

# SUMMARY



## S.1 FEDERAL HIGHWAY ADMINISTRATION

Draft       Final

Draft Section 4(f) Evaluation attached

## S.2 LEAD AGENCIES, COOPERATING AGENCIES, AND PARTICIPATING AGENCIES

The lead agencies for this project are the Federal Highway Administration (FHWA), the North Carolina Turnpike Authority (NCTA), and the North Carolina Department of Transportation (NCDOT). 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 email address: [gaston@ncturnpike.org](mailto:gaston@ncturnpike.org).

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The Section 6002 Coordination Plan for the Gaston East-West Connector identified agency roles for this project (**Section 9.2.3.2**). The US Army Corps of Engineers (USACE) is a cooperating agency. The Federal Energy Regulatory Commission (FERC) has been invited to be a cooperating agency. The following agencies are participating agencies:

- US Environmental Protection Agency (USEPA)
- US Fish and Wildlife Service (USFWS)
- NC Department of Environment and Natural Resources Division of Water Quality (NCDWQ)
- NC Department of Environment and Natural Resources Wildlife Resources Commission (NCWRC)
- NC Department of Cultural Resources State Historic Preservation Office (HPO)
- Gaston Urban Area Metropolitan Planning Organization (GUAMPO)
- Mecklenburg-Union Metropolitan Planning Organization (MUMPO)

### S.3 PROPOSED ACTION

The NCTA proposes to construct a project known as the Gaston East-West Connector, which would be a controlled-access toll road extending from I-85 west of Gastonia in Gaston County to I-485 near the Charlotte-Douglas International Airport in Mecklenburg County. **Figure 1-1** shows the general project location.

The project is included in the NCDOT's *2009-2015 State Transportation Improvement Program* (STIP) as STIP Project U-3321. The project is known both as the "Gaston East-West Connector" and as the "Garden Parkway." This study refers to the project as the Gaston East-West Connector.

### S.4 PURPOSE AND NEED FOR PROJECT

The purpose of the proposed action is to improve east-west transportation mobility in the area around the City of Gastonia, between Gastonia and the Charlotte metropolitan area, and particularly to establish direct access between the rapidly growing areas of southeast Gaston County and western Mecklenburg County. The primary needs for the project are summarized below:

- **There is poor transportation connectivity between Gaston County and Mecklenburg County and within southern Gaston County.**
  - Limited crossings of the Catawba River constrain travel between Gaston and Mecklenburg Counties. No crossings are located in southern Gaston County.
  - Projected growth in southern Gaston County and western Mecklenburg County will continue to increase demands for accessibility and connectivity between the two counties.
  - Within southern Gaston County, south of I-85, a lack of connecting east-west roadways makes travel circuitous and limits mobility.

- The GUAMPO and the MUMPO include a new location roadway running through southern Gaston County and connecting over the Catawba River to Mecklenburg County in their long range transportation plans.
- The Gaston East-West Connector is a state-designated Strategic Highway Corridor, envisioned as a new freeway facility on the Strategic Highway Corridors Vision Plan.
- **There are existing and projected poor levels of service on the Project Study Area's major roadways.**
  - Traffic volumes are projected to increase on I-85, I-485, US 29-74 and US 321 in the Project Study Area through 2030.
  - There are existing poor levels of service on segments of I-85 in Gaston County; from Exit 19 (NC 7 [Ozark Avenue]) through Exit 27 (NC 273 [Park Street]).
  - Levels of service on I-85, US 29-74 and US 321 are projected to worsen in the future.
  - Congestion and frequent incidents on I-85 inhibit regional travel and diminish the ability of I-85 to function as a Strategic Highway Corridor and Intrastate Corridor.

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

## S.5 OTHER MAJOR ACTIONS IN THE PROJECT STUDY AREA

Fifteen other roadway projects in the NCDOT's *2009-2015 STIP* are in the general vicinity of the proposed action. Two of these projects are rural projects (R-2608 and R-2248). Seven projects are urban projects (U-2408, U-2713, U-3405, U-3411, U-3425, U-3806, and U-2325). Five projects are bridge replacement projects (B-4517, B-4752, B-4753, B-4860, and B-4344). There is one interstate project (I-5000). These are described in **Section 1.8.1**, and their general locations are shown in **Figure 1-7**.

Charlotte-Douglas International Airport, located in west Charlotte near the eastern end of the proposed project, is constructing a third runway (**Section 1.5.2.2**) scheduled for completion in January 2010. The runway project requires the relocation of three area roads: Old Dowd Road (SR 1191), Wallace Neel Road (SR 1195), and West Boulevard (NC 160) (Charlotte-Douglas International Airport Web site:

[www.charmeck.org/Departments/Airport/Runway+Road+Relocations.htm](http://www.charmeck.org/Departments/Airport/Runway+Road+Relocations.htm)).

Charlotte-Douglas International Airport has plans for an "intermodal zone" that would combine direct rail and truck access with incoming air cargo. The intermodal facility is planned to be located between the new runway and the existing runway and is expected to have a 10-track rail yard and approximately 2,500 tractor trailer parking spaces. Additional truck traffic generated from the site would use the relocated NC 160 (West Boulevard) for access to and from the site (Charlotte-Douglas International Airport Web site:

[www.charmeck.org/Departments/Airport/Runway+Road+Relocations.htm](http://www.charmeck.org/Departments/Airport/Runway+Road+Relocations.htm)). According to the Airport's *2007 Annual Report to the Community*, planning for this facility is underway, but no opening date was provided. However, it is likely it would open after the runway project is completed in January 2010.

## S.6 ALTERNATIVES CONSIDERED

### S.6.1 ALTERNATIVES SCREENING PROCESS

A two-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 First Screening (**Section 2.2**), six alternative concepts were evaluated to determine if they were reasonable and practicable based upon their ability to meet purpose and need, their potential impacts, and their financial feasibility. The six alternative concepts included:

- Transportation System Management (TSM) Alternative
- Transportation Demand Management (TDM) Alternative
- Mass Transit Alternative
- Multimodal Alternative
- Improve Existing Roadways Alternatives (Toll and Non-Toll Scenarios)
- New Location Alternatives (Toll and Non-Toll Scenarios).

Only the New Location Alternative Toll Scenario was carried forward to the Second Screening. In the Second Screening (**Section 2.3**), Preliminary Corridor Segments were overlain onto land suitability maps, avoiding sensitive features to the extent possible and in accordance with the design criteria. Based on a quantitative evaluation of the potential impacts of the preliminary corridors and consideration of comments received through public involvement and agency coordination, the set of 90 preliminary corridors was screened to twelve DSAs.

