

Attachment 198

Part 1 of 3

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Volume 1
Text and Figures;
Appendices A, C-K

Gaston East-West Connector

Administrative Action Final Environmental Impact Statement

December 2010

Lead Agencies: US Department of Transportation
Federal Highway Administration
North Carolina Turnpike Authority
North Carolina Department of Transportation

Cooperating Agency: US Army Corps of Engineers

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Gaston East-West Connector
Gaston and Mecklenburg Counties
STIP Project U-3321

ABSTRACT

The proposed action is the construction of a controlled-access toll facility extending from I-85 west of Gastonia in Gaston Mecklenburg County to I-485 near the Charlotte-Douglas International Airport in Mecklenburg County, a distance of approximately 22 miles. This Condensed Final Environmental Impact Statement (EIS) documents the need for proposed action, identifies the Preferred Alternative, and assesses potential direct, indirect, and cumulative impacts of the Preferred Alternative, including socioeconomics, community resources, cultural resources, natural resources, environmental quality, and costs. Public and government agency comments on the Draft EIS are also addressed in this document.



NORTH CAROLINA
Turnpike Authority

**Gaston East-West Connector
I-85 to I-485 and NC 160
Gaston and Mecklenburg Counties**

Federal Aid Project Number STP-1213(6)
State Project Number 8.2812501
WBS Element 34922.1.TA.1
STIP Project Number U-3321

**Administrative Action
Final Environmental Impact Statement**

Submitted Pursuant to the National Environmental Policy Act
42 USC 4332(2)(c)
US Department of Transportation
Federal Highway Administration
and
North Carolina Turnpike Authority

Cooperating Agency: US Army Corps of Engineers

12.21.2010

Date

A handwritten signature in black ink, appearing to read "S. D. DeWitt".

Steven D. DeWitt, PE
Chief Engineer
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12-21-2010

Date

A handwritten signature in black ink, appearing to read "John F. Sullivan, III".

John F. Sullivan, III, PE
Division Administrator
Federal Highway Administration



NORTH CAROLINA
Turnpike Authority

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 I-85 to I-485 and NC 160
 Gaston and Mecklenburg Counties**

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**Document Prepared By:
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12/21/10
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Jill Gurak
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12/21/10
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**Document Prepared For:
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Jennifer Harris
 Jennifer Harris, PE
 Staff Engineer
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Note: *This Final EIS has been published in two volumes:*

VOLUME 1 – Table of Contents; Text and Figures; Appendices A, C-K

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 - B3. Interest Group Letters and Letters Responding to the USACE Public Notice
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- K. Intensive Archaeological Survey Information and Agency Correspondence

P. PREFACE



This Preface lists the lead agencies and their contact information, provides background on the National Environmental Policy Act, explains how the Final Environmental Impact Statement (Final EIS) will be used, and describes the organization of this Final EIS. A brief history of the project is included along with an update on activities since the Draft EIS was prepared.

P.1 LEAD AGENCIES, COOPERATING AGENCIES, AND PARTICIPATING AGENCIES

The lead agencies for this project are the Federal Highway Administration (FHWA) and the North Carolina Turnpike Authority (NCTA). In the Draft EIS, the North Carolina Department of Transportation (NCDOT) also was listed as a lead agency. On July 27, 2009, Session Law 2009-343 was signed, transferring the functions and funds of the NCTA to the NCDOT, and the NCTA became a division of the NCDOT.

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

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North Carolina Turnpike Authority (a Division of NCDOT)

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The US Army Corps of Engineers (USACE) is a cooperating agency. The Federal Energy Regulatory Commission (FERC) was invited to be a cooperating agency; however, the FERC provided no response, so they automatically are a participating agency. The following agencies are participating agencies:

- US Environmental Protection Agency (USEPA)
- US Fish and Wildlife Service (USFWS)
- Federal Energy Regulatory Commission

- 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)

The cooperating and participating agencies are identified in the *Gaston East-West Connector Section 6002 Coordination Plan* (NCTA, October 2008), prepared in accordance with Section 6002 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU). The *Section 6002 Coordination Plan*, included in Appendix A-7 of the Draft EIS, describes agency roles and public and agency participation in the planning process.

SAFETEA-LU promotes more efficient and effective Federal surface transportation programs by focusing on transportation issues of national significance, while giving State and local transportation decision makers more flexibility for solving transportation problems in their communities (FHWA Web site: www.fhwa.dot.gov/safetealu/summary.htm). Section 6002 of SAFETEA-LU provides provisions affecting the timely delivery of the environmental review process and the completion of environmental impact statements (FHWA Web site: http://environment.fhwa.dot.gov/wizard/wiz_provisions.asp).

P.2 HOW THIS FINAL EIS WILL BE USED

The National Environmental Policy Act (NEPA) of 1969, as amended, requires federal agencies to consider the potential environmental consequences of their proposals, document their analyses, and make this information available to the public for comment prior to project or program implementation (FHWA Web site: <http://environment.fhwa.dot.gov/projdev/index.asp>).

This document will be used by FHWA as the basis for the Record of Decision (ROD), which is the final document prepared under the National Environmental Policy Act (NEPA) process. The Record of Decision (ROD) identifies the Selected Alternative corridor and presents the basis for the decision. It should be noted that the ROD identifies a corridor, not a specific design. The preliminary design for the Preferred Alternative presented in this Final EIS may change during final design activities occurring after the ROD, provided the modifications are within the Selected Alternative corridor.

The FHWA NEPA process allows transportation officials to make project decisions that balance engineering and transportation needs with social, economic, and natural environmental factors. During the process, a wide range of partners (including the public, businesses, interest groups, and agencies at all levels of government) provides input into project and environmental decisions (FHWA Web site: <http://environment.fhwa.dot.gov/projdev/pd3tdm.asp>).

P.3 ORGANIZATION OF THIS FINAL EIS

This Final EIS uses a “condensed” format, as described in the FHWA Technical Advisory T6640.8A, *Guidance for Preparing and Processing Environmental and Section 4(f) Documents* (FHWA Web site: <http://environment.fhwa.dot.gov/projdev/impTA6640.asp>). This approach avoids repetition of material from the Draft EIS by incorporating by reference the Draft EIS, and instead allows the focus of the Final EIS to be on important changes that have occurred since the

Draft EIS, comments received on the Draft EIS and responses to those comments, and new information that has been considered.

As described in the Technical Advisory, the “crux of this approach is to briefly reference and summarize information from the draft EIS which has not changed and to focus the final EIS discussion on changes in the project, its setting, impacts, technical analyses, and mitigation that have occurred since the draft EIS was circulated.” The Draft EIS, incorporated by reference, is available for download on the NCTA Web site (www.ncturnpike.org/projects/gaston) and is included as a CD with all hard copies of the Final EIS.

This Final EIS is divided into eight sections, as described briefly below:

- **Chapter P** is this Preface.
- **Chapter PC** lists the special project commitments that NCTA has agreed to implement for the Preferred Alternative.
- **Chapter 1** provides a summary of information presented in *the Gaston East-West Connector Administrative Action Draft Environmental Impact Statement (April, 2009)*, including the purpose and need and the alternatives considered. This section also contains minor corrections (errata) (a list of all errata is included in **Appendix A**), clarifications, and updates to information in the Draft EIS not specific to the Preferred Alternative. These include, but are not limited to, updates to the existing environment and an update to background information on mobile source air toxics.
- **Chapter 2** describes the Preferred Alternative and the reasons it was selected. This chapter also describes additional design work, other studies conducted for the Preferred Alternative, and updates to impacts associated with the Preferred Alternative that have been prepared since the Draft EIS.
- **Chapter 3** details continued coordination efforts with the public, as well as federal, state, and local agencies, since the Draft EIS was issued for public review. Substantive comments on the Draft EIS and responses to those comments are also included. All comments and responses are included in **Appendix B**.
- **Chapter 4** lists the principal participants in the preparation of this Final EIS.
- **Chapter 5** contains the distribution list for this Final EIS.
- **Chapter 6** includes the references and supporting documentation used in the preparation of this Final EIS. **Chapter 6** also includes a list of acronyms found throughout this Final EIS.

The Final EIS also includes appendices that are referenced throughout the document. The Final EIS, including figures and appendices, is available for download on the NCTA Web site (www.ncturnpike.org/projects/gaston). The supporting documentation listed in **Chapter 6** is comprised of technical memoranda and reports incorporated by reference into the Final EIS. This reference material is available for review upon request, with most documents also available on the NCTA Web site.

Note that throughout the Final EIS, references to sections, tables, figures, and appendices included in the Final EIS are in bold text, while references to these elements from the Draft EIS are not in bold text.

P.4 HISTORY OF THE PROJECT

Plans to improve east-west mobility in southern Gaston County through construction of a new location roadway have been discussed by the GUAMPO since the late 1980s. The NCDOT began planning for the Gaston East-West Connector in 2001. NCTA's involvement began in 2005, with the adoption of the project by the NCTA Board as a candidate toll facility.

P.5 ACTIVITIES SINCE THE DRAFT EIS

The *Gaston East-West Connector Administrative Action Draft Environmental Impact Statement* was signed on April 24, 2009 and made available for public and agency review on May 1, 2009 on the NCTA Web site. Copies of the document were distributed to public review locations and agencies May 11-13, 2009. The public comment period for the Draft EIS ended on July 21, 2009.

Public and Agency Coordination. Coordination efforts with the public and federal, state, and local agencies since the Draft EIS are summarized in **Chapter 3**. Four Pre-Hearing Open Houses and two Corridor Design Public Hearings were held June 22-25, 2009.

The NCTA conducted regularly scheduled agency coordination meetings throughout the project development process. These Turnpike Environmental Agency Coordination (TEAC) meetings were held to review the status of the current NCTA projects, to discuss and agree upon study methodologies, and to discuss and resolve environmental concerns and adherence to permitting requirements. For the Gaston East-West Connector, these meetings also included discussion of NEPA/404 Merger Process Concurrence Points (**Section 3.2**). Concurrence Points 1 (Purpose and Need), 2 (Detailed Study Alternatives), and 2a (Bridging and Alignment) were achieved prior to the Draft EIS. Concurrence Point 3 (Least Environmentally Damaging Practicable Alternative) and Concurrence Point 4a (Avoidance and Minimization of Impacts to Jurisdictional Resources) were achieved after the Draft EIS and prior to publication of the Final EIS.

Updates and Refinements to the Preferred Alternative. Refinements were made to the design of the Preferred Alternative based on input received from state and federal agencies and the public. Refinements include a 20-foot reduction in the median, the elimination of the Bud Wilson Road interchange, reconfiguration of five other project interchanges (Robinson Road, NC 274 (Union Road), NC 273 (Southpoint Road), Dixie River Road, and I-485), and further consideration of potential service road locations. These are described in **Section 2.3**.

Additional Studies. Several additional studies were prepared for the Preferred Alternative, including the following:

- Service Road Study (**Section 2.3.2**)
- Year 2035 Traffic Forecasts (**Section 2.3.5**)
- Traffic Operations Analysis based on 2035 Forecasts (**Section 2.3.5**)
- Traffic Noise Study Addendum (**Section 2.5.2.1**)
- Updated Hazardous Materials Study (**Section 2.5.2.6**)
- Phase II Intensive Archaeology Survey (**Section 2.5.3.2**)
- Conceptual Mitigation Plan (**Section 2.5.4.4**)
- Quantitative Indirect and Cumulative Effects Analysis (**Section 2.5.5**)

PC. SPECIAL PROJECT COMMITMENTS



This "SPECIAL SHEET" identifies the special project commitments made to avoid, minimize, or mitigate project impacts beyond those required to comply with applicable federal and state requirements and regulations.

During the National Environmental Policy Act (NEPA) process, commitments are made to avoid, minimize, or mitigate project impacts. Commitments result from public comment or through the requirements of, or agreements with, environmental resource and regulatory agencies.

In addition to compliance with applicable federal and state requirements and regulations, such as Section 404 Individual Permit Conditions, Nationwide Permit Conditions, Regional Conditions, and State Consistency Conditions; North Carolina Department of Transportation (NCDOT) Guidelines for Best Management Practices for the Protection of Surface Waters; General Certification Conditions and Section 401 Conditions of Certification, and the Endangered Species Act, Table PC-1 lists special project commitments that have been agreed to by the North Carolina Turnpike Authority (NCTA).

TABLE PC-1: Special Project Commitments

Item	Final EIS Section	Project Commitment	Project Stage
1	Community Resources and Services 2.5.15	NCTA will coordinate with Gaston County Public Schools and Mecklenburg County Public Schools to share information.	Final Design through Construction Management
2	Community Resources and Services 2.5.15	NCTA will coordinate with the Gaston Urban Area Metropolitan Planning Organization and the Catawba Land Conservancy to identify needed accommodations for any existing and funded greenways that cross the Preferred Alternative. NCTA will incorporate into the final design accommodations for existing and funded greenways, subject to applicable cost sharing.	Final Design
3	Community Resources and Services 2.5.15	Implementation of the Preferred Alternative may require re-routing of existing service routes during construction. NCTA will coordinate with the Gaston County Fire Marshal to ensure continuation of services during construction.	Final Design through Construction Management
4	Community Resources and Services 2.5.15	The refined preliminary design for the Preferred Alternative results in the direct taking of the Dixie Community Center on Garrison Road. If final design results in a direct taking, NCTA will conduct additional coordination with the Garrison Road Community Center non-profit organization and provide mitigation for the loss of this facility. The organization would be eligible for all the benefits for non-residential relocations under the NCCOT's relocation assistance program described in Section 2.5.1.2. Benefits would include, but not be limited to, advisory services to identify replacement sites, moving costs, and reestablishment expenses.	Final Design, ROW Acquisition
5	Community Safety 2.5.16	NCTA will ensure the bridge over the Catawba River will be designed so as not to preclude future accommodation of a pedestrian/bicycle facility funded by others, such as local jurisdictions. For established and planned bicycle routes, NCTA will coordinate with MUMPO and GUAMPD to accommodate these facilities where appropriate.	Final Design
6	Noise 2.5.21	A Design Noise Study will be prepared to update the noise analysis based upon the most recent FHWA regulations and NCCOT noise policies, traffic forecasts, and the final design.	Final Design

SPECIAL PROJECT COMMITMENTS **Chapter PC**

Item	Final US Section	Project Commitments	Project Stage
7	Farmland	25.3.3 The NCTA will comply with the VAD ordinance (Gaston County Voluntary Agricultural District Ordinance, Gaston County Web site: www.co.gaston.nc.us/ordinances/VADordinances0004-07-22.pdf) and will work with Gaston County regarding public hearings related to land condemnation proceedings against the VAD parcels prior to right-of-way acquisition.	Final Design, ROW Acquisition
8	Utilities and Infrastructure - Electrical	25.2.4 NCTA will coordinate with local utilities to avoid and minimize disruptions in service.	Final Design, Construction
9	Utilities and Infrastructure - Railroads	25.2.4 NCTA will coordinate with the NCDOT Rail Division and Norfolk Southern during final design for the project's interchange at I-85, which would offset the east-west rail mainline through Gaston County.	Final Design
10	Utilities and Infrastructure - Railroads	25.2.4 NCTA will coordinate with the NCDOT Rail Division and Norfolk Southern during final design of the crossing of the rail spur that serves Duke Energy Corporation's Allen Steam Station.	Final Design
11	Utilities and Infrastructure - Railroads	25.2.4 NCTA will coordinate with the NCDOT Rail Division and Norfolk Southern during final design for the project's interchange at US 321, which would offset the Norfolk Southern branch line that runs north-south parallel to the east side of US 321.	Final Design
12	Visual Resources	25.2.2 NCTA will investigate the feasibility and reasonableness of incorporating cost-effective treatments for the bridge sides, piers, and railings on the bridges over the South Fork Catawba River and Catawba River as part of an aesthetic plan for the project.	Final Design
13	Hazardous Materials	25.2.2 When the final proposed alignment is established and right-of-way limits are determined, a hazardous materials site assessment will be performed to the degree necessary to determine levels of contamination at any potential hazardous materials sites along the Preferred Alternative. The assessment will be made prior to right-of-way acquisition.	Final Design, ROW Acquisition
14	Historic Architectural Resources	25.3.3 NCTA will ensure that there is no taking of property, either by fee simple or permanent easement, from the Jiffy Ridge House.	Final Design
15	Historic Architectural Resources	25.3.3 NCTA will ensure that full access is maintained to the Harrison Family Dairy Farm.	Final Design
16	Archaeological Resources	25.3.2 Geotechnical studies and surveys conducted by NCTA will identify abandoned mines in the area.	Final Design through Construction Management
17	Water Resources	25.4.2 NCTA will coordinate with Duke Energy Corporation to obtain the necessary FERC permit. The process is expected to result in a FERC license revision to allow the granting of an easement within the FERC project boundary to NCTA to construct the Gaston East-West Connector, including the bridges over Lake 1916.	Final Design
18	Water Resources	25.4.2 An erosion and sedimentation plan will be developed for the Preferred Alternative prior to construction in accordance with all applicable regulations and guidance. The FFWA, NCTA, and NCDOT will work with the permitting agencies to determine the appropriate best management practices to implement for the project.	Final Design
19	Small Group Meetings	3.2.2 NCTA will review the refined preliminary design for evaluate ways to minimize costs and impacts on the Brouse's Iron & Metal site.	Final Design

CH. 1 DRAFT EIS SUMMARY & UPDATES



Chapter 1 provides a summary of information presented in the Draft Environmental Impact Statement (EIS) for the Gaston East-West Connector (April 2009). The information in this chapter is presented in the same order as in the Draft EIS. This chapter also contains, where indicated, clarification and updates such as changes in the existing environment or changes in guidance documents. Errata related to the Draft EIS is included in **Appendix A**.

1.1 PURPOSE AND NEED FOR ACTION

The purpose and need for the project are documented in detail in the *Final Updated Statement of Purpose and Need for the Gaston East-West Connector* (PBS&J, October 2008), incorporated by reference and available on the North Carolina Turnpike Authority (NCTA) Web site (www.ncturnpike.org/projects/gaston).

1.1.1 PROPOSED ACTION

The NCTA¹, in cooperation with the Federal Highway Administration (FHWA), 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. The purpose of the project is to improve east-west transportation mobility in the area around the City of Gastonia and other municipalities in southern Gaston County (between Gastonia and the Charlotte metropolitan area), with special emphasis on establishing direct access between the rapidly growing areas of southeast Gaston County and western Mecklenburg County.

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

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 resources in the foreseeable future to construct all priority projects. The current NCDOT *2009-2015 STIP* includes the project as a toll facility, and traditional (non-toll) transportation funding for this project is not likely in the foreseeable future. The *2035 Long Range Transportation Plan (LRTP)* for the Gaston Urban Area Metropolitan Planning Organization (GUAMPO) and the *2035 LRTP* for the Mecklenburg-Union MPO (MUMPO) both include the project as a toll facility.

A series of Citizens Informational Workshops (CIWs) took place in August 2008 to give the public an opportunity to comment on the purpose and need for the project. Agency comments on the purpose and need for the project were solicited; beginning with the initial project scoping letter on April 9, 2003. Additional information on public involvement and agency coordination related to the purpose and need is presented in **Section 1.4**.

¹ On July 27, 2009, NCTA became a division of NCDOT (NC Session Law 2009-343). Where applicable, references to NCDOT as a separate agency have been removed.

1.1.2 SUMMARY OF NEED FOR PROPOSED ACTION

The primary needs for the proposed action are summarized below, and have not changed since the Draft EIS was published. Detailed discussions of existing and projected conditions within the Project Study Area are presented in Sections 1.5 through 1.8 of the Draft EIS.

Poor Transportation Connectivity Between Gaston County and Mecklenburg County and Within Southern Gaston County

- Limited crossings of the Catawba River are constraining travel between Gaston and Mecklenburg Counties. The Catawba River separates Gaston and Mecklenburg Counties. Presently, there are only four crossings of the river between the two counties, with none of them located in the southern half of Gaston County (Section 1.5.1.3 of the Draft EIS).
- Projected growth in southern Gaston County and western Mecklenburg County will continue to increase demands for accessibility and connectivity between the two counties. A review of tax parcel data shows that from 2000 to 2008, the number of residences in southern Gaston County and western Mecklenburg County has increased approximately 24 percent (Sections 1.6.1 and 1.7.1 of the Draft EIS).
- South of I-85 in Gaston County, a lack of connecting east-west roadways makes travel circuitous and limits mobility for travel in southern Gaston County. Currently, there are no continuous east-west routes in southern Gaston County. The roads in southern Gaston County generally run north-south (Section 1.6.1 of the Draft EIS).
- Planned growth in southern Gaston County will result in an increased need for east-west mobility. Between 1990 and 2000, southeastern Gaston County was the fastest growing part of the county. This part of the county is expected to continue to experience high residential growth through 2020 (*Gaston County Comprehensive Plan*, Gaston County, adopted November 2002) (Sections 1.6.1, 1.7.1, and 1.8.3.1 of the Draft EIS).
- The GUAMPO and the MUMPO show in their plans a new location roadway running through southern Gaston County and connecting over the Catawba River to Mecklenburg County (Section 1.8.2 of the Draft EIS).
- The Gaston East-West Connector is a Strategic Highway Corridor (SHC). The Gaston East-West Connector is designated as a new freeway facility within the *Strategic Highway Corridors Vision Plan* (SHCVP) (Section 1.8.1.2 of the Draft EIS).

Existing and Projected Poor Levels of Service on the Project 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. On I-85, traffic volumes are projected to increase 29-50 percent between 2006 and 2030, to 105,000-198,400 vehicles per day (Section 1.6.2 of the Draft EIS).
- There are existing poor levels of service (LOS) on segments of I-85 in the Project Study Area. Based on 2006 traffic volumes, I-85 is operating at an LOS E or F from Exit 19 (NC 7 [Ozark Avenue] through Exit 27 (NC 273 [Park Street]) in Gaston County (Section 1.6.2.3 of the Draft EIS).
- Levels of service on I-85, US 29-74, and US 321 are projected to worsen in the future (Section 1.6.2 of the Draft EIS).

- 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 (Section 1.6.2.3 of the Draft EIS).

1.1.3 PROJECT PURPOSE

The purpose of the proposed action has not changed since the Draft EIS was circulated. 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 area of southeast Gaston County and western Mecklenburg County.

To meet the purpose and need, an alternative must provide more than a minor improvement. An improvement would be considered minor if it is localized, temporary, and/or largely unnoticeable to the typical user of the transportation system. Alternatives that provide only a minor improvement do not meet the purpose and need, and therefore are not reasonable alternatives.

1.1.4 BACKGROUND INFORMATION

Project setting, the existing road network, and public and agency involvement in the development of the purpose and need are discussed in more detail in Section 1.4 of the Draft EIS. These sections are briefly summarized below.

Project Setting. The Project Study Area is located in southern Gaston County and western Mecklenburg County, consisting of the following general boundaries: I-85 to the north, the South Carolina state line to the south, Charlotte-Douglas International Airport to the east, and the I-85 and US 29-74 junction and Crowders Mountain State Park to the west. Figure 1-1 shows the Project Study Area.

Local Project Planning Efforts. Plans to improve east-west mobility in southern Gaston County and western Mecklenburg County through construction of a new location roadway have been discussed by GUAMPO since the late 1980's, and MUMPO since the early 1990's. In 1991, the project concept was included in GUAMPO's Thoroughfare Plan. In 1994, MUMPO adopts a Thoroughfare Plan that includes the project.

NCTA selected the Gaston East-West Connector as a candidate toll facility in 2005.

Planning by NCDOT and NCTA. The NCDOT began planning for the Gaston East-West Connector in 2001, and NCTA's involvement began in 2005.

Public and Agency Involvement in Development of the Purpose and Need. The purpose and need for the project was first developed in 2002 when the project was being planned by NCDOT. In 2008, the purpose and need for the project was updated by NCTA to include the 2030 travel demand forecasts and recent updates to transportation and land use plans. The environmental resource and regulatory agencies concurred on the updated purpose and need in October 2008.

Public comment was solicited at the first series of Citizens Informational Workshops, held in September and December 2003. A majority of the citizens providing written comments supported a new location roadway and the purpose of the project. In January and February of 2006, a second series of workshops presented the recommended Detailed Study Alternatives (DSA) for input and comment. Most attendees were in support of the new location roadway. The updated purpose and need for the project was presented to the public at a third series of

workshops, held in August 2008. Written comments were submitted both supporting and disagreeing with the need for the project.

Traffic Forecasting for Purpose and Need. When the purpose and need for the project was initially developed in 2002, the planning horizon year was 2025. The 2002 version of the project's purpose and need was based on traffic forecasts for 2025. The travel demand model used for the 2008 update to the project's purpose and need (Metrolina regional model) has a planning horizon of 2030. Both the 2025 and 2030 forecasts predict increasing traffic volumes on the Project Study Area's major roadway network over existing conditions.

1.1.5 EXISTING TRANSPORTATION SYSTEM

Section 1.5 of the Draft EIS discusses the existing transportation system within the Project Study Area. There have been no changes to the information in this section since the Draft EIS was published, which is briefly summarized below, with an update to the status of projects at the Charlotte-Douglas International Airport (CDIA).

Existing Road Network and Connections. I-85 and US 29-74 are the primary east-west routes through Gaston County, including the Project Study Area. US 321 is the primary north-south route through Gaston County and intersects the I-85/US 29-74 corridor in the center of Gastonia. I-485 provides north-south travel in the Mecklenburg County portion of the Project Study Area.

Roadway Connections

I-85 is the only controlled access east-west highway through Gaston County. There are only four bridges over the Catawba River between Gaston and Mecklenburg Counties. None are in southern Gaston County.

Gaston County is separated from Mecklenburg County, the region's largest employment and destination generator, by the Catawba River. There are only four roadway connections between the two counties; NC 16 and NC 27 in the northern half of Gaston County, and I-85 and US 29-74 in the middle of Gaston County. Based on 2006 annual average daily traffic (AADT), the I-85/US 29-74 corridor carries approximately 82 percent of the traffic volume traveling between Gaston and Mecklenburg Counties.

Types of Travel on Existing Roadways. The predominant transportation type for the region is car, van, or truck (92.6 percent), followed by school bus (3.8 percent), and walking (2.2 percent). Transit bus, bicycle, and motorcycle are used for only 1 percent of the trips in the region, according to the *Greater Charlotte Region Household Travel Survey* (NCDOT, SCDOT, City of Charlotte DOT, September 2002). Based on 2000 Census data, Mecklenburg County attracts the majority of commuters in the region. Altogether, there are more than 27,000 workers community between Gaston and Mecklenburg Counties, demonstrating a need for connectivity.

Other Transportation Modes. The Project Study Area includes a broad system of available transportation modes, including rail service, air service, and public transportation. These various transportation modes are described in Section 1.5.2 of the Draft EIS.

The CDIA is located at the eastern end of the project, just east of I-485. The Draft EIS noted that the CDIA was constructing a third parallel runway, with a scheduled completion date of January 2010. The new runway opened January 11, 2010. The Draft EIS also stated that the CDIA has plans for an intermodal facility that would combine direct rail and truck access with incoming air cargo. The intermodal facility would be located between the new runway and the existing runways and is expected to have a 10-track rail yard and approximately 2,500 trailer parking

spaces. The intermodal facility is scheduled to open in late 2011 (Meeting with CDIA, November 4, 2009).

1.1.6 PERFORMANCE OF THE EXISTING ROADWAY SYSTEM

Section 1.6 of the Draft EIS describes the performance of the existing roadway system within the Project Study Area. There have been no changes to the information in this section since the Draft EIS was published, which is briefly summarized below.

Mobility and Connectivity Issues. Within southern Gaston County (south of the I-85 and US 29/74 corridor), a lack of connecting east-west roadways makes travel circuitous and limits mobility. In addition, mobility is inhibited between southern Gaston County and Mecklenburg County by the limited number of bridges over the Catawba River, which acts as a natural barrier between the two counties.

Traffic Volumes and Operations on Existing Roadways. The traffic forecasts prepared for the project using the Metrolina Regional Model project a substantial increase in traffic volumes from 2006 to 2030 on the Project Study Area's major roadways (*Gaston East-West Connector (U-3321) Traffic Forecast for Toll Alternatives* [Martin/Alexiou/Bryson, August 2008]).

By 2030, the level of service (LOS) on I-85 is projected to degrade to LOS E or F, indicating congestion on I-85 throughout the Project Study Area. In addition to high traffic volumes creating congestion, incidents such as vehicle breakdowns or accidents occur frequently on I-85. These incidents affect travel on I-85 by causing traffic slowdowns and occasional lane closures and temporary detours onto US 29-74.

Congestion on I-85

By 2030, the level of service (LOS) on I-85 is projected to degrade to LOS E or F, indicating congestion on I-85 throughout the Project Study Area.

Along US 29-74, year 2030 levels of service are projected to be LOS F east of McAdenville. US 321 is projected to operate at LOS D or better through 2030 in the Project Study Area.

1.1.7 SOCIAL AND ECONOMIC CONDITIONS

Section 1.7 of the Draft EIS discusses population characteristics, economic data, and major attractions in southern Gaston County. There are no changes or updates to these sections, which are briefly summarized below.

Population Characteristics. The populations of both Gaston and Mecklenburg Counties are expected to increase through 2030. According to the North Carolina Office of State Budget and Management, Gaston County is projected to grow 12.8 percent from 2006 to 2030, while Mecklenburg County is projected to have a much higher growth rate at 68.2 percent during the same period (NC State Demographics Web site: www.demog.state.nc.us).

Economic Data. The manufacturing sector currently employs the most workers in Gaston County, while the government sector employs the most workers in Mecklenburg County.

Major Attractions in Southern Gaston County. Daniel Stowe Botanical Garden is located in southeast Gaston County. In 2006, the 450-acre botanical garden attracted approximately 84,000 visitors (DSBG, Annual Report, 2006). Crowders Mountain State Park is on the western boundary of the Project Study Area. The 5,096-acre park attracted more than 400,000 visitors in 2007 (Telephone interview, Crowders Mountain State Park staff, April 11, 2008).

1.1.8 TRANSPORTATION PLANS AND LAND USE PLANS

Section 1.8 of the Draft EIS summarizes state and local transportation plans and local land use plans as they apply to the project. Several plans, as described below, have been updated since the Draft EIS was published.

State Transportation Plans. The project is included in, and consistent with, the following state transportation plans: NCDOT 2009-2015 STIP (Project U-3321), NCDOT Strategic Highway Corridors Vision Plan, and the North Carolina Intrastate System.

Transportation and Land Use Plans

The project is consistent with state and local transportation and land use plans.

Local Transportation Plans. The project is included in, and consistent with, the *Gaston Urban Area Thoroughfare Plan*, the *GUAMPO 2030 LRTP*, the *Mecklenburg-Union Thoroughfare Plan*, and the *MUMPO 2030 LRTP*. Both the *GUAMPO 2030 LRTP* and the *MUMPO 2030 LRTP* have been updated to 2035 since the Draft EIS was published. Figure 1-2 shows the projects included in the 2035 LRTPs. The Gaston East-West Connector project is included in the *GUAMPO 2035 LRTP* and *MUMPO 2035 LRTP* as a regionally significant project and a toll facility.

However, there were two inconsistencies between the Preferred Alternative and the project included in the *GUAMPO 2035 LRTP*. The *GUAMPO 2035 LRTP* included an interchange at Bud Wilson Road, and there were different assumptions for the year 2015 configuration (Section 2.5.2.2). The Bud Wilson Road interchange has been eliminated from the Preferred Alternative (Section 2.3.1.6). Current plans are for the Preferred Alternative in 2015 to be constructed as a four-lane facility from I-485 to US 321 and as an interim two-lane facility from US 321 to I-85. The remaining two lanes for the segment from US 321 to I-85 would be constructed by 2035. The GUAMPO prepared an amendment to the LRTP and air quality conformity determination (Section 2.5.2.2) to resolve these inconsistencies and the USDOT issued a conformity determination on October 5, 2010 (see letter in Appendix K).

Local Land Use Plans. The project is consistent with the various local land use planning documents covering the Project Study Area. These include the *Gaston County Comprehensive Plan* (July 2002), *Mecklenburg County Southwest District Future Land Use Map* (July 9, 2007 in Draft EIS, updated December 29, 2009), and the *Mecklenburg County Dixie-Berryhill Strategic Plan* (April 2003).

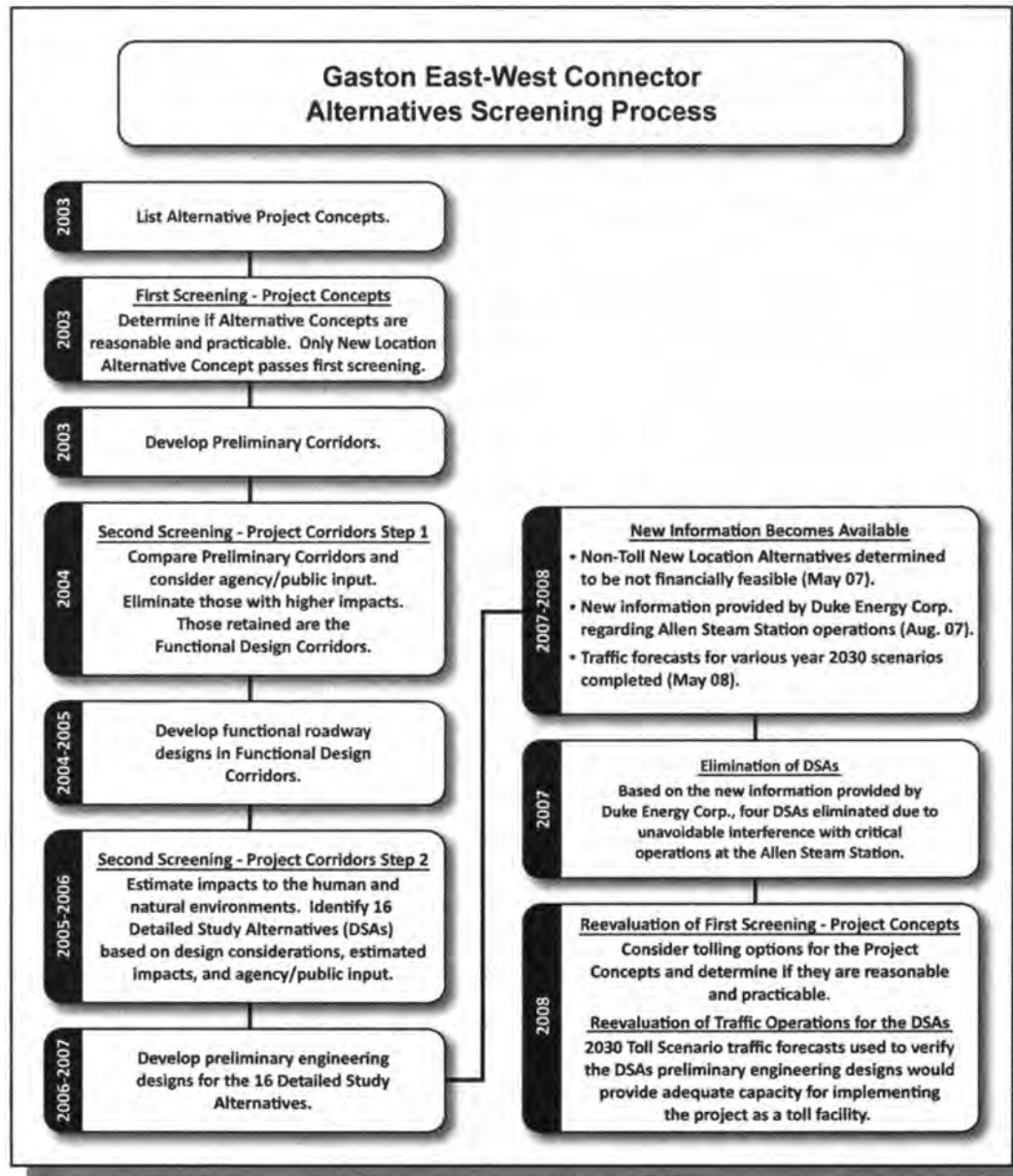
Figure 1-11 in the Draft EIS shows the *Gaston County Comprehensive Plan Composite Initiatives Map* (Gaston County Web site: www.co.gaston.nc.us/CompPlan/maps.htm). Figure 1-13 in the Draft EIS shows the *Dixie-Berryhill Strategic Plan Proposed Land Use Map*. Figure 1-3 in this Final EIS shows the updated *Southwest District Future Land Use Map* adopted December 29, 2009. There are no substantial changes on the map in the vicinity of the Gaston East-West Connector.

