SR 1009). On the eastern portion of the project, all DSAs would cross the CSX railroad line with a grade separation before reconnecting with existing US 74, as shown in **Figures 2-10bb** and **2-10cc**.

S.8.3.5 Visual Resources

Because visual impacts can be subjective, a distinction was not made among alternatives concerning which alternative possessed the most or least visual impact. However, some general conclusions can be made regarding visual/aesthetic changes. Overall, the DSAs that have a higher number of neighborhoods exposed to the roadway (i.e., those which impact a greater number of neighborhoods with residential relocations) were estimated to have a greater degree of visual impacts. In this case, all of the DSAs have similar numbers and types of relocation

impacts to neighborhoods (**Section 3.2.2**). As such, visual impacts to neighborhoods are not expected to vary significantly among the DSAs as a result of this project.

If a DSA that includes DSA Segment 2 (DSAs C, D, C1, D1, C2, D2, C3, or D3) is selected as the Preferred Alternative, unique visual impacts could occur due to the potential elevation of an approximately 1-mile section of roadway that would follow the existing US 74 alignment, from just east of I-485 to just east of Stallings Road. A visualization of this elevated roadway can be found in **Appendix G**. Aesthetic treatments and structural alternatives for this elevated roadway would be identified and coordinated with local municipalities to minimize any visual impacts through this primarily commercial area.

S.8.3.6 Hazardous Materials

Hazardous materials sites within and near the DSAs are generally concentrated around US 74. All sites known to be potentially contaminated (mostly due to the presence of underground storage tanks) are estimated as having a low anticipated impact severity. DSAs that utilize portions of US 74 (DSAs C, D, C1, D1, C2, D2, C3, and D3) contain the highest number of potentially contaminated sites (11-12 sites). DSAs A, B, A1, B1, A2, B2, A3, and B3 contain the lowest number of potentially contaminated sites (6-7 sites).

S.8.3.7 Floodplains/Floodways

The DSAs have been located in floodplains and/or floodways only in locations where existing residential and business development and other human and natural environment constraints have left no feasible alternatives to the use of floodplains. The effect of all DSAs on floodways and floodplains can be mitigated effectively through proper sizing and design of hydraulic structures (culverts, bridges, and channel stabilization). A detailed hydrologic and hydraulic analysis will be performed for each stream crossing location along the Preferred Alternative.

Based upon preliminary hydraulic analysis, DSAs A, B, A2, and B2 would have the highest number of bridges (nine) and DSAs C1, D1, C3, and D3 would have the lowest (five). DSAs A and A2 would have the highest number of major culverts and pipes (38 culverts and pipes), while DSAs D1 and D3 would have the lowest (33 culverts and pipes).

DSAs A, B, C, D, A2, B2, C2, and D2 would cross three floodways and DSAs A1, B1, C1, D1 A3, B3, C3, and D3 would cross two.

S.8.4 IMPACTS TO CULTURAL RESOURCES

S.8.4.1 Historic Architectural Resources

Four resources on, or eligible for listing on, the National Register of Historic Places (NRHP) were identified in the project's Area of Potential Effects. None of the DSAs would result in an "Adverse Effect" to a historic property on or eligible for the NRHP. There would be "No Effect" to the William Bivens House from any of the DSAs. The remaining three properties (Secrest Farm, Hiram Secrest House, and Perry-McIntyre House) have an effects determination of "No Adverse Effect" from any of the DSAs. During final design of the Preferred Alternative, the designs will be reviewed to ensure that the applicable conditions are met to maintain the "No Adverse Effect" determinations.

S.8.4.2 Archaeological Resources

No NRHP archaeological sites have been discovered by previous archaeological investigations and no currently recorded NRHP archaeological sites are located in or near the project study area. This is mainly due to poor site integrity, which is the result of excessive soil erosion from extensive farming in Union County. Studies also indicate there is a long history of erosion and soil disturbance in Union County and a low probability that sites worthy of further investigation are present within the project study area. Following selection of the Preferred Alternative, a final decision regarding any necessary archaeological surveys will be made.

S.8.4.3 Section 4(f) and 6(f) Resources

Section 4(f) Resources. DSAs A, B, A1, B1, A2, B2, A3, and B3 (DSA Segment 18A) would involve a minor encroachment into the undeveloped parcels owned by Mecklenburg County that are designated for future park use as the Matthews Sportsplex. DSAs C, D, C1, D1, C2, D2, C3, and D3 would avoid impacts to the proposed Matthews Sportsplex. The Mecklenburg County Park and Recreation Department concurs that the estimated right of way needed under DSAs A, B, A1, B1, A2, B2, A3, and B3 would not adversely affect the activities, features, and attributes of the proposed Matthews Sportsplex.