### S.6.2 DETAILED STUDY ALTERNATIVES

There are twelve DSAs considered in this Draft EIS: DSAs 4, 5, 9, 22, 23, 27, 58, 64, 68, 76, 77, and 81. These DSAs are controlled-access toll facilities on new location. In February 2005, the NCTA Board of Directors selected the Gaston East-West Connector as a candidate toll facility.

**Figure S-1a-b** and **Table S-1** present the 1,400-foot wide corridor segments that comprise the twelve DSAs. **Figure 2-9a-ii** shows the corridor boundaries and the preliminary engineering design right-of-way limits in each Corridor Segment, combined to create the DSAs. Corridor Segments are wider than 1,400 feet in areas where interchanges and/or service roads will be considered.

The preliminary engineering designs for the DSAs are for a controlled-access toll facility with six lanes and a 46-foot-wide grass median. The preliminary engineering designs were initially based upon traffic projections for DSAs for the Non-Toll Scenario. The traffic projections for the Toll Scenario may show that four lanes may be sufficient. If the number of lanes is reduced from six to four along the Preferred Alternative, that reduction would be achieved by removing the two lanes in the center. The outside footprint of the project would remain the same. The width of the grass median would change from 46 feet to 70 feet. The number of lanes and median width will be resolved prior to the Final EIS.

TABLE S-1: Twelve Detailed Study Alternatives

Detailed Study Alternative #	West Area – Generally west of US 321	Central Area – Generally east of US 321 and west of NC 279 or the South Fork Catawba River	East Area – Generally east of NC 279 or the South Fork Catawba River
	H Segments	J Segments	K Segments
4	H2A-H3	J4a-J4b-J2c-J2d-J5a-J5b	K2A-KX1-K3B-K3C
5	H2A-H3	J4a-J4b-J2c-J2d-JX4-J1e-J1f	K1A-K1B-K1C-K4A
9	H2A-H3	J4a-J4b-J2c-J2d-JX4-J1e-J1f	K1A-K3A-K3B-K3C
22	H2A-H2B-H2C	J3-J2c-J2d-J5a-J5b	K2A-KX1-K3B-K3C
23	H2A-H2B-H2C	J3-J2c-J2d-JX4-J1e-J1f	K1A-K1B-K1C-K4A
27	H2A-H2B-H2C	J3-J2c-J2d-JX4-J1e-J1f	K1A-K3A-K3B-K3C
58	H1A-H1B-H1C	J1a-JX1-J2d-J5a-J5b	K2A-KX1-K3B-K3C
64	H1A-H1B-H1C	J1a-J1b-J1c-J1d-J1e-J1f	K1A-K1B-K1C-K4A
68	H1A-H1B-H1C	J1a-J1b-J1c-J1d-J1e-J1f	K1A-K3A-K3B-K3C
76	H1A-HX2	J2a-J2b-J2c-J2d-J5a-J5b	K2A-KX1-K3B-K3C
77	H1A-HX2	J2a-J2b-J2c-J2d-JX4-J1e-J1f	K1A-K1B-K1C-K4A
81	H1A-HX2	J2a-J2b-J2c-J2d-JX4-J1e-J1f	K1A-K3A-K3B-K3C

The mainline design speed is 70 miles per hour (mph), with a planned posted speed limit of 65 mph. Each DSA currently is proposed to have 11 to 12 interchanges (depending upon the DSA), as listed below from west to east.

- I-85
- US 29-74
- Linwood Rd (SR 1133)
- Lewis Rd (SR 1126)  
(DSAs 58, 64, and 68 only)
- US 321
- Robinson Rd (SR 2416)
- Bud Wilson Rd (SR 2423)
- NC 274 (Union Rd)
- NC 279 (South New Hope Rd)
- NC 273 (Southpoint Rd)
- Dixie River Rd (SR 1155)
- I-485

In addition to the twelve new location build DSAs, the No-Build Alternative is being retained to provide a baseline for comparison with the DSAs, in accordance with National Environmental Policy Act (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 Gaston and Mecklenburg counties would evolve as currently planned in their respective Long Range Transportation Plans, but without major capacity improvements to I-85 or to US 29-74. However, the No-Build Alternative would not meet the project's purpose and need.

Tolls would be collected by an electronic toll collection (ETC) system. There would be no cash toll booths. The primary means of ETC would involve pre-registration with the NCTA and use of a transponder/receiver system. The transponder may be mounted on the windshield of a vehicle. This would allow the vehicle to move through the toll-collection locations at highway speeds. The user's account would then be debited for the cost of the toll. The NCTA would work with other toll authorities to enable, where possible, other systems' transponders to work on the Gaston

East-West Connector. For travelers who do not have a transponder, a video system would capture license plate information and the NCTA would bill the vehicle's registrant. In addition, in accordance with State law (NCGS 136-89.213), the NCTA would operate a facility in the immediate vicinity of the project that accepts cash payment for prepaid tolls. 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 9 as the Recommended Alternative. This alternative is comprised of Corridor Segments H2A-H3-J4a-J4b-J2c-J2d-JX4-J1e-J1f-K1A-K3A-K3B-K3C, as shown in **Figure 2-8a-b**.

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 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, which will document the Selected Alternative to be constructed.

DSA 9 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 9, just those elements that differentiated DSA 9 when compared to the other DSAs.

### **Cost and Design Considerations**

- DSA 9 is one of the shortest alternatives at 21.9 miles (all alternatives range from 21.4 to 23.7 miles).
- DSA 9 has the second-lowest median total cost (\$1,282 million) (all alternatives range from \$1,281 million to \$1,378.4 million).

### **Human Environment Considerations**

- DSA 9 is one of the four DSAs with the fewest numbers of residential relocations at 348 residential relocations (the range being 326 to 384 residential relocations).
- Although DSA 9 is higher in the range of business relocations at 37 (the range being 24 to 40 business relocations), it would avoid impacts to Carolina Specialty Transport (provides transportations services to special needs groups) that would occur under DSAs 58, 64, 68, 76, 77 and 81.
- DSA 9 is in the middle of the range of total neighborhood impacts at 25 impacted neighborhoods (the range being 21 to 31 impacted neighborhoods).

- DSA 9 would have no direct impacts to schools. (DSAs 5, 23, and 27 also avoid direct impacts to schools.)
- DSA 9 would not require relocation of known cemeteries. (DSAs 27, 68, and 81 also would not require relocation of known cemeteries.)
- At Linwood Road, DSA 9 is one of three alternatives (DSAs 4, 5, and 9) that would avoid impacting either the Karyae Park YMCA Outdoor Family Center or the Pisgah Associate Reformed Presbyterian Church (part of the church property is also an historic site eligible for listing on the National Register of Historic Places).
- DSA 9 is one of the three alternatives (DSAs 4, 5, and 9) farthest from Crowders Mountain State Park.
- DSA 9 would avoid right-of-way requirements from Daniel Stowe Botanical Garden. (DSAs 4, 22, 27, 58, 68, 76, and 81 also avoid these right-of-way requirements.)
- DSA 9 would avoid the relocation of Ramoth AME Zion Church and cemetery, which is part of the Garrison Road/Dixie River Road community. (DSAs 4, 22, 27, 58, 68, 76, and 81 also avoid this church.)
- DSA 9 is one of the eight alternatives (DSAs 4, 9, 22, 27, 58, 68, 76, and 81) with the least amount of right of way required from future Berewick District Park in Mecklenburg County.