1.2 ALTERNATIVES CONSIDERED

1.2.1 ALTERNATIVES DEVELOPMENT AND SCREENING

The development and evaluation of alternatives to determine the DSAs is described in Chapter 2 of the Draft EIS and documented in detail in the *Addendum to the Final Alternatives Development and Evaluation Report for the Gaston East-West Connector* (PBS&J, October 2008), incorporated by reference, and available on the NCTA Web site (www.ncturnpike.org/projects/gaston).

The Alternatives Screening Process flowchart presented below shows the alternatives evaluation process and general timeframes for when the different screenings occurred. The first screening evaluated general project concepts. The second screening refined the concepts retained from the first screening.



As summarized in Section 2.1.2 of the Draft EIS, the general public, in addition to local, state, and federal environmental resource and regulatory agencies, were provided opportunities for input and comment regarding the alternatives and the alternatives development and analysis process.

The first and second screenings of alternatives were originally discussed with the environmental resource and regulatory agencies through the NEPA/404 Merger 01 Process under the administration of the North Carolina Department of Transportation (NCDOT). A series of eight meetings regarding project alternatives were held from February 2004 through September 2005, resulting in concurrence on the DSAs on September 20, 2005. At that time, three agencies (US

Environmental Protection Agency [USEPA], US Fish and Wildlife Service [USFWS], and NC Wildlife Resources Commission [NCWRC]) elected to abstain, rather than expressing concurrence or non-concurrence in the DSAs.

Within the context of the NEPA/404 Merger process, “abstain” means that an agency representative participating in the merger process does not actively object to a concurrence point, but the agency representative does not sign the concurrence point form. The process may continue and the agency representative agrees not to revisit the concurrence point.

After the initial concurrence was achieved on the DSAs in September 2005, the FHWA and NCTA reevaluated the alternatives screening process in light of the project being determined a candidate toll facility and the receipt of updated travel demand forecasts. The FHWA and NCTA coordinated with the environmental resource and regulatory agencies on this reevaluation at several Turnpike Environmental Agency Coordination (TEAC) meetings held in January, June, and September 2007, and February, July, September and October 2008 (Draft EIS Section 9.2.3.3). The environmental resource and regulatory agencies confirmed concurrence on the DSAs at the October 2008 TEAC meeting. The three agencies that previously had abstained, the USEPA, USFWS and NCWRC, concurred at this stage along with all the other cooperating and participating agencies.

Public comment regarding alternatives was solicited at all three Citizens Informational Workshop series. Public comment on project concepts and preliminary alternatives was solicited at the first series of Citizens Informational Workshops held in September and December, 2003. The Detailed Study Alternatives were presented for public comment and input at the second series of Citizens Informational Workshops held in January and February 2006. The third series of Citizens Informational Workshops, held in August 2008 (Section 9.1.1.3), provided the public an opportunity to comment on the elimination of Corridor Segment K1D from detailed study (due to interference with critical operations at Duke Energy Corporation’s Allen Steam Station), presented the remaining DSAs, announced the availability of the *Addendum to the Final Alternatives Development and Evaluation Report for the Gaston East-West Connector* (PBS&J, October 2008) on the project web site, and showed the right-of-way limits for the preliminary engineering designs within the DSA corridors. None of the comments received resulted in the addition, elimination, or substantial modification of the DSAs.

1.2.2 FIRST SCREENING – PROJECT CONCEPTS

In the First Screening – Project Concepts, six alternative concepts (discussed in Section 2.2 of the Draft EIS) were evaluated in an iterative process to determine if they were reasonable and practicable, based upon their ability to meet the project’s purpose and need, potential impacts, and their financial feasibility. The six alternative concepts include:

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

Qualitative and quantitative performance measures were used to the level of detail necessary to evaluate the ability of the various project concepts to meet the project’s purpose and need, including mobility and direct access components. To meet the purpose and need, an alternative must provide more than a minor improvement. Those concepts that could not be developed to

meet the defined purpose and need were removed from further consideration. Each alternative concept was evaluated to determine whether they would:

- Reduce travel distances and/or travel times between representative origin/destination points within southern Gaston County and between southern Gaston County and Mecklenburg County.
- Provide a transportation facility that would operate at acceptable levels of service (generally Level of Service [LOS] D or better on the mainline) in the design year (2030) for travel between Gaston County and Mecklenburg County.
- Reduce congested vehicle miles traveled and/or congested vehicle hours traveled in Gaston County compared to the No-Build Alternative in 2030.

In some instances, financial feasibility also was addressed. The iterative first screening resulted in some alternatives being developed to a higher level of detail than others in order to determine whether they should be retained for the Second Screening or eliminated. Table 1-1 summarizes the results of the First Screening – Project Concepts process.

TABLE 1-1: Summary of Results for First Screening – Project Concepts

Project Concept	Ability to Meet Purpose and Need*			Decision to Eliminate/ Retain for Second Screening	Reason for Decision
	Reduces Travel Times / Distances	Provides a Transportation Facility with Acceptable Levels of Service in the Design Year	Reduces Congested Vehicle Miles and/or Congested Vehicle Hours Traveled Compared to No-Build Alternative		
TSM Alternative	✗	✗	✗	Eliminated	Does not meet the project's purpose and need.
TDM Alternative	✗	✗	✗	Eliminated	Does not meet the project's purpose and need.
Mass Transit Alternative – Transit on Existing Alignment	✗	✗	✗	Eliminated	Does not meet the project's purpose and need.
Mass Transit Alternative – Transit on New Alignment	✓ (for transit users only)	✓ (for transit users only)	✗	Eliminated	Does not meet the project's purpose and need. Not financially feasible.
Multi-Modal Alternative – Transit on Existing Alignment	✗	✗	✗	Eliminated	Does not meet the project's purpose and need.
Multi-Modal Alternative – Transit on New Alignment	✓ (for transit users only)	✓ (for transit users only)	✗	Eliminated	Does not meet the project's purpose and need. Not financially feasible.
Improve Existing Roadways Alternative – Scenario 4 – Toll or Non-Toll on I-85	✗	✗	✗	Eliminated	Does not meet the project's purpose and need.

TABLE 1-1: Summary of Results for First Screening – Project Concepts

Project Concept	Ability to Meet Purpose and Need*			Decision to Eliminate/Retain for Second Screening	Reason for Decision
	Reduces Travel Times / Distances	Provides a Transportation Facility with Acceptable Levels of Service in the Design Year	Reduces Congested Vehicle Miles and/or Congested Vehicle Hours Traveled Compared to No-Build Alternative		
Improve Existing Roadways Alternative – Scenario 8 – Toll or Non-Toll on I-85	✗	✗	✗	Eliminated	Minimal improvements do not meet project’s purpose and need. High levels of impacts.
New Location Alternative – Non-Toll Scenario	✓	✓	✓	Eliminated	Meets the project’s purpose and need. Not financially feasible.
New Location Alternative – Toll Scenario	✓	✓	✓	Retained	Meets the project’s purpose and need. Is financially feasible. Retained for detailed study.
No-Build Alternative	✗	✗	✗	Retained	Retained for comparison purposes.

* See Sections 1.2 and 1.3 of the Draft EIS for details on the purpose and need for the project. The column headings are abbreviations for the evaluation measures listed in Section 1.3.

✗ - means the alternative concept cannot meet this evaluation factor.

✓ - means the alternative concept does meet, or could be designed to meet, this evaluation factor.

No-Build Alternative. The No-Build Alternative is the baseline alternative for the design year (2030). The No-Build Alternative assumes that the transportation systems for Gaston County and western Mecklenburg County would evolve as planned, but without the proposed project. Although the No-Build Alternative would not improve mobility, access or connectivity and thereby would not meet the project’s purpose and need, the No-Build Alternative was retained for additional screening so as to provide a baseline for comparison with the DSAs.

Transportation System Management Alternative. The TSM Alternative includes modest physical and operational enhancements to improve performance, safety, and management of traffic operations without major construction. TSM improvements on I-85 ramps and ramp termini, US 29-74, and US 321 would not noticeably improve mobility, access or connectivity. Travel distances would remain the same and travel times would not be noticeably reduced. Similarly, signal coordination and intersection improvements would not be expected to noticeably improve congested vehicle hours traveled or congested vehicle miles traveled in Gaston County when compared to the No-Build Alternative.

Transportation Demand Management Alternative. The TDM Alternative includes measures and activities that change traveler behavior. The TDM Alternative includes demand management strategies currently being implemented in Gaston and/or Mecklenburg County –

such as a freeway management system, staggered work hours, and flex-time; and the conversion of existing lanes to high-occupancy vehicle (HOV) lanes or high-occupancy toll (HOT) lanes.

Although TDM measures such as dynamic message boards, ramp meters, incident management systems, etc. would help optimize the efficiency of traffic flow on existing roadways, these roadways would remain congested due to the projected high volumes of traffic. Similarly, HOV or HOT lanes would improve traffic flow for travelers using those lanes, but general purpose lanes would remain congested. The use of the TDM Alternative would not reduce travel distances or travel times, nor would they noticeably improve congested vehicle hours traveled or congested vehicle miles traveled in Gaston County when compared to the No-Build Alternative. As such, the TDM Alternative would not meet the purpose and need of the project and was eliminated from further study.

Mass Transit Alternative. The Mass Transit Alternative, using expanded bus or rail service on existing facilities, was eliminated from further study because it would not meet the project's purpose and need. Although new alignments could provide increase connectivity and mobility, it would not meet the project's purpose and need and it would not be financially feasible. None of the Mass Transit Alternative scenarios would noticeably reduce vehicle miles traveled and/or congested vehicle miles traveled in Gaston County compared to the No-Build Alternative.

Multi-Modal Alternative. The Multi-Modal Alternative includes a combination of the Mass Transit Alternative and the TSM Alternative. Various combinations were reviewed in Section 2.2.5.2 of the Draft EIS. However, none of the options served to attract enough trips to reduce vehicle miles traveled and/or congested vehicle miles traveled compared to the No-Build Alternative and as such would not meet the project's purpose and need. In addition, the Multi-Modal Alternative was determined to be cost prohibitive.

Improve Existing Roadways Alternative. Two alternatives to improve existing roadways, known as Scenario 4 and Scenario 8, were evaluated in the Draft EIS (Section 2.2.6). These scenarios involve variations in widening I-85 to eight and ten lanes as well as various improvements to US 29-74 and north-south feeder routes. Both non-toll and toll options were evaluated. These alternatives would not improve travel times, mobility, access, or connectivity within southern Gaston County nor between southern Gaston County and Mecklenburg County. As such, the Improve Existing Roadways Alternative would not meet the project's purpose and need. These alternatives also would result in travel delays during construction, long construction duration, and community disruption cause by the required improvements to existing I-85. There are no controlled-access routes between Gaston and Mecklenburg Counties that could serve as an alternate route to I-85 during construction.

New Location Alternative. The New Location Alternative would extend from I-85 west of Gastonia to I-485 and NC 160 in Mecklenburg County, with various interchanges along the mainline. There would be new bridge crossings of the South Fork Catawba River and the Catawba River. Both toll and non-toll scenarios were assessed. As discussed in Section 2.2.7 of the Draft EIS, the New Location Alternative would meet the project's purpose and need and is consistent with local transportation plans. However, due to the financial infeasibility of the non-toll scenario, only the toll scenario was carried forward for further analysis.

1.2.3 SECOND SCREENING – PROJECT CORRIDORS

In the Second Screening – Project Corridors (discussed in Section 2.3 of the Draft EIS), the alternative concept (New Location Alternative) that made it through the First Screening process was further refined and evaluated to determine the DSAs.

The process used to develop and evaluate preliminary alternatives to ultimately determine DSAs is summarized in the flowchart in **Section 1.2.1** and described in detail below.

1. A Refined Study Area for the New Location Alternatives was identified, relying upon land suitability mapping (Draft EIS Section 2.3.2.1).
2. Numerous 1,200-foot-wide Preliminary Corridor Segments were developed within the Refined Study Area using the land suitability mapping and design criteria. These Preliminary Corridor Segments (approximately 116 miles of corridors) were presented to the public at the first series of Citizens Informational Workshops in September and December 2003 (Draft EIS Chapter 9 provides more detail on public involvement).
3. Second Screening Step 1 - Preliminary Corridor Segments were reviewed with local, state, and federal resource and regulatory agencies to determine if any should be eliminated based upon "fatal flaws" or high levels of estimated impacts to the human and/or natural environments, as compared to other segments under consideration.
4. The remaining Preliminary Corridor Segments (approximately 72 miles) were connected to form endpoint-to-endpoint corridors from I-85 to I-485 and the corridor width was extended from 1,200 feet to 1,400 feet in order to allow for more flexibility in establishing alignments.
5. Functional designs were prepared within these corridors, taking into consideration engineering design constraints and the locations of known sensitive human and natural resources. These are referred to as the Functional Design Corridors. The 1,400-foot-wide Functional Design Corridor boundaries then were shifted to be centered around the functional design alignments.
6. Second Screening Step 2 - Impacts to the natural and human environments based on the functional designs within the Functional Design Corridors were estimated and tabulated. The impact evaluation factors are listed in Table 2.2 of the Draft EIS. There were 90 possible endpoint-to-endpoint combinations of Functional Design Corridors evaluated.
7. From the set of Functional Design Corridors, sixteen DSAs were recommended based upon estimated impacts to the natural and human environments, engineering design considerations, and input from local, state, and federal resource and regulatory agencies. These recommendations were presented to the public for comment and input at the second series of Citizens Informational Workshops in January and February 2006.
8. Preliminary engineering designs were developed for the sixteen DSAs, based on 2030 Non-Toll Scenario traffic forecasts.
9. New information became available after the DSAs were identified and preliminary engineering designs completed. The new information included:
 - New information provided by Duke Energy Corporation regarding Allen Steam Station operations.
 - New traffic forecasts for various year 2030 scenarios, including the New Location Alternative Toll Scenario.
10. Four DSAs were eliminated due to unavoidable interference with critical operations at Duke Energy Corporation's Allen Steam Station.

11. The 2030 Toll Scenario traffic forecasts were used to verify that the DSAs' preliminary engineering designs would provide adequate capacity for implementing the project as a toll facility.

1.2.4 DETAILED STUDY ALTERNATIVES

As noted above, twelve endpoint-to-endpoint new location DSAs were identified for further study based upon the first and second screenings. These DSAs are listed in **Table 1-2** and shown in **Figure 1-4a-b**. In addition to the twelve new location DSAs, the No-Build Alternative was retained for comparison purposes throughout the planning process.

TABLE 1-2: Twelve Final 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 Segment	J Segment	K Segment
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

Refer to **Figure 1-4a** for a map of the DSAs and their corridor segments.

Preliminary designs were developed for each DSA, using the design criteria presented in Appendix D of the Draft EIS. Each DSA was a controlled-access toll facility consisting of six lanes with a 46-foot grass median. At the time the Draft EIS was prepared, each DSA included 11 to 12 interchanges. The lengths of the DSAs are similar, ranging from 21.4 miles to 23.7 miles.

Traffic forecasts and operations analyses for the DSAs are discussed in Section 2.4.4 of the Draft EIS. Preliminary cost estimates for each DSA are presented in Section 2.4.5 of the Draft EIS. The total estimated median costs reported in the Draft EIS ranged from \$1,281 million to \$1,378 million. DSA 9 is identified as having the second to lowest cost.

Updated costs, typical sections, and traffic forecasts for the Preferred Alternative are discussed in **Section 2.3**.

1.2.5 RECOMMENDED ALTERNATIVE

The following information is from Section 2.5 of the Draft EIS, which describes the selection of DSA 9 as the Recommended Alternative. DSA 9 is comprised of Corridor Segments H2A-H3-J4a-J4b-J2c-J2d-JX4-J1e-J1f-K1A-K3A-K3B-K3C, as shown in **Figure 1-4a-b**.

The FHWA, NCTA, and NCDOT identified a Recommended Alternative in the Draft EIS, which provided readers an indication of the agencies' thinking at the time the Draft EIS was published. After the Draft EIS comment period ended, the FHWA and NCTA (now a division of NCDOT, as described in Section P.1), identified 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 the Draft EIS and at the public hearings (Chapter 3).

The Preferred Alternative is developed further in this Final EIS, as described in Chapter 2. The NEPA process will conclude with a Record of Decision (ROD), which will document the Selected Alternative to be constructed.

DSA 9 was identified in the Draft EIS 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 were 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 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).

Note: In the Draft EIS, impacts to the White Oak subdivision from Corridor Segment JX4 (DSAs 5, 9, 23, 27, 77, and 81) were inadvertently not included in Table 3-5 of the Draft EIS). In addition, impacts to the Saddlewood neighborhood were double-counted for DSAs 4, 5, 9, 22, 23, 27, 76, 77, and 81. (Appendix A, Errata). The total number of neighborhood impacts for DSA 9 is still 25 based on the Draft EIS preliminary design, with the range being 21 to 32.

- 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 Regional 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 (VAD). DSA 9 also is one that is expected to have the least indirect and cumulative effects to farmlands, based on the qualitative indirect and cumulative effects analysis (Draft EIS Chapter 7).
- 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.

1.3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section of the Final EIS summarizes the affected environment and environmental consequences described in Chapters 3 through 9 of the Draft EIS, and also includes general updates to the existing environment where indicated. The impact summary table from the Draft EIS, Table S-2, is included in Appendix C for reference.

1.3.1 HUMAN ENVIRONMENT

1.3.1.1 Land Use and Planning

The information in this section is summarized from Section 3.1 of the Draft EIS and includes updates to local land use plans in the study area and the *GUAMPO 2035 LRTP* and *MUMPO 2035 LRTP*. More detailed information regarding local land use planning and changes in land use as a result of the Preferred Alternative is provided in the *Quantitative Indirect and Cumulative Effects Analysis* (Louis Berger Group, Inc., August 2010) and Section 2.5.5 of this Final EIS.

Land Use and Transportation Plans
Generally, each of the DSAs would be consistent with area land use and transportation plans

Existing Land Use. Land use within the Project Study Area is of mixed intensity and density, and includes farmland, estate homes, single-family neighborhoods, rural housing clusters, manufactured/mobile homes, and multi-family housing.

Pockets of commercial, office, and industrial uses are concentrated generally in the cities and towns, near Charlotte-Douglas International Airport, and along major transportation routes such as I-85, US 321, US 29-74, NC 274 (Union Road), NC 279 (South New Hope Road), and NC 273 (Southpoint Road), particularly where water and sewer services are provided. Other land uses include places of worship and public and private recreational areas.

Land Use Trends. The population of the Project Study Area is growing, and rural areas have been transitioning to suburban uses. This transition from rural to more of a suburban nature is generally consistent with what Gaston County and municipalities near the DSAs (Bessemer City, Gastonia, Cramerton, Belmont, McAdenville, and City of Charlotte) have envisioned in their land use plans.

Consistency with Land Use and Transportation Plans. Section 3.1.3 of the Draft EIS provides a summary of local land use and transportation plans within the Project Study Area. Generally, each of the DSAs would be consistent with area land use and transportation plans, and the No-Build Alternative would not be consistent. Since the Draft EIS was published, Bessemer City and Mecklenburg County updated their land use plans and GUAMPO and MUMPO updated their LRTPs.

The *Bessemer City Land Use Plan* was adopted in July 2009, replacing the *1995 Land Use Plan*. The updated plan recommends that land be set aside to accommodate future growth that may be generated by the Gaston East-West Connector.

Figure 1-3 in this Final EIS shows the updated *Southwest District Future Land Use Map* adopted December 29, 2009. There are no substantial changes on the map in the vicinity of the Gaston East-West Connector.

The *GUAMPO 2035 LRTP* and *MUMPO 2035 LRTP* both include the proposed Gaston East-West Connector as a toll facility.

Land Use Impacts. Since the DSAs are 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 transportation use.

Even without construction of the project, southern Gaston County and western Mecklenburg County are generally planned for continued suburban development, with much of the undeveloped land slated for residential use. It is conceivable that the Gaston East-West Connector could influence a transition to other types/mixes of land uses, as well as the timing of these potential transitions, particularly at proposed interchange locations. As such, the project could play a role in the transition of the overall character within southern Gaston County from rural to suburban, which is consistent with the *Gaston County Comprehensive Plan*.

1.3.1.2 Existing Social and Economic Resources and Community Characteristics

The Draft EIS Sections 3.2.1 and 3.2.2 includes an overview of the Project Study Area's existing social and economic characteristics summarized from the *Final Community Impact Assessment for the Gaston East-West Connector* (PBS&J, October 2008), available on the NCTA Web site (www.ncturnpike.org/projects/gaston), and the *Community Characteristics Report for the Gaston East-West Connector* (PBS&J, November 2007).

The following is a brief summary of the information presented in Sections 3.2.1 and 3.2.2 of the Draft EIS. Updates to information about populations with limited English proficiency and updates to cemeteries, schools, and fire departments are noted below.

Population Characteristics. The Demographic Study Area consists of 53 Gaston County Block Groups and seven Mecklenburg County Block Groups and was established to identify and analyze population growth, household, and other demographic characteristics. Between 1990 and 2000, the Demographic Study Area grew 13 percent, with the largest percent increases in population generally occurring south of Gastonia, followed by southeast and southwest Gaston County and the southern end of Mecklenburg County. The areas having the most block groups with negative or smaller growth increases are located west of Gastonia and within and around Bessemer City.

Whites, African-Americans, and Hispanics are the three largest racial/ethnic groups within the project study area. Based upon the 2000 Census, the median family income for Gaston County (\$46,271) was about the same as the state average (\$46,335) and the median family income for Mecklenburg County (\$60,608) was higher than the state average.

Executive Order 13166 – Improving Access to Services for Person with Limited English Proficiency, federal and state agencies are directed to take reasonable steps to ensure meaningful access to information and services is provided. US Census data for the Demographic Study Area was reviewed to identify Limited English Proficiency (LEP) populations in

accordance with NCDOT's current standards and the Department of Justice Safe Harbor Act threshold. This threshold is defined as language groups in a demographic area in which more than 5 percent of the adult population or 1,000 persons speak English less than "Very Well" as reported in the US Census. The 2000 US Census data for the Demographic Study Area indicate the presence of a Spanish language group that exceeds the threshold of 1,000 persons. The Demographic Study Area contains 1,587 adult persons whose primary language group is Spanish and who speak English less than "Very Well". This is approximately 3 percent of the population of the Demographic Study Area.

In accordance with the Safe Harbor Act provisions, written translations of documents have been, and will be, provided for the LEP language group in addition to other measures assuring meaningful access. These other measures include notice of Right of Language Access for future meetings for this project, continued advertisements in, and offer of articles for, publication in Spanish language newspapers, and continued inclusion of community service organizations on the project mailing list. Thus, the requirements of Executive Order 13166 – Improving Access to Services for Persons with Limited English Proficiency will be satisfied.

Economic Characteristics. In 1990, the Manufacturing sector provided the highest percentage of jobs in Gaston County at 46.8 percent, followed by Trade/Transportation/Utilities at 18.9 percent. In 2006, the Manufacturing sector still provided the highest percentage of jobs in Gaston County, but the percentage fell by over half to 22.9 percent. Education/Health moved to the second highest percentage, followed by Trade/Transportation/Utilities. In 1990 and 2006 the sector that provided the highest number of jobs in Mecklenburg County was Trade/Transportation/Utilities. The Professional/Business sector provided the second highest number of jobs in both 1990 and 2006.

Named Neighborhoods and Other Communities. The Project Study Area contains 59 named neighborhoods within the municipalities and unincorporated areas of Gaston County and Mecklenburg County. A complete list of these neighborhoods is included in the *Final Community Impact Assessment for the Gaston East-West Connector* (PBS&J, October 2008). **Figure 1-5a-b** depicts the general locations of the existing neighborhoods in relation to the DSAs.

Also within and near the DSAs are housing clusters that are not identified as named communities in available GIS data. These could represent rural communities in which there are social interconnections. These seventeen areas are shown in **Figure 1-5a-b** (labeled with an "N" and a number).

One of the rural communities is the Garrison Road/Dixie River Road community. This community is defined roughly by Mt. Olive Church Road (SR 1184) on the north, Dixie River Road (SR 1155) on the west/south, Sadler Road (SR 1150) on the north/west, and I-485 on the east (Telephone interview, Dixie River Community Association president, December 7, 2007). The Dixie Community Center located on Garrison Road essentially serves as the center of the community.

Community Resources and Services. Community resources and services within and near the DSAs are described in detail in Section 3.2.2.3 and Figure 3-7a-b of the Draft EIS.

Churches and Cemeteries. There are seventeen churches within and near the DSAs. Most cemeteries are located on church properties, but five are located on separate properties. Additional information about the boundaries of the Mt. Pleasant Baptist Church cemetery, discovered since the Draft EIS was published, is discussed in Section 1.3.1.6.

Schools. There are four public schools located within or near the DSAs. From west to east, these are: Edward D Sadler Elementary, Forest Heights Elementary, Forestview High School, and WA Bess Elementary.

At the time the Draft EIS was published, there were two preliminary sites being considered by Gaston County Schools for a future middle/high school campus. These are located in Corridor Segment K2A (DSAs 4, 22, 58, and 78) and Corridor Segment K3A (DSAs 9, 27, 68, and 81). Since the publication of the Draft EIS, the process to determine the actual location has been dropped, and there will be no new school in either of these locations. (Telephone interview, Executive Director Auxiliary Services for the Gaston School District, January 28, 2010).

Fire Departments. There is an update to fire station locations since the Draft EIS was published. The Crowders Mountain South Volunteer Fire Department previously located at 4802 York Highway (US 321) in Gastonia (Station F3 on Draft EIS Figure 3-7a) is no longer in operation (Telephone interview, Gaston County Fire Marshal's office, May 26, 2010). There are still two other volunteer fire departments (VFDs) within or near the DSAs: Crowders Mountain Central VFD (also known as Chapel Grove) and Crowders Mountain #2 VFD and Rescue.

Libraries. There is one library located within or near the DSAs. Union Road Branch Library is located just south of Forestview High School.

Parks and Recreation Areas. There are two publicly-owned parks and several privately-owned recreation areas within or near the DSAs. Publicly-owned parks, from west to east, include Crowders Mountain State Park, the Park at Forestview High School, and Berewick Regional Park.

Privately-owned recreational facilities include, from west to east: Camp Rotary Girl Scout Camp, Karyae Park YMCA facility, Linwood Springs Golf Course, Carolina Speedway, Daniel Stowe Botanical Garden, Allen Fishing Access Area (owned by Duke Energy Corporation), and the Belmont Optimist Club recreation fields (on property leased from Duke Energy Corporation).

There are also planned greenways within the Project Study Area. Planned greenways are shown on Figure 3-8a-b of the Draft EIS and include greenways proposed by GUAMPO and also the Carolina Thread Trail. The Carolina Thread Trail is proposed by the Catawba Lands Conservancy and the Trust for Public Land (Carolina Thread Trail Web site: www.carolinathreadtrail.org).

Bicycle Routes. There are five bicycle routes in Gaston County (NCDOT Web site: www.ncdot.org/it/gis/DataDistribution/BikeMaps/default.html). One of these routes, Route 1 – High Shoals-Crowders Mountain, crosses all the DSAs.

1.3.1.3 Relocations and Displacements

Residential and business relocation impacts for each of the DSAs are presented in Section 3.2.3 of the Draft EIS. A summary of relocation impacts reported in the Draft EIS is included in the table in **Appendix C**.

All DSAs would require relocation of residences and businesses. The total number of residential relocations for each DSA ranges from 326 residences (DSA 68) to 384 residences (DSA 76). Eight of the DSAs would include one to two farm relocations. The DSAs would relocate between 24 businesses (DSA 77) and 40 businesses (DSA 22).

Section 2.5.1.2 of this Final EIS provides updated relocation impacts associated with the refined preliminary design of the Preferred Alternative.

The NCTA will follow state and federal regulations and NCDOT policies for right-of-way acquisition and relocation.

1.3.1.4 Impacts to Neighborhoods

The information in this section is summarized from Section 3.2.4 of the Draft EIS. The preliminary design for the Preferred Alternative was refined in areas adjacent to several neighborhoods, as discussed in Section 2.3.1. An updated discussion of impacts to neighborhoods associated with the Preferred Alternative is included in Section 2.5.1.3 of this Final EIS.

Due to the large project size and number of neighborhoods affected by the preliminary designs for the DSAs, a matrix was developed in order to better organize and describe impacts to neighborhoods. The matrix is presented in Table 3-5 and Table 3-6 of the Draft EIS.

The impacts from Corridor Segment JX4 (DSAs 5, 9, 23, 27, 77, and 81) to the White Oak subdivision were inadvertently not included in Table 3-5, and were not counted in the total neighborhood impacts reported for DSAs 5, 9, 23, 27, 77, and 81 (**Appendix A**).

The impacts to the Saddlewood subdivision were inadvertently counted twice in the Draft EIS for DSAs 4, 5, 9, 22, 23, 27, 76, 77, and 81. Because this neighborhood is located at the junction of two Corridor Segments (J2c and J2d), it was erroneously counted as being impacted by both segments (**Appendix A**).

All DSAs would have a negative impact to some existing neighborhoods. Impacts range from minor right-of-way encroachments on neighborhood properties to complete acquisition of a neighborhood. The number of named neighborhoods impacted by the DSAs range from 15 (DSAs 68 and 81) to 24 (DSA 5). The revised total neighborhood impacts for all DSAs are included in Table 1-3, with the complete corrected matrix (Draft EIS Table 3-5) reproduced in **Appendix A**.

TABLE 1-3: Summary of Impacts to Named Neighborhoods and Rural Communities

Type of Impact*	Detailed Study Alternative											
	4	5	9	22	23	27	58	64	68	76	77	81
Total Number of Category B Impacts	5	6	4	7	8	6	6	7	5	5	6	4
Total Number of Category C Impacts	13	14	12	13	14	12	9	11	9	10	11	9
Total Number of Category D Impacts	9	9	8	4	4	3	10	9	8	8	8	7
Total Number of Category E Impacts	1	3	1	0	2	0	2	4	2	1	3	1
Total Number of Neighborhood Impacts	28	32	25	24	28	21	27	31	24	24	28	21

Category A – No Impact (so not reported in this table), B – No relocations, C – Relocation of homes on end of road or at edge of neighborhood, D – Relocation of homes in midst of neighborhood, E – Total displacement of a neighborhood

1.3.1.5 Environmental Justice

The information in this section is summarized from Section 3.2.5 of the Draft EIS. There have been no updates to this information since the Draft EIS was published.

The Gaston East-West Connector project was evaluated for the potential for disproportionately high and adverse impacts on minority and low-income populations in two ways: 1) impacts that

result from building and operating any new road (e.g., taking of land, noise impacts, air impacts, etc.) and 2) impacts that result specifically from tolling the proposed facility.

The first category of impacts mainly involves people who are living in the immediate vicinity of the project. The general locations of African-American populations, Hispanic populations, and low-income populations are shown in Figures 3-3, 3-4, and 3-5 of the Draft EIS. Based on information presented in Section 3.2.5 of the Draft EIS, the construction of any of the DSAs was determined not to have a disproportionately high or adverse impact on minority and low-income populations.

The second category involves people who are potential users of the road – a much broader geographic area. All of the DSAs would provide a new, limited-access, east-west route in the region. A result of the project would be reduced traffic on the existing alternate non-toll route; I-85. Completing the project would benefit all motorists, including low-income motorists who may choose not to use the toll facility or may tend to use it less frequently.

All reasonable efforts have been made to include low-income and minority groups in the decision-making process to date. The project will not deny, reduce, or delay receipt of project benefits to low-income and minority groups. 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”.

1.3.1.6 Impacts to Community Resources and Services

The information in this section is summarized from Section 3.2.6.1 of the Draft EIS. The impact summary table from the Draft EIS included in **Appendix C** lists the impacts to community resources for each DSA. Additional information regarding the historic boundaries of the Mt. Pleasant Baptist Church cemetery has been discovered since the Draft EIS. In addition, there is a correction noted for impacts to cemeteries.

An updated discussion of impacts to community resources associated with the refined preliminary design of the Preferred Alternative is included in **Section 2.5.1.5** of this Final EIS.

Churches and Cemeteries. Table 3-8 in the Draft EIS shows the estimated impacts to churches and cemeteries. All DSAs would result in an impact to at least one church and/or cemetery.

As included in **Appendix A**, impacts to Mt. Pleasant Baptist Church cemetery were listed for DSA Segment KX1 (DSAs 4, 22, 58, and 76) in Draft EIS Table 3-8, but these same impacts should also have been listed for DSA Segment K3A (DSAs 9, 27, 68, and 81) since the segments overlap in the area near the cemetery. The impact was stated as taking 2.1 acres (60 percent) of wooded area on the south and east side of parcels owned by the Mt. Pleasant Baptist Church. The area of this property with observed gravestones would not be impacted.

The Mt. Pleasant Baptist Church Cemetery is located in the northwest quadrant of the proposed interchange of the Gaston East-West Connector and Southpoint Road (NC 273). During the Phase II Archaeological Survey for the Preferred Alternative (**Section 2.5.3.2**), additional gravesites were discovered south of the Mt. Pleasant Baptist Church cemetery’s present-day parcel boundaries. The historic boundaries of the cemetery were larger, and encompassed approximately an additional one-half acre to the southwest (*Gaston East-West Connector Intensive Archaeological Survey*, Coastal Carolina Research, February 2010).

The preliminary designs shown in the Draft EIS for DSAs 4, 9, 22, 27, 58, 68, 76, and 81 included a ramp and loop in the northwest quadrant of the Southpoint Road (NC 273) interchange. The proposed right of way would impact the gravesites discovered in the historic boundaries of the

cemetery. As discussed in Section 2.5.3.2, a redesign of the Preferred Alternative's interchange with Southpoint Road (NC 273) removed the loop, reducing the right of way needed in the northwest quadrant, and therefore avoiding the historic boundaries of the cemetery and the gravesites. This redesign would have been able to be applied to the other DSAs that would impact this site.

Schools. DSAs that use Corridor Segment H1A (DSAs 58, 64, 68, 76, 77, and 81) would require a minor encroachment (0.36 acres) onto Sadler Elementary School property from construction of the US 29-74 interchange. However, normal use of the school and its access would not be impacted.

DSAs that use Corridor Segment J4a (DSAs 4, 22, 58, and 76) would require land from the southeast corner and the front of the Forestview High School property to construct the relocation of NC 264 (Union Road). All existing access to the school would remain. A maximum of 20 parking spaces in the visitor lot and 20 parking spaces in the student lot could be impacted.

It is anticipated that no matter which DSA is selected as the Preferred Alternative, the project would temporarily impact school bus routes during construction, as well as result in modifications to existing routes and/or promote new school bus routes. The NCTA will coordinate with Gaston County Schools and Mecklenburg County Schools to minimize impacts to school bus routes.

Fire Stations. DSAs that use Corridor Segment H1C (DSAs 58, 64, and 68) could require a maximum of 0.64 acres of right of way from the front of Crowders Mountain #2 VFD and Rescue on Bethany Road. It is unlikely that any impacts to parking or other uses would occur.

All DSAs would result in short term impacts to fire and rescue service during construction, including potential re-routing of existing service routes. Maintenance of traffic along these routes will be important during construction, and NCTA will coordinate with the Gaston County Fire Marshal and area fire stations to ensure continuation of services.