It appears there are grounds for a finding of *de mimimis* effect, and NCTA intends to seek a *de minimis* finding from FHWA. By publishing this Draft EIS, FHWA is requesting comments on the proposed finding of *de minimis* impact for the proposed Matthews Sportsplex. Following consideration of public comments, FHWA will make a determination on the *de minimis* finding if DSA A, B, A1, B1, A2, B2, A3, or B3 is selected as the Preferred Alternative, and then inform the officials with jurisdiction over the property of their intent regarding the *de minimis* finding. Also following consideration of public comments, the officials with jurisdiction over the property must concur in writing that the project will not adversely affect the activities, features, or attributes that make the property eligible for Section 4(f) protection. This concurrence may be combined with other comments on the project provided by the officials. If applicable, the final determination regarding this property will be included in the Final EIS. Additional information is presented in **Section 5.4.3.1**.

Section 6(f) Resources. There are no properties within the project study area that are subject to Section 6(f) of the Land and Water Conservation Fund Act.

S.8.5 IMPACTS TO NATURAL RESOURCES

S.8.5.1 Soil and Geology

The entire area underlain by the DSAs is rated “moderate” or “severe” for road construction, meaning that the soil properties indicate that special planning, design, or maintenance is needed to overcome soil limitations. The expected soil limitations can be overcome through proper engineering design, to be determined during final design.

S.8.5.2 Water Resources

Short-term impacts on water quality within the project study area may result from soil erosion and sedimentation. Construction impacts to water quality may not be restricted to the communities in which the construction activity occurs, but may also affect downstream communities. Long-term impacts on water quality also are possible due to particulates, heavy

metals, organic matter, pesticides, herbicides, nutrients, and bacteria that are often found in highway runoff.

Prior to construction, an erosion and sedimentation plan will be developed for the Preferred Alternative in accordance with the NC Department of Environment and Natural Resources (NCDENR) publication *Erosion and Sediment Control Planning and Design* and NCDOT's *Best Management Practices for Protection of Surface Waters*. In addition, because all DSAs pass through the hazardous spill basin area for Lake Twitty, all DSAs would need to incorporate hazardous spill basins in this area during final design.

The Monroe Connector/Bypass DSAs would have indirect and cumulative effects to water quality. The longevity of indirect impacts that contribute cumulatively to water quality degradation, when considered with other actions, is dependent on the magnitude and duration of upstream hydrologic events; including sediment inputs, flooding, land use change (including changes in land use regulations), and, ultimately, watershed stability. The effect of these events can be minimized through implementation of local stormwater ordinances and Best Management Practices (BMPs).

Various actions, including the Monroe airport expansion, residential and commercial development, and infrastructure improvements, have the potential to cumulatively impact water quality through erosion and stream sedimentation, although there are stormwater management programs in place to help minimize these effects. Increasing levels of non-point source pollution associated with increasing impervious surfaces and land disturbing activities are anticipated with the construction of any of the DSAs.

S.8.5.3 Natural Communities and Wildlife

Terrestrial (Upland) Communities. Both direct and indirect impacts from the DSAs would occur to the terrestrial communities and to the animals that inhabit them. Destruction of natural communities along the DSAs' rights of way would result in the loss of foraging and breeding habitats for the various animal species that utilize the area. All DSAs equally have the potential to indirectly affect terrestrial communities through fragmentation, which would result from road construction and induced land use change. Habitat fragmentation also is expected to occur under the No-Build Alternative due to continued growth in population and development within Union County.

Aquatic Communities. Impacts to aquatic communities include fluctuations in water temperature as a result of the loss of riparian (forest) vegetation. Construction impacts may not be restricted to the communities in which the construction activity occurs, but may also affect downstream communities. Temporary and permanent impacts to aquatic organisms may result from increased sedimentation. Impacts to aquatic communities and wildlife from erosion and sedimentation will be minimized through implementation of a stringent erosion-control schedule and the use of BMPs.

Invasive Species. Construction of any of the DSAs has the potential to provide opportunities for introduction or spread of invasive plant species. Known invasive plant species will not be used in construction, revegetation, or landscaping. BMPs will be implemented to reduce the potential for spreading invasives.

S.8.5.4 Water Resources in Federal Jurisdiction

Wetlands, Streams, and Ponds. Construction of any of the DSAs cannot be accomplished without infringing on surface waters, including streams, wetlands, and ponds.

DSA A2 would have the greatest total stream impacts (24,818 linear feet), while DSA D1 would have the least total stream impacts (21,146 linear feet). The difference between the highest and lowest total stream impacts is 3,672 linear feet.

Wetland impacts range from 6.2 acres to 11.0 acres. DSAs A, C, and C1 would have the greatest wetland impacts (10.7 to 11.0 acres) and DSA B3 would have the least impacts to wetlands (6.2 acres).