#### **Physical Environment Considerations**

- DSA 9 is in the middle range of estimated numbers of receptors impacted by traffic noise at 245 receptors (the range being 204 to 309 impacted receptors).
- DSA 9 is one of the alternatives (DSAs 4, 5, 9, 22, 23, and 27) that would impact the least acreage of land in Voluntary Agricultural Districts. DSA 9 also is one that is expected to have the least indirect and cumulative effects to farmlands.
- DSA 9 is one of the alternatives with the fewest power transmission line crossings at 14 crossings (the range being 13 to 18).

#### **Cultural Resources Considerations**

- DSA 9 is one of six alternatives (DSAs 4, 5, 9, 22, 23, and 27) that would not require right of way from the Wolfe Family Dairy Farm historic site. Selection of DSA 9 makes it more likely that, if the US 321 Bypass is constructed at some future time, the project would also avoid the Wolfe Family Dairy Farm historic site.
- DSA 9 is one of four alternatives (DSAs 5, 9, 23, and 27) with low to moderate potential to contain archaeological sites requiring preservation in place or complex/costly mitigation.

#### **Natural Resources Considerations**

- DSA 9 is one of eight alternatives (DSAs 4, 9, 22, 27, 58, 68, 76, and 81) that would cross the South Fork Catawba River and the Catawba River where the rivers have been more affected by siltation and they are less navigable, and water-based recreation would be affected less than with DSAs that cross farther south.

- DSA 9 would impact the least amount of Upland Forested Natural Communities at 882 acres (all alternatives range from 882 to 1042 acres).
- DSA 9 is one of the alternatives (DSAs 4, 9, 22, and 76) having the lowest potential to indirectly affect upland wildlife species due to habitat fragmentation.
- DSA 9 is lower in the range of impacts to ponds at 4.1 acres (all alternatives range from 2.1 to 6.3 acres).
- DSA 9 is lower in the range of impacts to wetlands at 7.5 acres (all alternatives range from 6.9 to 13.2 acres).
- DSA 9 is lower in the range of impacts to perennial streams at 38,894 linear feet (all alternatives range from 36,771 to 50,739 linear feet).
- DSA 9 would have the fewest number of stream crossings at 91 (all alternatives range from 91 to 120 crossings).
- DSA 9 is one of eight alternatives (DSAs 5, 9, 23, 27, 64, 68, 77, and 81) that has a biological conclusion of No Effect relating to the federally endangered Schweinitz's sunflower.

## S.8 SUMMARY OF ENVIRONMENTAL IMPACTS

**Table S-2**, found at the end of this chapter, 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 been in the past. Traffic conditions would worsen, creating traffic impacts that could affect the reliability of the transportation system and further reduce mobility and accessibility within southern Gaston County and between southern Gaston County and western Mecklenburg County. 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 would be on new location, direct land use changes from any of the DSAs would include converting the land needed for right of way from its existing use to a transportation use. This land includes a wide variety of uses, such as industrial, commercial, residential, recreational, agricultural, and undeveloped. The proposed project would be consistent with local land use plans and regional, state, and local transportation plans (**Section 3.1.3**).

The Gaston East-West Connector would provide better access to portions of Gaston County, potentially facilitating faster growth and different kinds of development than under the No-Build Alternative. Growth induced in western Mecklenburg County from the project is expected to be

moderate, although the roadway would potentially accelerate non-residential construction plans, particularly in the area of the Charlotte-Douglas International Airport. The Charlotte-Douglas International Airport is a generator of cumulative effects and is currently expanding roadway access points; adding a third runway on the west side of the facility; and creating a new intermodal (rail switching area) facility on the existing airport site. The project also would provide improved access to portions of York County, South Carolina, resulting in a moderate potential for indirect impacts in York County.

### 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 326 residences (DSA 68) to 384 residences (DSA 76). Eight of the DSAs (DSAs 5, 9, 23, 27, 64, 68, 77, and 81) would include one to two farm relocations. Business relocations would range from 24 (DSA 77) to 40 (DSA 22). Most of the business relocations for each DSA are concentrated around US 321, US 29-74 and I-85. The NCTA will follow the NCDOT's policies for right-of-way acquisition and relocation.

### S.8.2.3 Neighborhoods

All DSAs would impact neighborhoods. The type of effect ranges from a minor right-of-way encroachment with no relocations/access changes to total displacement of a neighborhood. The most impacts to neighborhoods would be in the area between I-85 and US 321. The number of named neighborhoods impacted by the DSAs ranges from 15 (DSA 68 and DSA 81) to 24 (DSA 5). The number of rural (unnamed) neighborhoods impacted ranges from five (DSA 27) to ten (DSAs 58 and 64).

Indirect effects could occur to neighborhoods under any of the DSAs. The project could accelerate land use changes and 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 Gaston East-West Connector as a toll facility are not anticipated to be "disproportionately high and adverse".

### S.8.2.5 Community Resources and Services

**Churches and Cemeteries.** All of the DSAs, except for DSA 81, would result in an impact to at least one church and/or cemetery. DSAs 4, 5, and 23 would result in the most impacts. DSAs 27, 76, and 77 would have the least impacts to these facilities, other than DSA 81.

**Schools.** A minor encroachment on Sadler Elementary School property would be needed under DSAs 58, 64, 68, 76, 77, and 81. Normal use of the school and its access would not be impacted.

DSAs 4, 22, 58, and 76 could require land from the southeast corner and the front of the Forest View High School property to construct the relocation of NC 274 (Union Road). All access points to the school would remain. DSAs 5, 9, 23, and 27 would not impact either school.

**Parks and Recreation Areas.** All DSAs would require minor right-of-way acquisition from the edges of the publicly-owned property designated as future Berewick District Park, owned by Mecklenburg County. Private recreational facilities impacted by the DSAs include Karyae Park YMCA Outdoor Family Center (DSAs 58, 64, 68, 76, 77, and 81), Carolina Speedway (DSAs 5, 9, 23, 27, 64, 68, 77, and 81), and Duke Energy Corporation's Recreation Fields managed by the Belmont Optimist Club (DSAs 4, 9, 22, 27, 58, 68, 76, and 81). In addition, DSAs 5, 23, 64, and 77 would require a minor right-of-way acquisition on the northeastern corner of the privately-owned Daniel Stowe Botanical Garden.