Libraries and Community Centers. The Union Road Branch Library would not be impacted by any of the DSAs.

The preliminary designs shown in the Draft EIS for all DSAs would not displace the Dixie Community Center. However, the presence of the project in this area could affect community cohesion and interaction among persons/groups in the community.

The preliminary design for the Preferred Alternative was updated in this area, and its impacts to the Dixie Community Center are discussed in Section 2.5.1.5.

Parks and Recreation Areas. None of the DSAs would directly impact Crowders Mountain State Park, Park at Forestview High School, Camp Rotary Girl Scout Camp, or Allen Fishing Area.

Berewick Regional Park. All DSAs would involve a minor encroachment into undeveloped parcels owned by Mecklenburg County that are part of Berewick Regional Park. Based upon the preliminary designs in the Draft EIS, DSAs that use Corridor Segment K3C (DSAs 4, 9, 22, 27, 58, 68, 76, and 81) would acquire approximately 1.6 acres of this public park site west of and adjacent to I-485. DSAs that use Corridor Segment K4A (DSAs 5, 23, 64, and 77) would acquire approximately 3.3 acres (2.1 acres on the west of and adjacent to I-485, 0.6 acres from the northernmost parcel, and 0.6 acres on the southwest side of the property along Dixie River Road). These minor encroachments on the edges of the property owned by Mecklenburg County are not anticipated to impact access or any future uses.

Mecklenburg County Park and Recreation Department stated its belief that all DSAs would provide improved access to the future Berewick Regional Park, which would benefit the park. The Department did not believe that the proposed right of way needed from Mecklenburg County property for any of the DSAs would detract from the planned function and use of the site as a park. However, the Department would like to continue coordinating with NCTA to ensure that, for the Preferred Alternative, right of way and construction limits within the property boundaries are minimized as necessary to ensure that significant activities, features, and attributes of the proposed park are not adversely affected (Letters from Mecklenburg County Park and Recreation Department dated September 25, 2008 and December 5, 2008, Appendix A-5 in the Draft EIS). Additional discussion about the future Berewick Regional Park as a Section 4(f) resource is included in Section 5.4.3.1 of the Draft EIS and Section 1.3.3.3 and Section 2.5.3.3 of this Final EIS.

The preliminary design for the Preferred Alternative was updated in this area, and as discussed in Section 2.5.1.5, no right of way is expected to be required from Berewick Regional Park.

Karyae Park. The uses and functions of this privately-owned YMCA facility would be adversely impacted by DSAs that include Corridor Segment H1A (DSAs 58, 64, 68, 76, 77, and 81).

Linwood Springs Golf Course. Under DSAs that use Corridor Segment H3 (DSAs 4, 5, and 9), access to the golf course entrance on Linwood Road would change slightly with the construction of the Linwood Road interchange, but the functions of the golf course would not be impacted.

Carolina Speedway. Approximately 7.7 acres of the northern and western sides of this privately-owned speedway property would be impacted by DSAs that include Corridor Segment J1f (DSAs 5, 9, 23, 27, 64, 68, 77, and 81). Impacts would occur to the parking areas.

The preliminary design for the Preferred Alternative was updated in this area, as discussed in Section 2.5.1.5.

Daniel Stowe Botanical Garden. None of the DSAs are anticipated to negatively impact the privately-owned Daniel Stowe Botanical Garden (DSBG). All the DSAs pass to the north of DSBG.

The nearest DSAs are those that use Corridor Segment K1C (DSAs 5, 23, 64, and 77). The mainline of these DSAs passes approximately one-quarter mile north of the northern boundary of DSBG. However, construction of the NC 279 (South New Hope Road) interchange in Corridor Segment K1C (DSAs 5, 23, 65, and 77) would require a minor right-of-way encroachment of approximately 0.6 acres required at the northeastern end of the DSBG property. These minor encroachments would not impact the use and function of the DSBG property. Access to the truck entrance at the northern end of the property would be maintained.

Duke Energy Corporation Recreational Fields (Belmont Optimist Club). DSAs that include Corridor Segment K3B (DSAs 4, 9, 22, 27, 58, 68, 76, and 81) would impact the recreational ball fields owned by Duke Energy Corporation and leased by the Belmont Optimist Club. The recreational fields have a total area of approximately 4.9 acres. The preliminary designs for Corridor Segment K3B would impact the edge of the baseball field's outfield and the north corner of the general recreational field. The current right-of-way limits require approximately 0.3 acres, while the construction limits impact approximately 0.1 acres. Minimization measures will be investigated during final design if DSA 4, 9, 22, 27, 58, 76, or 81 is selected as the Preferred Alternative.

The preliminary design for the Preferred Alternative was updated in this area to avoid impacts to the recreational fields, as discussed in Section 2.5.1.5.

Planned Greenways. There are several planned greenways in the Project Study Area, as shown in Figure 3-8a-b of the Draft EIS. All DSAs have the potential to cross greenways that have yet to be constructed. During final design of the Preferred Alternative, NCTA will coordinate with the applicable groups to identify needed accommodations for existing and funded greenways that cross the Preferred Alternative.

1.3.1.7 Community Safety

The information in this section is summarized from Section 3.2.6.2 of the Draft EIS. There have been no changes to this information since the Draft EIS.

Emergency Response. The Gaston East-West Connector would have a long-term positive impact on emergency response times within the Project Study Area. The project is likely to quicken some response times for services by decreasing travel times, and by providing improved east-west connectivity in southern Gaston County. There are not likely to be considerable differences among the DSAs with regard to response times.

Pedestrians and Bicycles. The proposed project does not include pedestrian and bicycle provisions since it is a controlled-access freeway.

One of Gaston County's bicycle routes (Route 1: High Shoals – Crowders Mountain) runs east-west through the area along Linwood Road, and crosses Corridor Segments H1A, H2C and H3 (i.e., all of the DSAs). As such, the project may impede or block pedestrian and bicycle traffic desiring to travel from one side of the highway to the other, because travel over/under the roadway would only be possible at interchanges and grade-separated crossings. For established and planned bicycle routes and existing and funded greenways, NCTA will coordinate with the entities having jurisdiction over these facilities during the final design of the Preferred Alternative to provide appropriate and safe crossing of these facilities.

Maintenance of Traffic During Construction. Maintenance of traffic and sequencing of construction would be planned and scheduled in order to minimize traffic delays throughout the Project Study Area. Access to all businesses and residences would be maintained to the extent possible through controlled construction scheduling.

Fog. Dense fog may occur at certain times of the year along the major rivers in the Project Study Area, including the Catawba River and the South Fork Catawba River. NCTA and NCDOT do not have a written policy regarding procedures for designing projects in fog-prone areas. Projects are studied on a case-by-case basis, typically after a project has been constructed. For example, NCDOT evaluated the conditions on the I-95 bridge over the Roanoke River near Roanoke Rapids. In this location, NCDOT installed a weather station to assess weather conditions, such as fog, and to prompt a variable message sign warning travelers of thick fog and limited visibility. Additional devices used to enhance safety in fog-prone areas can include reflective pavement markers and lighting. In accordance with NCDOT normal operating procedures, fog-related safety issues will be evaluated on a case-by-case basis after construction, and measures installed where warranted.

1.3.2 PHYSICAL ENVIRONMENT

1.3.2.1 Noise

Section 4.1 of the Draft EIS provides details of the noise analysis conducted for the DSAs. A summary of impacts and mitigation reported in the Draft EIS is presented in the Draft EIS impact summary table included in Appendix C.

The noise analysis for the Preferred Alternative (DSA 9) has been updated to incorporate design changes and updated year 2035 traffic forecasts prepared since the Draft EIS was circulated. The updated noise analysis for the Preferred Alternative is discussed in Section 2.5.2.1 of this Final EIS.

Traffic noise from the DSAs was evaluated based upon FHWA and NCDOT criteria. The FHWA Traffic Noise Model® (TNM), Version 2.5, was used to predict future traffic noise levels for this project and to evaluate the feasibility and reasonableness of preliminary noise barriers.

The table in **Appendix C** lists the numbers of receptors predicted to be impacted by traffic noise, based upon the 2030 traffic noise contours (Draft EIS Appendix G). Impacted receptors are receptors expected to experience traffic noise impacts either by approaching or exceeding the FHWA Noise Abatement Criteria (NAC) based upon the 71 dBA Leq traffic noise contour (for Category C) and 55 dBA Leq noise contours (for Category B), or by a substantial increase in exterior noise levels (as defined in NCDOT's Traffic Noise Abatement Policy). Impacted receptors do not include noise-sensitive receptors that would be relocated by the project.

The numbers of impacted receptors range from 196 impacted Category B receptors for DSA 68, to 301 impacted Category B receptors for DSA 76. Category B receptors in the vicinity of the DSAs include residences and churches. Relatively few businesses (Category C) would be impacted by noise along the DSAs, with the numbers of impacts ranging from three businesses for DSA 77 to ten businesses for DSA 22.

If traffic noise impacts are predicted, examination and evaluation of alternative noise abatement measures for reducing or eliminating the noise impacts must be considered. Types of abatement measures include highway alignment selection, traffic management measures, vegetative buffers, property acquisition, or noise barriers. Due to design restraints, access and space requirements, and cost considerations, noise barriers were found to be the only feasible and reasonable method of abatement.

Twenty-two locations were identified where noise barriers were preliminarily determined to be feasible and reasonable. The twenty-two preliminary noise barriers are listed in Table 4-5 of the Draft EIS and are shown in **Figure 1-6**.

1.3.2.2 Air Quality

The information in this section is summarized from Section 4.2 of the Draft EIS. Air quality issues addressed include transportation conformity, mobile source air toxics (MSATs), potential air quality impacts from construction activities, and potential for road and bridge icing from the Allen Steam Station air pollution control equipment. As discussed below, there have been updates to transportation conformity and MSATs since the Draft EIS was published. Due to the complexity of air quality issues, background text from the Draft EIS has been included here under "Existing Conditions Related to National Ambient Air Quality Standards" and "Transportation Conformity Background".

Existing Conditions Related to National Ambient Air Quality Standards. The US Environmental Protection Agency (USEPA) has established National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants: carbon monoxide, nitrogen dioxide, ozone, lead, particulate matter, and sulfur dioxide. An area that exceeds the NAAQS for one or more criteria pollutants is said to be in "non-attainment" of the NAAQS enforced under the Clean Air Act.

As presented in Section 4.2 of the Draft EIS, the Charlotte-Gastonia-Rock Hill air quality region, which includes the project area, is in attainment for nitrogen dioxide, lead, particulate matter,

and sulfur dioxide. Except for Mecklenburg County, all other areas within the Charlotte-Gastonia-Rock Hill air quality region are designated as attainment for carbon monoxide. Mecklenburg County is a maintenance area for carbon monoxide.

On June 15, 2004, the Charlotte-Gastonia-Rock Hill air quality region was designated as a moderate non-attainment area for the 1997 8-hour ozone NAAQS (USEPA Web site: www.epa.gov/oar/oaqps/greenbk). The region includes the following counties in North Carolina: Mecklenburg, Gaston, Lincoln, Cabarrus, Rowan, Union, and the southern portion of Iredell. The urbanized area of eastern York County, South Carolina, also is included. Compliance with the 1997 ozone standard was required by June 15, 2010. The State Implementation Plan (SIP) for ozone for this region submitted to USEPA by the NC Department of Environment and Natural Resources (NCDENR) Division of Air Quality (DAQ) projected that the 8-hour ozone standard would be met by this time (*State of the Environment Report 2008*, Mecklenburg County Land Use & Environmental Services).

The SIP in North Carolina is developed by the NCDENR-DAQ. The SIP describes how North Carolina will maintain or achieve compliance with the NAAQS.

Transportation Conformity Background. Section 176(c) of the Clean Air Act Amendments (42 USC 7506(c)) requires that transportation plans, programs, and projects conform to the intent of the SIP. Conformity requirements apply to transportation plans, programs, and projects funded or approved by the FHWA or the Federal Transit Administration (FTA) in areas that do not meet, or previously have not met, NAAQS for ozone, carbon monoxide, particulate matter, or nitrogen dioxide (*Fact Sheets on Highway Provisions*, FHWA Web site: www.fhwa.dot.gov/safetealu/factsheets/conformity.htm).

Under the transportation conformity regulations, a transportation conformity determination is required every time a Metropolitan Planning Organization (MPO) approves an update or amendment to its LRTP and transportation improvement program (TIP). A regional conformity determination is needed for each update and amendment to an LRTP and TIP.

In addition to the regional conformity determination for LRTPs and TIPs, FHWA also must make a project-level conformity determination. For all pollutants, a project-level conformity determination can be made only if the project is included in a conforming LRTP and TIP. In addition, for carbon monoxide and particulate matter, a project-level conformity finding requires a localized conformity analysis, known as a "hot-spot" analysis.

For the Gaston East-West Connector project, transportation conformity determinations are required for two pollutants: ozone and carbon monoxide. The conformity requirements apply to these pollutants because the Metrolina region as a whole is designated as a nonattainment area for the 1997 8-hour ozone standard and Mecklenburg County is designated as a maintenance area for carbon monoxide.

Transportation Conformity Update. The Draft *Conformity Analysis and Determination Report for the Cabarrus-Rowan MPO, Mecklenburg-Union MPO, and the Gaston Urban Area MPO 2035 Long Range Transportation Plans and the FY 2009-2015 Transportation Improvement Programs and for Non-MPO Areas of Lincoln County, Iredell County, Gaston County, and Union County areas (8-Hour Ozone, and CO (Mecklenburg County Only))* was made available for public review on February 5, 2010. Public meetings to solicit comments on these documents as well as the Draft 2035 LRTP and the 2009 – 2015 STIP Amendment were held on February 24, 2010 in the Charlotte Mecklenburg Government Center, on February 17, 2010 in the Gaston County Main Library, and other locations in the region.

All of the above referenced documents were made available for review until the close of the public review and comment period on March 8, 2010. As of that date, no substantive comments were received and all were endorsed by the MUMPO TCC on March 11, 2010, by MUMPO on March 24, 2010, by GUAMPO TCC on March 10, 2010, and by GUAMPO on March 23, 2010. USDOT made a conformity determination on the LRTP and TIP on May 3, 2010. A copy of the USDOT letter, along with USEPA's April 22, 2010 review, can be found in **Appendix K** of this Final EIS.

After the May 3, 2010 conformity determination made by the USDOT, the GUAMPO prepared an amendment to the *2035 LRTP* and *2009-2015 TIP* so that the project design concept and scope included in the LRTP and TIP is consistent with the Preferred Alternative. GUAMPO made a conformity determination on the amended *2035 LRTP* and *2009-2015 TIP* on August 24, 2010. USDOT issued a conformity determination on the amendments on October 5, 2010. A copy of the USDOT letter is included in **Appendix K** of this Final EIS.

Mobile Source Air Toxics Update. Subsequent to circulation of the Draft EIS, the FHWA released updated guidance regarding MSATs, titled *Interim Guidance Update on MSAT Analysis in NEPA Documents* (FHWA, September 2009) (FHWA Web site: www.fhwa.dot.gov/environment/airtoxic/100109guidmem.htm). The interim guidance update "reflects recent regulatory changes, addresses stakeholder requests to broaden the horizon years of emission trends performed with MOBILE6.2, and updates stakeholders on the status of scientific research on air toxics." The update "does not change any project analysis thresholds, recommendations, or guidelines."

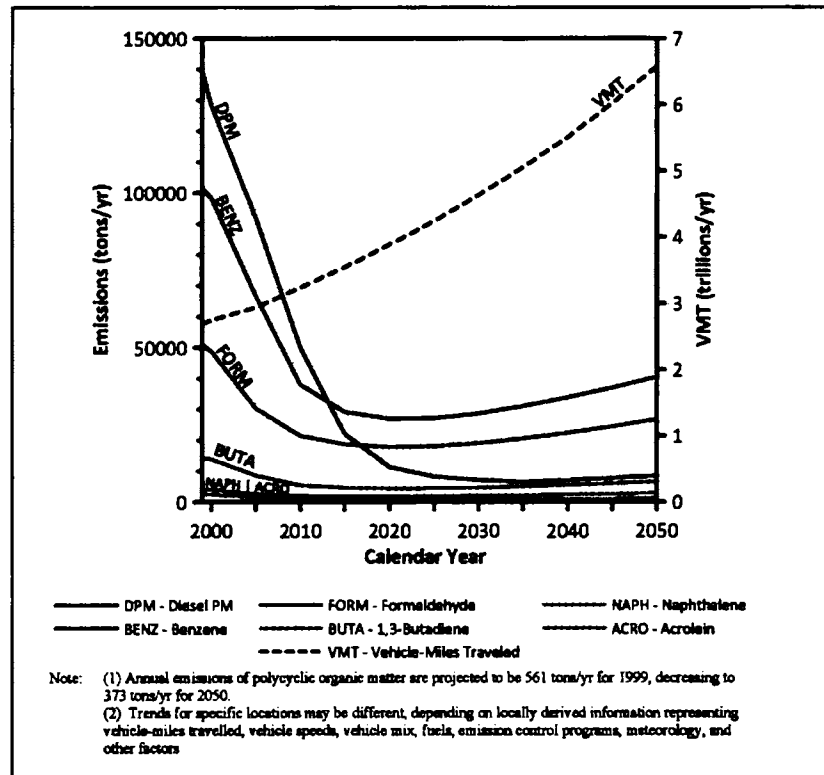
The following discussion replaces the text in Section 4.2.3 of the Draft EIS.

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments of 1990, whereby Congress mandated that the USEPA regulate 188 air toxics, also known as hazardous air pollutants. The USEPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (www.epa.gov/iris/).

In addition, USEPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (www.epa.gov/ttn/atw/nata1999/). These are acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future USEPA rules.

The 2007 USEPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using the USEPA MOBILE6.2 model, even if vehicle activity vehicle-miles traveled (VMT) increases by 145 percent as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050, as shown in **Exhibit 1-1**.

EXHIBIT 1-1: National MSAT Emission Trends 1999 – 2050 for Vehicles Operating on Roadways Using USEPA MOBILE6.2 Model



Source: *Interim Guidance Update on MSAT Analysis in NEPA Documents* (FHWA, September 2009).

Mobile Source Air Toxics Impact Analysis Update. As mentioned above, the *Interim Guidance Update on MSAT Analysis in NEPA Documents* (FHWA, September 2009) does not change any project analysis thresholds, recommendations, or guidelines. Therefore, the qualitative impact evaluation conclusions described in Section 4.2.5.2 and Appendix H of the Draft EIS do not change. However, the interim guidance update did recommend updated language for incomplete and unavailable information and provided information on new research. Section 4.2.5.2 of the Draft EIS is updated as described below. Appendix H in the Draft EIS also has been updated and is included as **Appendix D** in this Final EIS.

The following text replaces the text in Section 4.2.5.2 of the Draft EIS.

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making within the context of the NEPA.

Nonetheless, air toxics concerns continue to be raised on highway projects during the NEPA process. Even as the science emerges, FHWA is duly expected by the public and other agencies to address MSAT impacts in environmental documents. The FHWA, USEPA, the Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this emerging field.

While this research is ongoing, FHWA requires each NEPA document to address MSATs and their relationship to the specific highway project through a tiered approach (*Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents*, FHWA, September 2009). A qualitative analysis of MSATs for this project appears in its entirety in **Appendix D** of this Final EIS.

Construction Air Quality. Provided that local ordinances for open burning and dust are followed, significant air quality impacts due to construction of the proposed project are not anticipated. The proposed project would be constructed in sections, limiting the overall construction activity occurring at any one location. There would also be emissions related to construction equipment and vehicles. However, these impacts related to construction would be temporary.

Road and Bridge Icing Potential from Allen Steam Station Air Pollution Control Equipment. Duke Energy Corporation's Allen Steam Station, a major coal-fired power plant, is located between Southpoint Road and the Catawba River on the Belmont peninsula (Draft EIS Figure 2-8a).

The Allen Steam Station recently installed air pollution control equipment to comply with the North Carolina Clean Smokestacks Act of 2002. The Allen Steam Station air pollution control equipment is located north of the main power plant, just south of Corridor Segments K3B/K3C.

The air pollution control equipment includes scrubbers for sulfur dioxide control that will emit steam through a tall stack. In correspondence with NCTA, Duke Energy Corporation raised concerns that the steam emitted from the stack could result in icing on the nearby proposed roadway and the associated bridge crossing of the Catawba River (Telephone interview, Duke Energy Regional Manager, September 14, 2005).

In response to the concerns, a study was conducted to evaluate the likelihood and extent of potential icing on the proposed roadways and bridge crossings of the Catawba River for Corridor Segments K3B/K3C (DSAs 4, 9, 22, 27, 58, 68, 76, and 81) and Corridor Segment K4A (DSAs 5, 23, 64, and 77) (*Analysis of Potential Icing Impacts Due to Allen Steam Station SO₂ Scrubber – Gaston East-West Connector*, MACTEC, September 2008, incorporated by reference).

The model predicted there would be no potential for icing on the proposed Gaston East-West Connector due to exhaust gases released from the air pollution control scrubber stack.

1.3.2.3 Farmland

The following information is summarized from Section 4.3 of the Draft EIS, with an update to prime and important farmland soils and an update to agricultural census information. Updated information on impacts to prime and important farmland soils associated with the refined preliminary design of the Preferred Alternative is presented in **Section 2.5.2.3** of this Final EIS.

Prime and Important Farmland Soils. Section 4.3.2 and Table 4-8 of the Draft EIS discuss prime and important farmland soils within the DSA corridors. This discussion is based on Natural Resource Conservation Service (NRCS) soils surveys for Gaston County (dated May 1989) and Mecklenburg County (dated June 1980) and a list of prime and statewide important farmland soils for North Carolina downloaded from the US Department of Agriculture (USDA) Web site in April 2005. This data also is presented in Appendix M of the Draft EIS.

Updated soils surveys and lists of prime and important farmland soils for Gaston County and Mecklenburg County were published by the NRCS on June 17, 2009 and April 29, 2009, respectively (NRCS Web site: <http://soildatamart.nrcs.usda.gov>)

Table 1-4 replaces Table 4-8 of the Draft EIS with the most recent list of prime and important farmland soils within the DSAs. The updated data is included in Appendix E of this Final EIS.

TABLE 1-4: Prime and Important Farmland Soils in the Detailed Study Alternative Corridors

Soil Symbol	Soil Name	Percent Slope	County
Prime Farmland Soils			
AmB	Alamance variant gravelly loam	2-8	Gaston
ApB	Appling sandy loam	1-6	Gaston
CeB2	Cecil sandy clay loam	2-8	Gaston & Mecklenburg
CoA	Congaree loam	0-2	Gaston
HeB	Helena sandy loam	1-6	Gaston
LdB2	Lloyd sandy clay loam	2-8	Gaston
MaB2	Madison sandy clay loam	2-8	Gaston
TaB	Tatum gravelly loam	2-8	Gaston
VaB	Vance sandy loam	2-8	Gaston
WnB	Winnsboro loam	2-8	Gaston
*ChA	Chewacla loam	0-2	Gaston
EnB	Enon sandy loam	2-8	Mecklenburg
HeB	Helena sandy loam	2-8	Mecklenburg
MeB	Mecklenburg fine sandy loam	8-15	Mecklenburg
*MO	Monacan loam	n/a	Mecklenburg
Statewide Important Farmland Soils			
CeD2	Cecil sandy clay loam	8-15	Gaston & Mecklenburg
LdD2	Lloyd sandy clay loam	8-15	Gaston
LgB	Lignum silt loam	1-6	Gaston
MaD2	Madison sandy clay loam	8-15	Gaston
PaD2	Pacolet sandy clay loam	8-15	Gaston
TaD	Tatum gravelly loam	8-15	Gaston
VaD	Vance sandy loam	8-15	Gaston & Mecklenburg
WeD	Wedowee sandy loam	6-15	Gaston
WnD	Winnsboro loam	8-15	Gaston
DaD	Davidson sandy clay loam	8-15	Mecklenburg
EnD	Enon sandy loam	8-15	Mecklenburg
MeD	Mecklenburg fine sandy loam	8-15	Mecklenburg

Source: NRCS Web site: <http://soildatamart.nrcs.usda.gov>; Gaston County data dated June 17, 2009; Mecklenburg County data dated April 29, 2009.

*Prime if drained and either protected from flooding or not frequently flooded during growing season.

All proposed DSAs would involve the use of prime and statewide important farmland soils. The No-Build Alternative would not directly impact prime and important farmland soils. Table 1-5 presents the updated acreages of prime and important farmland soils within the preliminary design right of way for each DSA, based on the 2009 soils surveys. This is an update to the data reported in Table 4-9 of the Draft EIS. Using the updated soils data, the acreages were recalculated using GIS by overlaying the preliminary design right of way on the soils GIS layer and subtracting out disturbed land already in urban development. See Section 2.5.2.3 of this Final EIS for impacts associated with the refined preliminary design for the Preferred Alternative.

TABLE 1-5: Impacts to Prime and Important Farmland Soils

DSA	Total Acreage in DSA Right of Way	Prime Farmland Soils (Acres in Right of Way)*			Statewide Important Farmland Soils (Acres in Right of Way)*			Total acreage of Prime and Important Farmland Soils in DSA
		Gaston	Mecklenburg	Total Prime	Gaston	Mecklenburg	Total Important	
4	1,901	621	134	754	260	71	331	1,085
5	1,837	593	83	677	238	65	303	980
9	1,893	628	134	762	252	71	323	1,084
22	1,940	614	134	748	255	71	325	1,073
23	1,872	586	84	670	233	65	298	968
27	1,931	621	134	755	247	71	317	1,072
58	2,009	633	134	767	338	71	408	1,175
64	1,991	578	84	661	344	65	409	1,070
68	2,047	612	134	746	357	71	428	1,174
76	1,901	629	134	763	263	71	334	1,097
77	1,837	602	84	686	242	65	307	992
81	1,893	637	134	770	255	71	326	1,096

Sources for Soils Information: Soils Survey of Gaston County, North Carolina (NRCS, June 17, 2009); Soils Survey of Mecklenburg County, North Carolina (NRCS, April 29, 2009). Available for download on the NRCS Web site: <http://soildatamart.nrcs.usda.gov>

*Acreages are calculated for the preliminary design right of way for each DSA. Areas of prime and statewide important soils already in urban development were not included in the totals.

Farmland Conversion Impact Ratings. Section 4.3.4.2 of the Draft EIS discusses farmland conversion impact ratings. There are no updates to this section, which is summarized below.

In accordance with the Farmland Protection Policy Act of 1981 (FPPA) and FHWA’s *Guidelines for Implementing the Final Rule of Farmland Protection Policy Act for Highway Projects*, a “Farmland Conversion Impact Rating for Corridor Type Projects” form was prepared. The NRCS forms are included in Appendix I of the Draft EIS.

The ratings on the NRCS forms are comprised of two parts. The Land Evaluation Criterion Value represents the relative value of the farmland to be converted on a scale from 0 to 100 points. The Corridor Assessment, which is rated on a scale of 0 to 160 points, evaluates farmland soils based upon its use in relation to the other land uses and resources in the immediate area. The two ratings are added together for a possible total rating of 260 points. Sites receiving a total score of 160 points or more are given increasingly higher levels of consideration for protection (7 CFR 658.4).

Table 4-10 in the Draft EIS lists the total points for each DSA. The total point value for each DSA is less than 160 points. According to the FPPA, lands that receive a combined score of less than 160 points are not covered by the FPPA. Since the soils impacted by the DSAs did not meet the threshold of protection based on the evaluation under the FPPA, the impacts to prime and statewide important farmland were not considered under FPPA.

Existing Agricultural Uses. Since publication of the Draft EIS, there has been an update to the 2002 agricultural census information presented in Section 4.3.3.2 of the Draft EIS.

According to the *2007 Census of Agriculture* (USDA National Agricultural Statistics Service, February 2009, USDA Web site: www.agcensus.usda.gov/Publications/2007/index.asp), the number of farms between 2002 and 2007 increased from 450 to 516 and the average farm size decreased from 93 to 73 acres in Gaston County. For Mecklenburg County, the number of farms between 2002 and 2007 decreased from 300 to 236, while the average farm size decreased from 85 to 81 acres.

Local Agricultural Programs. In July 2004, Gaston County adopted a Voluntary Agricultural District (VAD) ordinance under the authority of the Agricultural Development and Farmland Preservation Enabling Act (NCGS Chapter 106 Sections 735-743). Mecklenburg County does not have a VAD ordinance.

Parcels participating in the VAD program are shown in Draft EIS Figure 4-3. Gaston County farmers who enroll their farms in the Gaston County VAD program agree to keep their lands dedicated to agricultural uses for 10 years, and they have the right to public hearings in their communities if there are ever land condemnation proceedings against lands within the districts (*Gaston County Voluntary Agricultural District Ordinance*, Gaston County Web site: www.co.gaston.nc.us/ordinances/VADordinance2004-07-22.pdf).

There are 21 parcels currently participating in the VAD program that would be directly impacted by various DSAs. The No-Build Alternative would not directly impact any VAD properties.

As shown in Draft EIS Table 4-11, the number of impacted VAD program properties range from 8 to 11, with impacted acreage ranging from 44.7 to 138.4 acres. DSAs 64 and 68 impact the most number and acreage of VAD properties, as these DSAs are located in more rural areas. DSAs 4 and 22 would impact the least number and acreage of VAD properties.

Although all DSAs would impact agricultural lands in Gaston County, the project is consistent with the County's land use plans, which designate southern Gaston County as an area targeted for more suburban development. Discussion with Gaston County staff and reviews of local planning documents indicate that the area surrounding the proposed project is slated for suburban development.

Farm Relocations. As reported in Section 4.3.4.3 of the Draft EIS, the *Relocation Reports for the Gaston East-West Connector* (Carolina Land Acquisitions, Inc., June 2008) note that zero to two farms would be displaced, depending upon the DSA. DSAs 4, 22, 58, and 76 would not displace any farms. DSAs 5, 9, 23, 27, 77 and 81 would displace one farm, and DSAs 64 and 68 would displace two farms. Because much of southern Gaston County is still rural, it is anticipated that there would be suitable replacement property available for farm relocation.

1.3.2.4 Utilities and Infrastructure

The following information is summarized from Section 4.4 of the Draft EIS. Utilities addressed include electric power, natural gas, telecommunications, water and sewer facilities, and railroads. Table 4-12 in the Draft EIS summarizes major utility impacts for each DSA. There has been one update to this information since the Draft EIS was circulated, which is a new rail spur near the Charlotte-Douglas International Airport.

Electrical Power Generation and Transmission.

None of the DSAs would directly impact the Duke Energy Corporation's Allen Steam Station. The number of crossings of electrical power transmission lines varies from a minimum of 13 (DSA 5 and DSA 23) to a maximum of 18 (DSA 58). The preliminary designs for the DSAs minimized impacts to electrical power transmission lines to the extent feasible, based upon data available at that time.

Natural Gas. All DSAs would cross natural gas transmission easements owned by Plantation Pipeline Company and Colonial Pipeline Company. Each easement contains two natural gas transmission pipelines. Although both natural gas transmission and distribution lines would be

Transmission Lines vs Distribution Lines

Electric power transmission lines transmit power between a power plant and a substation near a populated area. Electric power distribution lines deliver the power from the substation to the consumer. This same concept also applies to other utilities, such as natural gas and water.

crossed by the DSAs, the project is not expected to impact consumer gas service. To avoid disruptions in service and delivery, NCTA would coordinate any required relocation or modification of transmission lines with Plantation Pipeline Company and Colonial Pipeline Company in addition to any required relocation or modification of distribution lines with area providers.

Telecommunications. No communications towers or cell towers would be impacted by any of the DSAs. Various AT&T and Time Warner Cable telecommunication lines cross the Project Study Area and the DSAs.

Water and Sewer Service. The DSAs would cross water and sewer lines, but no negative impacts, or disruptions in service, are anticipated with any of the DSAs. None of the DSAs would impact water or wastewater treatment facilities.

Wells within the Preferred Alternative's right of way would be surveyed prior to project construction. NCTA would purchase these wells and cap and abandon them in accordance with State standards (15 NCAC 2C).

Railroads. The Norfolk Southern mainline that runs east-west through Gaston County would be impacted by DSAs that use Corridor Segment H2A (DSAs 4, 5, 9, 22, 23, and 27). The track is close to, and parallels, the east side of NC 274 (Bessemer City Road). Modifications to the I-85/NC 274 (Bessemer City Road) interchange will require the replacement of the existing railroad bridge over I-85. Substantial disruptions in rail service are not anticipated.

All DSAs cross the Norfolk Southern branch line that runs north-south parallel to the east side of US 321. The interchange design at US 321 for all DSAs has the ramps located on the west side of US 321 to avoid the rail line.

The DSAs that use Corridor Segment K3B (DSAs 4, 9, 22, 27, 58, 68, 76, and 81) would cross the rail spur that serves Duke Energy's Allen Steam Station.

All DSAs would cross the new Norfolk Southern rail spur located east of I-485 that will serve the intermodal facility at the Charlotte-Douglas International Airport.

Utility coordination would be conducted during final design. All utility providers would be contacted and coordinated with to ensure that the proposed design and construction of the project would not substantially disrupt service.

1.3.2.5 Visual Resources

The following information is summarized from Section 4.5 of the Draft EIS. There have been no updates to this information since the Draft EIS was circulated.

As visual impacts can be subjective, a distinction was not made among alternatives with regard to the most or least visually impacting alternative. 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., impact a greater number of neighborhoods with residential relocations) are expected to have a greater amount of visual impacts. In this case, all of the DSAs have similar numbers and types of relocation impacts to neighborhoods. As such visual impacts to neighborhoods are not expected to vary significantly among the DSAs as a result of this project.

During final design of the Preferred Alternative, NCTA will investigate the feasibility and reasonableness of incorporating cost-effective treatments for the proposed major bridges over the Catawba River and South Fork Catawba River to enhance aesthetics.

1.3.2.6 Hazardous Materials

The following is summarized from Section 4.6 of the Draft EIS. There are no updates to this section of the Draft EIS. The impact summary table from the Draft EIS included in **Appendix C** of this Final EIS lists the numbers of potentially contaminated sites with each DSA. Appendix J in the Draft EIS includes more detailed information about potentially contaminated sites.

Additional studies to evaluate potentially contaminated sites were conducted for the Preferred Alternative. Updated information on hazardous materials impacts associated with the Preferred Alternative is presented in **Section 2.5.2.6** of this Final EIS.

As discussed in Section 4.6.1 of the Draft EIS, an assessment of the project area was performed to identify the presence of potentially contaminated sites. Forty-six sites were identified within the immediate vicinity of the DSAs. The 46 sites include 25 Underground Storage Tanks (UST), twelve manufacturing facilities, three junkyards, two hazardous waste sites, one apparent landfill, and three other contaminated sites. Figure 4-6 of the Draft EIS identifies the locations of these sites.

Table 4-13 of the Draft EIS summarizes the impacts from potentially contaminated sites for each DSA. All potential impacts were rated as low, low to medium, or medium. This means there would be little to no impact to cost or schedule for a site rated low. A medium rating may incur additional costs and time due to the handling of contaminated materials and/or a need for special construction techniques or products.

Impacts to Potentially Contaminated Sites

All impacts to potentially contaminated sites were rated low, low to medium, or medium in regards to additional costs and time.

Based on the assessment presented in Section 4.6.2 of the Draft EIS, the DSAs closest to Gastonia's city limits on the west side had the highest numbers of potentially contaminated sites. DSAs 4, 5, 9, 22, 23, and 27 would impact 21-24 potentially contaminated sites, while DSAs 58, 64, 68, 76, 77, and 81 would impact 12 to 14 potentially contaminated sites.

1.3.2.7 Floodplains and Floodways

The following information is summarized from Section 4.7 of the Draft EIS. Updated Flood Insurance Rate Maps (FIRMs) for portions of Gaston County and Mecklenburg County have been issued since publication of the Draft EIS, as described below.