Anticipated stream mitigation lengths range from 12,550 linear feet to 16,387 linear feet. DSAs D and D2 would require the least linear feet (12,550 linear feet and 13,122 linear feet, respectively), and DSAs A3 and A1 the most (16,387 linear feet and 15,815 linear feet, respectively).

Pond impacts range from 2.5 acres to 3.8 acres. DSAs B1, D1, B3, and D3 would have the greatest impacts to ponds (3.8 acres), and DSAs A, C, A2, and C2 would have the least impacts to ponds (2.5 acres).

Anticipated surface water impacts are under the jurisdiction of the US Army Corps of Engineers (USACE) and the NCDENR-DWQ. Implementation of any of the DSAs would require a Clean Water Act Section 404 Individual Permit from USACE for the surface water impacts, and a corresponding Section 401 Water Quality Certification from NCDENR-DWQ. Mitigation for impacts would be required under the permit.

Catawba Buffer Rules. No streams within the project study area are subject to river basin buffer rules.

S.8.5.5 Protected Species

There are four federally protected species of plants and animals considered to have ranges extending into Union County and/or Mecklenburg County: Carolina heelsplitter mussel (*Lasmigona decorata*), Michaux's sumac (*Rhus michauxii*), Schweinitz's sunflower (*Helianthus schweinitzii*), and smooth coneflower (*Echinacea laevigata*). There is designated critical habitat in Union County for the Carolina heelsplitter in portions of Goose Creek, Duck Creek, and Waxhaw Creek.

The biological conclusion regarding the Carolina heelsplitter for all the DSAs is "Unresolved." The larger streams within the project study area may provide potentially suitable habitat for this species. All DSAs have similar stream crossings.

The biological conclusion for the Carolina heelsplitter designated critical habitat in Goose Creek and Duck Creek is "Unresolved". Goose Creek and Duck Creek are outside of the project study area but within the project's Future Land Use Study Area (FLUSA) as defined in the *Indirect and Cumulative Effects Assessment* (HNTB, January 2009) and also discussed in **Section 7**. Waxhaw Creek is outside of the project study area as well as the FLUSA and was not considered in this study.

Since the project study area does not extend into either the Goose Creek drainage basin or the Duck Creek drainage basin, it is not anticipated that there will be any direct impacts from the project to either of these drainage basins. The *Indirect and Cumulative Effects Assessment* (HNTB, January 2009) determined there would be a low potential for indirect impacts to the Goose Creek and Duck Creek basins, and therefore, to the critical habitat of the Carolina heelsplitter. Therefore, there is low potential for the project to cause effects to the critical habitat for the Carolina heelsplitter.

As part of the Section 7 of the Endangered Species Act consultation process, the FHWA and NCTA will coordinate and consult with the USFWS to reach a biological conclusion regarding the Carolina heelsplitter and the critical habitat for the Carolina heelsplitter. The outcome of the consultation process will be reported in the Final EIS.

The biological conclusion regarding the Schweinitz's sunflower for all DSAs is "May Affect/Not Likely to Adversely Affect." Potential habitat for this species is present within the project study area along roadsides and utility rights of way. A review of the North Carolina Natural Heritage Program (NCNHP) records (updated August 27, 2008) indicated three documented occurrences of Schweinitz's sunflower within 1 mile of the project study area. During the field investigations, two population sites were discovered and documented just outside the boundaries of DSA Segments 22A and 30. The functional designs in this area do not directly encroach on either population, and it is expected that no direct disturbance to the populations would occur from construction activities. Care should be taken to reduce the potential for indirect impacts. Informal consultation with USFWS will be conducted for the Preferred Alternative.

The biological conclusion regarding Michaux's sumac and the smooth coneflower for all the DSAs is "No Effect."

S.8.5.6 Indirect and Cumulative Effects

The locations of the DSAs are close enough together such that indirect impacts are not expected to vary substantially by DSA. For all DSAs, residential development patterns are expected to continue at relatively the same pace and intensity as the No-Build Alternative in Mecklenburg County and near the Mecklenburg County/Union County line south of US 74. These areas tend to be more influenced by proximity to Charlotte and I-485. The DSAs may influence residential development in the central and eastern parts of Union County because the project would improve travel time from those areas to Charlotte.

Given the already strong residential growth within the area, DSAs would not cause major shifts in population, but could increase the pace of development in some areas, particularly in areas surrounding existing US 74. Because the DSAs would provide enhanced accessibility, they have the potential to encourage residential development along the intersecting roads to the interchange locations, as well as increase residential densities as compared to current plans. There is high potential for additional infill residential development in the area around existing US 74 within and west of Monroe, which has experienced high levels of residential growth during past years. There is also high potential for new residential growth east of Monroe, where the DSAs would improve access and allow for easier and faster commutes to the Charlotte-Mecklenburg County urban area.