**Fire Stations.** DSAs 58, 64, and 68 could require right of way from the front of the Crowders Mountain Volunteer Fire Department along Bethany Road (SR 1112), but impacts to parking or other uses are not anticipated.

Overall, the cumulative effects of population growth and development in southern Gaston County could impact local school systems and place more of a burden on emergency management services.

### **S.8.3 IMPACTS TO THE PHYSICAL ENVIRONMENT**

#### **S.8.3.1 Traffic Noise**

Traffic noise from the DSAs was evaluated based on FHWA and NCDOT criteria. The numbers of receptors estimated to be impacted by year 2030 traffic noise from the project range from 196 impacted Category B receptors for DSA 68, to 301 impacted receptors for DSA 76. Category B receptors in the Project Study Area are mostly residential, with some churches. Few Category C receptors (businesses) are impacted by noise along the DSAs, with the numbers of impacts ranging from three businesses for DSA 77 to ten businesses for DSA 22. For an explanation of noise activity categories (A, B, C, etc.), refer to **Table 4-1 in Section 4.1.2.**

Overall, ambient noise levels would be expected to increase in 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. Twenty-two locations were identified where preliminary noise barriers were determined to be potentially reasonable and feasible. In general, DSAs closer to the municipal limits (e.g. DSAs 4, 5, 9, 22, 23, and 27), particularly on the west side of the Project Study Area, have more noise impacts, a greater number of noise barriers, and higher noise abatement costs. DSAs 4, 9, and 22 have the longest length of barrier and the highest noise abatement costs. DSA 64 has the shortest length of barrier and the lowest noise abatement costs. 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 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 designs.

### S.8.3.2 Air Quality

The Project Study Area is in the Charlotte-Gastonia-Rock Hill air quality region (which includes Gaston County and Mecklenburg 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 NAAQS (National Ambient Air Quality Standards) is demonstrated if the project is included in a conforming transportation plan, which considers the urban area as a whole. The proposed project (STIP Project U-3321) is included in both the *2030 Long Range Transportation Plan* (LRTP) for the portion of the project located in the GUAMPO area and the *2030 LRTP* for the portion of the project located in the MUMPO area, both of which are conforming transportation plans, and so the project is in conformity with air quality standards at a regional level. The project is included in both LRTPs as a four-lane, non-toll facility. If the Preferred Alternative is a toll facility, the LRTPs will need to be amended prior to completion of the NEPA process to designate the project as a toll road.

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 H**). 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 the 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 on the evaluation under the Farmland Protection Policy Act (FPPA).

There are 21 parcels currently participating in the Voluntary Agricultural District (VAD) program that would be directly impacted by various DSAs. These parcels are mainly concentrated in the area surrounding the intersection of Union Road and Union New Hope Road with additional parcels along Robinson Road near York Road and north of Lewis Road near Camp Rotary Road. The impacted VAD acreage ranges from 44.7 to 138.4 acres. DSAs 64 and 68 would impact the most VAD acreage and DSAs 4 and 22 would impact the least VAD acreage.

Duck Crossing Farm in Corridor Segment J1c would require relocation with DSAs 64 and 68, and the White Rock Horse Farm in Corridor Segment K1A would require relocation with DSAs 5, 9, 23, 27, 64, 68, 77, and 81. Because much of southern Gaston County is still rural, it is anticipated there would be suitable replacement property available for farm relocation.

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 Gaston East-West Connector, but at a higher rate if the project is implemented.

#### **S.8.3.4 Utilities**

All proposed DSAs would cross power transmission lines, natural gas transmission pipelines, natural gas distribution lines, water lines, sewer lines, and other utilities. The NCTA would coordinate with all utility providers to avoid or minimize service disruptions caused by construction or permanent relocation/modification of the utility.

Future growth in the Project Study Area has the potential to place increased pressure on the county's water and sewer infrastructure. Future growth in some areas is constrained due to current sewer capacity issues.

A Norfolk-Southern Railroad mainline runs east-west through Gaston County. It is close to, and parallels, the east side of NC 274 (Bessemer City Road). Under DSAs 4, 5, 9, 22, 23, and 27, modifications to the I-85/NC 274 interchange and the interstate mainline would require replacement of the existing Norfolk-Southern railroad bridge over I-85. The NCTA would coordinate with Norfolk Southern Railroad and the NCDOT Rail Division during final design if DSA 4, 5, 9, 22, 23, or 27 is selected as the Preferred Alternative.

#### **S.8.3.5 Visual Resources**

DSAs that have a higher number of neighborhoods exposed to the roadway (i.e., impact a greater number of neighborhoods with residential relocations) were estimated to have a greater degree of visual impacts. Therefore, DSAs 4 and 5 would have the most visual impacts, and DSAs 27 and 81 would have the least.

All DSAs would result in visual impacts to riverfront residents (particularly those in proximity to the Catawba River bridge) and to boaters on the Catawba River and South Fork Catawba River.

#### **S.8.3.6 Hazardous Materials**

Hazardous materials sites within and near the DSAs are generally concentrated around I-85, US 29-74, and US 321. The potentially contaminated sites are estimated as having a low, low to medium, or medium anticipated impact severity, and no sites have an anticipated impact severity of high. DSA 64 contains the lowest number of potentially contaminated sites (12) and DSAs 4 and 9 contain the highest number of potentially contaminated sites (each has 24).

#### **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 on preliminary hydraulic analysis, DSAs 22, 23, and 27 would have the largest numbers of bridges (eight bridges) and DSA 58 would have the least (six bridges). DSAs 4 and 58 would have the most numbers of major culverts and pipes (47 culverts and pipes), while DSA 77 would have the fewest (39 culverts and pipes).

DSAs closer to the municipal limits of Gastonia and Belmont (DSAs 4, 5, and 9) would cross the most numbers of floodways, since floodway limits in Gaston County have only been defined for areas within and near the municipal limits. DSAs that are closer to Crowders Creek (DSAs 4, 5, 9, 22, 23, and 27) have the most total floodway and floodplain crossings.

## S.8.4 IMPACTS TO CULTURAL RESOURCES

### S.8.4.1 Historic Architectural Resources

Eighteen resources on or eligible for listing on the National Register of Historic Places 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 National Register of Historic Places. Thirteen properties would have No Effect from the DSAs. There are five properties with a No Adverse Effect determination. Each DSA is associated with one to three of these properties. During final design of the Preferred Alternative, the designs will be reviewed to ensure the applicable conditions are met to maintain the No Adverse Effect determinations.