As discussed in Section 4.7.1 of the Draft EIS, the Federal Emergency Management Agency (FEMA), in cooperation with federal, state, and local governments, developed floodplain and floodway boundaries and FIRMs for Gaston County and Mecklenburg County. The Draft EIS referred to September 2007 FIRM for Gaston County and February 2004 FIRM for Mecklenburg County.

In the Project Study Area, FIRMs were updated in March and November 2009 for panels in the eastern end of the project (North Carolina Floodplain Mapping Program Web site: www.ncfloodmaps.com/firm_indexes.htm). A comparison of these new maps with the floodplains and floodways in Draft EIS Figure 4-7 show no noticeable differences in boundaries at the scale of the figure.

Named streams with defined floodplains in the Project Study Area include, from west to east: Abernethy Creek, Oates Branch, Bessemer Branch, Crowders Creek, Blackwood Creek, Ferguson Branch (floodplain only), McGill Branch (floodplain only), South Crowders Creek (floodplain only), Catawba Creek, South Fork Catawba River, Catawba River, Beaverdam Creek, and

Legion Lake Stream. Several unnamed tributaries of Crowders Creek and Catawba Creek also have defined floodplains. Defined floodways generally are located within or near municipal limits.

As discussed in Section 4.7.3 of the Draft EIS, a preliminary hydraulics analysis (*Final Preliminary Hydraulic Technical Memorandum for the Gaston County East-West Connector*, PBS&J, December 2007) was performed to identify the preliminary sizes and locations of major drainage structures along the DSAs that would be needed to adequately carry floodwaters. Major drainage structures are bridges, box culverts, or pipe culverts greater than 72 inches in diameter.

The major drainage structures and crossings were reviewed by the environmental regulatory and resource agencies at Turnpike Environmental Agency Coordination (TEAC) Meetings on February 5, March 4, and April 8, 2008. As a result of these meetings, the NCTA agreed to include several bridges in the preliminary designs beyond those required to convey floodwaters. The recommended bridges are listed in Section 4.7.3 of the Draft EIS.

Figure 4-8 and Table 4-14 of the Draft EIS summarize the major drainage structures associated with each DSA. Details are provided in Appendix K of the Draft EIS. DSAs 22, 23, and 27 would have the most bridges (8 bridges), and DSA 58 the fewest (6 bridges). DSAs 4 and 58 would have the greatest number of major culverts and pipes (47 culverts and pipes), while DSA 77 would have the fewest (39 culverts and pipes).

DSAs that are closer to Crowders Creek (DSAs 4, 5, 9, 22, 23, and 27) have the most total combined floodway and floodplain crossings (21-23 crossings).

The preliminary designs for DSAs that use Corridor Segment J4a (DSAs 4, 5, and 9) would involve a longitudinal encroachment on the Crowders Creek floodplain just north of New Haven Drive. This longitudinal encroachment would be approximately 1,400 feet in length and include an area of approximately 5 acres.

For all new location crossings on FEMA-regulated streams (streams where a floodway and/or floodplain has been identified), a Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR) will be submitted to the NC Flood Mapping Program for streams in Gaston County and to Charlotte-Mecklenburg Storm Water Services for streams in Mecklenburg County.

In National Flood Insurance Program (NFIP) flood hazard areas, the final hydraulic designs for the Preferred Alternative will ensure that the floodway will carry the 100-year flood without adversely affecting floodplain elevations. The effect of all the DSAs can be mitigated effectively through proper sizing and design of hydraulic structures (culverts, bridges, and channel stabilization).

A LOMR is FEMA's modification to an effective FIRM, or Flood Boundary and Floodway Map (FBFM), or both. LOMRs are generally based upon the implementation of physical measures affecting the hydrologic or hydraulic characteristics of a flooding source, and thus result in the modification of the existing regulatory floodway, the effective Base Flood Elevations (BFEs), or the Special Flood Hazard Area (SFHA). The LOMR officially revises the FIRM or Flood Boundary and FBFM, and sometimes the Flood Insurance Study (FIS) report, and when appropriate, includes a description of the modifications (FEMA Web site: www.fema.gov/plan/prevent/floodplain/nfipkeywords/lomr.shtm).

1.3.3 CULTURAL RESOURCES

1.3.3.1 Historic Architectural Resources

The following information is summarized from Section 5.2 of the Draft EIS. There have been no updates to this information since the Draft EIS was published.

Meetings were held with the State Historic Preservation Office (HPO) on April 21, 2008 and July 21, 2008 to reach concurrence on properties eligible for listing on the National Register of Historic Places (NRHP), and to reach concurrence on the assessment of effects to listed and eligible properties from the DSAs. Concurrence forms are included in Appendix A-2 of the Draft EIS.

Historic Architectural Sites

None of the DSAs would result in an Adverse Effect to a historic property on or eligible for listing on the National Register of Historic Places.

Eighteen properties within the DSAs were determined on or eligible for listing in the NRHP. These are shown in Figure 5-1 of the Draft EIS. Effects to these properties were determined based on the preliminary design for each DSA. Table 5-2 in the Draft EIS presents the effects determination for each listed and eligible property, as well as any conditions placed on the DSAs to achieve a No Adverse Effect determination.

As listed in Table 5-2 of the Draft EIS, none of the DSAs would result in an Adverse Effect to a historic property listed on or eligible for listing on the NRHP. During final design of the Preferred Alternative, the designs will be reviewed to ensure the applicable conditions listed in Table 5-2 are met to maintain the No Adverse Effect determinations.

Properties with a No Adverse Effect related to one or more DSAs include the Wolfe Family Dairy Farm, William Clarence Wilson House, JBF Riddle House, Harrison Family Dairy Farm, and Thomas Allison House. Each property with a No Adverse Effect determination is discussed briefly in Section 5.2.2 of the Draft EIS. Appendix L of the Draft EIS contains figures showing each historic resource receiving a No Adverse Effect determination in relation to the DSAs' preliminary designs on aerial photography.

1.3.3.2 Archaeological Resources

The following information is summarized from Section 5.3 of the Draft EIS. There are no updates to this section of the Draft EIS.

Since the Draft EIS was published, an intensive archaeological survey and assessment has been prepared for the Preferred Alternative. Additional information regarding this assessment is provided in Section 2.5.3.2 of this Final EIS.

There are 33 previously recorded sites within or immediately adjacent to the DSAs. Most of these sites have limited potential for additional significant information due to low artifact densities and/or loss of integrity through agriculture or erosion.

Sites from all the major prehistoric and historic periods are represented in the Project Study Area. Only one known site dates to the time of early European explorations. This Native American habitation site with burials, Site 31 GS55 (Crowders Creek site) is located south of the DSAs. Eighteenth and nineteenth century sites are numerous, and include gold mines. Other types of industrial sites, such as a textile mill, also have been noted within the DSAs.

It is unlikely that any of the 33 known archaeological sites within or adjacent to the DSAs warrant preservation in place. However, there is the potential for impacts to archaeological sites that have not been previously identified. The archaeological resource assessment included an

evaluation of the potential for site types that would merit preservation in place or would require costly and complex excavation. Based upon this information, Table 1-6 presents a ranking of the DSAs.

TABLE 1-6: Ranking of DSAs by Potential to Impact Archaeological Resources

Overall Potential for Archaeological Sites Requiring Preservation in Place or Costly and Complex Excavation	DSAs
High	4, 22, 58, 76
Moderate to High	64, 68
Moderate	5, 9, 77, 81
Low	23, 27

Source: *Archaeological Assessment of Detailed Study Alternatives for the Proposed Gaston East-West Connector* (Coastal Carolina Research, Inc., April 2007).

1.3.3.3 Section 4(f) and Section 6(f) Resources

The following information is summarized from Section 5.4 of the Draft EIS. An update is included below summarizing input received during the Draft EIS public review period regarding Berewick Regional Park. Also, since the Draft EIS was published, the preliminary design for the Preferred Alternative was modified and the refined preliminary design avoids encroachment on Berewick Regional Park. This design refinement is discussed in Section 2.5.3.3.

Section 4(f) Resources. There are three publicly-owned parks and eighteen significant historic sites located in or near the DSAs that are protected by Section 4(f) (49 USC Section 303 and 23 CFR Part 774).

Parks. Publicly-owned parks include Crowders Mountain State Park, Gaston County's Park at Forestview High School, and Mecklenburg County's Berewick Regional Park.

As described in Section 5.4.3 of the Draft EIS, none of the DSA's will directly or indirectly impact Crowders Mountain State Park or Gaston County's Park at Forestview High School. However, all of the DSAs' preliminary designs, as presented in the Draft EIS, would encroach upon Berewick Regional Park.

The refined preliminary design for the Preferred Alternative would not encroach on Berewick Regional Park. The information presented below documents public comments received regarding this issue prior to the design modifications.

DSAs that use Corridor Segment K3C (DSAs 4, 9, 22, 27, 58, 68, 76, and 81) would impact approximately 1.6 acres on the east end of the park, adjacent to I-485 based on the preliminary designs presented in the Draft EIS. DSAs that use Corridor Segment K4A (DSAs 5, 23, 64, and 77) would impact approximately 3.3 acres. These minor encroachments on the edges of the property owned by Mecklenburg County were not anticipated to impact access or any future planned uses.

The Mecklenburg County Park and Recreation Department concurred that the estimated right of way needed under any of the DSAs (as shown in the Draft EIS) would not adversely affect the activities, features, and attributes of Berewick Regional Park (Section 5.4.3.1 of the Draft EIS).

After the Draft EIS was published, potential Section 4(f) impacts were presented at the Public Hearings for the proposed project held in June 2009, and public comment was solicited on the comment forms regarding the estimated encroachments into the proposed Berewick Regional Park. Of the 153 comment forms received during the public comment period, more than fifty-

eight percent had no comment on potential impacts to the Berewick Regional Park; approximately ten percent felt there were no adverse effects; twenty-one percent felt there would be adverse effects; and eleven percent were unsure, did not know, or just did not want the project to be built at all.

Since Mecklenburg County Park and Recreation Department, and the majority of the public, do not believe Berewick Regional Park would be adversely impacted by the DSAs, there appears to be grounds for a finding of *de minimis* effect. However, as discussed in Section 2.5.3.3, the Preferred Alternative refined preliminary design avoids taking right of way from Berewick Regional Park, and no further action under Section 4(f) is required. If the refined preliminary design for the Preferred Alternative is modified during final design in such a way as to encroach on Berewick Regional Park, then the Section 4(f) issue will need to be reevaluated.

De minimis effects

De minimis effects on publicly-owned parks, recreation areas, and wildlife and waterfowl refuges are defined as those that do not "adversely affect the activities, features and attributes" of the Section 4(f) resource (FHWA Web site: www.fhwa.gov/hep/qasdeminimis.hm).

Historic Architectural Sites. There are eighteen historic architectural resources listed on or eligible for listing on the NRHP located in the Area of Potential Effect (APE) (Section 5.2.1.2 and Figure 5-1 of the Draft EIS). Because they are listed on or eligible for listing on the NRHP, they are considered significant historic sites under Section 4(f). Of these eighteen historic architectural resources, there are five historic architectural resources receiving a determination of No Adverse Effect from the HPO and FHWA: 1) Wolfe Family Dairy Farm; 2) William Clarence Wilson House; 3) JBF Riddle House; 4) Harrison Family Dairy Farm; and 5) Thomas Allison House.

Approximately 29 acres of the Wolfe Family Dairy Farm site would be needed for the right of way for DSAs 58, 64, 68, 76, 77, and 81). FHWA and the State Historic Preservation Officer (SHPO) found that the impacts to the Wolfe Family Dairy Farm would constitute a *de minimis* effect and the analysis of avoidance alternatives is not required (Appendix A-5 in the Draft EIS).

There would be no land required from the William Clarence Wilson House, the JBF Riddle House, the Harrison Family Dairy Farm, or the Thomas Allison House for any of the DSAs. As long as the conditions are met to maintain the No Adverse Effects determinations, there would be no use of these resources and no Section 4(f) evaluation would be required.

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 use.

1.3.4 NATURAL RESOURCES

1.3.4.1 Geology, Mineral Resources, and Soils

The following information is summarized from Section 6.1 of the Draft EIS, with updates based on the most recent soil surveys for Gaston and Mecklenburg Counties.

Mineral Resources. According to the NCDENR Department of Land Resources, there are several active and inactive permitted mines in Gaston and Mecklenburg counties (*List of Permitted Active and Inactive Mines in North Carolina*, Department of Land Resources – Division of Land Resources, May 2008). None of the active or inactive mines would be impacted

by the DSAs. Geotechnical surveys conducted during the final design phase would identify abandoned mine shafts in the area that could affect construction activities.

Soils. The USDA NRCS has published soil surveys for all counties within North Carolina. The surveys for the project study area described in the Draft EIS Section 6.1, *Soil Survey of Gaston County, North Carolina* (USDA, May 1989) and *Soil Survey of Mecklenburg County, North Carolina* (USDA, June 1980) were updated June 17, 2009 and April 29, 2009, respectively (NRCS Web site: <http://soildatamart.nrcs.usda.gov>). The updated soils information reflects changes in soil series information and farmland classifications.

The soil surveys provide maps showing the soil types within Gaston County and Mecklenburg County and information on soil properties that can affect land use. The 2009 soil surveys identify the soil types within the DSAs. This soil data serves to update the data presented in Appendix M of the Draft EIS and is included in **Appendix E** of this Final EIS.

The entire area underlain by the DSAs is rated “somewhat limited” or “very limited” for road construction. This means the soil properties indicate that special planning, design, or maintenance is needed to overcome soil limitations. The concern cited in the soil surveys is low strength (i.e., the soil is unable to support loads). Some soils also have shrink-swell potential, which is the potential for a soil volume to change with a loss or gain of moisture. Shrinking and swelling can cause damage to structures and roads, if either lack special design (USDA, January 1996). A complete list of soils and soil properties can be found in **Appendix E**.

The expected soil limitations can be overcome through proper engineering design, including the incorporation of techniques such as soil modification, appropriate choice of fill material, use of non-corrosive subgrade materials, and design of drainage structures capable of conveying estimated peak flows. Decisions regarding soil limitations and methods to overcome them would be determined during the final design phase.

1.3.4.2 Water Resources

The following information is summarized from Section 6.2 of the Draft EIS. Section 6.2.1 describes existing water resources, Section 6.2.2 describes water quality, and Section 6.2.3 discusses water resources impacts and mitigation. Updates are provided below, as noted. Updated discussions of potential indirect and cumulative effects to water quality associated with the Preferred Alternative are included in **Section 2.5.5** of this Final EIS.

Water Resource Descriptions. There are no updates to this section of the Draft EIS (Section 6.2.1) since it was published. A summary of water resources in the Project Study Area is provided below.

River Basins, Named Streams, and Lakes. DSAs are located within the Catawba River Basin (USGS Hydrologic Unit Codes 03050101 and 03050102; NC Division of Water Quality sub-basins 03-08-34, 03-08-36, and 03-08-37). Named streams within the Project Study Area are shown in Figure 4-7 of the Draft EIS. The named streams include Abernethy Creek, Oates Creek (Branch), Bessemer Branch, Crowders Creek, McGill Branch, Ferguson Branch, Blackwood Creek, Mill Creek, Catawba Creek, South Fork Catawba River, Catawba River, Beaverdam Creek, and Legion Lake Stream. Numerous unnamed perennial and intermittent tributaries are also present in the Project Study Area.

Named Streams

There are thirteen named streams crossing or in the immediate vicinity of the DSAs. Ten are in Gaston County, two are in Mecklenburg County, and one (Catawba River/Lake Wylie) forms the county boundary.

Lake Wylie in the Project Study Area is a dammed portion of the Catawba River and is comprised of segments of the Catawba River, South Fork Catawba River, and Catawba Creek. Lake Wylie is part of the Catawba-Wateree Hydro Project operated by Duke Energy.

The Catawba-Wateree Hydro Project is licensed by the Federal Energy Regulatory Commission (FERC). The FERC licenses and governs all non-federal hydropower projects located on navigable waterways. For Lake Wylie, the FERC project boundary is the "full pond contour", which is 569.4 feet above Mean Sea Level (Duke Energy Corporation Web site: www.duke-energy.com/catawba-wateree-relicensing/relicensing-terms.asp).

Water Supply Resources. Two named water bodies that cross the DSAs are designated as water supply uses. The Catawba River/Lake Wylie downstream of Paw Creek (Stream Index #11-(123.5)) and the South Fork Catawba River (Stream Index #11-129-(15.5)) are classified as Water Supply V (WS-V) water supplies by the NCDENR-Division of Water Quality (NCDWQ). The Catawba River/Lake Wylie upstream of Paw Creek to I-85 (Stream Index #11-(122)) is designated WS-IV (NCDWQ Web site: <http://h2o.enr.state.nc.us/bims/reports/reportsWB.html>). Water supply watershed critical and protected areas associated with Lake Wylie are just north of the DSAs, and are shown in Figure 4-7 of the Draft EIS.

The majority of the area crossed by the DSAs is not currently served by public water (Draft EIS Figure 4-4), and these areas rely on private wells or community wells for drinking water.

Water Quality. Section 6.2.2 of the Draft EIS describes best usage classifications (Section 6.2.2.1), impaired waters (Section 6.2.2.2), point source dischargers (Section 6.2.2.3), non-point source dischargers (Section 6.2.2.4), and water quality monitoring and basin-wide assessments (Section 6.2.2.5). These sections are summarized below, with updates as noted.

Best-Usage Classifications. There have been no updates to the best-usage classifications of the named stream segments in the study area since the Draft EIS was published. Out of the thirteen named streams, eleven are classified as Class C waters, which are designated for aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. South Fork Catawba River and Catawba River/Lake Wylie are classified as water supplies, as described above. No waters classified as High Quality Waters (HQW) or Outstanding Resource Waters (ORW) occur within one mile of the Project Study Area.

Impaired Waters. Section 303(d) of the Clean Water Act requires states to develop a list of waters that are not meeting water quality standards or which have impaired uses. The 2006 *Final North Carolina 303(d) List* (NCDWQ Web site: http://h2o.enr.state.nc.us/tmdl/documents/303d_Report.pdf) is the most recent list, as reported in the Draft EIS. Portions of Abernethy Creek, Crowders Creek, and Catawba Creek within the Project Study Area are included on the list.

303(d)-Listed Streams in the Project Study Area

Abernethy Creek, Crowders Creek, and Catawba Creek, are listed on the Final 2006 303(d) list as having impaired use for aquatic life.

A Draft 2010 303(d) list has been published (NCDWQ Web site: http://h2o.enr.state.nc.us/tmdl/documents/draft_2010_Cat_5.pdf). Within the Project Study Area, Crowders Creek, McGill Branch, Catawba Creek, and South Fork Catawba River are listed on the 2010 Draft 303(d) list. Although Abernethy Creek was included on the Final 2006 303(d) list, it is not included on the Draft 2010 list.

Point and Non-Point Source Dischargers. Point source dischargers in North Carolina are regulated through the National Pollutant Discharge Elimination System (NPDES) program administered by the NCDWQ. Appendix O in the Draft EIS has been updated in Appendix F of this Final EIS. No new dischargers have been added since the last download of the information

on October 7, 2008 from the NCDWQ Web site. However, Plantation Pipe Line is no longer listed as an active permit.

In Appendix O of the Draft EIS, Permit Numbers NC0086193, NC0086142, NC0084468, NC0072061, NC0069035, and NC0063860 are listed under "Heater Utilities Inc". The most recent version of the NPDES list (01/04/10) lists these same permits under "Aqua North Carolina, Inc".

Water Quality Monitoring and Basin-Wide Assessments. The discussions and references to basinwide water quality plans included in Section 6.2.2.5 of the Draft EIS have not changed since the Draft EIS was prepared.

Water Resources Impacts and Mitigation. This section is summarized from Sections 6.2.3 and 6.2.4 of the Draft EIS. There have been no changes since the Draft EIS.

Water Quality. As discussed in more detail in Section 6.2.3 of the Draft EIS, 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 Preferred Alternative in accordance with applicable rules, regulations and guidance, including the latest versions of the NCDENR publication *Erosion and Sediment Control Planning and Design Manual*, the NCDWQ's *Stormwater Best Management Practices Manual* (July 2007), and NCDOT's *Best Management Practices for Protection of Surface Waters*.

The *Standard Specifications for Roads and Structures* requires proper handling and use of construction materials (NCDOT, January 2002) (NCDOT Web site: www.ncdot.org/doh/preconstruct/ps/specifications/dual/). The contractor would be responsible for taking every reasonable precaution throughout the construction of the project to prevent the pollution of any body of water. The contractor also shall be responsible for preventing soil erosion and stream siltation.

Water-Based Recreational Activities. Boating, fishing, and waterskiing occur on the Catawba River and South Fork Catawba River, particularly in the areas south of the Allen Station Station on the Catawba River and south of the Allen Steam Station canal on the South Fork Catawba River. The DSAs that cross the Catawba River and South Fork Catawba River south of the Allen Steam Station (DSAs 5, 23, 64, and 77) would cross in areas having more recreational opportunities, and recreation likely would be temporarily affected during project construction.

DSAs 4, 9, 22, 27, 58, 68, 76, and 81) would cross the rivers north of the Allen Steam Station, which are areas that are less navigable due to siltation. Therefore, these DSAs would have less impact on recreational uses of the rivers.

Catawba-Wateree Hydro Project. Lake Wylie is part of the Catawba-Wateree Hydro Project operated by Duke Energy. Any crossings of the Lake Wylie "full pond contour" (569.4 feet Above Mean Sea Level) require a permit from FERC (Telephone interview, Allen Steam Station FERC Permit Coordinator, March 2, 2006). Portions of the Catawba River, South Fork Catawba River, and Catawba Creek are part of Lake Wylie.

Since all the proposed DSAs cross Lake Wylie, they will cross the contour line, thus triggering the need for a permit. NCTA has initiated coordination with Duke Energy Corporation regarding the FERC permit process. The process is expected to result in a FERC license revision

to allow an easement within the FERC project boundary for NCTA to construct the Gaston East-West Connector, including the bridges over Lake Wylie. The No-Build Alternative would not require initiation of the FERC permit process.

1.3.4.3 Natural Communities and Wildlife

The following information is summarized from Section 6.3 of the Draft EIS. There are no updates to terrestrial communities, terrestrial wildlife, aquatic communities and wildlife, or invasive plant species as documented in Sections 6.3.1 through 6.3.5 of the Draft EIS.

Updated direct impacts to natural communities and wildlife as a result of design changes to the Preferred Alternative can be found in Section 2.5.4.3 of this Final EIS. Indirect and cumulative impacts are analyzed and discussed in the *Quantitative Indirect and Cumulative Effects Analysis* (Louis Berger Group, Inc., August 2010) and in Section 2.5.5 of this Final EIS.

Terrestrial Communities. Nine terrestrial communities were identified within the DSAs, as described in Section 6.3.1 of the Draft EIS: disturbed/maintained, agricultural land, clearcut, hardwood forest, mesic mixed hardwood forest (piedmont subtype), mixed pine-hardwood forest, pine forest, pine plantation, and successional community.

As indicated in Section 6.3.6 of the Draft EIS, terrestrial communities would be impacted permanently by project construction from clearing and paving. Table 6-4 in the Draft EIS and the Draft EIS Summary of Impacts table included in Appendix C provide the acreage of terrestrial communities by habitat type impacted by DSA. The acreage represents the area within each DSA's proposed right-of-way limits. The predominant community types in all DSAs are disturbed/maintained areas and pine hardwood forest, followed by hardwood forest. These three community types comprise 72-78 percent of the DSAs' preliminary design rights of way.

Terrestrial Wildlife. 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 using Corridor Segments H1C, J1c, K1A, and K4A (DSAs 5, 23, 27, 58, 64, 68, 77, and 81) have a greater potential to indirectly affect upland species due to habitat fragmentation in that these corridor segments are located the farthest distance away from previously fragmented forestland. DSAs 4, 9, 22, and 76 would have comparable 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. In consultation with the NCWRC (NC Wildlife Resources Commission), US Fish and Wildlife Service (USFWS), and USEPA, at a TEAC Meeting on April 8, 2008, the NCTA identified a location along all DSAs where wildlife passage structures could be provided to maintain habitat connectivity.

A wildlife passage structure will be studied at the crossing of Stream S156 during final design of the Preferred Alternative. Stream S156 (Figure 2-9q and 2-9r in the Draft EIS) is located between Forbes Road to the west and Robinson Road to the east. All DSAs cross this stream. DSAs 64 and 68 cross this stream using Corridor Segment J1b/J1c, DSA 58 crosses this stream using Corridor Segment JX1, and DSAs 4, 5, 9, 22, 23, 27, 76, 77, and 81 cross this stream using Corridor Segment J2c.

Wildlife passages are often additional culverts placed adjacent to the culverts needed for water passage. During final design, the NCTA will coordinate with the NCWRC, USFWS, and USEPA

on the feasibility and design of the wildlife passage at Stream S156, and on designing bridge crossings to be wildlife friendly when feasible.

Aquatic Communities and Wildlife. Aquatic communities in the DSAs include both intermittent and perennial piedmont streams, as well as still-water ponds. 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 Best Management Practices.

Important Natural Areas. None of the DSAs' preliminary designs would encroach on the three important natural areas within or immediately adjacent to the DSAs: NC Natural Heritage Program's (NCNHP) Crowders Mountain State Park and Vicinity, NCNHP's Stagecoach Road Granitic Outcrop, and the Catawba Lands Conservancy conservation easement.

Invasive Plant Species. Several known invasive species are present within the DSA corridors, as described in Section 6.3.5 of the Draft EIS. 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. NCTA will follow the Best Management Practices (BMP) recommended by NCDOT for management of invasive plant species.

1.3.4.4 Jurisdictional Issues

The following information is summarized from Section 6.4 of the Draft EIS. Updates related to jurisdictional water resource surveys and impacts for the Preferred Alternative are discussed in more detail in Section 2.5.4.4 of this Final EIS.

Waters of the United States. Section 404 of the Clean Water Act prohibits discharge of dredged or fill material into waters of the US, except when executed in accordance with a permit. The term Waters of the US has broad meaning and incorporates both wetlands and surface waters such as streams and ponds. The US Army Corps of Engineers (USACE) is responsible for issuing permits and enforcing permitting requirements under Section 404 of the Clean Water Act. The NCDWQ has regulatory input through Section 401 of the Clean Water Act (Water Quality Certification). The USEPA also participates in the permitting process.

Catawba River Riparian Buffer Rules. Permanent riparian buffer protection rules were enacted by the State for the main stem of the Catawba River and its main stem lakes below Lake James to the south to the North Carolina/South Carolina border (15 NCAC 02B.0243-0244). Lake Wylie is one of the main stem lakes in which the buffer rules apply. All of the DSAs cross water bodies that are part of Lake Wylie.

The buffer protection rules apply within 50 feet of all riparian shorelines along the Catawba River main stem and the seven main stem lakes, including Lake Wylie. Zone 1 of the buffer is the 30 feet nearest the water's edge, and Zone 2 is 20 feet landward of Zone 1.

Certain activities (including road crossings) may be allowable with mitigation but must first be reviewed and given written approval by NCDWQ. If it can be shown that there are "no practical alternatives" to the proposed activity, a variance may be allowed with mitigation (NCDWQ Web site: <http://h2o.enr.state.nc.us/nps/documents/FactSheet7-29-04.pdf>).

Existing Jurisdictional Resources. More than 400 jurisdictional stream segments, 350 jurisdictional wetlands, and 58 ponds were identified within the DSA corridors during surveys conducted in April through May of 2007. Figure 2-9a-ii in the Draft EIS shows these resources. Appendix N in the Draft EIS lists the attributes of each surveyed pond, wetland, and stream.

Streams range from small intermittent channels to large perennial streams and rivers. Four types of wetlands were identified within the DSAs; palustrine emergent (PEM1), palustrine forested (PFO1), palustrine shrub/scrub (PSS1 and PSS3C), and palustrine with unconsolidated bottoms (PUBHh). Approximately seven percent of the wetlands were rated High Quality, approximately 30 percent were rated Medium Quality, and the remainder (approximately 63 percent) were rated Low Quality.

Field jurisdictional verifications for streams and wetlands were performed by the USACE and the NCDWQ on April 12 and 13; May 2, 3, 10 and 11; and June 25 and 26, 2007. Written verification was received from NCDWQ by letter dated August 2, 2007 (Draft EIS Appendix A-5). Written verification from the USACE on final jurisdictional determinations will be provided for the Preferred Alternative (Telephone interview, USACE representative, October 15, 2007).

Impacts to Jurisdictional Resources. This section is a summary of Section 6.4.4 of the Draft EIS. There have been no changes to this information since the Draft EIS.

Impacts to Wetlands, Ponds, and Streams. Project construction for any of the DSAs cannot be accomplished without infringing on surface waters, including streams, wetlands, and ponds. Streams may be filled, relocated, or placed in a culvert by project construction. Wetlands may be either partially or completely filled. In some instances, larger wetland areas may become hydraulically disconnected from an adjacent stream.

Table 6-5 in the Draft EIS and the Draft EIS summary table in Appendix C present the amounts of streams, wetlands, and ponds estimated to be impacted by each DSA's preliminary design. These impact estimates take into account avoidance and minimization measures that have been incorporated into the project, including the bridging of streams and wetlands (discussed in detail in Draft EIS Section 4.7.3). The impacts were calculated using the preliminary designs' construction limits, with an additional 25-foot buffer, in accordance with NCDOT procedures.

DSA 58 would have the greatest perennial stream impacts (totaling 50,739 linear feet), and DSA 81 would have the greatest intermittent stream impacts (10,417 linear feet). DSA 81 would have the fewest linear feet of perennial stream impacts (36,771 linear feet), and DSA 22 would have the least intermittent stream impacts (8,953 linear feet).

Impacts to Catawba River Buffers. Based on the preliminary design 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. Table 6-6 in the Draft EIS lists the impacts to Catawba River Buffers.

Permitting and Mitigation. An Individual Permit under Section 404 of the Clean Water Act and an individual Section 401 Water Quality Certification will be required for roadway encroachment into jurisdictional wetlands and surface waters.

The DSAs incorporate measures to avoid and minimize impacts to Waters of the US. The NCTA met with the environmental resource and regulatory agencies at TEAC Meetings on February 5, March 4, and April 8, 2008, to discuss bridging and alignment discussions for the DSAs' preliminary designs. As a result of those meetings, NCTA agreed to include several bridges in

the preliminary designs, beyond those required to convey floodwaters, to avoid or minimize stream and wetland impacts.

Design refinements for the Preferred Alternative resulted in additional avoidance and minimization measures. These are discussed in greater detail in **Section 2.3** of this Final EIS.

Because this project would be permitted under an Individual 404 Permit, mitigation for impacts to surface waters will be required by the USACE and the NCDWQ. Furthermore, in accordance with its regulations (33 CFR Part 332), the USACE requires compensatory mitigation to ensure that adverse effects to the aquatic environment are minimal. It is anticipated that USACE and NCDWQ will require compensatory mitigation for stream impacts.

Section 404 Permit

Implementation of any of the DSAs will require an Individual Permit from the USACE and a Section 401 Water Quality Certification from the NCDWQ for wetland and stream impacts.

A conceptual mitigation plan for the Preferred Alternative has been prepared, and is described in **Section 2.5.4.4** of this Final EIS. As part of this plan, NCTA has received agreement from the NCDENR Ecosystem Enhancement Program (EEP) to provide compensatory mitigation through the in-lieu fee program. All impacts, corresponding mapping, and mitigation information will be included in the 401 Water Quality Certification Application submitted by NCTA to NCDWQ and the 404 Dredge and Fill permit package submitted to USACE following the completion of the NEPA process.

Catawba River Buffers. Implementation of DSA 5, 9, 23, 27, 64, 68, 77, or 81 would be designated as uses that are allowable with mitigation because they would cumulatively impact more than one-third acre of buffer. The NCDWQ will issue a mitigation determination that specifies the required area and location of mitigation (15A NCAC 02B.0244). Mitigation may be met by payment of a compensatory mitigation fee to the Riparian Buffer Restoration Fund, donation or real property of interest in real property, or restoration or enhancement of a non-forested riparian buffer (15A NCAC 02B.0244).

1.3.4.5 Protected Species

The following information is summarized from Section 6.5 of the Draft EIS.

Additional surveys for Schweinitz's sunflower were conducted for the Preferred Alternative after publication of the Draft EIS, as summarized in **Section 2.5.4.5**. These surveys were conducted for the Preferred Alternative service roads and areas where the refined preliminary design was outside the original study corridor boundary.

Federally-Protected Species. Plants and animals with a federal classification of Endangered (E), Threatened (T), Proposed Endangered (PE), and Proposed Threatened (PT) are protected under provisions of Sections 7 and 9 of the *Endangered Species Act of 1973* (ESA), as amended.

The USFWS lists three species under federal protection that are considered to have ranges extending into Gaston County, and five species under federal protection that are considered to have ranges extending into Mecklenburg County (USFWS Web site: www.fws.gov/nc-es/es/countyfr.html). These species are listed in Table 6-7 of the Draft EIS and in **Table 1-7**, along with the bald eagle, which has been delisted but is still federally protected by the Bald and Golden Eagle Protection Act.

Impacts to Protected Species. Table 6-9 in the Draft EIS summarizes the DSAs' potential effects on protected species and is reproduced here as **Table 1-7**.

TABLE 1-7: Summary of Effects on Federally Protected Species

Common Name	Scientific Name	County	Status	Potential Habitat Present in DSAs?	Biological Conclusion
Vertebrates					
Bald eagle	<i>Haliaeetus leucocephalus</i>	Gaston, Mecklenburg	Delisted	Yes	None Required
Bog turtle	<i>Clemmys muhlenbergii</i>	Gaston	T(S/A)	Yes	None Required
Invertebrates					
Carolina heelsplitter	<i>Lasmigona decorata</i>	Mecklenburg	E	Yes	No Effect
Vascular Plants					
Michaux's sumac	<i>Rhus michauxii</i>	Mecklenburg	E	Yes	No Effect
Schweinitz's sunflower	<i>Helianthus schweinitzii</i>	Gaston, Mecklenburg	E	Yes	May Affect/ Not Likely to Adversely Affect
Smooth coneflower	<i>Echinacea laevigata</i>	Mecklenburg	E	Yes	No Effect

Source: USFWS Web site: www.fws.gov/nc-es/es/countyfr.html, Updated 1/31/08

Notes: E-Endangered-A species that is threatened with extinction throughout all or a significant portion of its range.
 T - Threatened-A species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. T(S/A) - Similarity of Appearance-Threatened due to similarity of appearance with other rare species and is listed for its protection. These species are not biologically endangered or threatened and are not subject to Section 7 consultation.

Endangered plant surveys were conducted in November 2009 for the Preferred Alternative in areas where the refined preliminary design and service roads extended outside of the original study corridor boundaries (Section 2.5.4.5). These surveys did not find any Schweinitz's sunflowers.

1.3.5 INDIRECT AND CUMULATIVE EFFECTS

Chapter 7 of the Draft EIS presents information from the qualitative *Indirect and Cumulative Effects Assessment for the Gaston East-West Connector* (Louis Berger Group, Inc., March 2009). The information presented below is summarized from Chapter 7 of the Draft EIS.

A *Quantitative Indirect and Cumulative Effects Analysis* (Louis Berger Group, Inc., August 2010) has been completed for the Preferred Alternative and the results of that assessment are presented in Section 2.5.5 of this Final EIS.

1.3.5.1 Analysis Methodology

The qualitative assessment summarized in Chapter 7 of the Draft EIS was performed in accordance with NCDOT guidance titled, *Assessing Indirect and Cumulative Effects of Transportation Projects in North Carolina* (November, 2001), referred to in the Draft EIS as *ICI Guidance*.