With the DSAs, it is also expected that some development would shift to land parcels within the vicinity of project interchanges, as opposed to locating elsewhere, depending upon the availability

of water and sewer service (which is one of the primary factors limiting growth in the area). The shift would occur to take advantage of the improved access and visibility that these parcels would have to the new freeway and the reduced commute times to the major employment center within the region.

The DSAs would not be expected to induce substantial land use changes or growth north and west of the DSAs, which is the area that includes habitat for the federally-endangered Carolina heelsplitter mussel. The DSAs would also have low to moderate potential for indirect impacts to other sensitive resources, including water resources, farmland, and terrestrial communities.

It is anticipated that any indirect impacts that occur within the FLUSA would be in the form of complementary land development (such as highway-retail oriented businesses) surrounding the interchange locations, potential shifts of commercial development to more accessible and visible interchange locations, and residential and associated development in proximity to the new location facility or upgraded facility. Construction of this facility has been anticipated for many decades, and it has been programmed into land use plans and other local regulations; in addition, local officials are targeting development for the major feeder roads in anticipation of the project.

The DSAs would likely contribute only minimally to cumulative effects on water quality and terrestrial habitat, as development that is affecting these resources is already occurring, and is expected to continue. Local plans are in place that will help minimize cumulative impacts to water quality. The DSAs are not expected to contribute to cumulative effects on the Carolina heelsplitter and Goose Creek and Duck Creek watersheds. In fact, the DSAs may serve to shift growth and development demand away from the Goose Creek and Duck Creek watersheds compared to the No-Build Alternative by improving accessibility and reducing travel times to land well outside these watersheds (land along the US 74 corridor within and west of Monroe and land east of Monroe).

S.9 UNRESOLVED ISSUES AND AREAS OF CONTROVERSY

Unresolved issues to be addressed prior to the publication of the Final EIS include:

- Selection of the Least Environmentally Damaging Practicable Alternative (LEDPA) and development of avoidance and minimization efforts within the corridor of the Preferred Alternative in coordination with regulatory agencies.
- Preparation of a conceptual mitigation plan for unavoidable wetland and stream impacts.
- Completion of additional archaeological surveys for the Preferred Alternative corridor, as necessary, based on coordination with NCDOT and the State Historic Preservation Office (HPO).
- Development and implementation of a survey protocol for the Carolina heelsplitter in coordination with USFWS and, if required, Section 7 consultation under the Endangered Species Act to consider impacts on this species and its critical habitat.

In addition, the next update to the MUMPO LRTP and conformity determination will need to designate the Monroe Bypass portion of the project as a toll facility prior to completion of the ROD.

S.10 OTHER GOVERNMENT ACTIONS REQUIRED

S.10.1 PERMITS REQUIRED

All of the proposed DSAs for the Monroe Connector/Bypass would require environmental regulatory permits from the following agencies:

United States Army Corps of Engineers

Section 404 Permit. A permit from the USACE is required for any activity occurring in water or wetlands that would discharge dredged or fill materials into Waters of the United States and adjacent wetlands. To obtain permit approval, impacts to wetlands must be mitigated through avoidance, minimization, and compensation measures in accordance with the *Memorandum of Agreement Between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act Section 404 (b)(1) Guidelines* (February 1990). Additional policy and guidance is provided through the NEPA/404 Merger Agreement (May 1997).

Authority. Federal Pollution Control Act Amendments of 1972 and Section 404 of the Clean Water Act of 1977. Regulations promulgated in 33 CFR Part 323.

United States Fish and Wildlife Service

Section 404 Permit Review. The USFWS reviews Section 404 permits and provides recommendations to USACE on how impacts to fish and wildlife resources and habitats can be minimized.

Authority. Endangered Species Act of 1973, Section 7.

North Carolina Department of Environment and Natural Resources, Division of Water Quality

Section 401 Water Quality Certification. Any activity that may result in discharge to Waters of the United States requires a certification that the discharge will be in conducted in compliance with applicable state water quality standards. An application for a USACE Section 404 permit (see above) is considered an application for a water quality certification.

Authority. North Carolina General Statute 143, Article 21, Part 1. Regulations promulgated in 15A NCAC 2H and 2B.

National Pollutant Discharge Elimination System (NPDES) Permit. A permit is required for projects involving sewer systems, treatment works, disposal systems, and certain stormwater runoff that could result in a discharge to surface waters. The state has the authority to administer the national NPDES program for projects in North Carolina.

Authority. North Carolina General Statute 143, Article 21, Part 1. Regulations promulgated in 15A NCAC 02H.0100.

Isolated Wetland Permit. The NCDENR-DWQ has established rules to protect isolated wetlands and isolated waters located within the state of North Carolina. Activities which result in a discharge within these areas may be authorized by the issuance of either an Individual Permit or a Certificate of Coverage to operate under a General Permit.

Authority. North Carolina General Statute 143, Article 215, Part 1. Regulations promulgated in 15A NCAC 02H.1300.