#### S.8.4.2 Archaeological Resources

The archaeological resource assessment included an evaluation of the potential for archaeological site types that would merit preservation in place or would require costly and complex excavation. The results indicate that DSAs 4, 22, 58, and 76 have the highest overall potential for these types of archaeological sites, while DSAs 23 and 27 have the lowest potential. Regardless of ranking, the Preferred Alternative, once defined, is recommended for additional survey to determine if archaeological sites eligible for listing on the National Register of Historic Places are present. The results of the archaeological survey will be reported in the Final EIS.

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

**Section 4(f) Resources.** All DSAs would involve a minor encroachment into the undeveloped parcels owned by Mecklenburg County that are designated for future park use as Berewick District Park. It appears there are grounds for a finding of *de minimis* effect, and NCTA intends to seek a *de minimis* finding from FHWA. Section 4(f) property may be used where the FHWA determines that the use of the property, including any measure(s) to minimize harm (such as any avoidance, minimization, mitigation, or enhancement measures) committed, will have a *de minimis* impact (as defined in 23 CFR 774.17) on the property. By publishing this Draft Environmental Impact Statement (Draft EIS), FHWA is requesting comments on the proposed finding of *de minimis* impact for the planned Berewick District Park. The final determination regarding this property will be included in the Final Environmental Impact Statement (Final EIS).

Of the five historic architectural properties within the DSAs, only the Wolfe Family Dairy Farm would have a direct encroachment. Approximately 29 acres from the property would be required to construct DSA 58, 64, 68, 76, 77, or 81. Provided specific conditions are met, there is a determination of No Adverse Effect to the property. The FHWA has determined that the impacts from DSAs 58, 64, 68, 76, 77, and 81 would constitute a *de minimis* effect, and therefore an analysis of avoidance alternatives is not required. If DSA 58, 64, 68, 76, 77, or 81 is selected as the Preferred Alternative, the FHWA intends to make a *de minimis* finding, and at that time the Section 4(f) process would be complete for this property. The SHPO concurred with the *de*

*minimis* finding on August 11, 2008 (letter in **Appendix A-5** from FHWA dated August 7, 2008, with signed SHPO concurrence dated August 11, 2008).

**Section 6(f) Resources.** Crowders Mountain State Park is the only Section 6(f) resource located near the DSAs. None of the DSAs would directly impact the park or convert any of the park property to a non-recreational purpose.

## 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 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 would be developed for the selected alternative in accordance with the NC Department of Environment and Natural Resources (NCDENR) publication *Erosion and Sediment Control Planning and Design* and the NCDOT’s *Best Management Practices for Protection of Surface Waters*.

Boating, fishing, and waterskiing occur on the Catawba River and South Fork Catawba River. The DSAs that cross the South Fork Catawba River and Catawba River south of the Duke Energy Corporation’s Allen Steam Station (DSAs 5, 23, 64, and 77) would cross in areas with greater potential for impacts to recreational opportunities. Recreation likely would be temporarily affected during construction of the bridges.

Lake Wylie is included in the Federal Energy Regulatory Commission (FERC) boundary for the Catawba-Wateree Hydro Project for which Duke Energy has a FERC license. All the proposed DSAs cross Lake Wylie and a FERC permit would be needed. The NCTA has initiated coordination with Duke Energy Corporation regarding the FERC permit process. In addition, FERC has been invited to be a cooperating agency in this study because FERC’s approval would be needed for any of the DSAs.

The Gaston East-West Connector 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).

Actions including the 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 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. DSAs 5, 23, 27, 58, 64, 68, 77, and 81 would have a greater potential to indirectly affect upland species due to habitat fragmentation because these corridor segments are located the farthest distance away from previously fragmented forestland. DSAs 4, 9, 22, and 76 would have similar levels of lesser indirect effects due to existing habitat fragmentation.

The impacts of habitat fragmentation can be reduced by providing connections between habitats on either side of the Gaston East-West Connector. During final design, the NCTA will coordinate with the USFWS, USEPA, and the NCWRC on the possible design of the wildlife passage at Stream S156. All DSAs cross Stream S156, located between Forbes Road to the west and Robinson Road to the east.

**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 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 Jurisdictional Resources

**Wetlands, Streams, and Ponds.** Project construction for any of the DSAs cannot be accomplished without infringing on surface waters; including streams, wetlands, and ponds. Anticipated surface water impacts are under the jurisdiction of the USACE and the NCDWQ.

Most stream impacts would occur to perennial streams. DSA 58 and DSA 22 would impact the most linear feet of perennial stream, at 50,739 linear feet and 50,100 linear feet, respectively. The fewest linear feet of perennial stream impacts would occur with DSA 81 (36,771 linear feet) and DSA 68 (37,223 linear feet).

Wetland impacts for the DSAs range from 6.9 acres for DSA 5 to 13.2 acres for DSA 68. The three DSAs with the most wetland impacts (DSAs 58, 64, and 68) are those that use Corridor Segment H1C, the westernmost corridor segment.

Pond impacts range from 2.1 acres for DSA 68 to 6.3 acres for DSA 4.

Implementation of any of the DSAs would require an Individual Section 404 Permit from the USACE for the surface water impacts, and a corresponding Section 401 Water Quality Certification from the NCDWQ. Mitigation for impacts will be required under the permit.

**Catawba Buffer Rules.** Based upon the preliminary engineering designs within each DSA, impacts to the Catawba River riparian buffers are projected for the crossings of Lake Wylie. Since Lake Wylie spans the Project Study Area, none of the DSAs could avoid crossing Catawba River buffers. DSAs 4, 22, 58, and 76 would have the least overall impacts to Catawba River buffers. These DSAs would be designated as uses that are allowable without mitigation because they would cumulatively impact less than one-third acre (14,505 square feet) of buffer area. DSAs 5, 9, 23, 27, 64, 68, 77, and 81 would be designated as uses that are allowable with mitigation because they would cumulatively impact more than one-third acre of buffer.

#### S.8.5.5 Protected Species

The DSAs were surveyed for federally protected plants and animals: bald eagle, bog turtle, Carolina heelsplitter (mussel), Michaux's sumac, Schweinitz's sunflower, and smooth coneflower. The DSAs are anticipated to have no effects on bald eagle, bog turtle, Carolina heelsplitter, Michaux's sumac and smooth coneflower.

There is a population of the endangered Schweinitz's sunflower on the northern edge of Corridor Segment K2A (DSAs 4, 22, 58, and 76). Due to its location along the northern edge of the DSA corridor, it is assumed that all direct impacts to the observed Schweinitz's sunflower population can be avoided. Indirect impacts from the DSAs to this site also are not likely. Concurrence from the USFWS on the biological conclusion of May Affect/Not Likely to Adversely Effect would be needed if DSA 4, 22, 58 or 76 is selected as the Preferred Alternative. Only informal consultation is likely to be required.