This qualitative analysis was undertaken in five steps based on the NCDOT guidance, including:

- Definition of Indirect and Cumulative Effects (ICE) Study Areas (Step 1)
- Identification of the ICE Study Area's Direction and Goals (Step 2)
- Inventory of Notable Features (Step 3)
- Identification of Impact-Causing Activities (Step 4)
- Identification and Analysis of Potential Indirect and Cumulative Effects (Step 5)

To aid in defining the scope of the ICE assessment, meetings were offered with the following agencies: FHWA, NCTA, North Carolina Department of Transportation (NCDOT), US Army Corps of Engineers (USACE), US Fish and Wildlife Service (USFWS), NC Wildlife Resources Commission (NCWRC), US Environmental Protection Agency (USEPA), North Carolina Department of Environment and Natural Resources - Division of Water Quality (NCDWQ), State Historic Preservation Office (HPO), GUAMPO, and MUMPO. The USFWS, NCWRC, and NCDWQ offered assistance.

Representatives from the FHWA, NCTA, and NCDOT met with representatives from US Fish and Wildlife Service and NC Wildlife Resources Commission on June 29, 2007 (meeting minutes included in Draft EIS Appendix A-5). The purpose of the meeting was to collaboratively identify the sensitive resources, identify the study methodologies, define the ICE study area boundaries, and confirm the timeframe for the assessment. Based on input from the NCWRC, the ICE assessment included a section addressing potential indirect effects on upland wildlife habitat, including habitat fragmentation.

A similar scoping meeting was held with North Carolina Department of Environment and Natural Resources - Division of Water Quality (NCDWQ) on July 26, 2007 (meeting minutes included in Draft EIS Appendix A-5). NCDWQ agreed with the proposed multi-county qualitative approach of assessing potential ICEs associated with the proposed project, and the boundaries based on local watersheds.

Interviews also were held with local agency staff and local experts to gather information on notable features considered in this ICE assessment.

1.3.5.2 Study Areas

ICE Study Area. The study area used for analysis is called the ICE Study Area and includes most of Gaston and parts of Cleveland, Mecklenburg, and York (South Carolina) counties as shown in Figure 7-1a of the Draft EIS. The purpose of the ICE Study Area was to provide a basic level of geography that would encompass any reasonably foreseeable, potential indirect effects stemming from the proposed Gaston East-West Connector project. The potential transportation impact activities would fall within a portion for the ICE Study Area, and are more sharply described at the District and Interchange Area levels.

ICE Study Areas

Three geographic study areas were used. The largest, the ICE Study Area includes most of Gaston County and parts of Mecklenburg, Cleveland and York counties. The ICE Study Area was divided into ten Districts to better describe impacts. The smallest study areas were Interchange Areas, used to describe changes that may occur in the immediate vicinity of new access points created by the project.

Districts. The ICE Study Area was divided into ten districts (Districts 1 through 10) to facilitate discussions with local experts during interviews, as well as to provide a level of geography that would better describe potential indirect and cumulative effects that were more localized in nature.

Interchange Areas. The Interchange Areas are the third (and smallest) study area type used to assess the unique changes that would potentially be produced by increasing accessibility in the immediate vicinity of proposed interchanges with the Gaston East-West Connector (Draft EIS Figure 7-1b).

Temporal Boundary. A timeframe for analysis spanning from 1989 to 2030 was established for the ICE analysis. This temporal boundary is intended to encompass other past, present, and reasonably foreseeable future actions that could incrementally contribute to substantial changes

in land use, in combination with the proposed project. The year 1989 is the year the Gaston East-West Connector concept was first identified on the Gaston Urban Area Thoroughfare Plan. The year 2030 is the horizon year for the *GUAMPO 2030 LRTP* (May 2005), and the *MUMPO 2030 LRTP* (Amended September 2005).

1.3.5.3 Study Area Directions and Goals and Notable Features

Study Area Directions and Goals. In order to determine study area directions and goals, plans adopted by the local jurisdictions were reviewed. Reviews also were conducted of development policies, guidelines, utility provisions, and other actions that specifically provide information on the approach that local governments take toward managing growth. Meeting minutes from Planning Commissions, Boards of Commissioners, and City and Town Councils were reviewed and considered as well.

Jurisdictions in the ICE Study Area include four counties and four municipalities:

- Gaston County
- City of Gastonia (Gaston County)
- City of Bessemer City (Gaston County)
- City of Belmont (Gaston County)
- Mecklenburg County
- City of Charlotte (Mecklenburg County)
- Cleveland County
- York County, SC

The study area directions and goals for these jurisdictions are described in Section 7.3 of the Draft EIS.

Notable Features. Notable features is a broad term that describes characteristics of the environment that society would like to protect, emphasizing characteristics such as (1) recovery time from disturbance/destruction, (2) sensitivity to disruption, and (3) vulnerability to changes directly, indirectly, or cumulatively induced by the project (*ICI Guidance Volume II*, NCDOT, November 2001).

The qualitative *Indirect and Cumulative Effects Assessment* considered and assessed a wide range of notable features, including growth and land use, wildlife habitat, water resources, protected species, farmland, noise, air quality, and cultural resources.

Based on the information in the qualitative *Indirect and Cumulative Effects Assessment*, interviews with representatives from local governments and agencies, and input received from resource and regulatory agencies in the scoping process; FHWA and NCTA decided to highlight three notable features in the Draft EIS. These are: (1) growth and land use, (2) habitat fragmentation, and (3) water quality and aquatic habitat. These are described in Sections 7.4.1 through 7.4.3 of the Draft EIS.

Details on all the evaluated notable features and the assessments of indirect and cumulative effects to these features are included in the qualitative *Indirect and Cumulative Effects Assessment for the Gaston East-West Connector* (Louis Berger Group, Inc., March 2009).

1.3.5.4 Summary of Findings

Table 1-8 presents an overall summary of the potential for indirect and cumulative effects to occur in Gaston County, Mecklenburg County, Cleveland County, and York County, SC as a result of the Gaston East-West Connector. Table S-2 of the Draft EIS (included in **Appendix C** of this Final EIS) compares the DSAs in relation to direct impacts, indirect, and cumulative effects.

In Table 1-8, the column describing the potential for the project to improve mobility, access, and connectivity relates to travel time savings that would occur as a result of any of the DSAs. The column describing the potential for indirect effects relates to the potential for the project to influence growth rates and types and to affect notable features in the portions of each County that are part of the ICE Study Area. The column describing the potential for cumulative effects relates to how much the project would contribute to the overall factors that would drive land use change. For example, in York County, SC, growth and land use would be more heavily influenced by availability of water and sewer service and by implementation of their land use plans, than it would be by the project. Therefore, the potential for the project to contribute to cumulative effects related to land use change was rated low for the York County, SC portion of the ICE Study Area.

There are some minor differences between the DSAs, but overall there are no significant differences between the DSAs in terms of their general potential for indirect and cumulative effects to all the notable features assessed at the ICE Study Area level, District level, and Interchange level (Gaston and Mecklenburg Counties only).

The following sections summarize the indirect and cumulative effects on the three notable features that have been highlights in this chapter; growth and land use, habitat fragmentation, and water quality and aquatic habitat. Discussions of the indirect and cumulative effects to all notable features assessed are included in the qualitative *Indirect and Cumulative Effects Assessment for the Gaston East-West Connector* (Louis Berger Group, Inc., March 2009).

TABLE 1-8: Summary of Potential for Indirect and Cumulative Effects by County

Portion of County in ICE Study Area	Potential for Project to Improve Mobility, Access and Connectivity*	Potential for Accelerated Growth and Other Indirect Effects as a Result of the Project*	Potential for Project to Contribute to Cumulative Effects Related to Land Use Change*	DSAs which Contribute to Indirect and Cumulative Effects
Gaston	High	High	Moderate	All DSAs (4, 5, 9, 22, 23, 27, 58, 64, 68, 76, 77, 81)
Mecklenburg	High	Moderate	Moderate	All DSAs (4, 5, 9, 22, 23, 27, 58, 64, 68, 76, 77, 81)
Cleveland	Low	Low	Low	None
York, SC	Low/Moderate	Moderate	Low	All DSAs (4, 5, 9, 22, 23, 27, 58, 64, 68, 76, 77, 81)

Source: *Indirect and Cumulative Effects Assessment for the Gaston East-West Connector*, Louis Berger Group, Inc., March 2009

* Low – there would be some change from current or expected future No-Build condition, but the change would be minor and likely not noticeable.

Moderate – there would be a noticeable change from current or expected future No-Build conditions.

High – there would be a substantial change from current or expected future No-Build conditions.

Indirect and Cumulative Effects on Growth and Land Use (ICE Study Area). As shown in Table 1-8, the Gaston East-West Connector has a low potential to cause indirect or cumulative effects in Cleveland County. As shown in Draft EIS Figure 7-2, average travel time savings would be small for areas in Cleveland County. There would be no distinguishable differences in development rates in Cleveland County anticipated between the construction of any one of the proposed DSAs and the No-Build Alternative.

There is a low/moderate potential for the project to improve mobility and access in York County, SC. York County’s average travel time savings is occasionally greater than 10 minutes with the proposed project in place. However, other data gathered from local sources did not indicate a significant anticipated influence from the Gaston East-West Connector on growth and land use changes. Therefore, the potential for accelerated growth and indirect effects to notable features

in York County as a result of the project are moderate. The potential for cumulative effects in York County, SC are primarily due to planned provisions for water and sewer service and residential development anticipated with or without the project.

Gaston County has a high potential to experience accelerated growth and indirect effects to notable features as a result of the project, and Mecklenburg County has a moderate potential. Both Gaston County and Mecklenburg County have a moderate potential to experience cumulative effects related to land use changes as a result of the project. In addition, Gaston and Mecklenburg counties have a high potential to experience improved mobility, access and connectivity, which is the purpose and need of the project. Growth and land use changes, along with the proposed project, are anticipated in the *Gaston County Comprehensive Plan* (July 2002) and Mecklenburg County's *2015 Plan: Planning for Our Future* (November 1997) and *2008-2010 Strategic Business Plan*.

The additional new runway at Charlotte-Douglas International Airport will increase that facility's passenger and freight capacities, as well as increase rail shipping capacity at this location and in the eastern section of the ICE Study Area. Residential development in western Mecklenburg County and throughout southeastern and south-central Gaston County, with some mixed uses, will be the predominant form of future development. Interchanges with the Gaston East-West Connector are physically within both Gaston and Mecklenburg counties, and notable for development potential during the analysis were the interchanges at US 321 and NC 274 (both in Gaston County). The cumulative impact of these activities will depend in part on local planning and policy guidelines, such as the Phase II water quality standards that are being considered in Gaston County.

Additionally, cumulative effects from increased residential and retail-oriented development are expected to continue in the attractive areas around the Catawba River (for example, in the River Bend and South Point Townships). Many of these homes are large, single-family detached units on one acre or more of land without public water/sewer connections. Unique descriptions of development activities within each of the small towns in Gaston County are provided in the *Indirect and Cumulative Effects Assessment for the Gaston East-West Connector* (Louis Berger Group, Inc., March 2009).

The indirect and cumulative effects associated with the DSAs may vary somewhat regarding effects on habitat fragmentation and water quality and aquatic habitat. These potential effects are summarized below. A more detailed table listing specific indirect and cumulative effect factors at the DSA level, and the differences amongst the DSAs, is provided in Draft EIS Appendix P. The table in Draft EIS Appendix P is a summary of a variety of factors used to draw conclusions regarding notable features.

Indirect and Cumulative Effects on Habitat Fragmentation (Gaston County and Mecklenburg County). All DSAs would have the potential to add to forest fragmentation and wildlife disturbance in the southwest section of Mecklenburg County. DSAs using Corridor Segments H1C, J1c, K1A, and K4A (DSAs 5, 23, 27, 58, 64, 68, 77, and 81) have a greater potential to indirectly affect upland species in Gaston County 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 comparable levels of lesser indirect effects due to existing habitat fragmentation. Direct impacts to natural communities are discussed in Draft EIS Section 6.3.6.

Indirect and Cumulative Effects on Water Quality and Aquatic Habitat (ICE Study Area). Regarding the differentiation of impacts from individual Detailed Study Alternatives, DSAs 58, 64, 68, 76, 77, and 81 would have comparable levels of indirect effects and cumulative

effects to water quality and aquatic habitat as a result of induced development. These potential effects would be greater than those associated with the No-Build Alternative, but less than potential effects associated with DSAs 4, 5, 9, 22, 23, and 27. DSAs 4, 5, 9, 22, 23, and 27 are closer to Crowders Creek, and would be expected to have a greater amount of stormwater runoff effects. However, these can be minimized through implementation of local stormwater ordinances and BMPs. Direct and indirect impacts to water quality and water resources would occur in Gaston and Mecklenburg counties and these are discussed in Draft EIS Sections 6.2.2 and 6.2.3.

1.3.6 OTHER IMPACTS

1.3.6.1 Irretrievable and Irreversible Commitment of Resources

The following information is reproduced from Section 8.1 of the Draft EIS. There have been no updates to this information.

Implementation of any of the DSAs would involve a commitment of a range of natural, physical, human, and fiscal resources. Land used for the construction of the proposed facility is considered an irreversible commitment during the time period that the land is used for a highway facility. However, if a greater need arises for use of the land or if the highway facility is no longer needed, the land can be converted to another use. At present, there is no reason to believe such a conversion will be necessary or desirable.

Considerable amounts of fossil fuels, labor, and highway construction materials such as cement, aggregate, and bituminous material would be expended. Additionally, large amounts of labor and natural resources would be used in the fabrication and preparation of construction materials. These materials are generally not retrievable. However, they are not in short supply and their use will not have an adverse effect upon continued availability of these resources. Any construction also would require a substantial one-time expenditure of both state and federal funds, which are not retrievable.

The commitment of these resources is based on the concept that residents in the immediate area, region, and state will benefit by the improved quality of the transportation system. These benefits will consist of improved accessibility and connectivity, savings in time, and greater availability of quality services which are anticipated to outweigh the commitment of these resources.

1.3.6.2 Relationship between Short-Term Impacts and Long-Term Impacts

The following information is reproduced from Section 8.2 of the Draft EIS. As previously noted, the date for the MUMPO and GUAMPO LRTPs has been updated from 2030 to 2035.

The most disruptive local short-term impacts associated with the proposed projects would occur during land acquisition and project construction. However, these short-term uses of human, physical, socioeconomic, cultural, and natural resources would contribute to the long-term productivity of the Project Study Area.

The local, short-term impacts and use of resources by implementation of any of the DSAs would be consistent with the maintenance and enhancement of long-term productivity. Construction of the proposed Gaston East-West Connector would add a vital link to the long range transportation system for the region. It is anticipated that the proposed project would enhance long-term access and connectivity opportunities in Gaston County and Mecklenburg County, and

would support local and regional commitments to transportation improvement and economic viability.

1.4 PUBLIC INVOLVEMENT AND AGENCY COORDINATION

The following information is summarized from Chapter 9 of the Draft EIS, which discusses public involvement and agency coordination activities prior to preparation of the Draft EIS. Public involvement and agency coordination activities since the Draft EIS was prepared are described in Chapter 3 of this Final EIS.

1.4.1 PUBLIC INVOLVEMENT

1.4.1.1 Citizens Informational Workshops

Three series of Citizens Informational Workshops (CIWs) were held for the project prior to the Draft EIS. In 2003, the first series of CIWs were held on September 30, (Forestview High School, Gastonia), December 9, (South Point High School, Belmont), and December 10, (Hunter Huss High School, Gastonia). The workshops, held by NCDOT, presented the purpose and need for the project and the preliminary alternatives being considered. Approximately 734 citizens signed in at the first series of workshops, and 192 written comment forms were received at, and following, the workshops.

The second series of CIWs took place in 2006 on January 31 (Hunter Huss High School, Gastonia), February 1 (Olympic High School, Charlotte), and February 2 (South Point High School, Belmont). These workshops were held by NCTA with assistance from NCDOT. The purpose of this series of workshops was to present the recommended DSAs for input and comment. Approximately 813 citizens signed in at the second series of workshops and there were 185 written comment forms during and after the workshops.

The third series of CIWs, held by NCTA, took place in 2008 on August 6 (Olympic High School, Charlotte), August 7 (South Point High School, Belmont), and August 11 (Gastonia Adult Recreation Center, Gastonia). The purpose of this workshop series was to seek feedback regarding the elimination of Corridor Segment K1D from detailed study and to present the following the additional public comment:

- Updates to the project's *Purpose and Need Statement*, June 2008,
- *The Addendum to the Final Alternatives Development and Evaluation Report*, July 2008,
- The DSAs and the preliminary right-of-way limits for the roadway designs within the study corridors, and
- The potential elimination of the project's interchange at US 29-74.

A total of 1,026 citizens signed in at the third series of workshops. There were 205 written comments received at and following the workshops.

1.4.1.2 Local Officials Meetings

Local Officials Meetings were held September 30, 2003, January 31, 2006, February 1, 2006, and August 6, 2008, prior to each series of CIWs. Their purpose was to provide local officials with opportunities to ask questions and submit comments, as well as an opportunity for NCTA to give a project overview and status report.

1.4.1.3 Small Group Meetings

Throughout the study process, the project study team met with a variety of organizations, agencies, and groups to exchange information, collect data, or to make a presentation about the project at the request of community groups. At these meetings, NCTA provided project updates and answered questions from attendees.

These groups included the Duke Energy Corporation, Gaston Chamber of Commerce, Friends of Crowders Mountain, Paradise Point Neighborhood Group, Medallist Development Corporation, NC League for Transportation and Logistics, Ramoth AME Zion Church, Brown's Cove Neighborhood Group, Garrison Road/Horton Road Community, Misty Waters Subdivision, River Lakes Subdivision, Karyae Park YMCA, Pisgah ARP Church, and Town of Belmont.

1.4.1.4 Other Outreach Efforts

Newsletters distributed in April 2003 and September 2003 announced the upcoming Citizens Informational Workshops and included project information and updates. Brochures and postcards also were used to provide the public with information about the project and project-related events. These items were posted to the project web site and available for download.

A project web site (www.ncturnpike.org/projects/gaston) provides project information, documents, previous newsletters and postcards, project maps and an online comment form. The online comment form enables users to add their name to the project mailing list and/or provide comments and ask questions. Visitors are also able to e-mail the project study team directly (at gaston@ncturnpike.org). The Web site is periodically updated as new information, documents, maps, and reports become available.

A toll-free hotline number was created for the project (1-800-475-6402). This provides a resource for citizens to ask questions, provide input, or request a meeting for a particular organization. All calls received are logged and responded to in a timely manner.

1.4.2 AGENCY COORDINATION

1.4.2.1 Scoping Letter

A formal scoping letter, as required by NEPA, was sent by NCDOT to local, state, and federal agencies on April 9, 2003. The letter is included in Appendix A-3 of the Draft EIS, along with agency response letters. The purpose of the scoping letter was to solicit comments and collect pertinent project information early in the project development process. The coordination (NEPA scoping) between NCDOT, FHWA, and the agencies assisted with the development of the purpose and need statement, range of alternatives considered, and the determination of the DSAs.

Table 9-1 in the Draft EIS lists the agencies that provided comments in response to the scoping letter, along with a brief summary of the comments.

1.4.2.2 Notice of Intent

A Notice of Intent (NOI) to prepare a Draft EIS for the project was published by FHWA in the Federal Register on April 27, 2006 (Volume 71, No. 81, pages 24909-24910).

1.4.2.3 Section 6002 Project Coordination Plan

In October 2008, in accordance with Section 6002 of SAFETEA-LU (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users), the NCTA developed a *Section 6002 Project Coordination Plan* for the proposed Gaston East-West Connector project. The plan establishes a project schedule, sets a monthly schedule for coordination meetings, establishes agency review times, identifies a process for resolving issues of concern, and identifies cooperating and participating agencies.

The *Section 6002 Project Coordination Plan* was developed and finalized in consultation with the Federal Highway Administration (FHWA), and North Carolina Department of Transportation (NCDOT), as well as the cooperating and participating agencies.

The project's final *Section 6002 Project Coordination Plan*, which provides for a process similar to Merger 01, is included in Appendix A-7 of the Draft EIS, along with copies of invitation letters to Cooperating Agencies and Participating Agencies, and responses to those invitations.

1.4.2.4 Agency Coordination Meetings

Agency coordination meetings regarding the Gaston East-West Connector have been held from 2002 through 2009. When the NCTA assumed administration of the project in 2005, the NCTA included the project in regularly scheduled monthly meetings, referred to as TEAC Meetings, to review the status of the current NCTA projects, environmental concerns, and permitting requirements.

Table 9-3 in the Draft EIS provides summaries of the agency coordination meetings held for the Gaston East-West Connector prior to publication of the Draft EIS. Descriptions of TEAC meetings which occurred after the publication of the Draft EIS are included in Section 3.2 of this Final EIS.

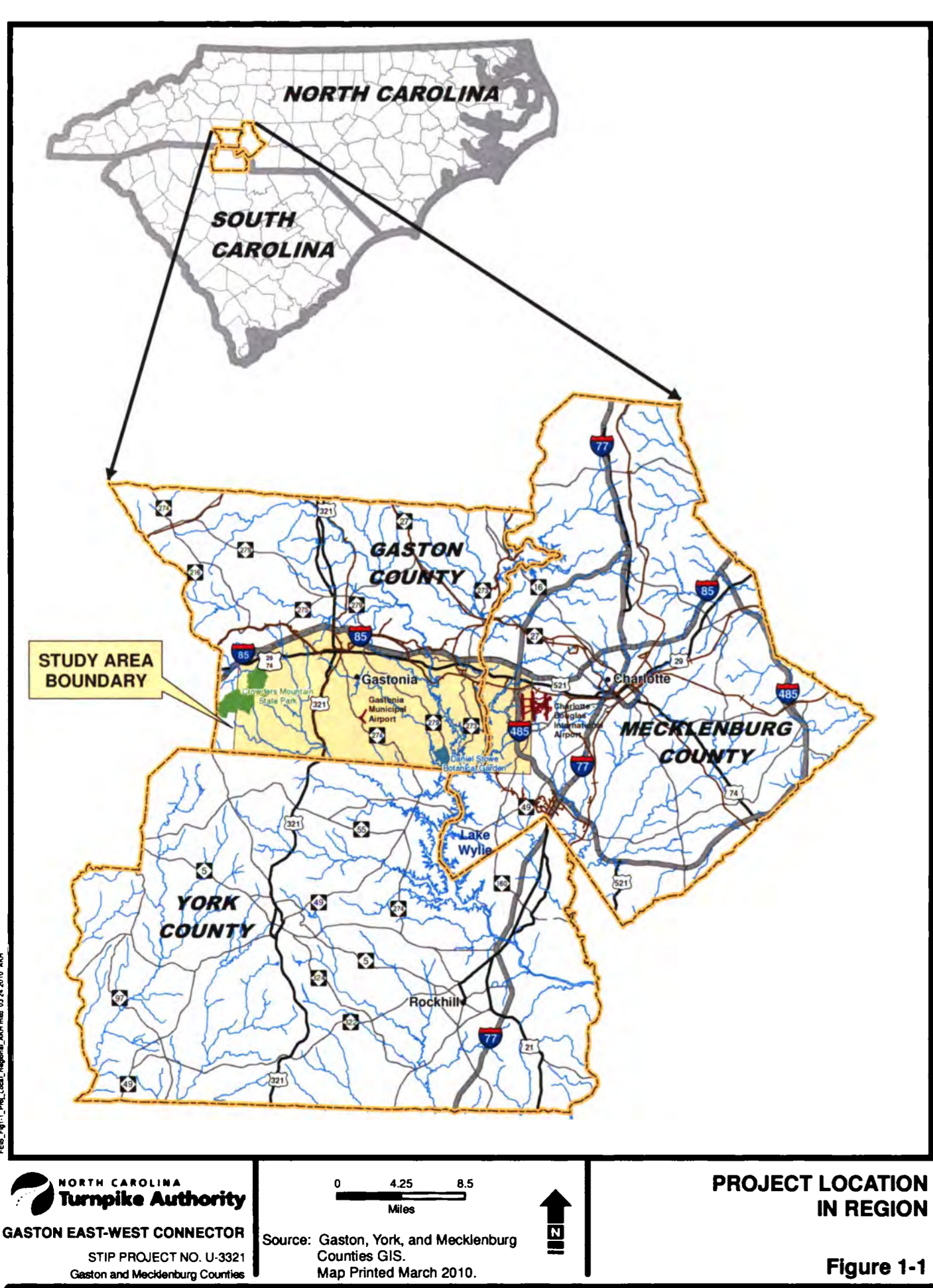
1.5 UNRESOLVED ISSUES AND ISSUES RESOLVED SINCE DRAFT EIS

Section S.9 of the Draft EIS lists unresolved issues to be addressed prior to the publication of the Final EIS. These issues are listed below, along with a brief description of the resolution.

- 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.
 - DSA 9 was selected as the LEDPA in coordination with the environmental resource and regulatory agencies, as detailed in Section 3.2.1.1 of this Final EIS. Avoidance and minimization efforts are described in Section 2.3.3.
- Preparation of a conceptual mitigation plan for unavoidable wetland and stream impacts.
 - A conceptual mitigation plan was prepared for the Preferred Alternative, as described in Section 2.5.4.4 of this Final EIS.
- Completion of additional archaeological surveys for the Preferred Alternative corridor, as necessary, based on coordination with NCDOT and the State Historic Preservation Office (HPO).
 - Additional archaeological surveys for the Preferred Alternative were conducted, as described in Section 2.5.3.2 of this Final EIS.

- The next update to the GUAMPO LRTP and MUMPO LRTP and conformity determinations will need to designate the project as a toll facility prior to completion of the ROD.
 - The 2035 LRTPs for GUAMPO and MUMPO include the proposed project as a toll facility. USDOT made a conformity determination on the LRTPs and TIPs on May 3, 2010. However, there were still two inconsistencies between the Preferred Alternative and the project included in the GUAMPO 2035 LRTP. The GUAMPO 2035 LRTP included an interchange at Bud Wilson Road, and there were different assumptions for the year 2015 configuration (Section 2.5.2.2). The Bud Wilson Road interchange has been eliminated from the Preferred Alternative (Section 2.3.1.6). Current plans are for the Preferred Alternative in 2015 to be constructed as a four-lane facility from I-485 to US 321 and as an interim two-lane facility from US 321 to I-85. The remaining two lanes for the segment from US 321 to I-85 would be constructed by 2035.

After the May 3, 2010 conformity determination made by the USDOT, the GUAMPO prepared an amendment to the 2035 LRTP and 2009-2015 TIP so that the project design concept and scope included in the LRTP and TIP is consistent with the Preferred Alternative. GUAMPO made a conformity determination on the amended 2035 LRTP and 2009-2015 TIP on August 24, 2010. USDOT issued a conformity determination on the amendments on October 5, 2010. A copy of the USDOT letter is included in Appendix K of this Final EIS.



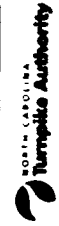
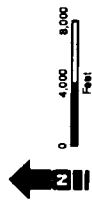
Legend

- Roadway Projects
- 2010 Projects
- 2015 Projects
- 2025 Projects
- 2035 Projects
- Major Roads
- County Lines
- Hydrology

NOTE: Only locally constrained road and bridge projects are shown.

L RTP adopted March 2010 shows the Gaston East-West Connector segment from US 321 to I-85 as a 2035 project. An amendment to the L RTP is in process to show a two-lane Gaston East-West Connector from US 321 to I-85 as a 2015 project, with the remaining two lanes of this segment constructed by 2035.

Source: GUAMPO 2035 L RTP and MUMPO 2035 L RTP for Gaston and Mecklenburg Counties.
Map Printed July 2010.