North Carolina Department of Environment and Natural Resources, Division of Land Quality

Soil and Erosion Control Plan. Persons conducting any land-disturbing activity shall take all reasonable measures to protect public and private property from damage caused by such activities. Pursuant to NC General Statute 112A-57(4) and 113A-54(d)(4), an erosion- and sedimentation control plan must be filed and approved by the agency having jurisdiction.

Authority. North Carolina Administrative Code, Title 15A. Department of Environment and Natural Resources, Chapter 4. Regulations promulgated in 15A NCAC 04B.0101.

North Carolina Department of Environment and Natural Resources, Division of Air Quality

Burn Permit. Any burning conducted during construction of the proposed project will be done in accordance with applicable local laws and ordinances and regulations of the North Carolina State Implementation Plan for air quality in accordance with 15A NCAC 02D.0520.

Authority. Regulations promulgated in 15A NCAC 02D.0520.

Mecklenburg County Land Use and Environmental Services Agency, Department of Air Quality

Burn Permit. Any burning conducted during construction of the proposed project will be done in accordance with applicable local laws and ordinances. This applies to work performed in the Mecklenburg County portion of the project only.

Authority. Mecklenburg County Air Pollution Control Ordinance (MCAPCO) Section 1.5106.

S.10.2 SUBSEQUENT ACTIONS

Approval of this Draft EIS does not complete the project implementation process. The Draft EIS will be circulated to local, state, and federal agencies; local governments; and the public for review. The following is a summary of actions to be completed prior to project construction. Coordination with environmental resource and regulatory agencies will be maintained throughout the process.

- A public hearing will be held to receive comments on the Draft EIS and the proposed locations and designs of the DSAs. The comments received through the Draft EIS review and public hearing processes will be thoroughly considered in the selection of the LEDPA and Preferred Alternative by NCTA in consultation with FHWA, NCDOT, and through the Turnpike Environmental Agency Coordination (TEAC).
- Hazardous materials investigations will be conducted, if necessary, to further review sites which could be potentially impacted by the Preferred Alternative.
- Designs may be refined for the Preferred Alternative, and will include efforts to further minimize impacts to the human and natural environments. Additional minimization may occur during the final design of the project.
- Engineering designs for the Preferred Alternative will be provided to the HPO to determine a survey protocol for further evaluation of archaeological resources along the Preferred Alternative.

- A mitigation plan for unavoidable impacts to streams and wetlands will be developed in consultation with USACE.
- Additional surveys for protected species will be conducted as needed for the Preferred Alternative, in coordination with USFWS.

The Final EIS will be prepared based upon the results of the items listed above. The Final EIS will be circulated for public and agency review. In addition, agency concurrence with the Final EIS will be pursued. After approval of the Final EIS and ROD, additional public involvement will be conducted to receive public comments on the refined engineering designs for the Preferred Alternative.

Final roadway design plans will be prepared, taking into consideration all public and agency comments received on the preliminary designs and Final EIS. The following studies will be conducted as a part of the final design process:

- Drainage and hydrological studies will identify and design drainage structures.
- Traffic control plans will be developed to facilitate access during the construction phase.
- Surveys for wells within and adjacent to the proposed right-of-way limits will be conducted.
- Noise analyses based upon updated traffic and detailed design plans will be conducted to evaluate whether or not preliminary noise barriers are still feasible and reasonable.
- Geotechnical investigations will be conducted. This will include identifying abandoned mine shafts and recommending techniques and materials to overcome any soil limitations along the Preferred Alternative.
- Project right-of-way limits will be finalized.

Other actions that must be completed prior to the start of project construction include (but are not limited to) the following:

- Preparation of an erosion control plan incorporating NCDOT's *Best Management Practices for Protection of Surface Waters.*
- Coordination with municipalities and utility owners for relocation and reconfiguration of utility systems.
- Implementation of the Relocation Assistance Program and other right-of-way programs.
- Approval of all required permits and certifications.