## S.9 UNRESOLVED ISSUES AND AREAS OF CONTROVERSY

Unresolved issues to be addressed prior to the publication of the Final Environmental Impact Statement (Final EIS) include:

- Selection of the Least Environmentally Damaging Practicable Alternative (LEDPA) and Preferred Alternative, and identification of avoidance and minimization efforts within the corridor of the selected alternative.
- Preparation of a conceptual mitigation plan for unavoidable wetland and stream impacts.
- Completion of additional archaeological surveys for the Preferred Alternative corridor.
- Amendment of the local LRTPs to ensure consistency of design concept and scope with the Preferred Alternative (if the Preferred Alternative is a toll facility).

## S.10 OTHER GOVERNMENT ACTIONS REQUIRED

### S.10.1 PERMITS REQUIRED

All the proposed DSAs for the Gaston East-West Connector 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 in water or wetlands that would discharge dredged or fill materials in to 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 the USACE on how impacts to fish and wildlife resources and habitats can be minimized.

*Authority.* Endangered Species Act of 1973, Section 7; Fish and Wildlife Coordination Act.

#### Federal Energy Regulatory Commission

*Federal Energy Regulatory Commission (FERC) Permit.* Lake Wylie is included in the FERC boundary for the Catawba-Wateree Hydro Project for which Duke Energy Corporation has a FERC license. Any crossings of Lake Wylie's contour line at 569.4 feet above Mean Sea Level require a permit. All DSAs would cross Lake Wylie. Upon identification of a Preferred Alternative, the NCTA will coordinate with Duke Energy Corporation to comply with the FERC permit process. The process is anticipated to result in a FERC license revision to allow the transfer of land within the FERC project boundary to the NCTA to construct the Gaston East-West Connector including bridges over Lake Wylie. Information on FERC licensing can be found at the FERC Web site: [www.ferc.gov](http://www.ferc.gov).

*Authority.* Federal Power Act, 16 USC 791a-825r, 2601-2645 and 42 USC 7101-7352. Regulations promulgated in 18 CFR Part 4 (FERC Web site: [www.ferc.gov/legal/maj-ord-reg.asp](http://www.ferc.gov/legal/maj-ord-reg.asp)).

**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 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.

*Catawba River Riparian Buffer Certification.* The Catawba River Buffer Certification will be obtained from NCDWQ in conjunction with the Section 401 Water Quality Certification.

*Authority.* North Carolina General Statute 143, Article 214, Parts 20-23. Regulations promulgated in 15A NCAC 02B.0243-0244.

*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.* NCDWQ has established rules to protect isolated wetlands and isolated waters within the state of North Carolina. Activities which result in a discharge in 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 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 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 to advance the project through the NEPA process, Section 404 permitting, and other requirements. 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 Least Environmentally Damaging Practicable Alternative (LEDPA) and Preferred Alternative by the NCTA in consultation with the FHWA, NCDOT, and the Agency Coordination Team.
- Hazardous materials investigations will be conducted, if necessary, to further review sites which could be potentially impacted by the Preferred Alternative.
- Preliminary designs may be refined for the Preferred Alternative, and will include efforts to further minimize impacts to the human and natural environments, specifically to streams and wetlands.
- 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 the USACE.
- Additional surveys for protected species will be conducted as needed for the Preferred Alternative, in conjunction with USFWS.

The Final Environmental Impact Statement (Final EIS) will be prepared based on 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 Record of Decision, additional public involvement will be conducted to receive public comments on the refined preliminary 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 major 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 on updated traffic and detailed design plans will be conducted to evaluate whether or not potential noise barriers are still feasible and reasonable.
- Geotechnical investigations will be conducted to identify abandoned mine shafts and recommend 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 the 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											
	4	5	9	22	23	27	58	64	68	76	77	81
Length (miles)	21.4	21.5	21.9	21.9	22.0	22.4	23.1	23.3	23.7	21.8	21.9	22.2
Construction Costs (millions \$) <sup>1</sup>	955.0-1,140.8	980.2-1,173.2	974.5-1,168.4	999.5-1,195.0	1,022.6-1,228.2	1,019.7-1,221.7	978.2-1,171.3	992.4-1,188.6	986.2-1,180.9	982.1-1,174.0	1,007.4-1,209.6	1,000.5-1,199.7
Right-of-Way Cost (millions \$) <sup>1</sup>	186.7-228.5	199.1-243.0	173.9-213.0	197.0-241.1	208.8-255.5	183.5-224.5	197.3-241.3	215.7-263.2	190.8-233.2	182.4-223.2	194.6-237.6	169.6-207.3
Environmental Mitigation Costs(millions \$) <sup>1</sup>	38.9-41.1	34.8-36.7	32.2-34.0	40.4-42.6	36.4-38.4	33.8-35.7	41.5-43.7	34.3-36.1	31.8-33.5	37.7-39.8	33.2-35.0	31.1-32.8
Total Costs (millions \$) <sup>1</sup>	1,180.6-1,410.4	1,214.1-1,452.9	1,180.6-1,415.4	1,236.9-1,478.7	1,267.9-1,522.0	1,237.1-1,481.9	1,217.0-1,456.3	1,242.4-1,488.0	1,208.7-1,447.6	1,202.1-1,436.9	1,235.2-1,482.3	1,201.2-1,439.8
Median Total Project Cost (millions \$) <sup>1</sup>	1,280.5	1,316.9	1,282.0	1,342.2	1,378.4	1,342.9	1,321.2	1,348.2	1,312.6	1,304.3	1,341.9	1305.0
<b>LAND USE</b>												
Compatible with Land Use Plans	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ICE <sup>2</sup> : Potential for Accelerated Growth and Indirect Effects in Gaston County	High	High	High	High	High	High	High	High	High	High	High	High
<b>RELOCATIONS AND NEIGHBORHOOD IMPACTS</b>												
Residential Relocations	377	358	348	373	354	344	359	336	326	384	365	355
Business Relocations	38	33	37	40	35	39	30	26	30	29	24	28
Named Neighborhoods	21	24	18	19	22	16	17	21	15	18	21	15
Rural Neighborhoods <sup>3</sup>	8	8	7	6	6	5	10	10	9	7	7	6
ICE <sup>2</sup> : Potential for indirect effects due to proximity to neighborhoods	Most	Most	Most	Most	Moderate	Most	Most	Least	Moderate	Most	Least	Moderate