STIP PROJECT NO. U-33321
Gaston County and Mecklenburg County

GASTON EAST-WEST CONNECTOR
2035 LONG RANGE TRANSPORTATION PLANS

Figure 1-2

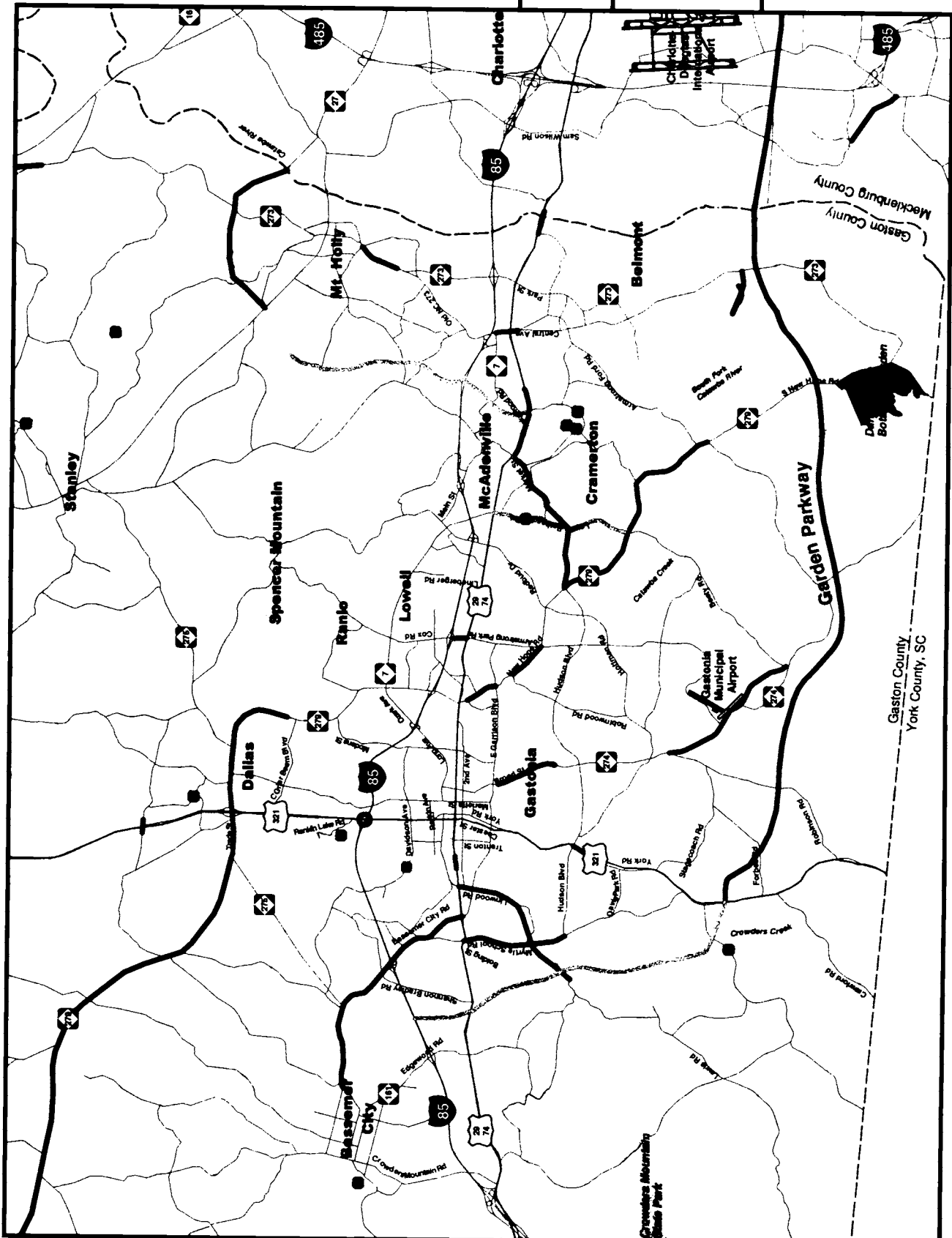


FIG. 1-2, 2010 L RTP AND MPO OF 10-2010

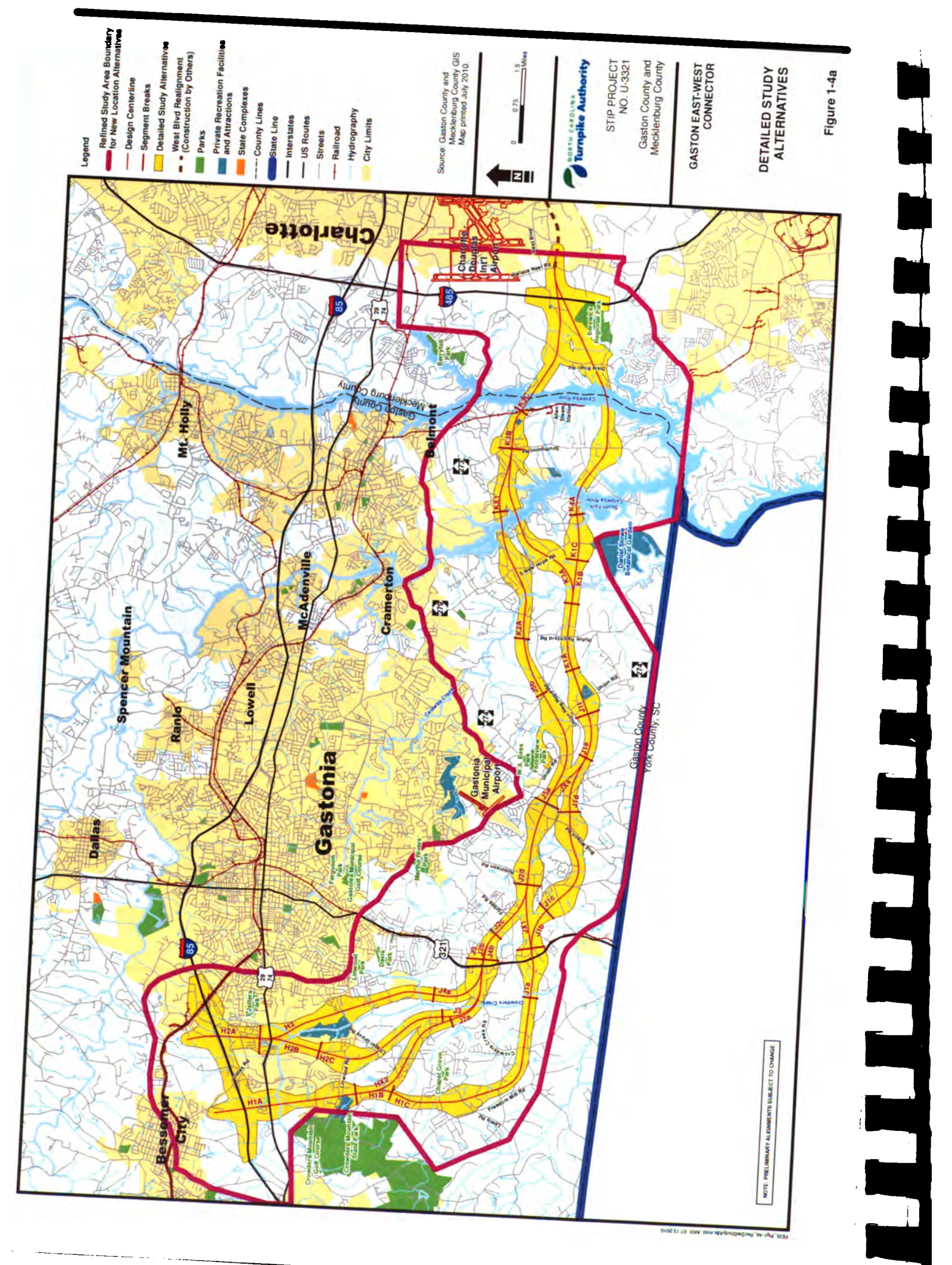


Figure 1-14

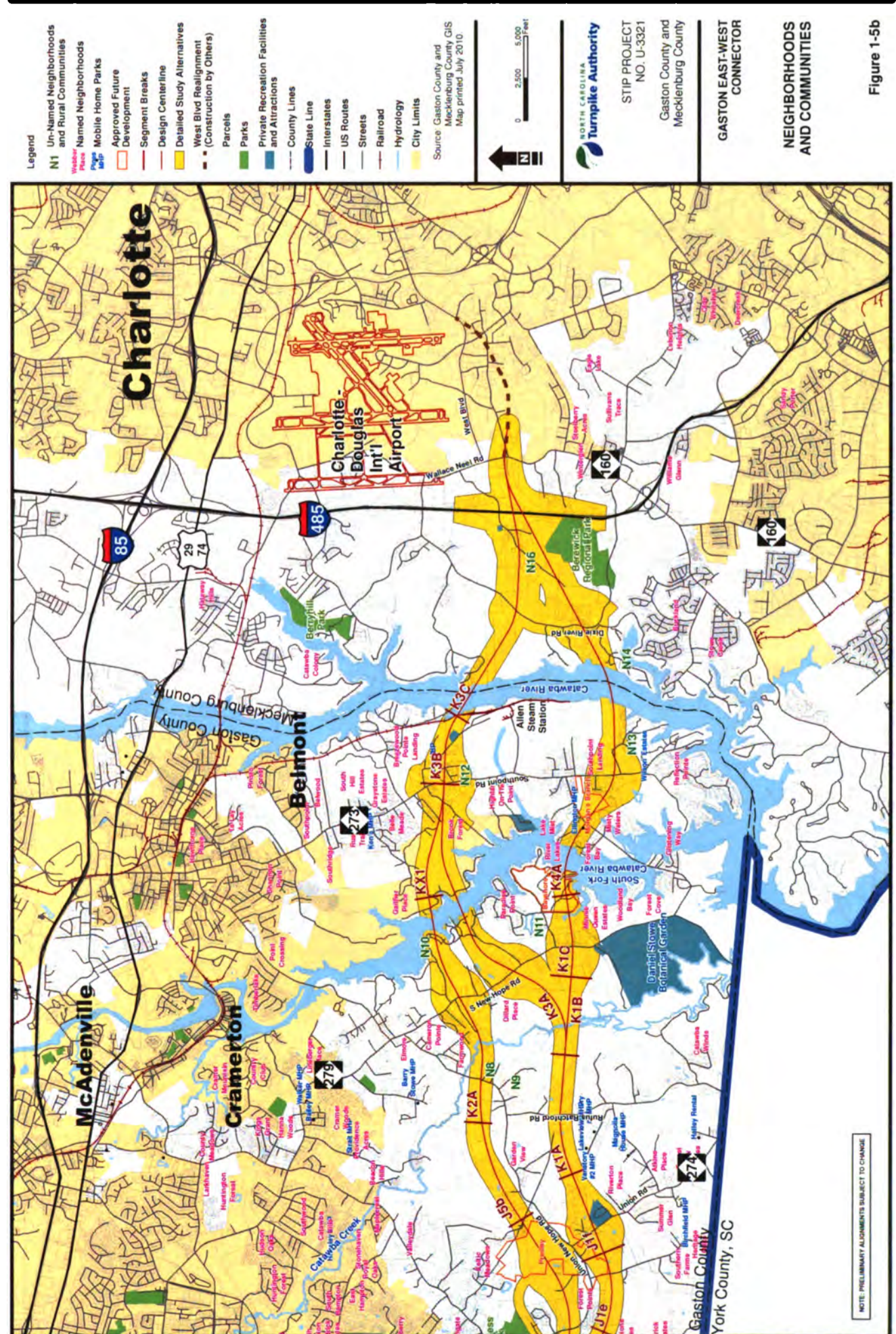


Figure 1-5b

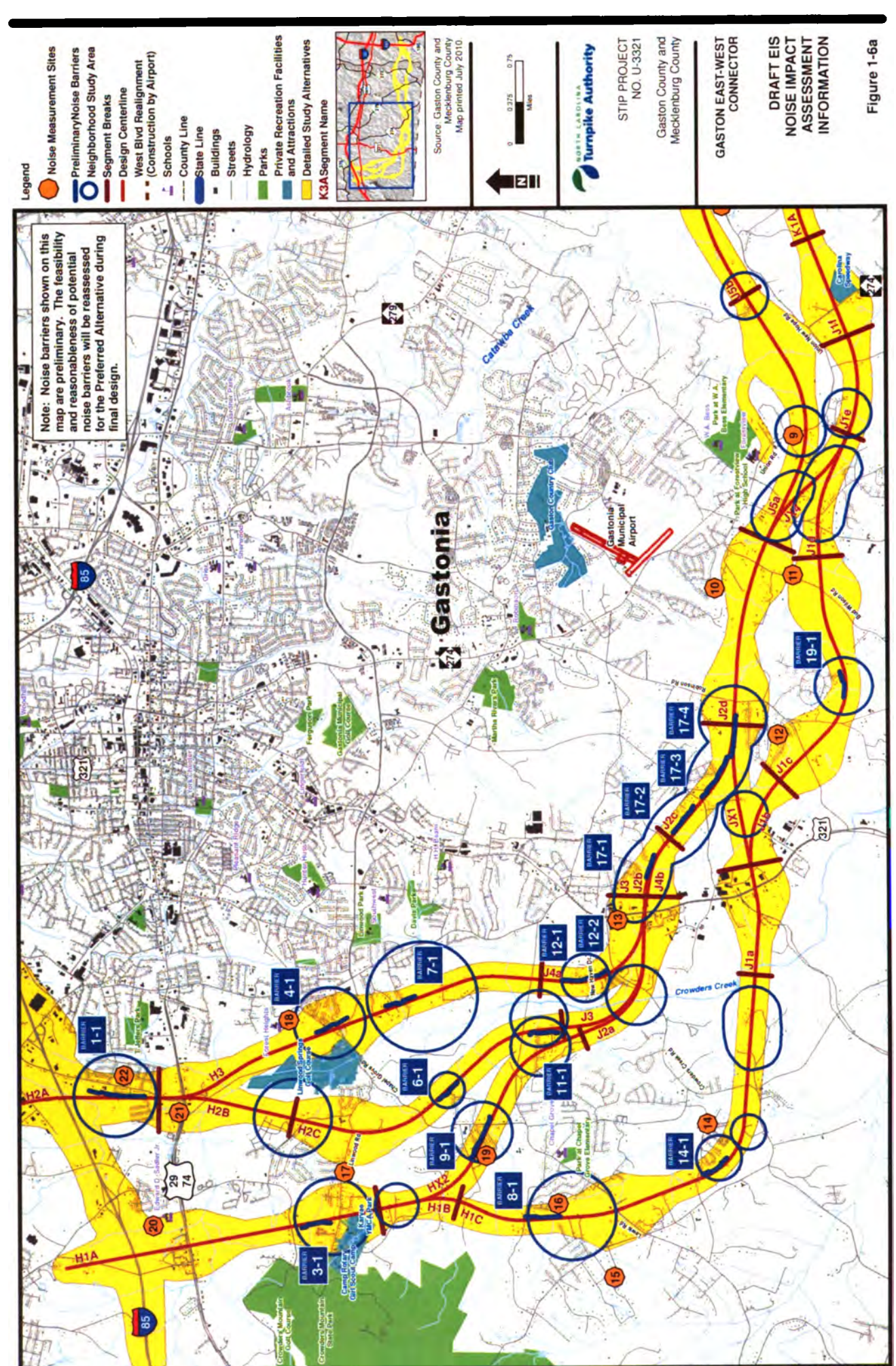
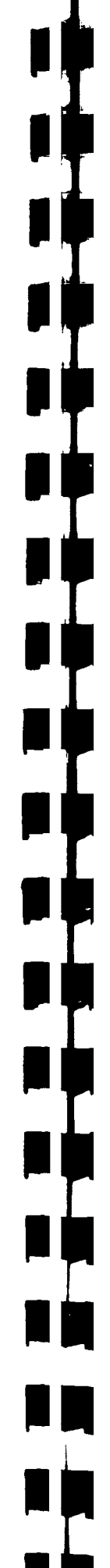
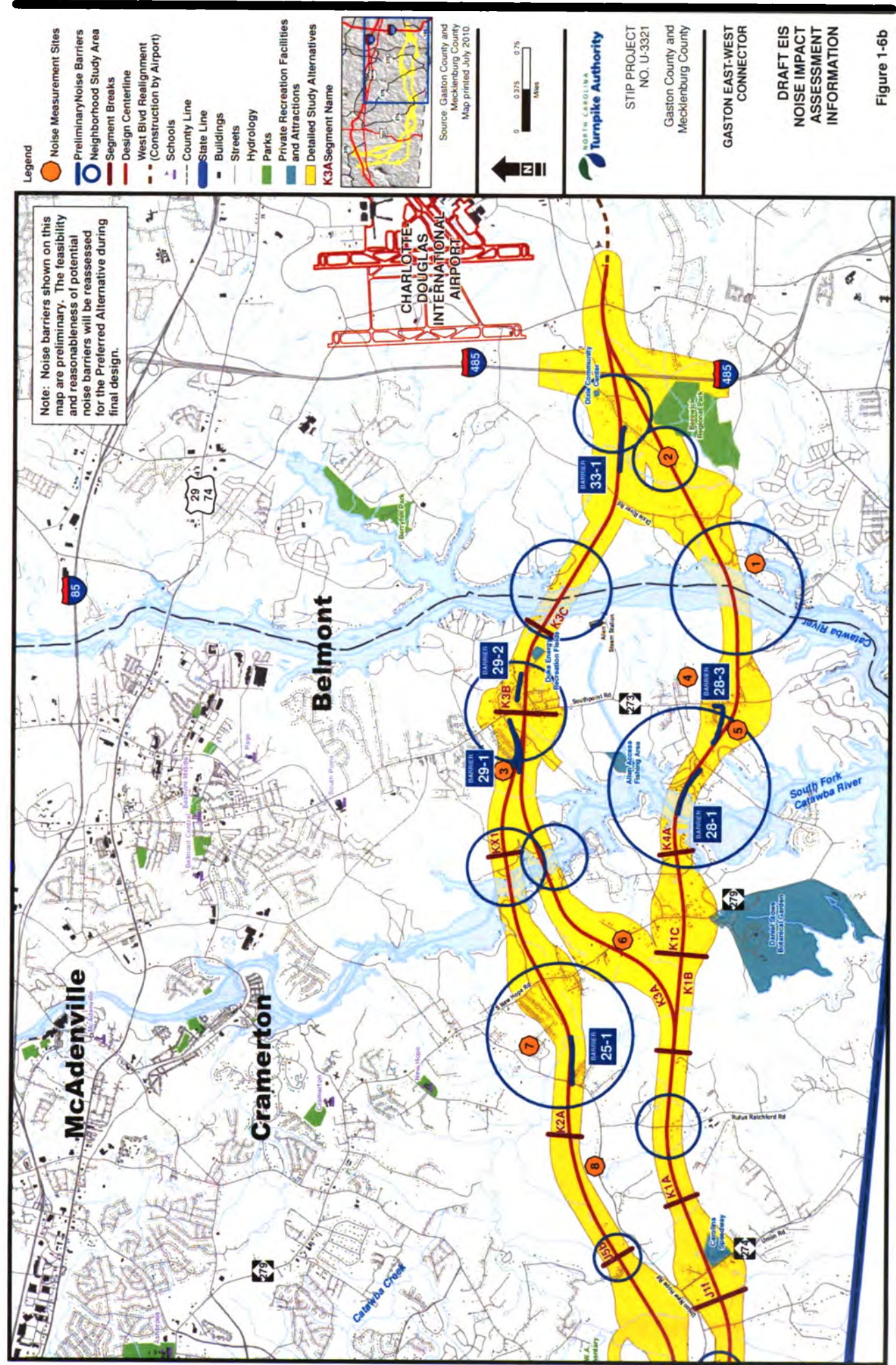


Figure 1-14





2. PREFERRED ALTERNATIVE



Chapter 2 describes the Preferred Alternative and reasons for selecting DSA 9 as the Preferred Alternative. This section also describes additional design work and other studies completed for the Preferred Alternative, and presents updated impacts associated with the Preferred Alternative.

2.1 DESCRIPTION OF THE PREFERRED ALTERNATIVE

The FHWA and NCTA (a division of NCDOT as of July 27, 2009) have identified Detailed Study Alternative (DSA) 9 as the Preferred Alternative, based on the information in the Draft EIS and input received during the public comment period (**Chapter 3**). The Preferred Alternative is shown in **Figure 2-1**. DSA 9 was identified as the Recommended Alternative in the Draft EIS. DSA 9 in relation to the other eleven DSAs is shown in **Figure 1-2**.

2.1.1 GENERAL DESCRIPTION

The Gaston East-West Connector, also known as the Garden Parkway, would be a controlled-access median-divided toll facility extending from I-85 west of Gastonia in Gaston County to I-485 near the Charlotte-Douglas International Airport in Mecklenburg County. The typical section for the Preferred Alternative is shown in **Figure 2-2**. The eastern terminus of the project also would tie into NC 160 (West Boulevard) just east of I-485. The total length of the Preferred Alternative is approximately 21.9 miles.

From west to east, interchanges along the Preferred Alternative would be located at I-85, US 29-74, Linwood Road (SR 1133), US 321, Robinson Road (SR 2416), NC 274 (Union Road), NC 279 (South New Hope Road), NC 273 (Southpoint Road), Dixie River Road (SR 1155), and I-485. An interchange at Bud Wilson Road (SR 2423) was proposed for all DSAs in the Draft EIS, but was eliminated as part of the Preferred Alternative (**Section 2.3.1.6**).

The project would include mainline bridge crossings of Blackwood Creek, an unnamed tributary to Crowders Creek (Stream S146) located just east of US 321, Catawba Creek, South Fork Catawba River, and Catawba River.

Design refinements to the Preferred Alternative incorporated since the Draft EIS was prepared are discussed in **Section 2.3.1**. They generally include modifications to improve access to neighborhoods, reduce impacts, and maintain local connectivity.

The boundaries of the Preferred Alternative study corridor have been expanded from what was shown for DSA 9 in the Draft EIS. The study corridor was expanded to include cross-street improvements that extended beyond the original boundaries, and areas where access roads and service roads are proposed outside the original corridor boundaries. The expanded study corridor areas are shown in **Figure 2-3** in a different color than the original study corridor boundaries.

2.1.2 DESIGN CRITERIA

The proposed design speed is 70 miles per hour (mph) for the mainline, which would accommodate a posted speed limit of 65 mph. The general design criteria for the project are presented in Appendix D of the Draft EIS.

The Preferred Alternative would have four 12-foot travel lanes, with a 50-foot median and 12-foot paved inside and outside shoulders (**Figure 2-2**). The typical right of way would be approximately 280 feet, with additional right of way required for interchanges, service roads, and improvements to intersecting roads. In addition, between NC 273 (Southpoint Road) and I-485, there would be an auxiliary lane in each direction, as there was in the preliminary designs shown in the Draft EIS.

This typical section in **Figure 2-2** is different than the one presented in **Figure 2-3** and Section 2.3.1.3 of the Draft EIS. In the Draft EIS, all DSAs were proposed to have six travel lanes with a 46-foot median, and a typical right of way of approximately 300 feet. Section 2.3.1.3 of the Draft EIS notes that the proposed six lanes were determined to adequately carry projected 2025 non-toll traffic volumes, and that the number of lanes and median width may be changed based on new traffic forecasts prior to the Final EIS.

The currently proposed number of through lanes (four) shown in the typical section in **Figure 2-2**, with the auxiliary lanes noted above between NC 273 (Southpoint Road) and I-485, would be sufficient to carry projected year 2035 toll traffic at an adequate level of service (LOS D or better). The 2035 forecasts are documented in the *Gaston East-West Connector Updated Traffic Forecast and Revised Preliminary Design Traffic Capacity Analysis for the Preferred Alternative* (HNTB, May 2010), incorporated by reference and summarized in **Section 2.3.5**.

Change in Typical Section

The number of through lanes along the Gaston East-West Connector was reduced from six in the Draft EIS to four. The typical right of way also was reduced 20 feet.

The proposed median was reduced from 70 feet (if four lanes were constructed) to 50 feet in the refined typical section. This change also reduced the typical right of way width from 300 feet to 280 feet.

Although not part of the ultimate project, if a fifth and sixth lane are needed in the future beyond the horizon year, they would be constructed to the inside, resulting in a 26-foot paved median (two 10-foot shoulders and six feet for a barrier, bridge piers, signs, etc.) instead of the original 46-foot median proposed in the Draft EIS.

2.1.3 TOLLING INFORMATION

Planning for Tolls. The NCDOT *2009-2015 Statewide Transportation Improvement Program* (STIP) includes the project as a toll facility. In 2000, the Gaston Urban Area Metropolitan Planning Organization (GUAMPO) Transportation Advisory Committee passed a resolution stating its support of the use of alternative funding methods to accelerate construction of the project, including methods that would require the payment of tolls by motorists. The 2035 Long Range Transportation Plans (LRTPs) for the Gaston Urban Area Metropolitan Planning Organization (GUAMPO) and Mecklenburg-Union MPO (MUMPO) include the project as a toll facility.

Toll Collection System. Tolls would be collected by an electronic toll collection (ETC) system. There would be no cash toll booths. The primary means of ETC involves 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 Gaston East-West Connector. 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, NCTA would operate a facility in the immediate vicinity of the project that accepts cash payments for prepaid tolls, so establishing an account would not be required. It is anticipated that this storefront-type facility would operate from an existing commercial building or strip shopping center within the project area. The facility is not expected to generate a high volume of traffic.

Incorporating Tolls In Preliminary Design. There are minimal differences between a roadway design with and without an ETC system. The ETC equipment, which is primarily mounted on an overhead structure, takes up little space, and would not require additional right of way. While the right-of-way requirements may not differ between a non-toll facility and a toll facility, the alignment of loop ramps that have ETC equipment may slightly differ. At these locations, the loop ramp is modified slightly to provide a tangent section that facilitates accurate video capture of license plates.

Financial Feasibility of Tolling and Toll Rates. The financial feasibility of tolling the proposed project is being evaluated in progressively more detail as the project moves forward. The following documents are incorporated by reference into this Final EIS and are available for review and download on the NCTA Web site: www.ncturnpike.org/projects/gaston.

- *Proposed Gaston East-West Connector Preliminary Traffic and Revenue Study* (Wilbur Smith Associates, October 2006). This document was incorporated by reference into the Draft EIS and summarized in Section 2.4.3 of the Draft EIS.
- *Update for Gaston East-West Connector Preliminary Traffic and Revenue Study* (Wilbur Smith Associates, December 2009). The update was conducted at a preliminary level of study. Updates from the 2006 study included toll collection methods and alignment and interchange configurations.

Prior to project construction, an Investment Grade Traffic and Revenue Study would be prepared for use by bond rating agencies and investors to evaluate financial return on the project.

The initial price of the toll would be determined as part of the Investment Grade Traffic and Revenue Study. The price of the toll likely will vary over time, based upon variables such as managing demand, financing the initial construction of the project, and paying for roadway operations and maintenance. The toll rate will differ for cars and trucks and will also be dependent on the collection method, i.e., transponder, registered license plate, or bill via US Mail.

2.2 REASONS FOR SELECTING DSA 9 AS THE PREFERRED ALTERNATIVE

According to FHWA regulations (23 CFR 771.125) and Council on Environmental Quality regulations (40 CFR 1502.14), the lead agency(ies) should identify a Preferred Alternative in a Final EIS. This is the alternative the lead agency(ies) believes would fulfill its statutory mission and responsibilities, giving consideration to social, economic, environmental, technical and other factors.

The FHWA and NCTA (a division of NCDOT since July 27, 2009) have identified DSA 9 as the Preferred Alternative, for the reasons listed below. DSA 9 was identified by the FHWA, NCTA,

and NCDOT as the Recommended Alternative in the Draft EIS (Section 2.5). Generally, the reasons cited in the Draft EIS for selecting DSA 9 as the Recommended Alternative still apply to its selection as the Preferred Alternative. This decision was made prior to the design refinements described in Section 2.3. The relative comparisons listed below still apply, since it is expected that design refinements for each DSA would be similar to those described in Section 2.3, and therefore the relative values would be similar.

Please note this list is not in order of importance and does not represent all benefits or impacts of DSA 9, just those elements that differentiated DSA 9 when compared to the other DSAs. Additional information regarding input received during the Draft EIS public review period is included at the end of this section.

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 had the second-lowest median total cost (\$1,282 million) (all alternatives ranged from \$1,281 million to 1,378.4 million).

Note: Updated costs for the Preferred Alternative are presented in Section 2.3.4.

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 transportation services to special needs groups) that would occur under DSAs 58, 64, 68, 76, 77 and 81.

Note: Design refinements for the Preferred Alternative resulted in a reduction in residential relocations by four residences.

Note: Design refinements for the Preferred Alternative associated with the provision of a service road in the southeast quadrant of US-29-74 resulted in one additional business relocation.

- DSA 9 is in the middle of the range of total neighborhood impacts at 25 impacted neighborhoods (the range being 21 to 32 impacted neighborhoods).
- DSA 9 would have no direct impacts to schools (DSAs 5, 23, and 27 also avoid direct impacts to schools).
- DSA 9 is one of eight DSAs (DSAs 5, 9, 23, 27, 64, 68, 77, 81) that 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 Regional Park in Mecklenburg County.

Note: Design refinements for the Preferred Alternative modified the I-485 interchange design and shifted it northward, resulting in no encroachment on Berewick Regional Park.

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).
Note: Updated 2035 traffic forecasts and design refinements for the Preferred Alternative resulted in an updated estimate of 283 receptors impacted by traffic noise.
- 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 fourteen crossings (the range being 13 to 18 crossings).

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.

Note: Based on the Intensive Archaeological Survey conducted for the Preferred Alternative (Coastal Carolina Research, February 2010), the Office of State Archaeology concurred that there were no archaeological resources within the Area of Potential Effect eligible for the National Register of Historic Places. This study is summarized in Section 2.5.3.2.

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 1,042 acres).
Note: Design refinements for the Preferred Alternative resulted in an updated estimate of 792 acres of impact to upland forested natural communities.
- 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).
Note: Design refinements for the Preferred Alternative resulted in an updated estimate of 4.5 acres of impacts to ponds.
- 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).
Note: Design refinements for the Preferred Alternative resulted in an updated estimate of 7.0 acres of impacts to wetlands.
- 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).
Note: Design refinements for the Preferred Alternative resulted in an updated estimate of 29,033 linear feet of impacts to perennial streams.
- 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.

Public Involvement After the Draft EIS

The formal public review period for the Draft EIS was from May 22, 2009 (the day the Notice of Availability of the Draft EIS was published in the Federal Register (Volume 74, No. 98, page 24006) to July 21, 2009. The Draft EIS was made available for public review beginning May 13, 2009, at local libraries and government offices.

A series of Public Hearings and Open Houses was held the week of June 22, 2009. The purpose of the public review period and the Pre-Hearing Open Houses/Public Hearings was to receive input on the Draft EIS and project corridors and design, as well as the selection of DSA 9 as the Recommended Alternative. These are described in more detail in Section 3.1.2. Approximately 785 people attended the two Public Hearings and 890 people attended the four Pre-Hearing Open Houses.

Comments were received via comment forms, emails, letters, and Public Hearing transcripts. Most comments received did not state a DSA preference. There were approximately twice as many public commenters who stated they opposed the project in general compared to those who supported the project.

As described in Section 3.3.1, three petitions were received. Two petitions were in general opposition to the project, one with approximately 7,000 signatures and the other with 275 signatures. The third petition, with 109 signatures, opposed DSAs that would impact the Mt. Pleasant Baptist Church Cemetery (DSAs 4, 9, 22, 27, 58, 68, 76, and 81). The NCTA did not verify the signatures on the petitions or check for duplicates. The refined preliminary design

for the Preferred Alternative would not impact gravesites in the existing or historic boundaries of the cemetery (Section 2.3.1.10).

None of the public comments received resulted in changes to any of the reasons listed above for selecting DSA 9 as the Preferred Alternative. Local government agencies, such as GUAMPO and MUMPO, support the project. Detailed information regarding comments received from the public, as well as local, state, and federal agencies, is presented in Chapter 3 of this Final EIS. Common generalized comments, and responses to those comments, are included in Section 3.3.2. All comments received on the Draft EIS, and responses to the comments, are included in Appendix B.

2.3 DESIGN REFINEMENTS TO THE PREFERRED ALTERNATIVE

Several design modifications were made to the Preferred Alternative as a result of public involvement activities, coordination with environmental resource and regulatory agencies, and comments received during the Draft EIS public review period. The following sections describe the design refinements (Section 2.3.1), service roads (Section 2.3.2), avoidance and minimization of impacts to Waters of the US (Section 2.3.3), updated cost estimates (Section 2.3.4), and traffic forecasts and operational analyses (Section 2.3.5) for the Preferred Alternative.

Figure 2-3a-r shows the refined preliminary design for the Preferred Alternative that incorporates the design modifications and service roads described in Sections 2.3.1 and 2.3.2.

2.3.1 DESIGN REFINEMENTS

The preliminary design refinements described in this section include mainline design changes (median width and realignment), access road changes, interchange reconfiguration or elimination, and the addition of service roads, as listed below. Appendix H includes graphics that show the “before and after” preliminary designs for all items listed, except “Reduce Median by 20 Feet and Revise Typical Section”, and “Retain the US 29-74 Interchange”.

- Reduce Median by 20 Feet and Revise Typical Section
- Modify Access to Matthews Acres Subdivision
- Retain the US 29-74 Interchange
- Modify the Forbes Road Grade Separation
- Compress the Robinson Road Interchange
- Eliminate the Bud Wilson Road Interchange
- Compress the NC 274 (Union Road) Interchange
- Relocate Tucker Road Connection to Canal Road
- Realign Mainline to Avoid Recreation Fields and Provide Access Road to NC 273 (Southpoint Road)
- Reconfigure the NC 273 (Southpoint Road) Interchange to Avoid Historic Boundary of Mt. Pleasant Baptist Church Cemetery
- Relocate Boat Club Road Connection North of Mainline to NC 273 (Southpoint Road)
- Reconfigure the I-485 Interchange and Dixie River Road Interchange

Many of the design refinements result in reduced impacts to jurisdictional resources. The USEPA, USFWS, NCDWQ, and NCWRC provided comments on the Draft EIS that included general requests for additional consideration of avoidance and minimization measures for jurisdictional resources. In addition, the USEPA specifically requested that the NCTA review the mainline design and interchange configurations for opportunities to reduce the proposed project's footprint. The NCWRC specifically requested consideration of a narrower median.

2.3.1.1 Reduce Median by 20 Feet and Revise Typical Section

Preliminary Design in the Draft EIS. The preliminary design typical section for DSA 9 and all DSAs included six through lanes and a 46-foot median (Draft EIS Figure 2-3). The preliminary design also included an additional auxiliary lane in each direction between the NC 273 (Southpoint Road) interchange and the I-485 interchange. The Draft EIS acknowledges that the number of through lanes might be reduced to four based upon updated 2035 traffic projections (Draft EIS Section 2.4.1), resulting in a four-lane road with a 70-foot median.

Public Comments Received. Comments were received from environmental resource and regulatory agencies requesting minimization of the construction footprint where possible.

Refined Preliminary Design for the Preferred Alternative. Traffic forecasts were updated for the Preferred Alternative, including updates to the horizon year from 2030 to 2035. The forecasts are documented in the *Gaston East-West Connector Updated Traffic Forecast and Revised Preliminary Design Traffic Capacity Analysis for the Preferred Alternative* (HNTB, May 2010).

Based on a review of year 2035 traffic projections (Toll Scenario) for the Preferred Alternative, two through lanes in each direction are needed, along with an additional auxiliary lane in each direction between the NC 273 (Southpoint Road) interchange and the I-485 interchange. With this configuration, the mainline is projected to operate at LOS D or better through 2035.

Design criteria for the Preferred Alternative are discussed in Section 2.1.2. Figure 2-2 shows the typical section for the Preferred Alternative.

2.3.1.2 Modify Access to Matthews Acres Subdivision

Preliminary Design in the Draft EIS. The preliminary design for DSA 9 shown on Figure 2-9b in the Draft EIS and on the Corridor Design Public Hearing Maps (April 24, 2009) shows existing access to the Matthews Acres Subdivision would be cut off, and new access provided via a westward extension of Belfast Drive to Diane 29 Theater Road. This extension would cross Bessemer Branch, and the crossing type was changed from a triple box culvert to a bridge as a result of Concurrence Point 2a. Existing access to Matthews Acres is via Belfast Drive to Brightington Lane/Northwynn Road to Shannon Bradley Road (SR 1135).

Public Comments Received. Several residents of the Matthews Acres subdivision provided verbal comments during the Pre-Hearing Open House held on June 22, 2009 at the Gastonia Adult Recreation Center. In addition, members of the Broomfield Neighborhood Watch (includes neighborhoods surrounding Shannon Bradley Road) provided comments at a small group meeting held July 7, 2009. The residents of the area requested that the proposed access be modified to more directly connect to Shannon Bradley Road. Residents of Matthews Acres are included in the broader neighborhood area that surrounds Shannon Bradley Road north of US 29-74.

Refined Preliminary Design for the Preferred Alternative. The preliminary design for the Preferred Alternative was altered by extending Belfast Drive eastward, under the mainline, to tie directly back into Shannon Bradley Road. The mainline would be bridged over the Belfast Drive extension.

This new access would be similar to the access that currently exists (i.e., Matthews Acres access is from Shannon Bradley Road) and would provide the shortest route to reconnect Matthews Acres to the rest of the community surrounding Shannon Bradley Road.

Figure 2-3a and Appendix H, Figure H-1, show the Preferred Alternative refined preliminary design in this area.

2.3.1.3 Retain the US 29-74 Interchange

Preliminary Design in the Draft EIS. The preliminary design for DSA 9 shown on Figure 2-9e in the Draft EIS and on the Corridor Design Public Hearing Maps (April 24, 2009) includes a half clover-leaf interchange with US 29-74. Section 2.4.5.1 of the Draft EIS discusses the option of eliminating this interchange, and notes that a final decision on inclusion/elimination would be documented in the Final EIS.

Public Comments Received. As discussed in Section 2.4.5.1 of the Draft EIS, environmental resource and regulatory agencies requested that NCTA consider the removal of the US 29-74 interchange due to estimated impacts to wetlands and streams.

The public was asked about the potential elimination of the US 29-74 interchange at the series of Citizens Informational Workshops held in August 2008 (Series #3). As summarized in Section 9.1.1.3 of the Draft EIS, there were 205 written comments received during this workshop series. Of these, 23 commenters specifically stated they believed the interchange was not needed, while 25 commenters stated they believed the interchange was needed.

Decision Not to Revise the Preliminary Design for the Preferred Alternative. An updated traffic and revenue study prepared for the Preferred Alternative included an evaluation of the effects on toll revenue if the US 29-74 interchange was eliminated from the project. The study, titled *Proposed Gaston East-West Connector December 2009 Update to the 2006 Preliminary Study Interchange Analysis* (Wilbur Smith Associates, December 2009), is incorporated by reference.

Based on the results of this study, there would be substantial revenue loss from elimination of the US 29-74 interchange. There would be approximately 12 to 13 percent fewer transactions and approximately 5 percent less revenue. In the vicinity of the Gaston East-West Connector, US 29-74 is a four-lane divided arterial that provides direct access into downtown Gastonia.

Based on the effect of the interchange on revenue forecasts as described in the updated traffic and revenue study, and the importance of US 29-74 as a direct route to downtown Gastonia, the NCTA has determined that the US 29-74 interchange would be retained as part of the Preferred Alternative's ultimate design.

2.3.1.4 Modify the Forbes Road Grade Separation

Preliminary Design in the Draft EIS. The preliminary design for DSA 9 shown on Figure 2-9o in the Draft EIS and on the Corridor Design Public Hearing Maps (April 24, 2009) shows a grade separation of Forbes Road over the mainline.

Public Comments Received. No specific comments were received regarding this grade separation. The redesigned grade separation avoids impacts to Stream S148.

Refined Preliminary Design for the Preferred Alternative. The curve radius of the grade separation of Forbes Road over the mainline was reduced, reducing the length of improvements along Forbes Road.

Figure 2-3h and Appendix H, Figure H-2, show the Preferred Alternative refined preliminary design in this area.

2.3.1.5 Compress the Robinson Road Interchange

Preliminary Design in the Draft EIS. The preliminary design for DSA 9 shown on Figure 2-9q in the Draft EIS and on the Corridor Design Public Hearing Maps (April 24, 2009) includes a partial clover-leaf interchange, with standard ramps in the northeast and northwest quadrants and a loop and standard ramp in the southeast quadrant. Pam Drive was proposed to be closed at Robinson Road and subdivision traffic routed to Saddlewood Road to access Robinson Road.

Public Comments Received. During the Pre-Hearing Open Houses and public review period, several comments were received from residents in the Pam Drive neighborhood expressing their desire to keep Pam Drive connected to Robinson Road. Also, the property owner in the northwest quadrant requested that design modifications be considered to reduce impacts to their property. The proposed ramp shown in the Draft EIS passed close to their house and access control along Robinson Road would extend past their property. The property owner across Robinson Road, in the northeast quadrant, supported this request.

Refined Preliminary Design for the Preferred Alternative. The preliminary design for the Preferred Alternative was altered by connecting Pam Drive to Robinson Road at the ramp terminus, and by moving the ramps in the northeast and northwest quadrant closer to the mainline. Traffic projections and operations analysis indicate that future loop ramps in the northeast and northwest quadrants (accommodated in the previous interchange design) likely would not be needed. Access control along Robinson Road to the north of the interchange was shortened, so the existing access driveway to the property in the northwest quadrant can be maintained. The refined design also shifts the right of way from approximately 10 feet from the house on the property in the northwest quadrant to approximately 300 feet from the house.

Figure 2-3h and Appendix H, Figure H-3, show the Preferred Alternative refined preliminary design in this area.

2.3.1.6 Eliminate the Bud Wilson Road Interchange

Preliminary Design in the Draft EIS. The preliminary design for DSA 9 shown on Figure 2-9s in the Draft EIS and on the Corridor Design Public Hearing Maps (April 24, 2009) includes a diamond interchange at Bud Wilson Road.

Public Comments Received. No specific comments regarding this interchange were received from the public. The elimination of this interchange was considered in relation to potential cost savings and to the requests from environmental resource and regulatory agencies to minimize the construction footprint or eliminate interchanges where possible.

Refined Preliminary Design for the Preferred Alternative. The projected traffic volumes at all interchanges were reviewed to identify candidate interchanges for elimination. The Bud Wilson Road interchange was the only one identified for possible elimination.

Additional modeling conducted for the Preferred Alternative in the *Proposed Gaston East-West Connector December 2009 Update to the 2006 Preliminary Study Interchange Analysis* (Wilbur Smith and Associates, December 2009), showed that eliminating this interchange would decrease transactions by approximately 9 percent and revenue by 4 percent. However, unlike US 29-74, which is a major urban arterial that provides direct access to downtown Gastonia, Bud Wilson Road is a rural collector. The Robinson Road interchange and NC 274 (Union Road) interchange would generally provide access to the same areas as the Bud Wilson Road interchange.

Based on the updated traffic and revenue forecasts described above, and the fact that other interchanges would provide similar access, the NCTA eliminated the Bud Wilson Road interchange from the Preferred Alternative's ultimate design.

Figure 2-3i and Appendix H, Figure H-4, show the Preferred Alternative refined preliminary design in this area. During final design, the Bud Wilson Road grade separation shown in the figures likely would be redesigned to shorten the length of the improvements on Bud Wilson Road and reduce costs.

2.3.1.7 Compress the US 274 (Union Road) Interchange

Preliminary Design in the Draft EIS. The preliminary design for DSA 9 shown on Figure 2-9v and Figure 2-9x in the Draft EIS and on the Corridor Design Public Hearing Maps (April 24, 2009) includes a half clover-leaf interchange at NC 274 (Union Road). The half-clover-leaf interchange was selected to minimize impacts to the Carolina Speedway, located on the east side of NC 274. The Carolina Speedway is a privately-owned 0.4-mile clay oval vehicular race track with spectator stands built in 1962. It was determined not eligible for listing on the National Register of Historic Place (NRHP).

Public Comments Received. Operators of the speedway provided input at the Pre-Hearing Open Houses in June 2009 and also at a site visit on October 19, 2009. The operators were concerned about parking and maintaining operations in the "pit area" on the north end of the speedway.