TABLE S-2: Summary of Environmental Impacts

Issue	Detailed Study Alternative															
	A	B	C	D	A1	B1	C1	D1	A2	B2	C2	D2	A3	B3	C3	D3
Length (miles)	20.6	20.5	19.7	19.7	20.5	20.5	19.6	19.6	20.6	20.5	19.7	19.6	20.5	20.5	19.6	19.6
Probable Range of Construction Costs (millions $)[1,2]	443.7–512.9	444.0–514.3	445.1–513.6	445.4–516.5	435.7–505.3	436.2–507.4	437.1–506.3	437.6–508.6	437.6–502.2	437.9–508.5	439.0–507.0	439.4–508.9	430.0–498.6	431.3–501.3	431.9–499.9	432.2–502.1
Probable Range of Right-of-Way Costs (millions $)[1,3]	160.2–201.4	166.7–197.5	176.3–221.6	178.4–224.2	174.2–218.9	176.4–221.8	190.9–239.5	192.8–242.1	164.6–206.7	166.4–209.1	180.8–227.3	182.8–229.6	178.4–224.2	180.2–226.7	194.7–244.9	196.7–247.3
Probable Range of Environmental Mitigation Costs (millions $)[1,4]	11.6–12.5	10.8–11.6	11.1–11.9	10.2–11.0	12.3–13.3	11.5–12.4	11.7–12.6	10.9–11.7	12.0–12.9	11.1–11.9	11.4–12.2	10.5–11.3	12.6–13.6	11.8–12.7	12.1–13.0	11.2–12.1
Probable Range of Total Costs (millions $)[1,5]	697.3–824.5	703.7–821.5	714.5–845.0	716.3–850.0	703.1–834.0	705.3–838.5	720.7–855.2	722.6–859.5	695.0–821.3	696.5–826.6	712.4–843.4	714.1–847.0	701.0–832.0	703.7–836.7	718.8–853.6	720.7–857.6
Median Total Project Costs (millions $)[16]	754.6	755.7	773.9	777.4	762.5	765.7	781.9	785.3	752.2	755.2	772.1	774.5	760.9	763.7	780.3	783.3
LAND USE																
Compatible with Land Use Plans	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ICE[6]: Potential for Accelerated Growth (Indirect Effect)	The DSAs are not expected to vary in their potential to accelerate growth. These potentials are as follows: Zone 1 – None; Zone 2 – Low; Zone 3 – Moderate; Zone 4 – None; Zone 5 – High. Additional information can be found in **Section 7.2.1**															
RELOCATIONS AND NEIGHBORHOOD IMPACTS																
Residential Relocations	94	97	104	107	112	115	122	125	118	121	128	131	136	139	146	149
Business Relocations	14	14	48	48	14	14	48	48	15	15	49	49	15	15	49	49
Named Neighborhoods Impacted	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
ICE[6]: Potential for Indirect Effects Due to Proximity to Neighborhoods	Variations in New Location Alternative DSA corridors are so small that indirect impacts are not expected to vary by alternative. The slight variations in the interchange locations by alternative are not anticipated to affect the location of residential development. Commercial and industrial development may shift somewhat due to the variations in interchange locations. However, these variations should not affect the quantity or type of development that occurs.															
MITIGATION	Conform to Uniform Relocation Act; continue public outreach efforts; meet with neighborhood-organization and business-community representatives; continue to look for design improvements to lessen impacts.															

TABLE S-2: Summary of Environmental Impacts

Issue	Detailed Study Alternative															
	A	B	C	D	A1	B1	C1	D1	A2	B2	C2	D2	A3	B3	C3	D3
COMMUNITY SERVICES AND FACILITIES IMPACTS																
Public Parks Impacted[7]	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0
Private Recreational Facilities Impacted	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Schools Impacted[8]	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0
Churches with Impacts to Main Buildings	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Churches with Impacts to Property and/or Outbuildings Only	5	4	4	3	5	4	4	3	5	4	4	3	5	4	4	3
Cemeteries Requiring Relocation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MITIGATION	Conform to Uniform Relocation Act. Continue public outreach efforts; meet with school district representatives regarding site planning, bus routes and property encroachments. Coordinate with church leaders on property encroachments and relocation strategies. Continue to look for design improvements to lessen impacts.															
NOISE IMPACTS																
Total # of Impacted Receptors	130	127	152	150	138	135	160	158	120	117	142	140	128	125	151	148
ICE[6]: Overall Ambient Noise Increase	Construction of the New Location Alternatives would introduce larger volumes of traffic into areas that do not currently experience high traffic volumes. However, impacts are not expected to vary substantially by DSA.															
NOISE MITIGATION																
Total Length of Noise Barriers (ft)	6,458	6,458	6,458	6,458	6,458	6,458	6,458	6,458	4,115	4,115	4,115	4,115	4,115	4,115	4,115	4,115
Total # of Noise Barriers	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2
Number of Benefitted Receptors	51	51	51	51	51	51	51	51	34	34	34	34	34	34	34	34
AIR QUALITY IMPACTS																
Transportation Conformity	The LRTPs and air quality conformity determinations for the MUMPO region will need to be updated prior to the completion of the ROD to modify the Monroe Bypass portion of the project to a toll facility.															
Mobile Source Air Toxics (MSATs)	Current tools and science not adequate to quantify the health impacts from MSATs.															