TABLE S-2: Summary of Environmental Impacts

ISSUE	DETAILED STUDY ALTERNATIVE											
	4	5	9	22	23	27	58	64	68	76	77	81
<b>MITIGATION</b>	Conform to Uniform Relocation Act; continue public outreach efforts; meet with neighborhood organization and business community representatives; continue to evaluate design improvements to lessen impacts.											
<b>COMMUNITY SERVICES AND FACILITIES IMPACTS</b>												
Public Parks <sup>4</sup>	1	1	1	1	1	1	1	1	1	1	1	1
Private Recreational Facilities <sup>5</sup>	2 <sup>b,d</sup>	3 <sup>b,c,e</sup>	3 <sup>b,c,d</sup>	1 <sup>d</sup>	2 <sup>c,e</sup>	2 <sup>c,d</sup>	2 <sup>a,d</sup>	3 <sup>a,c,e</sup>	3 <sup>a,c,d</sup>	2 <sup>a,d</sup>	3 <sup>a,c,e</sup>	3 <sup>a,c,d</sup>
Schools <sup>6</sup>	1	0	0	1	0	0	2	1	1	2	1	1
Churches with Impacts to Main Buildings	2	3	2	1	2	1	1	2	1	0	1	0
Churches with Impacts to Property and/or Outbuildings Only	3	3	1	4	4	2	2	2	0	2	2	0
Cemeteries Requiring Relocation	1	1	0	1	1	0	1	1	0	1	1	0
<b>MITIGATION</b>	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 evaluate design improvements to lessen impacts.											
<b>NOISE IMPACTS</b>												
Total # of Impacted Receptors	302	271	245	298	267	241	272	231	204	309	278	276
ICE <sup>2</sup> : Overall ambient noise increase	Weak to moderate effects	Weak to moderate effects	Weak to moderate effects	Weak to moderate effects	Weak to moderate effects	Weak to moderate effects	Weak to moderate effects	Weak to moderate effects	Weak to moderate effects	Weak to moderate effects	Weak to moderate effects	Weak to moderate effects
<b>NOISE MITIGATION</b>												
Total Length of Noise Barriers (ft)	22,162	19,220	20,562	19,922	16,980	18,322	13,926	10,335	11,677	17,967	15,025	16,367
Total # of Noise Barriers <sup>7</sup>	13	11	12	11	9	10	8	6	7	10	8	9

**TABLE S-2: Summary of Environmental Impacts**

ISSUE	DETAILED STUDY ALTERNATIVE											
	4	5	9	22	23	27	58	64	68	76	77	81
Number of Benefitted Receptors	191	157	169	171	144	149	132	98	110	161	128	139
<b>AIR QUALITY IMPACTS</b>												
Transportation Conformity	The LRTPs and air quality conformity determinations for the MUMPO and GUAMPO regions will need to be updated prior to the completion of the Record of Decision so the project design concept and scope are consistent.											
Mobile Source Air Toxics (MSATs)	Qualitative assessment completed. Current tools and science not adequate to quantify the health impacts from MSATs.											
<b>FARMLAND IMPACTS</b>												
VAD <sup>8</sup> Acreage Impacted by right of way	44.7	49.2	49.2	44.7	49.2	49.2	68.8	138.4	138.4	64.0	68.5	68.5
Farm Relocations	0	1	1	0	1	1	0	2	2	0	1	1
ICE <sup>2</sup> : Potential for indirect effects on agriculture and farmland	Least	Least	Least	Least	Least	Least	Moderate	Most	Most	Moderate	Moderate	Moderate
<b>MITIGATION</b>	None required.											
<b>UTILITIES IMPACTS</b>												
Power Transmission Line Crossings <sup>10</sup>	14	13	14	14	13	14	18	17	17	17	15	17
Gas Transmission Pipeline Crossings <sup>11</sup>	4	4	4	4	4	4	4	4	4	4	4	4
Railroad Crossings	2	1	2	2	1	2	2	1	2	2	1	2
<b>MITIGATION</b>	Coordinate temporary and permanent changes in utility lines with each of the utility providers.											
<b>VISUAL IMPACTS</b>												
Changes in the Visual Landscape	Most visual impacts	Most visual impacts	Moderate visual impacts	Moderate visual impacts	Moderate visual impacts	Least visual impacts	Moderate visual impacts	Least visual impacts				

TABLE S-2: Summary of Environmental Impacts

ISSUE	DETAILED STUDY ALTERNATIVE											
	4	5	9	22	23	27	58	64	68	76	77	81
<b>MITIGATION</b>	Implement a landscaping plan for the project. Investigate the feasibility and reasonableness of cost-effective treatments for the bridge sides, piers, and railings to enhance aesthetics.											
<b>HAZARDOUS MATERIALS IMPACTS</b>												
Hazardous Materials Sites within DSA Corridor	24	23	24	22	21	22	14	12	13	14	13	14
<b>MITIGATION</b>	A more detailed field reconnaissance will be conducted for the Preferred Alternative.											
<b>FLOODPLAINS/FLOODWAYS IMPACTS</b>												
Floodplain Crossings	12	13	13	12	13	13	11	12	12	10	11	11
Longitudinal Floodplain Encroachment	1	1	1	0	0	0	0	0	0	0	0	0
Floodway Crossings	10	10	10	9	9	9	7	7	7	7	7	7
Number of Major Culverts/Pipes (>72" diameter) <sup>12</sup>	47	43	45	45	41	43	47	42	44	42	39	40
<b>MITIGATION</b>	The effect of all the DSAs can be mitigated through proper sizing and design of hydraulic structures (culverts, bridges, and channel stabilization). A detailed hydrologic and hydraulic analysis will be conducted for the Preferred Alternative.											
<b>CULTURAL RESOURCES IMPACTS</b>												
Historic Resources with No Adverse Effect <sup>13</sup>	1 <sup>a</sup>	2 <sup>b,c</sup>	2 <sup>b,c</sup>	1 <sup>a</sup>	2 <sup>b,c</sup>	2 <sup>b,c</sup>	2 <sup>a,e</sup>	3 <sup>b,d,e</sup>	3 <sup>b,d,e</sup>	2 <sup>a,e</sup>	3 <sup>b,c,e</sup>	3 <sup>b,c,e</sup>
Overall Potential for Archaeological Sites	High	Moderate	Moderate	High	Low	Low	High	Moderate to High	Moderate to High	High	Moderate	Moderate
<b>MITIGATION</b>	During final design of the Preferred Alternative, the designs will be reviewed to ensure the applicable conditions are met to maintain the No Adverse Effect determinations. The Preferred Alternative, once defined, will be surveyed to determine if archaeological sites eligible for listing on the NRHP are present.											