The speedway operators stated that on any given race night, approximately 850 people are in the grandstand during the race, along with approximately 400 people in the pit area. The pit area has held up to 110 vehicles during larger race events. The main grassy parking area in front of the grandstand can hold approximately 500 vehicles. Overflow parking across the street can accommodate an additional 300 vehicles.

Refined Preliminary Design for the Preferred Alternative. The preliminary design for the Preferred Alternative was altered by shifting the mainline alignment northward and changing the interchange from a half-clover-leaf to a compressed diamond. These design modifications would minimize impacts to operations at the Carolina Speedway. The pit area, which they stated is important to the operation of their events, would be maintained.

Figure 2-3k and Appendix H, Figure H-5, show the Preferred Alternative refined preliminary design in this area.

2.3.1.8 Relocate Tucker Road Connection to Canal Road

Preliminary Design in the Draft EIS. The preliminary design for DSA 9 shown on Figure 2-9cc in the Draft EIS and on the Corridor Design Public Hearing Maps (April 24, 2009) includes a reconnection of Tucker Road south of the interchange since the proposed project would eliminate Tucker Road's connection with Southpoint Road. This reconnection would extend south to Canal Road, which connects to Southpoint Road (NC 273).

Public Comments Received. No specific comments were received regarding this access road. The realigned access road avoids impacting the edge of the South Fork Catawba Creek 100-year floodplain.

Refined Preliminary Design for the Preferred Alternative. The proposed extension connecting Tucker Road to Canal Road was shifted north to be adjacent to the south side of the electric power easement.

Figure 2-3n and Appendix H, Figure H-5, show the Preferred Alternative refined preliminary design in this area.

2.3.1.9 Realign Mainline to Avoid Recreation Fields and Provide Access Road to NC 273 (Southpoint Road)

Preliminary Design in the Draft EIS. The preliminary design for DSA 9 shown on Figure 2-9cc in the Draft EIS and on the Corridor Design Public Hearing Maps (April 24, 2009) encroaches on the Duke Energy Corporation/Belmont Optimist Club's newly expanded football field and the back edge of their baseball field.

The Draft EIS preliminary design was created prior to the improvements the Optimist Club made to the site. The site is privately-owned by Duke Energy Corporation and is under a long-term lease to the Belmont Optimist Club (therefore it is not a Section 4(f) resource). No access road was shown to the recreational fields in the Draft EIS preliminary design.

Public Comments Received. Project engineers met on-site with the Belmont Optimist Club President on May 11, 2009 to review the Draft EIS preliminary design in relation to the recreational fields and to provide information about the use of the fields. After this meeting, it was determined that minor design modifications could be made that would avoid the newly expanded recreation fields.

Refined Preliminary Design for the Preferred Alternative. The refined design shifts the mainline slightly northward. The Duke Energy Corporation/Belmont Optimist Club fields are avoided, as well as two electric transmission towers. Access to the Duke Energy Corporation/Belmont Optimist Club recreational fields and other landlocked properties in the southeast quadrant of the project's interchange with Southpoint Road (NC 273) would be provided by constructing a new access roadway from Southpoint Road north and east to Boat Club Road.

Figure 2-3n and Appendix H, Figure H-6, show the Preferred Alternative refined preliminary design in this area.

2.3.1.10 Reconfigure the NC 273 (Southpoint Road) Interchange to Avoid Historic Boundary of Mt. Pleasant Baptist Church Cemetery

Preliminary Design in the Draft EIS. The preliminary design for DSA 9 shown on Figure 2-9cc in the Draft EIS and on the Corridor Design Public Hearing Maps (April 24, 2009) includes a loop and ramp in the northwest quadrant of the NC 273 (Southpoint Road) interchange. As noted in the Draft EIS Section 3.2.6.1, this quadrant would require approximately 2.1 acres of land from the south and east sides of the parcels currently owned by Mt. Pleasant Baptist Church for the Mt. Pleasant Baptist Church Cemetery.

Public Comments Received. A petition was received with 109 signatures, which opposed DSAs that would impact the Mt. Pleasant Baptist Church Cemetery (DSAs 4, 9, 22, 27, 58, 68, 76, and 81).

Refined Preliminary Design for the Preferred Alternative. During the *Gaston East-West Connector Intensive Archaeological Survey* prepared for the project (Coastal Carolina Research, February 2010), gravesites with headstones were discovered south of the parcels currently owned by Mt. Pleasant Baptist Church. Research indicated that the cemetery once extended south of the current property boundaries into the area where the gravesites were found.

The refined preliminary design reconfigures this quadrant of the interchange from a loop and ramp to a compressed ramp. This modification would avoid the historic boundary of the cemetery where the gravesites were found. Approximately 0.3 acres of right of way would still be required from the undeveloped wooded parcel adjacent to NC 273, currently owned by Mt. Pleasant Baptist Church, but no gravesites were found in this location.

Figure 2-3n and Appendix H, Figure H-6, show the Preferred Alternative refined preliminary design in this area.

2.3.1.11 Relocate Boat Club Road Connection North of Mainline to NC 273 (Southpoint Road)

Preliminary Design in the Draft EIS. The preliminary design for DSA 9 shown on Figure 2-9cc in the Draft EIS and on the Corridor Design Public Hearing Maps (April 24, 2009) includes a reconnection of Boat Club Road north of the interchange. This reconnection would extend north to Mary Tate Road. Mary Tate Road connects to Henry Chapel Road, which connects to Southpoint Road (NC 273).

Public Comments Received. Comments were received from two citizens on Drennan Horne Drive (a short road off of Boat Club Road) requesting a shorter route back to Southpoint Road (NC 273).

Refined Preliminary Design for the Preferred Alternative. The extension connecting Boat Club Road to Henry's Chapel Road was replaced with a shorter reconnection directly to NC 273 (Southpoint Road). The refined connection would move the existing intersection of Boat Club Road and NC 273 (Southpoint Road) approximately 500 feet north to a location outside the interchange's access control area, resulting in a shorter service road and shorter route to NC 273 (Southpoint Road) compared to the connection originally shown.

Figure 2-3n and Appendix H, Figure H-6, show the Preferred Alternative refined preliminary design in this area.

2.3.1.12 Reconfigure the I-485 and Dixie River Road Interchanges

Preliminary Design in the Draft EIS. The preliminary design for DSA 9 shown on Figures 2-9ee, gg, hh, and ii in the Draft EIS and on the Corridor Design Public Hearing Maps (April 24, 2009) includes a half-clover-leaf interchange at Dixie River Road and a system interchange at I-485.

The system interchange at I-485 maintains route continuity between the Gaston East-West Connector and I-485, with traffic desiring to continue from eastbound Gaston East-West Connector to West Boulevard exiting to the right. This interchange is near the Charlotte-Douglas International Airport (CDIA).

Public Comments Received. The NCTA has been coordinating with CDIA and the Charlotte Department of Transportation (CDOT) throughout the project development process to obtain information on projects in the area. At the time the Draft EIS preliminary designs for the DSAs were created, the CDIA was planning/constructing a third parallel runway (opened in January 2010) and had plans for an intermodal facility on the south side of the airport between the second and third runways.

CDIA and CDOT also had plans for realigning West Boulevard south of the airport and for paving the currently graded but unpaved ramps at the I-485 interchange with Garrison Road. With the exception of the runway project, project schedules were uncertain at the time the Draft EIS preliminary designs were completed.

The CDIA and CDOT projects have continued to progress, along with the Gaston East-West Connector. Coordination meetings between NCTA, NCDOT, CDIA, and CDOT were held on November 4, 2009, January 6, 2010, and January 19, 2010. The CDIA stated that the intermodal facility is scheduled to be opened in late 2011. Access to I-485 is important for the operations at the facility. To support this project, the Garrison Road interchange ramp paving project (STIP Project R-2248H) and the West Boulevard extension project (STIP Project U-3411) to connect to the interchange are scheduled to be completed prior to opening the intermodal facility.

In order to preserve the investments made in these improvements, CDIA and CDOT requested that NCTA reevaluate the I-485/Gaston East-West Connector interchange to determine the feasibility of incorporating the existing Garrison Road bridge over I-485 and a planned bridge over a Norfolk Southern (NS) railroad spur (part of the intermodal facility) and the feasibility of maintaining full access to/from I-485 and West Boulevard during construction of the Gaston East-West Connector.

Refined Preliminary Design for the Preferred Alternative. Based on the coordination with CDIA, NCDOT, and CDOT described above, the interchange at I-485 was modified for the Preferred Alternative. The modifications at this interchange also required modifications to the Dixie River Road interchange and the access roads reconnecting Garrison Road to Dixie River Road.

The interchange at I-485 was shifted north and the configuration of the ramps was modified. An access road is proposed south of the Gaston East-West Connector to connect Garrison Road to Dixie River Road. Due to the interchange shifting north and the change in property impacts, the originally proposed access road on the north side of the Gaston East-West Connector is not needed.

These interchange modifications would result in a direct impact to the Dixie Community Center located on Garrison Road just west of I-485. The community center is described in Section 3.2.2.2

of the Draft EIS. The original preliminary design would avoid taking the community center. The NCTA intends to conduct additional coordination with this community and to develop a mitigation plan for this relocation, as listed in the Special Project Commitments (**Section PC**).

Figures 2-3p-r and Appendix H, Figure H-7, show the Preferred Alternative refined preliminary design in this area.

2.3.2 SERVICE ROADS

A *Gaston East-West Connector Service Road Study* (PBS&J, May 2010) was prepared for the Preferred Alternative, and is incorporated by reference. The objective of this study was to identify parcels whose access would be eliminated by the Preferred Alternative refined preliminary design (i.e., landlocked parcels) and to evaluate the feasibility and reasonableness of providing service roads to restore access to those parcels. The recommendations in the *Service Road Study* are preliminary. Final decisions on service roads will be made during final design.

2.3.2.1 Service Road Evaluation Methodology and Design Assumptions

The refined preliminary design for the Preferred Alternative was reviewed to identify those parcels that would be landlocked with implementation of the refined preliminary design. Once the impacted parcels were identified, they were then evaluated to estimate the cost of constructing a service road to the property from existing roadways near the project. This cost was then compared to an estimate of the total acquisition cost, based on tax values, for the isolated or remnant portions of the parcel. If the cost of constructing the service road to a property (or properties) was estimated to be less than the cost of total acquisition of the property(ies), then the service road was included in the refined preliminary design.

Several factors were used in formulating approximate costs to provide service roads. These factors include the cost associated with constructing the service road, any major hydraulic structures that may be necessary, environmental mitigation costs, and additional right of way necessary to develop the service road.

In addition, design criteria were developed to guide the design of each service road. These criteria were developed to serve the land-locked parcel with safe and cost-effective access. The intended use and expected traffic volumes, including vehicle mix, were major considerations in developing the following design criteria.

Design Speed. The design speed selected for the service roads is 30 mph with an anticipated posted speed of 25 mph. These facilities are intended to be low volume roadways providing access only to local, mainly residential, properties. Some of the service roads would provide access to only one parcel, but others could potentially serve two or more adjacent parcels. Design speed adjustments were made for unusual circumstances and unique property use situations, as necessary.

Typical Section. The service road typical section consists of two 11-foot lanes with 2-foot unpaved shoulders on each side. Depending on the profile, roadside ditches would be provided to convey drainage away from the roadway facility and reduce future maintenance costs.

Alignment and Grade. The alignments of the individual service roads vary based on property configurations. Each situation was unique and treated as such to develop the best design solution. The goal was to minimize the loss of adjacent properties by paralleling the control of access portion of the facility as closely as possible. Where following the control of access was not an option or would result in an unusually long service road, the alignment typically paralleled or

straddled the property line to balance the loss of property between the adjacent parcels. The grades of the proposed service roads were dictated by existing topography to reduce earthwork.

Hydraulic/Environmental Feature Crossings. Some of the service roads cross drainage features, as well as streams and wetland areas. In these cases, efforts to avoid impacting these resources were made by adjusting the horizontal alignments and/or reducing “footprint” impacts to these environmental features to the extent possible by tightly controlling the profile and steepening side slopes as necessary through these areas.

2.3.2.2 Proposed Service Roads

Based on the analysis conducted as described above, fourteen preliminary service roads are recommended. These fourteen proposed service roads are listed in **Table 2-1** and shown in **Figure 2-3a-r**. It should be noted that the layout and design of these service roads may be modified during final design based on potential cost and material savings or to accommodate modifications requested by individual land-locked property owners.

TABLE 2-1: Recommended Preliminary Service Roads

Figure Reference	Nearest Corridor Segment	Location	Number of Parcels Served
2-3b	H2A	North of I-85	16
2-3c	H3	Northwest of US 29-74 Interchange	8
2-3c	H3	Southeast of US 29-74 Interchange	11
2-3c	H3	Southwest of US 29-74 interchange	5
2-3e	H3	Connect Parcel to Stablegate Dr. South of Penny Park Dr	1
2-3f	J4a	Connect New Haven Dr to Crowders Creek Rd	19
2-3j	JX4	Reconnect Dorchester Rd	3
2-3j	JX4	Connect Parcel to Scott Dr	1
2-3k	J1f	Reconnect Crawford Rd to NC 274 (Union Rd)	11
2-3l	K1A	Connect Parcel to Rufus Ratchford Rd	1
2-3m	K3A	Reconnect Suzanne Dr to NC 279 (South New Hope Rd)	11
2-3m	K3A	Reconnect Teakwood Dr to NC 279 (South New Hope Rd)	13
2-3p	K3C	Connect parcel southwest of Dixie River Rd interchange to Lynn Parker Ln	1
2-3p	K3C	Connect parcels on Horton Rd to Garrison Rd southwest of I-485 interchange	11

Source: *Gaston East-West Connector Service Road Study*, PBS&J, May 2010.

2.3.3 AVOIDANCE AND MINIMIZATION OF IMPACTS TO WATERS OF THE US

The refined design for the Preferred Alternative resulted in an approximate 25 percent reduction in stream impacts (2.36 miles), an approximate 6 percent reduction in wetland impacts (0.4 acre), a slight increase in impacts to ponds (0.4 acre), and a slight decrease in Catawba River buffer impacts compared to the preliminary design for DSA 9 documented in the Draft EIS. The changes in jurisdictional resource impacts resulting from the individual refinements are summarized in **Table 2-2**. **Appendix I** includes tables listing impacts by individual resource.

TABLE 2-2: Summary of Changes in Jurisdictional Resource Impacts Due to Design Refinements and Service Roads for the Preferred Alternative

Design Refinement	Change in Impact to Resource Compared to Draft EIS DSA 9 Preliminary Design*					
	Catawba River Buffers (sq ft)	Perennial Streams (linear ft)	Intermittent Streams (linear ft)	Total Streams (linear ft)	Wetlands (acres)	Ponds (acres)
Reduce Median Width	Zone 1 6,758 Zone 2 -1,356	-980	-174	-1,154	-0.32	0
Modify Matthews Acres Access	0	0	0	0	0	0
Modify Forbes Rd Grade Separation	0	-71	0	-71	0	0
Compress Robinson Rd Interchange	0	-170	0	-170	0	-0.06
Eliminate Bud Wilson Rd Interchange	0	-3,109	-646	-3,755	0	0
Compress NC 274 (Union Rd) Interchange	0	-1,823	+398	-1,425	+0.02	+0.18
Relocate Tucker Rd Connection	0	+37	0	+37	0	0
Realign Mainline At Duke Energy/Belmont Optimist Club Fields	0	-181	+6	-175	0	0
Reconfigure NC 273 (Southpoint Rd) Interchange to Avoid Cemetery	0	0	0	0	0	0
Relocate Boat Club Rd North Connection	0	-135	0	-135	0	0
Reconfigure I-485 Interchange	0	-3,783	-2,335	-6,118	-0.34	0
TOTAL CHANGE	Zone 1 -6,758 Zone 2 -1,356	-10,215	-2,751	-12,966	-0.64	+0.12
Impacts Reported in Draft EIS for DSA 9	Zone 1 10,400 Zone 2 10,215	38,894	10,101	48,995	7.50	4.1
Impacts for Preferred Alternative (no service roads)	Zone 1 3,642 Zone 2 8,859	28,679	7,350	36,029	6.90	4.2
Add Service Roads	0	+354	+33	+387	+0.12	+0.3
TOTAL IMPACTS FOR PREFERRED ALTERNATIVE	Zone 1 3,642 Zone 2 8,859	29,033	7,383	36,416	7.02	4.5

* Impacts calculated based on slope stake limits plus a 25-foot buffer.

2.3.4 COST ESTIMATES FOR THE PREFERRED ALTERNATIVE

Cost estimates for the Preferred Alternative are presented in Table 2-3. Cost estimates are based on the Preferred Alternative refined preliminary design, as described in Sections 2.3.1 and 2.3.2. The estimates are in year-of-expenditure dollars, as described in the table notes. Cost estimates are provided as a range of probable project costs for construction, right-of-way acquisition, and environmental mitigation (mitigation of impacts to streams and wetlands). The Total Project Cost provided represents the 70 percent confidence level. This means that there is a 70 percent probability that the cost to construct the project will be less than or equal to \$943 million.

TABLE 2-3: Cost Estimates for Preferred Alternative

	Approximate Length (miles)	Probable Range of Costs Through Year of Expenditure (millions \$)*				Project Cost (70% chance costs will be less)
		Construction	Environmental Mitigation	ROW & Utility	Total Cost	
Preferred Alternative	21.9	713 to 743	25 to 28	175 to 189	913 to 960	943

Source: HNTB, June 22, 2010.

Notes: * Assumptions and notes regarding costs:

1. Construction cost includes construction, utilities, engineering, and administrative costs.
2. Year of expenditure costs were modeled using a range of possible inflation rates.
3. Future construction costs were modeled to mid-point of construction using inflation rates ranging from 2.5% to 4%, with 3% being most likely.
4. Future right-of-way costs were modeled to anticipated year of acquisition using inflation rates ranging from 0% to 4%, with 2% being most likely.
5. Future administrative costs were modeled to anticipated year of expenditure using inflation rates ranging from 2.5% to 4.5%, with 4% being most likely.
6. Ranges of costs are based on cost projections in which the lowest 10% and highest 10% were discarded.
7. Year of expenditure costs assume an award date of February 2011 and an opening in December 2014.
8. Environmental mitigation costs are based on NCEEP fee schedule dated July 1, 2009 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.
9. Right-of-way costs were provided by Carolina Land Acquisitions in July 2008.

A cost estimate review was held on June 14-17, 2010, that included individuals from FHWA, NCTA, and the project study team to review the cost and schedule estimates for the Preferred Alternative. The objective of the review was to verify the accuracy and reasonableness of the total cost estimate and schedule, and to develop a probability range for the cost estimate that represents the project's current stage of development. The costs provided in this table represent those costs.

In addition, prior to completing the Preferred Alternative cost estimate, an additional meeting was held to discuss factors that could influence the project's costs and the schedule. As outlined in Section 3.2.2, a workshop was held in August 2009 with FHWA, NCDOT, NCTA, NCWRC, NCDWQ, MUMPO, GUAMPO, the City of Gastonia, and the project study team. The purpose was to identify risks and opportunities, and to identify and evaluate context-sensitive solutions. This information was then utilized as part of the cost estimate review.

2.3.5 UPDATED TRAFFIC FORECASTS AND OPERATIONS ANALYSIS

2.3.5.1 Year 2035 Traffic Forecasts

The updated 2035 traffic forecast for the Preferred Alternative is documented in the *Gaston East West Connector Updated Traffic Forecast and Preliminary Design Traffic Capacity Analysis for the Preferred Alternative* (HNTB, May 2010), incorporated by reference. This report updates the information used in the Draft EIS from the *Proposed Gaston East-West Connector Preliminary Traffic and Revenue Forecast Final Report* (Wilbur Smith and Associates, October 12, 2006), and the *Gaston East-West Connector Traffic Forecasting and System Level Analysis for the Detailed Study Alternatives* (Martin/Alexiou/Bryson, April 2007).

Table 2-4 includes the Year 2035 traffic volumes along the Preferred Alternative. The 2035 forecast volumes along the Gaston East-West Connector are projected to be higher than the previously forecasted 2030 Toll scenario volumes based on the use of a different version of the Metrolina Regional Model (Version MRM06v1.1), updated socio-economic data, and the additional five years of traffic growth. Also, as the existing roadway network becomes more congested and

reaches or exceeds traffic capacity from 2030 to 2035, motorists would be more inclined to access the Gaston East-West Connector because this facility would remain under capacity and should allow for higher travel speeds and lower travel times than alternate routes in 2035. Given the expected increase in future congestion and delays along the I-85 corridor in the Project Study Area, it is anticipated that motorists will be more willing to travel the Gaston East-West Connector.

TABLE 2-4: Year 2035 Traffic Volumes Along the Preferred Alternative

Segment	2035 Annual Average Daily Traffic Volume
I-85 to US 29-74	21,300
US 29-74 to Linwood Road (SR 1133)	28,400
Linwood Road to US 321	23,500
US 321 to Robinson Road (SR 2416)	33,400
Robinson Road to NC 274 (Union Road)	36,400
NC 274 to NC 279 (South New Hope Road)	37,200
NC 279 to NC 273 (Southpoint Road)	53,800
NC 273 to Dixie River Road (SR 1155)	69,300
Dixie River Road to I-485	64,200
East of I-485	26,800

Source: *Gaston East West Connector Updated Traffic Forecast and Preliminary Design Traffic Capacity Analysis for the Preferred Alternative*, Prepared by HNTB, May 2010.

2.3.5.2 Traffic Operations

A traffic capacity analysis was prepared for the Preferred Alternative refined preliminary design to verify that the refined preliminary design would provide adequate capacity based on the 2035 forecast toll facility traffic volumes. The updated 2035 traffic capacity analysis is documented in the *Gaston East-West Connector (U-3321) Final Traffic Capacity Technical Memorandum 2030 Non-Toll/2035 Toll* (HNTB, February 2010) and the *Gaston East West Connector Updated Traffic Forecast and Preliminary Design Traffic Capacity Analysis for the Preferred Alternative* (HNTB, May 2010), incorporated by reference.

Based on the analysis of the Preferred Alternative refined preliminary design, all individual freeway, ramp merge, and ramp diverge locations are expected to operate at an acceptable peak hour LOS, which is defined as LOS D or better.

The ramp terminal intersections analyses for the 2035 Toll forecast traffic scenario shows that all intersections are expected to operate with acceptable LOS, with two exceptions: the intersection of US 321 and the Gaston East-West Connector eastbound off-ramp, and the intersection of Robinson Road with the westbound ramps. Based on 2035 forecasted volumes, it is recommended the laneage at the US 321/eastbound off-ramp intersection be revised from dual right-turn lanes and an exclusive left-turn lane to dual left-turn lanes with an exclusive right-turn lane. For the Robinson Road/westbound ramp intersection, a second right turn lane should be added on the westbound off ramp. Neither of these modifications would require additional right of way.

The final design laneage will be re-evaluated during the design-build process to determine the appropriate interchange and intersection designs with the updated 2035 Toll volumes.

2.4 ADDITIONAL STUDIES OF THE PREFERRED ALTERNATIVE

In addition to the design refinements, service road study, and updated traffic forecasts and operations analysis described in Section 2.3, several other environmental impact studies were prepared for the Preferred Alternative since the Draft EIS was published. The results of these studies, along with the design changes described in Section 2.3, were used in calculating updated impacts for the Preferred Alternative, as presented in Section 2.5. The studies cited below are all incorporated by reference into this Final EIS and are available for review and download on the NCTA Web site: www.ncturnpike.org/projects/gaston.

Traffic Noise Study Addendum. A noise study was prepared for all DSAs as part of the Draft EIS, and documented in the *Final Traffic Noise Technical Memorandum for the Gaston East-West Connector* (PBS&J, July 2008). Since that time, design modifications have been made to the DSA 9 (Preferred Alternative), and projected traffic volumes have been updated to 2035 (Section 2.3.5). Therefore, an updated noise study for the Preferred Alternative was prepared, as documented in the *Traffic Noise Technical Memorandum Addendum* (PBS&J, April 2010). Results of the updated study are presented in Section 2.5.2.1.

Hazardous Materials Study Update. An updated hazardous materials evaluation was prepared for the Preferred Alternative to investigate potentially contaminated parcels in the project corridor. The results are reported in a memorandum from the NCDOT Geotechnical Engineering Unit dated October 28, 2009, and are presented in Section 2.5.2.6.

Intensive Archaeological Survey. An intensive archaeological survey was conducted for the Preferred Alternative to identify archaeological resources that may be impacted. The *Intensive Archaeological Survey and Evaluation of Detailed Study Alternative 9 (Recommended Route) for the Proposed Gaston East-West Connector* (Coastal Carolina Resources, July 2010) (*Intensive Archaeological Survey*) is incorporated by reference into this Final EIS. The results of the intensive survey are presented in Section 2.5.3.2.

Surveys for Jurisdictional Resources and Federally Protected Schweinitz's Sunflower in Service Road and Cross-Street Areas. Some portions of the cross-street improvements shown in the Draft EIS, and some of the service roads proposed for the Preferred Alternative are located outside the original study corridor boundaries defined for the DSAs. These small areas outside the original DSA study corridor boundaries had not been surveyed for jurisdictional resources or protected plant species. Surveys were performed in these areas of the Preferred Alternative refined preliminary design in November 2009. Surveys for jurisdictional resources are documented in the *New Jurisdictional Resource Surveys for Service Roads* (PBS&J, J 2010), incorporated by reference into this Final EIS. Surveys for protected plant species are documented in a memorandum *Endangered Plant Species Surveys – Gaston East-West Connector* (PBS&J, February 12, 2010), incorporated by reference into this Final EIS.

Conceptual Mitigation Plan. A conceptual mitigation plan to address potential compensatory mitigation opportunities for impacts to Waters of the US was prepared for the Preferred Alternative. The *Conceptual Mitigation Plan for the Gaston East-West Connector* (PBS&J, June 2010) is discussed in Section 2.5.4.4.

Indirect and Cumulative Effects Quantitative Assessment. A quantitative indirect and cumulative effects (ICE) study was prepared for the Preferred Alternative to expand on the qualitative analysis previously prepared for the project. The *Gaston East-West Connector*

Quantitative Indirect and Cumulative Effects Analysis (Louis Berger Group, Inc., August 2010) examines potential indirect and cumulative effects in more detail for the Preferred Alternative. The *Quantitative ICE* study is summarized in Section 2.5.5.

2.5 IMPACTS OF THE PREFERRED ALTERNATIVE

This section presents updated impacts for the Preferred Alternative based on the studies and design refinements discussed in the previous sections. The sections below follow the same order as presented in the Draft EIS.

Existing conditions and background information on regulations and policies are included in Chapter 1 and in the Draft EIS. For some resources, the impacts documented in the Draft EIS have not changed. These are noted where applicable and are included in this section so that all the impacts of the Preferred Alternative can be reviewed in one section.

2.5.1 HUMAN ENVIRONMENT

2.5.1.1 Land Use and Transportation Planning

The information in this section is summarized from Sections 3.1.3 and 3.1.4 of the Draft EIS, with updates on local land use plans and the GUAMPO 2035 LRTP and the MUMPO 2035 LRTP described in Section 1.3.1.3.

Consistency With Land Use and Transportation Plans. As discussed in Section 1.3.1.1, the Preferred Alternative would be generally consistent with local land use plans and regional, state, and local transportation plans.

Section 3.1.3 of the Draft EIS discusses the inclusion of the Gaston East-West Connector in the GUAMPO 2030 LRTP and the MUMPO 2030 LRTP. The project was included in both LRTPs as a regionally significant project. The only inconsistency was that the project was not shown as a toll facility. The Gaston East-West Connector is included in the updated GUAMPO 2035 LRTP and MUMPO 2035 LRTP as a toll facility.

**Consistency with
Transportation Plans**

The local 2035 long range transportation plans include the Gaston East-West Connector as a toll facility.

However, there were still two inconsistencies between the Preferred Alternative and the project included in the GUAMPO 2035 LRTP. The GUAMPO 2035 LRTP included an interchange at Bud Wilson Road, and there were different assumptions for the year 2015 configuration (Section 2.5.2.2). The Bud Wilson Road interchange has been eliminated from the Preferred Alternative (Section 2.3.1.6). Current plans are for the Preferred Alternative in 2015 to be constructed as a four-lane facility from I-485 to US 321 and as an interim two-lane facility from US 321 to I-85. The remaining two lanes for the segment from US 321 to I-85 would be constructed by 2035.

After the May 3, 2010 conformity determination made by the USDOT, the GUAMPO prepared an amendment to the 2035 LRTP and 2009-2015 TIP so that the project design concept and scope included in the LRTP and TIP is consistent with the Preferred Alternative. GUAMPO made a conformity determination on the amended 2035 LRTP and 2009-2015 TIP on August 24, 2010. USDOT issued a conformity determination on the amendments on October 5, 2010. A copy of the USDOT letter is included in Appendix K of this Final EIS.

Land Use. Since the DSAs, including the Preferred Alternative, are on new location, direct land use changes associated with any of the DSAs include converting the land needed for right of way from its existing use to a transportation use. The land needed for right of way includes a wide variety of uses, such as industrial, commercial, residential, recreational, agricultural, and undeveloped.

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. The project also could play a role in the transition of the overall character of southern Gaston County from rural to suburban, which is consistent with the *Gaston County Comprehensive Plan*. Since this new roadway would enhance access, it would provide opportunities for increased intensity of development. More detailed information regarding potential changes in land use as a result of the Preferred Alternative is provided in the *Indirect and Cumulative Effects Quantitative Assessment* (Louis Berger Group, Inc., August 2010), as summarized in **Section 2.5.5** of this Final EIS.

2.5.1.2 Right-of-Way Acquisition and Relocations

The Preferred Alternative would require relocation of residences and businesses. In **Section 3.2.3.1** of the Draft EIS, the number of relocations for DSA 9 was estimated to be 348 residences, 37 businesses, one farm, and three non-profits (two churches and an Elks lodge).

The refined preliminary design for the Preferred Alternative would reduce the project's footprint, resulting in four fewer residential relocations. The provision of a service road in the southeast quadrant of US 29-74 would result in one additional business relocation. Overall, the Preferred Alternative refined preliminary design is estimated to relocate approximately 344 residences, 38 businesses, one farm and four non-profits. Business relocations are concentrated along existing US 321, US 29-74, and I-85. The additional non-profit relocation is the Dixie Community Center on Garrison Road, as discussed in **Section 2.5.1.5**.

Relocations

The Preferred Alternative would relocate approximately 344 residences, 38 businesses, 1 farm, and 3 non-profits.

According to the Relocation Reports in Appendix C of the Draft EIS, there is comparable replacement housing and farms within the Project Study Area for displaced homeowners and tenants.

As discussed in **Section 3.2.3.2** of the Draft EIS, the NCTA will follow the state and federal regulations and NCDOT policies for right-of-way acquisition and relocation. The policies ensure that comparable replacement housing is available for relocatees prior to construction of state and/or federally assisted projects. Furthermore, the NCTA will use three programs NCDOT has to minimize the inconvenience of relocation: Relocation Assistance, Relocation Moving Payments, and Relocation Replacement Housing Payments or Rent Supplement. The relocation program for the Preferred Alternative will be conducted in accordance with the federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646) and the North Carolina Relocation Assistance Act (NCGS 133-5 through 133-18).

More information on right-of-way acquisition and relocation is available in the following two NCDOT brochures: *Answers to the Questions Most Often Asked About Right of Way Acquisitions* and *Relocation Assistance* (NCTA Web site: www.ncturnpike.org/projects/gaston/documents.asp)

2.5.1.3 Neighborhoods

Impacts to neighborhoods from the DSAs are discussed in Section 3.2.4 of the Draft EIS and in Section 1.3.1.4. In the Draft EIS, DSA 9 was reported to impact 18 named subdivisions and seven rural communities (unnamed neighborhoods), a total of 25 neighborhoods.

Neighborhoods

Twenty-four neighborhoods would be impacted by the Preferred Alternative.

The refined preliminary design for the Preferred Alternative resulted in changes to neighborhoods impacts, with a total of 24 neighborhoods impacted. These updated impacts to neighborhoods from the Preferred Alternative are listed in the updated matrix in Table 2-5.

As in the Draft EIS, impacts in the matrix are divided into areas where relocations would occur and whether access would be modified. The type of relocation effect is divided into categories "A" through "E," and the type of access effect is divided into qualifiers "1" or "2" for each impact category "A" through "E." For example, when comparing impact categories "C1" and "C2", the "C" indicates the location of impacted homes in a neighborhood, and the number ("1" or "2") following the letter denotes if there is an access change (denoted by "2") or if there is not an access change (denoted by "1"). The footnotes in Table 2-5 describe the categories in detail.

As a result of the design refinements included with the Preferred Alternative, the potential impact category for four neighborhoods changed. In addition, one neighborhood was inadvertently not counted in the Draft EIS Table 3-5 for DSA 9, White Oak subdivision, and is now included in Table 2-5. These five neighborhoods are described below, from west to east.

Fall Estates. Impacts to Fall Estates changed from Category D1 to D2 because the access road to reconnect the homes in Fall Estates west of the Gaston East-West Connector changed from a bridge over the project mainline to a service road along the west side of the mainline connecting to Crowders Creek Road (Figure 2-3f).

Saddlewood/Pam Drive. Impacts to the Saddlewood/Pam Drive neighborhood changed from Category B2 to B1 because the connection of Pam Drive to Robinson Road that was proposed to be severed has been reinstated in the refined preliminary design (Section 2.3.1.4). Also, this neighborhood was counted twice in the Draft EIS for DSAs 4, 5, 9, 22, 23, 27, 76, 77, and 81 because this neighborhood is located at the junction of two Corridor Segments (J2c and J2d) and it was counted as being impacted by both segments (Appendix A, Errata).

White Oak. Impacts to the White Oak neighborhood, on Dorchester Road, were inadvertently not counted for Corridor Segment JX4 in the Draft EIS (DSAs 5, 9, 23, 27, 77, and 81) (Appendix A). The Preferred Alternative would impact the homes on the northeast side of Dorchester Road.

N17 - Wilmot Trail. Impacts to unnamed neighborhood N17, the cluster of residences on Wilmot Trail west of Bud Wilson Road, changed from Category C2 to Category A (No Impact) because the Bud Wilson Road interchange has been eliminated (Section 2.3.1.5) and the proposed right of way was reduced in this area.

TABLE 2-5: Potential Neighborhood Impacts

Affected Neighborhood (from west to east)	Preferred Alternative Type of Effect
Named Neighborhoods	
Brookhaven	B2
Edgewood Acres	A
Erskine Woods	A
Matthews Acres	C2
Spring Valley	C2
Myrtle Mill	A
Lakewood Forest	C2
Stablegate Farms	C2
Fall Estates (was D1 in Draft EIS)	D2
Levi's Mobile Home Park	E
Orion Oaks MHP No. 1	D2
Orion Oaks MHP No. 2	D2
Orion Oaks MHP No. 3	D2
Orion Oaks MHP No. 4	D2
Charleston	A
Forbes Cove	B1
Brittany Woods	C1
Wesley Acres	C1
Saddlewood/Pam Drive (was B2 in Draft EIS)	B1
White Oak (was not counted for DSA 9 in Draft EIS)	C1
Forest Pointe	A
Brook Forest/South Forest	C1
Joye Mobile Home Park	D2
Unnamed Neighborhoods	
N2 located west of Stagecoach Rd south of Linwood Rd	C1
N3 located west of Stagecoach Rd south of Linwood Rd	C1
N17 located west of Bud Wilson Rd (was C2 in Draft EIS)	A
N7 located on Union Rd south of Union New Hope Rd	C2
N11 located on Dixon Rd east of NC 279	B2
N12 located off of NC 273 (Southpoint Rd)	D2
N16 located along Garrison Rd east of Dixie River Rd (was D2 In Draft EIS)	C2
Total Number of Category B Impacts	4
Total Number of Category C Impacts	11
Total Number of Category D Impacts	8
Total Number of Category E Impacts	1
Total Number of Neighborhood Impacts	24

Based on refined preliminary design for the Preferred Alternative, February 2010.