TABLE S-2: Summary of Environmental Impacts

Issue	Detailed Study Alternative															
	A	B	C	D	A1	B1	C1	D1	A2	B2	C2	D2	A3	B3	C3	D3
FARMLAND IMPACTS																
Farm Relocations	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
MITIGATION	None required.															
UTILITIES IMPACTS																
Power Transmission Line Crossings[9]	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gas Transmission Pipeline Crossings[10]	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Railroad Crossings	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
MITIGATION	Coordinate temporary and permanent changes in utility lines with each of the utility providers.															
VISUAL IMPACTS																
Changes in the Visual Landscape	Visual impacts to neighborhoods are not expected to vary substantially by DSA. The elevated segment along existing US 74 proposed under DSA Segment 2 (DSAs C, D, C1, D1, C2, D2, C3 and D3) would have unique visual impacts.															
MITIGATION	Implement a landscaping plan for the project. Investigate aesthetic treatments and structural alternatives for the elevated roadway segment in DSA Segment 2, in coordination with local jurisdictions.															
HAZARDOUS MATERIALS IMPACTS																
Hazardous Materials Sites within DSAs	7	6	12	11	7	6	12	11	7	6	12	11	7	6	12	11
MITIGATION	A more detailed field reconnaissance will be conducted for the Preferred Alternative.															
FLOODPLAINS/FLOODWAYS IMPACTS																
Floodplain Crossings	14	14	11	11	13	13	10	10	14	14	11	11	13	13	10	10
Floodway Crossings	3	3	3	3	2	2	2	2	3	3	3	3	2	2	2	2
Number of Major Culverts/Pipes (>72" diameter)[11]	38	36	37	35	36	34	35	33	38	36	37	35	36	34	35	33
MITIGATION	The effect of all the DSAs can be mitigated through proper sizing and design of hydraulic structures (e.g., culverts, bridges, and channel stabilization). A detailed hydrologic and hydraulic analysis will be conducted for the Preferred Alternative.															

TABLE S-2: Summary of Environmental Impacts

Issue	Detailed Study Alternative															
	A	B	C	D	A1	B1	C1	D1	A2	B2	C2	D2	A3	B3	C3	D3
CULTURAL RESOURCES IMPACTS																
Historic Resources with No Adverse Effect[12]	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Overall Potential for Archaeological Sites	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
MITIGATION	During final design of the Preferred Alternative, the designs will be reviewed to ensure that applicable conditions are met to maintain the "No Adverse Effect" determinations. Following selection of the Preferred Alternative, a final decision regarding any necessary archaeological surveys will be made.															
SECTION 4(F)/6(F) RESOURCES IMPACTS																
Section 4(f)Resources (full "use")	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Section 4(f) Resources *de miminis* Impact[13]	1	1	0	0	1	1	0	0	1	1	0	0	1	1	0	0
Section 6(f) Resources Impacted	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MITIGATION	All applicable conditions must be met in order to maintain the "No Adverse Effects" determination to cultural resources. NCTA will continue coordination with local agencies with jurisdiction over park and recreation resources to ensure that right-of-way and construction limits within the property boundaries are minimized to the extent feasible.															
NATURAL COMMUNITIES IMPACTS[14]																
Disturbed/Clearcut (acres)	230	234	208	211	237	240	215	218	232	235	209	212	238	241	216	219
Agricultural (acres)	546	552	494	499	608	613	555	560	561	566	509	514	622	627	570	575
Upland Forested (acres)	507	498	460	450	416	406	367	358	514	505	467	457	423	413	374	365
Successional (acres)	101	97	105	101	88	84	92	88	101	97	105	101	88	84	92	88
Open Water (acres)	10	8	10	8	10	8	10	8	10	8	10	8	10	8	10	8
ICE[6]: Effects on Wildlife and Habitat through Habitat Fragmentation	All DSAs equally have the potential to indirectly affect terrestrial communities through fragmentation, which would be the result of road construction and induced land use change.															
MITIGATION	An erosion and sedimentation control plan will be developed for the Preferred Alternative to prevent runoff, erosion and sedimentation impacts, and to minimize impacts to aquatic communities and wildlife in accordance with the NCDENR guidelines and Best Management Practices. Control measures will be implemented to reduce the potential for spreading non-native invasive plant species.															