TABLE S-2: Summary of Environmental Impacts

ISSUE	DETAILED STUDY ALTERNATIVE												
	4	5	9	22	23	27	58	64	68	76	77	81	
<b>SECTION 4(F)/6(F) RESOURCES IMPACTS</b>													
Section 4(f) Resources with <i>de minimis</i> Impact <sup>14</sup>	1	1	1	1	1	1	2	2	2	2	2	2	
Section 6(f) Resources	0	0	0	0	0	0	0	0	0	0	0	0	
<b>MITIGATION</b>	All applicable conditions must be met in order to maintain the No Adverse Effects determination to cultural resources. The 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.												
<b>NATURAL COMMUNITIES IMPACTS<sup>15</sup></b>													
Disturbed/Clearcut (acres)	552	561	567	544	553	560	513	535	542	514	523	529	
Agricultural (acres)	121	142	177	121	142	177	153	220	256	128	148	184	
Upland Forested (acres)	913	902	882	982	972	951	1042	1008	987	965	955	935	
Successional (acres)	155	128	114	125	99	85	149	117	102	156	130	115	
Open Water (acres)	22	26	21	22	26	21	22	26	21	22	26	21	
ICE <sup>2</sup> : Effects on wildlife and habitat through habitat fragmentation	Weak to moderate effects	Strong effects	Weak to moderate effects	Weak to moderate effects	Strong effects	Weak to moderate effects	Strong effects	Strong effects					
<b>MITIGATION</b>	An erosion and sedimentation 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. The NCTA will coordinate with the USFWS, USEPA, and the NCWRC on the feasibility and design of a wildlife passage at Stream S156 for all DSAs, and on designing bridge crossings to be wildlife friendly when feasible for all DSAs. Control measures will be implemented to reduce the potential for spreading non-native plant species.												

TABLE S-2: Summary of Environmental Impacts

ISSUE	DETAILED STUDY ALTERNATIVE											
	4	5	9	22	23	27	58	64	68	76	77	81
<b>JURISDICTIONAL RESOURCES IMPACTS<sup>16</sup></b>												
Pond Impacts (acres)	6.3	5.1	4.1	5.1	3.9	2.9	5.5	3.1	2.1	5.5	6.1	3.3
Wetland Impacts (acres)	7.4	6.9	7.5	8.8	8.2	8.9	12.1	12.5	13.2	9.7	9.1	9.8
Perennial Stream Impacts (linear ft.)	48,296	42,733	38,894	50,100	44,609	40,766	50,739	40,915	37,223	46,105	40,033	36,771
Intermittent Stream Impacts (linear ft.)	9,048	9,501	10,101	8,953	9,406	10,006	9,505	9,537	9,986	9,364	9,678	10,417
Total Stream Crossings	106	99	91	111	105	97	120	112	103	111	105	97
Total Stream Impacts (linear ft.)	57,344	52,234	48,995	59,053	54,015	50,772	60,244	50,452	47,209	55,469	49,711	47,188
Total Impacts to Catawba River Buffers (sq ft) <sup>17</sup>	4,145	22,590	20,615	4,145	22,590	20,615	4,145	22,590	20,615	4,145	22,590	20,615
ICE <sup>2</sup> : Effects on water quality, wetlands, impaired waterways, and watersheds	Very Strong effects	Very Strong effects	Very Strong effects	Very Strong effects	Very Strong effects	Very Strong effects	Strong effects					
<b>MITIGATION</b>	The DSAs incorporate measures to avoid and minimize impacts to Waters of the US and the Catawba River buffers. The NCTA agreed to include several bridges in the preliminary 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 and Catawba River riparian buffers. Strict adherence to Best Management Practices will assist in minimizing project impacts.											

TABLE S-2: Summary of Environmental Impacts

ISSUE	DETAILED STUDY ALTERNATIVE											
	4	5	9	22	23	27	58	64	68	76	77	81
<b>PROTECTED SPECIES IMPACTS</b>												
Schweinitz's Sunflower <sup>18</sup>	May Affect/Not Likely to Adversely Affect	No Effect	No Effect	May Affect/Not Likely to Adversely Affect	No Effect	No Effect	May Affect/Not Likely to Adversely Affect	No Effect	No Effect	May Affect/Not Likely to Adversely Affect	No Effect	No Effect
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
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
Carolina Heelsplitter	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect	No Effect
<b>MITIGATION</b>	Concurrence needed from US Fish and Wildlife Service on the biological conclusion of May Affect/Not Likely to Adversely Effect. Once the Preferred Alternative is selected, additional surveys will be conducted as needed.											

Notes:

1. Source: Gaston Cost Estimate Support Memorandum, HNTB, December 2008
2. ICE = Indirect and/or cumulative effect
3. Neighborhoods not named/identified in available GIS mapping, but areas containing clusters of homes and considered rural communities
4. Berewick District Park (owned by Mecklenburg County)
5. a) Karyae YMCA Facility – impact to structures, entrance, and parking; b) Linwood Springs Golf Course - access change only; c) Carolina Speedway – right-of-way encroachment and impact to parking ; d) Duke Energy recreational fields – right-of-way encroachment, e) Daniel Stowe Botanical Garden – minor right-of -way encroachment
6. DSAs 4, 22, 58 and 76 encroach on Forestview High School’s property edge and some parking areas. DSAs 58, 64, 68, 76, 77, and 81 encroach on Sadler Elementary School property with no impacts to school use or access.
7. Undeveloped lots behind the barrier must have a building permit issued by the Date of Public Knowledge for this barrier to be cost effective.
8. VAD – Voluntary Agricultural District
9. Acreages are calculated for the preliminary engineering design right of way for each DSA. Areas of prime and statewide important soils already in urban development were not included in the totals.
10. There may be one to three individual lines in a power transmission easement. This table reports the numbers of individual transmission line crossings.
11. The four gas transmission pipeline crossings are located in the two easements that cross US 321 near Crowders Creek Road.
12. Includes all of the multiple pipes/culverts required at interchanges.
13. a) Thomas Allison House; b) Harrison Family Dairy Farm; c) JBF Riddle House; d) William Clarence Wilson House; e) Wolfe Family Dairy Farm
14. *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. Berewick District Park would be minimally impacted by all DSAs and it appears there are grounds for a *de minimis* finding. *De minimis* impacts related to historic sites are defined as the determination of either "No Adverse Effect" or "No Historic Properties Affected" in compliance with Section 106 of the National Historic Preservation Act (NHPA). The Wolfe Family Dairy Farm would be impacted by DSAs 58, 64, 68, 76, 77, and 81. The State Historic Preservation Office has concurred that these impact would constitute a *de minimis* effect , and FHWA intends to use SHPO’s concurrence as a basis of a *de minimis* finding for this property if DSA 58, 64, 68, 76, 77, or 81 is selected as the Preferred Alternative.
15. Acreages calculated within the DSA right-of-way limits.
16. These impacts were calculated using the preliminary engineering designs’ construction limits, with an additional 25-foot buffer.
17. This includes impacts to buffer zones 1 and 2 for the Catawba River, South Fork Catawba River, and Catawba Creek. Mitigation is not required for impacts of less than one-third acre (14,505 square feet).
18. Due to its location on the northern edge of the DSA corridor, it is assumed all impacts to the observed Schweinitz's sunflower population will be avoided.