TABLE S-2: Summary of Environmental Impacts

Issue	Detailed Study Alternative															
	A	B	C	D	A1	B1	C1	D1	A2	B2	C2	D2	A3	B3	C3	D3
JURISDICTIONAL RESOURCES IMPACTS[15]																
Pond Impacts (acres)	2.5	2.6	2.5	2.6	3.7	3.8	3.7	3.8	2.5	2.6	2.5	2.6	3.7	3.8	3.7	3.8
Wetland Impacts (acres)	10.7	7.7	11.0	8.1	10.3	7.3	10.7	7.7	9.5	6.6	9.9	7.0	9.2	6.2	9.5	6.6
Perennial Stream Impacts (linear ft.)	10,500	10,412	9,882	9,794	11,085	10,997	10,467	10,379	11,798	11,710	11,180	11,092	12,383	12,295	11,765	11,677
Intermittent Stream Impacts (linear ft.)	12,764	12,032	12,648	11,915	11,616	10,883	11,499	10,767	13,020	12,288	12,904	12,171	11,872	11,139	11,755	11,023
Total Stream Impacts (linear ft.)	23,264	22,444	22,530	21,709	22,701	21,881	21,966	21,146	24,818	23,998	24,084	23,263	24,254	23,434	23,520	22,699
Bridge Crossings over Streams	9	9	6	6	8	8	5	5	9	9	6	6	8	8	5	5
Linear Feet of Stream requiring Mitigation	14,314	13,439	13,425	12,550	15,815	14,941	14,926	14,052	14,885	14,010	13,996	13,122	16,387	15,512	15,498	14,623
ICE[6]: Effects on Water Quality, Wetlands, Impaired Waterways, and Watersheds	All DSAs equally have the potential to indirectly affect water quality, wetlands, impaired waterways, and watersheds, which would be the result of road construction and induced land use change															
MITIGATION	The DSAs incorporate measures to avoid and minimize impacts to Waters of the US. The NCTA agreed to include several bridges in the functional engineering designs, beyond those required to convey floodwaters. In addition, final design efforts will examine all appropriate and practical possibilities of avoiding and minimizing impacts to Waters of the US. Strict adherence to Best Management Practices for projects within sensitive watersheds will assist in minimizing project impacts.															
PROTECTED SPECIES IMPACTS																
Carolina Heelsplitter	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved
Carolina Heelsplitter Critical Habitat in Goose Creek and Duck Creek	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved	Unresolved
Schweinitz's Sunflower[17]	May Affect/ Not Likely to Adversely Affect	May Affect/ Not Likely to Adversely Affect	May Affect/ Not Likely to Adversely Affect	May Affect/ Not Likely to Adversely Affect	May Affect/ Not Likely to Adversely Affect	May Affect/ Not Likely to Adversely Affect	May Affect/ Not Likely to Adversely Affect	May Affect/ Not Likely to Adversely Affect	May Affect/ Not Likely to Adversely Affect	May Affect/ Not Likely to Adversely Affect	May Affect/ Not Likely to Adversely Affect	May Affect/ Not Likely to Adversely Affect	May Affect/ Not Likely to Adversely Affect	May Affect/ Not Likely to Adversely Affect	May Affect/ Not Likely to Adversely Affect	May Affect/ Not Likely to Adversely Affect
Michaux's Sumac	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
Smooth Coneflower	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect

TABLE S-2: Summary of Environmental Impacts

Issue	Detailed Study Alternative															
	A	B	C	D	A1	B1	C1	D1	A2	B2	C2	D2	A3	B3	C3	D3
MITIGATION	Concurrence needed from US Fish and Wildlife Service (USFWS) on the biological conclusions of May Affect/Not Likely to Adversely Affect. Once the Preferred Alternative is selected, additional surveys will be conducted as needed for protected species, in coordination with USFWS.															

1. Source: HNTB, January 2009
2. Construction costs include construction, utilities, and administrative costs.
3. Source: CLA, January 2009; Future right-of-way costs were modeled to anticipated year of acquisition using inflation rates ranging from 5% to 12%, with 8% being most likely.
4. Environmental mitigation costs are based on the North Carolina **Ecosystem Enhancement Program** (NCEEP) fee schedule dated July 18, 2008, for estimated impacts to streams and wetlands and assume mitigation for impacts to all wetlands, all perennial streams, and intermittent streams with a NCDENR-DWQ stream rating greater than or equal to 26.
5. Total cost may not add up exactly, due to rounding.
6. ICE = Indirect and/or Cumulative Effect
7. Proposed Matthews Sportsplex (owned by Mecklenburg County)
8. Central Piedmont Community College – no impacts to school facilities (including sports fields and recreational areas). These same DSAs pass just south of Stallings Elementary School with no impacts to school use or access, including sports fields and recreational areas.
9. There may be one to three individual lines in a power-transmission easement. This table reports the numbers of individual transmission line crossings.
10. The three gas transmission pipeline crossings are located in easements parallel to US 601, NC 200, and Olive Branch Road (SR 1006).
11. Includes all of the multiple pipes/culverts required at interchanges.
12. Secrest Farm, Hiram Secrest House, and Perry-McIntyre House. A determination of No Effect was made for the William Bivens House.
13. *De minimis* impacts on publicly-owned parks are defined as those that do not adversely affect the activities, features, and attributes of the Section 4(f) resource. The proposed Matthews Sportsplex is minimally impacted by DSAs A, B, A1, B1, A2, B2, A3, and B3.
14. Acreages calculated within the DSA right-of-way limit.
15. These impacts were calculated using the functional engineering designs' construction limits, with an additional 40-foot buffer.
16. Source: HNTB, March 2009
17. Due to its location on the southern edge of the DSA corridor, it is assumed that all impacts to the observed Schweinitz's sunflower population will be avoided.