TYPE OF EFFECT (Letter denotes type of direct impact. Number denotes access change):

A – No impact.

B1 – No relocations, but right-of-way encroachment and existing access maintained.

B2 – No relocations, but change in access (could include ROW encroachment).

C1 – Relocation of homes on end of road or at edge of neighborhood.

C2 – Relocation of homes on end of road or at edge of neighborhood and change in access.

D1 – Relocation of homes in midst of neighborhood.

D2 – Relocation of homes in midst of neighborhood and change in access.

E – Total displacement of a neighborhood.

N16 – Garrison Road. The impact category for the Garrison Road community (Neighborhood N16) changed from Category D2 to C2. The interchange has been shifted north, as described in Section 2.3.1.12. The new interchange design would relocate homes at the north end of Garrison Road, instead of in the midst of the neighborhood. An extension of Garrison Road west to Dixie River Road would provide access to the remaining homes south of the Gaston East-West Connector. However, the refined preliminary design would displace the Dixie Community Center, also located at the north end of Garrison Road (Section 2.5.1.5).

The most impacts to neighborhoods would occur in the area between I-85 and US 321. This area is relatively highly developed, and there are numerous other constraints, such as Crowders Creek and its floodplain and Crowders Mountain State Park. Designing an alternative that would not impact existing development was not possible.

A planned future subdivision with a site plan approved by the City of Gastonia also could be impacted by the Preferred Alternative. The Presley development, located north of the intersection of NC 274 (Union Road) and Union New Hope Road near Forestview High School, is partially located within Corridor Segments J1e and J1f. The preliminary design for the Preferred Alternative may have minor encroachments on the areas of the site plan labeled for a future commercial village.

Indirect effects could occur to neighborhoods under the Preferred Alternative (as well as the other DSAs). The project could accelerate land use changes to non-residential uses, causing changes in the character of neighborhoods.

2.5.1.4 Environmental Justice

There have been no updates to environmental justice information since the Draft EIS was published. Based on information presented in Section 3.2.5 of the Draft EIS and Section 1.3.1.5, the construction of the Preferred Alternative was determined not to have a disproportionately high and adverse impact on minority and low income populations.

2.5.1.5 Community Resources and Services

Community resources and services in the project study area include churches, cemeteries, schools, fire stations, libraries, community centers, parks, and private recreation areas. There are no hospitals within or adjacent to the DSAs.

Churches and Cemeteries. There is no change in impacts to churches since the Draft EIS was published, but there is an update to impacts to cemeteries.

The Preferred Alternative would impact three church properties and one cemetery, as shown in Table 2-6. Two churches, St. Titus AME Zion Church and Charity Independent Baptist Church, would need to be relocated. An outbuilding on the third church property, Broomfield Methodist Church, would be impacted.

TABLE 2-6: Church and Cemetery Impacts from Preferred Alternative

Name and Location	Preferred Alternative Segment	Buildings Taken?	Parcel Size in Acres (% Taken)	Notes
St. Titus AME Zion 437 Shannon Bradley Rd, Gastonia	H2A	No	1.4 (70%)	Construction would not take main church building, but due to amount of right of way required, relocation of the church would be necessary.
Broomfield Methodist (Carolina Conf. Christian Meth. Episcopal Church, Inc.) 937 Shannon Bradley Rd, Gastonia	H2A	Yes	17.6 (46%)	Medium-size building in back of property would be impacted. Main church building would not be impacted. Relocation of church not anticipated.
Charity Independent Baptist 2425 Hillmont St, Gastonia	H3	Yes	8.9 (60%)	Main church building would be impacted and relocation of church would be necessary.
Mt. Pleasant Baptist Church Cemetery. South side of Tucker Rd near Southpoint Rd, Belmont	JX4	NA	2.1 (14%)	Wooded area adjacent to NC 273 (Southpoint Rd) and southeast side of property would be impacted. Approximately 0.3 acres of right of way is needed. Area of current cemetery with gravestones, and historic boundaries with gravestones would not be impacted.

The Mt. Pleasant Baptist Church Cemetery is located in the northwest quadrant of the proposed interchange of the Gaston East-West Connector and Southpoint Road (NC 273). During the intensive archaeological survey for the Preferred Alternative (Section 2.5.3.2), gravesites with headstones were discovered south of the Mt. Pleasant Baptist Church Cemetery’s present-day parcel boundaries. The historic boundaries of the cemetery were larger, and encompassed approximately an additional one-half acre to the southwest (*Intensive Archaeological Survey and Evaluation of Detailed Study Alternative 9 (Recommended Route) for the Gaston East-West Connector*, Coastal Carolina Research, July 2010).

As discussed in Section 2.3.1.10, the refined preliminary design reconfigures this quadrant of the interchange from a loop and ramp to a compressed ramp. This modification would avoid the historic boundary of the cemetery where the gravesites were found and would reduce the right of way needed from the present-day cemetery property. Approximately 0.3 acres of right of way would still be required from the undeveloped wooded parcel adjacent to NC 273 owned by the Mt. Pleasant Baptist Church, but no gravesites were found in this location.

All applicable state and local regulations and requirements for relocating or mitigating the impact to cemeteries will be met.

Schools. The only school within or adjacent to the Preferred Alternative study corridor is Forest Heights Elementary at 2500 Sedgefield Drive in Gastonia (Corridor Segment H3). This school is just outside the corridor boundaries. The Preferred Alternative refined preliminary design would not require land from this school, nor would it directly impact any school facilities.

At the time the Draft EIS was prepared, a potential new middle/high school campus location in Corridor Segment K2A or K3A was being researched by Gaston County Schools. However, since the Draft EIS was published, potential school sites within the study area have been eliminated from consideration by Gaston County Schools (Telephone interview, Executive Director, Auxiliary Services for Gaston County Schools, January 28, 2010).

Construction of the Preferred Alternative would temporarily impact school bus routes during construction, as well as result in modifications of existing routes and/or promote new bus routes. Prior to construction, the NCTA will coordinate/initiate discussions with Gaston County Schools and Mecklenburg County Public Schools regarding minimizing impacts to school bus routes.

Fire Stations. There is an update to fire station locations since the Draft EIS. The Crowders Mountain South Volunteer Fire Department previously located at 4802 York Highway (US 321) in Gastonia (Station F3 on Draft EIS Figure 3-7a) was just south of the Preferred Alternative study corridor. This station is no longer in operation (Telephone interview, Gaston County Fire Marshal's office, May 26, 2010). However, implementation of the Preferred Alternative may require re-routing of existing service routes during construction. NCTA will coordinate with the Gaston County Fire Marshal's office to ensure continuation of emergency services during construction.

Libraries/Community Centers. There is one library and one community center in the vicinity of the Preferred Alternative. The existing Union Road Branch Library would not be impacted by the Preferred Alternative.

The Dixie Community Center, a meeting place for the Garrison Road/Dixie River Road community, is located at 9814 Garrison Road in Charlotte, just west of I-485 (Figure 2-3p), within the Preferred Alternative study corridor.

As discussed in Section 3.2.2.2 of the Draft EIS, the community center is an important forum that provides a location and opportunities for interaction among existing and former residents of the Garrison Road/Dixie River Road area. The construction of I-485 and expansion of the Charlotte-Douglas International Airport in this area has split and reduced the extent of this neighborhood. The Preferred Alternative would further impact this community.

The preliminary designs for the DSAs shown in the Draft EIS would not displace the Dixie Community Center. However, the Preferred Alternative refined preliminary design would displace the community center. The reasons for modifying the Preferred Alternative design in the I-485 interchange area are discussed in Section 2.3.1.12. The reasons are applicable to all the DSAs.

The NCTA recognizes the importance of the Dixie Community Center to the Garrison Road/Dixie River Road community and intends to conduct additional coordination with the community and provide mitigation for the loss of this facility. This is listed as a Special Project Commitment in Chapter PC. The Garrison Road Community Center is a registered non-profit and would be eligible for all the benefits for non-residential relocatees under the NCDOT's relocation assistance program described in Section 2.5.1.2. Benefits would include, but not be limited to, advisory services to identify replacement sites, moving costs, and reestablishment expenses.

Parks and Recreation Areas. Publicly and privately-owned facilities/areas are described in Section 3.2.2.3 of the Draft EIS. Those near or within the Preferred Alternative study corridor include the publicly-owned Berewick Regional Park, the privately-owned Carolina Speedway and the privately-owned Duke Energy Corporation/Belmont Optimist Club recreational fields. These are discussed below, along with planned greenways.

Parks and Recreation Areas

The Preferred Alternative refined preliminary design avoids direct impacts to Berewick Regional Park and the Duke Energy/Belmont Optimist Club Recreation Fields. Impacts to operations at the Carolina Speedway are minimized.

Berewick Regional Park. The Preferred Alternative refined preliminary design modified the I-485 interchange and shifted it northward; and the new proposed right of way would not encroach on Berewick Regional Park (Figure 2-3p-r).

Carolina Speedway. Approximately 7.7 acres of the northern and western sides of this privately-owned speedway property would be impacted by the DSA 9 preliminary design shown in the Draft EIS. As discussed in Section 2.3.1.7, the preliminary design for the Preferred Alternative was altered by shifting the mainline alignment northward and changing the interchange from a half-clover-leaf to a compressed diamond. These design modifications would minimize impacts to operations at the Carolina Speedway. The pit area, which has been identified as important to event operations, would not be impacted (Figure 2-3k).

Duke Energy Corporation/Belmont Optimist Club Recreational Fields. The preliminary design for DSA 9 shown in the Draft EIS would impact the recreational ball fields owned by Duke Energy Corporation and leased by the Belmont Optimist Club. These privately-owned recreational fields encompass approximately 4.9 acres. The Draft EIS preliminary design for DSA 9 would impact the edge of the baseball field's outfield and the north corner of a football field (previously a general recreational field). No access road was shown to these recreational fields in the Draft EIS preliminary designs.

As discussed in Section 2.3.1.9, the preliminary design for the Preferred Alternative was altered to shift the mainline slightly northward. The Duke Energy Corporation/Belmont Optimist Club recreational fields would be avoided, as well as two electric transmission towers. Access to the Duke Energy Corporation/Belmont Optimist Club recreational fields and other landlocked properties in the southeast quadrant of the project's interchange with Southpoint Road (NC 273) would be provided by constructing a new access roadway from Southpoint Road north and east to Boat Club Road (Figure 2-3n).

Planned Greenways. Planned greenways are shown in Figure 3-8a-b in the Draft EIS. Both private groups (Carolina Thread Trail led by the Catawba Lands Conservancy) and public entities (GUAMPO) are planning a system of greenway trails in the area and/or region. Preferred Alternative Corridor Segments H2A, H3, and J4b have the potential to cross greenways that have yet to be constructed. Although both greenway plans are conceptual at this time, there is the potential for several greenway crossings along the Preferred Alternative, particularly west of US 321. During final design of the Preferred Alternative, NCTA will coordinate with these groups to identify needed accommodations for any existing and funded greenways that cross the Preferred Alternative. This is included as a special project commitment in Chapter PC.

2.5.1.6 Community Safety

Emergency Response. As stated in Section 3.2.6.2 of the Draft EIS, the Gaston East-West Connector would have a long-term positive impact on emergency response times within the Project Study Area. The project is likely to quicken some response times for services by decreasing travel times, and by providing improved east-west connectivity in southern Gaston County.

Pedestrians and Bicycles. The proposed project does not include pedestrian and bicycle provisions since it is a controlled-access freeway. However, the bridge over the Catawba River will be designed so as not to preclude future accommodation of a pedestrian/bicycle facility funded by others, such as local jurisdictions.

As noted in Section 3.2.2.3 of the Draft EIS, one of Gaston County's bicycle routes (Route 1: High Shoals – Crowders Mountain) runs east-west through the area along Linwood Road, and crosses Corridor Segments H1A, H2C and H3 (i.e., all of the DSAs). As such, the Preferred Alternative may impede or block pedestrian and bicycle traffic desiring to travel from one side of the highway to the other, because travel over/under the roadway would only be possible at interchanges and grade-separated crossings. For established and planned bicycle routes, NCTA will coordinate with MUMPO and GUAMPO to accommodate these facilities where appropriate.

Maintenance of Traffic During Construction. Maintenance of traffic and sequencing of construction would be planned and scheduled in order to minimize traffic delays throughout the Project Study Area. Signs would be used (as appropriate) to provide notice of road closures and other pertinent information to the traveling public. The local news media would be notified in advance of road closings and other construction-related activities that could excessively inconvenience the public. Access to all businesses and residences would be maintained to the extent possible through controlled construction scheduling.

Truck traffic in the Project Study Area would increase during construction. If access to construction staging areas and the construction site requires temporary access roadways, a traffic plan would be developed during the final engineering design phase to define designated truck routes and parking areas for construction vehicles.

If there are places where pedestrian travel would be temporarily impeded by the work zone (e.g., in the case of an off-site traffic detour) consideration must be given to whether or not a work zone pedestrian detour is necessary. This would be included as part of the traffic control plan developed during final design of the Preferred Alternative.

Fog. Dense fog may occur at certain times of the year along the major rivers in the Project Study Area, including the Catawba River and the South Fork Catawba River. NCTA and NCDOT do not have a written policy regarding procedures for designing projects in fog-prone areas. However, projects are studied on a case-by-case basis, typically after a project has been constructed. For example, NCDOT evaluated the conditions on the I-95 bridge over the Roanoke River near Roanoke Rapids. In this location, NCDOT installed a weather station to assess weather conditions, such as fog, and to prompt a variable message sign warning travelers of thick fog and limited visibility. Additional devices used to enhance safety in fog-prone areas can include reflective pavement markers and lighting. In accordance with NCDOT normal operating procedures, fog-related safety issues would be evaluated on a case-by-case basis after construction, and measures installed where warranted.

2.5.2 PHYSICAL ENVIRONMENT

2.5.2.1 Noise

As a result of the design changes described in Section 2.3 and the new forecast year of 2035, an updated noise analysis was prepared for the Preferred Alternative (*Traffic Noise Technical Memorandum Addendum*, PBS&J, April 2010), incorporated by reference.

Analysis Methodology. The evaluation and modeling methodology used in the *Traffic Noise Technical Memorandum Addendum* (PBS&J, April 2010) is the same as that used in the *Final Traffic Noise Technical Memorandum for the Gaston East-West Connector* (PBS&J, July 2008), as summarized in Section 4.1 of the Draft EIS. The FHWA Noise Abatement Criteria and NCDOT policies described in Section 4.1.2 of the Draft EIS are the same.

Year 2035 Noise Contours. The FHWA Traffic Noise Model (TNM), Version 2.5, was used to develop year 2035 noise contours along the mainline of the Preferred Alternative. Appendix J of this Final EIS includes the updated 2035 noise contour maps for the Preferred Alternative.

Traffic volumes along the Gaston East-West Connector forecasted for 2035 are greater than the volumes forecasted for 2030 used to create the 2030 noise contours shown in Appendix G of the Draft EIS. However, the median width was reduced, as well as the pavement width, and both these factors act to reduce the noise contour distances. Therefore, changes in the noise contour distances were not as great as might be expected.

Table 2-7 lists the updated year 2035 traffic noise contours and the numbers of receptors predicted to be impacted by noise in each Activity Category (see table footnote for definitions). As listed in the table, there are 38 additional impacted receptors (for a total of 283 impacted receptors) based on the updated analysis compared to the 245 impacted receptors reported for DSA 9 in the Draft EIS (Table 4-4).

TABLE 2-7: 2035 Noise Contours and Impact Summary – Preferred Alternative

Mainline Segment	Leq Noise Levels (dBA) ¹			Maximum Contour Distances (ft) ²		Approximate Number of Impacted Receptors By Category ³				
	50 ft	100 ft	200 ft	72 dBA	67 dBA	A	B	C	D	E
I-85 to US 29-74	75	72	67	130	245	0	46	1	0	0
US 29-74 to Linwood Rd	76	73	69	150	270	0	11	0	0	0
Linwood Rd to US 321	75	72	68	140	260	0	52	0	0	0
US 321 to Robinson Rd	77	74	70	170	290	0	38	2	0	0
Robinson Rd to NC 274	78	75	71	190	305	0	30	0	0	0
NC 274 to NC 279	77	74	70	180	300	0	6	0	0	0
NC 279 to NC 273	78	76	71	215	330	0	52	0	0	0
NC 273 to Dixie River Rd	80	77	73	260	400	0	43	1	0	0
Dixie River Rd to I-485	80	77	73	260	390	0	1	0	0	0
East of I-485	76	73	68	145	260	0	0	0	0	0
TOTAL						0	279	4	0	0

1. Distance from center of nearest travel lanes.
2. Distances are from the roadway centerline.
3. Activity categories are defined in the FHWA Noise Abatement Criteria (23 CFR 772). Activity Category A - lands on which serenity and quiet are of extraordinary significance. Activity Category B - Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, church, libraries, and hospitals. Activity Category C - Developed lands and properties not included in Categories A and B. Activity Category D - Undeveloped lands. Activity Category E - Interiors of residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.

Barrier Evaluation Areas. As described in Section 4.1.6 of the Draft EIS, the noise sensitive sites predicted to be impacted by traffic noise (i.e., experience noise levels that approach or exceed the FHWA Noise Abatement Criteria or show a substantial increase over existing levels) that were not considered isolated sites were further reevaluated in terms of the feasibility and reasonableness of providing noise barriers.

The *Traffic Noise Technical Memorandum Addendum* (PBS&J, April 2010) focused on reevaluating areas where design changes occurred that could affect the noise analysis, and also where additional potentially impacted receptors were added as a result of the changes to the preliminary design or increase in noise contour distances.

No areas were identified where increases in noise contours added enough sensitive receptors to warrant a new detailed barrier evaluation.

Noise barriers recommended in the Draft EIS were reviewed to identify preliminary noise barrier locations where the preliminary design was refined for the Preferred Alternative and the originally recommended noise barrier would no longer be applicable. **Figure 1-6a-b** shows the preliminary noise barrier locations for the DSAs included in the Draft EIS. Two areas were identified for updated detailed barrier evaluations. These were the NC 273 (Southpoint Road) interchange area (Barriers 29-1 and 29-2) and the I-485 interchange area (Barrier 33-1).

As discussed in Sections 2.3.1.9 and 2.3.1.10, the Preferred Alternative preliminary design was refined in the area of the NC 273 (Southpoint Road) interchange. In the northwest quadrant of the interchange, the design changes results in eight existing residences on Tucker Road being added as sensitive receptors. The barrier proposed for this area, Barrier 29-1, was updated and found to be preliminarily reasonable and feasible.

In the northeast quadrant of the interchange, no additional noise sensitive receptors were identified. The updated preliminary Barrier 29-2 is longer and would benefit more receptors (22 versus 9) than the preliminary Barrier 29-2 recommended in the Draft EIS.

As discussed in Section 2.3.1.11, the Preferred Alternative preliminary design at I-485 was substantially changed. The mainline was shifted northward and the interchange configuration was modified. Preliminary Barrier 33-1 was recommended in this area based on the Draft EIS preliminary designs. Twenty-four residences were included in this barrier evaluation area. The refined preliminary design for the Preferred Alternative shifted the project farther away from these residences and only one receptor was identified as being potentially impacted by noise based on the updated evaluation. Because this is an isolated receptor, noise abatement does not need to be considered in this location.

Table 2-8 lists the updated preliminary feasible and reasonable noise barriers for the Preferred Alternative. These preliminary barriers are shown on **Figure 2-4a-b**. Eleven barriers have been preliminarily recommended, at a total preliminary cost of \$4,527,690. Approximately 175 receptors would be benefited. A Design Noise Study will be prepared for the Preferred Alternative during final design. The Design Noise Study will update the noise analysis and feasibility and reasonableness of noise barriers based on updated design and traffic forecast information and the latest noise abatement regulations and policies.

Preliminary Noise Barriers
Preliminary noise barriers are recommended at 11 locations along the Preferred Alternative refined preliminary design. These may be changed or eliminated in the Design Noise Study that will be prepared during final design.

It should be noted that FHWA published a final rule updating their Procedures for Abatement of Highway Traffic Noise and Construction Noise (23 CFR Part 772) on July 13, 2010 (FHWA Web site: www.fhwa.dot.gov/environment/noise/regulations_and_guidance). The final rule requires each State DOT to revise its noise policy to be in accordance with this final rule. States must submit their revised noise policy to FHWA for approval by January 13, 2011. The NCDOT is in the process of updating their Traffic Noise Abatement Policy, which may change the criteria by which noise barriers are determined feasible and reasonable.

The Design Noise Study will be conducted in accordance with the new regulations and policies in effect at the time the study is conducted. As such, a result of the Design Noise Study could be that some preliminary noise barriers are changed or eliminated.

TABLE 2-8: Preliminary Feasible and Reasonable Noise Barriers for the Preferred Alternative

Prelim. Barriers ¹	Segment	Description	Average dBA Reduction for Benefited Receptors	Number of Benefited Receptors	Barrier		Cost	Cost Per Receptor Allowable Cost per Receptor
					Length (ft)	Height (ft) ²		
1-1	H2A	North of US 29-74, westbound side of alignment. Brookhaven and Spring Valley subdivisions.	9	34	2,640	12	\$475,200	<u>\$13,976</u> \$40,824
4-1	H3	East of Linwood Springs Golf Course, at Linwood Rd, on westbound side of alignment. Lakewood Forest subdivision.	9	16	1,605	20	\$481,500	<u>\$30,094</u> \$41,188
7-1	H3	South of Linwood Rd on the westbound side of alignment. Stabgate Farms subdivision.	8	11	1,500	16	\$360,000	<u>\$32,727</u> \$41,909
12-1	J4A	North of Crowders Creek Rd north of New Haven Dr, westbound side of alignment. Falls Estates subdivision.	5	4	600	10	\$90,000	<u>\$22,500</u> \$40,000
12-2	J4A	North of Crowders Creek Rd, south of New Haven Dr, westbound side of alignment. Falls Estates subdivision.	8	6	1,395	12	\$251,100	<u>\$41,850</u> \$44,000
17-1	J4A	East of US321, westbound side of alignment. Charleston subdivision.	7	8	1,092	12/ 14	\$224,760	<u>\$28,095</u> \$38,188
17-2	J2C	East of US321, westbound side of alignment. Forbes Cove subdivision.	8	11	1,558	10/ 12/ 16/ 14	\$316,860	<u>\$28,805</u> \$38,818
17-3	J2C	East of US321, westbound side of alignment. Wesley Acres subdivision.	7	16	2,306	12/ 14/ 12/ 10	\$393,600	<u>\$24,600</u> \$42,125
17-4	J2C	West of Robinson Rd, eastbound side of alignment. Pam Dr subdivision.	7	16	1,949	10/ 12/ 14/ 12	\$368,280	<u>\$23,018</u> \$42,969
29-1	K3A	Northwest of NC273/Gaston interchange westbound side of alignment. Brook Forest subdivision.	6	31	3,760	14/16/ 18/20/ 18/16/ 14	\$893,010	<u>\$28,807</u> \$39,597
29-2	K3B	Northeast of NC273/Gaston interchange westbound side of alignment.	7	22	2,460	20/18	\$673,380	<u>\$30,608</u> \$43,636

Source: Final Traffic Noise Technical Memorandum for the Gaston East-West Connector (PBS&J, July 2008) and Traffic Noise Technical Memorandum Addendum (PBS&J, April 2010).

Notes: 1. The determination of feasibility and reasonableness is preliminary and subject to change based on final design, building permits issued as of the Date of Public Knowledge, and the public involvement process. 2. Barrier height varies as indicated. For example, "18/16/14" means that barrier has an 18-ft section, 16-ft section, and 14-ft section.

2.5.2.2 Air Quality

Air quality issues addressed in Section 4.2 of the Draft EIS and Section 1.3.2.2 include transportation conformity, mobile source air toxics (MSATs), potential air quality impacts from construction activities, and potential icing from Allen Steam Station air pollution control equipment. As noted in Section 1.3.2.2 and discussed below, there have been updates to transportation conformity and MSATs since the Draft EIS was published. A discussion of greenhouse gas emissions and climate change also has been added to this section and Section 3.3.2.4.

Transportation Conformity Update. The Draft *Conformity Analysis and Determination Report for the Cabarrus-Rowan MPO, Mecklenburg-Union MPO, and the Gaston Urban Area MPO 2035 Long Range Transportation Plans and the FY 2009-2015 Transportation Improvement Programs and for Non-MPO Areas of Lincoln County, Iredell County, Gaston County, and Union County areas (8-Hour Ozone, and CO (Mecklenburg County Only))* was made available for public review on February 5, 2010. Public meetings to solicit comments on these documents as well as the Draft 2035 LRTP and the 2009-2015 STIP Amendment were held on February 24, 2010 in the Charlotte Mecklenburg Government Center, on February 17, 2010 in the Gaston County Main Library, and other locations in the region.

All of the above referenced documents were made available for review until the close of the public review and comment period on March 8, 2010. As of that date, no substantive comments were received and all were endorsed by the MUMPO TCC on March 11, 2010, by MUMPO on March 24, 2010, by GUAMPO TCC on March 10, 2010, and by GUAMPO on March 23, 2010. USDOT made a conformity determination on the LRTP and TIP on May 3, 2010. A copy of this letter, along with USEPA's April 22, 2010 review, can be found in Appendix K of this Final EIS.

However, there were still two inconsistencies between the Preferred Alternative and the project included in the GUAMPO 2035 LRTP. The GUAMPO 2035 LRTP included an interchange at Bud Wilson Road, and there were different assumptions for the year 2015 configuration (Section 2.5.2.2). The Bud Wilson Road interchange has been eliminated from the Preferred Alternative (Section 2.3.1.6). Current plans are for the Preferred Alternative in 2015 to be constructed as a four-lane facility from I-485 to US 321 and as an interim two-lane facility from US 321 to I-85. The remaining two lanes for the segment from US 321 to I-85 would be constructed by 2035.

After the May 3, 2010 conformity determination made by the USDOT, the GUAMPO prepared an amendment to the 2035 LRTP and 2009-2015 TIP so that the project design concept and scope included in the LRTP and TIP is consistent with the Preferred Alternative. GUAMPO made a conformity determination on the amended 2035 LRTP and 2009-2015 TIP on August 24, 2010. USDOT issued a conformity determination on the amendments on October 5, 2010. Copies of the USDOT letter are included in Appendix K of this Final EIS.

Mobile Source Air Toxics Impact Analysis Update. An updated MSAT guidance document was published by FHWA in September 2009, *Interim Guidance Update on MSAT Analysis in NEPA Documents*. This update does not change any project analysis thresholds, recommendations, or guidelines. Therefore, the qualitative impact evaluation conclusions described in Section 4.2.5.2 of the Draft EIS and Appendix H (Mobile Source Air Toxics – Discussion of Impacts) of the Draft EIS do not change. However, the interim guidance update did recommend updated language for incomplete and unavailable information and provided information on new research.

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how the potential health risks posed by MSAT exposure should be factored into project-level decision-making within the context of NEPA.

Nonetheless, air toxics concerns continue to be raised on highway projects during the NEPA process. Even as the science emerges, FHWA is duly expected by the public and other agencies to address MSAT impacts in environmental documents. The FHWA, USEPA, the Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this emerging field.

While this research is ongoing, FHWA requires each NEPA document to address MSATs and their relationship to the specific highway project through a tiered approach (*Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents*, September 30, 2009). An updated qualitative analysis of MSATs for this project, based on the updated MSAT Guidance from FHWA, appears in its entirety in **Appendix D** of this Final EIS. The findings of this analysis are summarized below.

As discussed in **Appendix D**, there may be localized areas where VMT would increase, and other areas where VMT would decrease. Therefore, it is possible that localized increases and decreases in MSAT emissions may occur along the Preferred Alternative. The localized increases in MSAT emissions would likely be most pronounced along the new roadway sections that would be built where there are few major roadways and little industry, such as the area west of US 321 and south of Linwood Road, and the area west of Daniel Stowe Botanical Garden. However, even if these increases do occur, they will be substantially reduced in the future as the implementation of EPA's vehicle and fuel regulations improves the region's fleet of motor vehicles.

As discussed in Section 2.3.1.4 of the Draft EIS, schools and hospitals were mapped and avoided where possible in the development of all the DSAs. The alignment of the Preferred Alternative is within two miles of Sadler Elementary, Forest Heights Elementary, and Forestview High School/WA Bess Elementary. There are no hospitals nearby. Sadler Elementary (1 mile from the alignment) and WA Bess Elementary (.85 mile from the alignment) are the furthest from the Preferred Alternative, and therefore have the least potential to be affected by MSAT emissions. The nearest school to the Preferred Alternative is Forest Heights Elementary School (1,000 feet from roadway centerline). Forestview High School is located one half-mile from the Preferred Alignment centerline.

In summary, it is expected that there would be higher MSAT emissions in the immediate project area, relative to the No-Build Alternative, due to increased VMT. In comparing the DSAs, MSAT levels could be slightly higher in some locations than others, but current tools and science are not adequate to quantify them or the risks to human health. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

Construction Air Quality. Provided that local ordinances for open burning and dust are followed, significant air quality impacts due to construction of the Preferred Alternative are not anticipated. The proposed project would be constructed in phases, limiting the overall construction activity occurring at any one location. There would also be emissions related to

construction equipment and vehicles. However, impacts related to construction would be temporary.

Road and Bridge Icing Potential from Allen Steam Station Air Pollution Control Equipment. Duke Energy Corporation's Allen Steam Station, a major coal-fired power plant, is located between NC 273 (Southpoint Road) and the Catawba River on the Belmont peninsula (Draft EIS Figure 2-8a).

The Allen Steam Station has installed air pollution control equipment to comply with the North Carolina Clean Smokestacks Act of 2002. The Allen Steam Station air pollution control equipment is located north of the main power plant, just south of Corridor Segments K3B/K3C.

The air pollution control equipment includes scrubbers for sulfur dioxide control that will emit steam through a tall stack. In correspondence with NCTA, Duke Energy Corporation raised concerns that the steam emitted from the stack could result in icing on the nearby proposed roadway and the associated bridge crossing of the Catawba River (Telephone Interview, Duke Energy Regional Manager, September 14, 2005).

In response to this concern, a study was conducted to evaluate the likelihood and extent of potential icing on the proposed roadways and bridge crossings of the Catawba River for Corridor Segments K3B/K3C (DSAs 4, 9, 22, 27, 58, 68, 76, and 81) and Corridor Segment K4A (DSAs 5, 23, 64, and 77) (*Analysis of Potential Icing Impacts Due to Allen Steam Station SO₂ Scrubber – Gaston East-West Connector*, MACTEC, September 2008, incorporated by reference).

The model predicted there would be no potential for icing on the proposed Gaston East-West Connector due to exhaust gases released from the air pollution control scrubber stack.

Greenhouse Gas Emissions and Climate Change. The issue of greenhouse gas emissions and their effects on global climate is an important national and global issue, in which FHWA is actively engaged. FHWA has been working with other Federal agencies, including the USEPA and the Department of Energy, to evaluate effective approaches consistent with our national goals. However, no national approach has yet been set in law or regulations, nor has the USEPA established criteria or thresholds for greenhouse gas emissions. Because a national strategy to address greenhouse gas emissions from transportation – and all other sectors – is still being developed, FHWA believes that it is premature to implement policies that attempt to incorporate consideration of greenhouse gas emissions into transportation planning.

From a NEPA perspective, it is analytically problematic to conduct a project-level cumulative effects analysis of greenhouse gas emissions on a problem that is global in nature. It is technically unfeasible to accurately model how negligible increases or decreases of CO₂ emissions at a project scale would add or subtract to the carbon emissions from around the world. Given the level of uncertainty involved, the results of such an analysis would not be likely to inform decision-making at the project level, while adding considerable administrative burdens to the NEPA process. The scope of any such analysis, with any results being purely speculative, goes far beyond the disclosure of impacts needed to make sound transportation decisions. FHWA believes this approach meets the stated purpose of NEPA, in accord and with CEQ regulations, to concentrate on the analyses of issues that can be truly meaningful to the project decision, rather than simply amassing data.

2.5.2.3 Farmland

Prime and Important Farmland Soils and the Farmland Protection Policy Act. The US Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) has updated the lists of prime and other important farmland soils for Gaston and Mecklenburg Counties since the Draft EIS was published, as described in Section 1.3.2.3. Soils within the right of way for the Preferred Alternative considered by the NRCS to be prime or of statewide importance are listed in Table 1-3 and mapped in Appendix E. There are no farmland soils classified as unique or locally important within the right of way for the Preferred Alternative.

Construction of the Preferred Alternative would involve the use of prime and statewide important farmland soils. Table 2-9 presents the acreages of prime and statewide important farmland soils within the refined preliminary design right of way for the Preferred Alternative, including the proposed service roads. The acreages were calculated using GIS by overlaying the refined preliminary design right of way on the soils GIS layer and subtracting disturbed land (land already in urban development).

TABLE 2-9: Impacts to Prime and Important Farmland Soils

	Total Acreage in Right of Way	Prime Farmland Soils	Statewide Important Farmland Soils	Prime and Important Farmland Soils	
		Acres in Right of Way*		Total Acres in Right of Way	%
Preferred Alternative	1,631	588	274	862	53

*Acreages are calculated for the refined preliminary design right of way (January 2010). Areas of prime and statewide important soils already in urban development were not included in the totals.

In accordance with the Farmland Protection Policy Act (FPPA) and FHWA’s *Guidelines for Implementing the Final Rule of the Farmland Protection Policy Act for Highway Projects*, a “Farmland Conversion Impact Rating for Corridor Type Projects” form published by the NRCS was prepared for each DSA and included in Appendix I of the Draft EIS.

The ratings on the NRCS forms are comprised of two parts. The Land Evaluation Criterion Value represents the relative value of the farmland to be converted on a scale from 0 to 100 points. The Corridor Assessment, which is rated on a scale of 0 to 150 points, evaluated farmland soils based upon its use in relation to the other land uses and resources in the immediate area. The two ratings are added together for a possible total rating of 260 points. Sites receiving a total score of 160 points or more are given increasingly higher levels of consideration for protection (7 CFR 658.4).

The NRCS forms for DSA 9 included in Appendix I of the Draft EIS still apply to the Preferred Alternative. As listed in the forms, total acres of prime and unique farmland were assumed to be 793 acres and total acres of statewide and local important farmland were assumed to be 308 acres. These values are both greater than the values listed in Table 2-7. Therefore, the Land Evaluation Criterion Value reported on the form for DSA 9 would be the same or higher than what the value would be if the updated acreages were used.

The total points for DSA 9 are 124 points for the portion of the project in Gaston County and 122 points for the portion of the project in Mecklenburg County. Since the soils impacted by the Preferred Alternative do not meet the threshold of protection based on the evaluation under the FPPA, the impacts to prime and statewide important farmland are not considered under the FPPA.

Local Agricultural Programs. As discussion in Section 1.3.2.3 and in Section 4.3.3 of the Draft EIS, Gaston County adopted a Voluntary Agricultural District (VAD) ordinance in July 2004 under the authority of the Agricultural Development and Farmland Preservation Enabling Act (NCGS Chapter 106 Sections 735-743). Figure 4-3 in the Draft EIS shows VAD properties in the Project Study Area. Mecklenburg County does not have a VAD ordinance.

The Preferred Alternative would impact ten VAD properties. The VAD properties have a total acreage of approximately 449 acres. The acreage impacted would be approximately 49 acres.

Although the Preferred Alternative would impact agricultural lands in Gaston County, the project is consistent with the County's land use plans, which designate southern Gaston County as an area targeted for more suburban development. Discussion with Gaston County staff and reviews of local planning documents indicate that the area surrounding the proposed project is slated for suburban development.

Farmland

The Preferred Alternative would require relocation of one farm and would impact land from 10 parcels participating in the Gaston County Voluntary Agricultural District program.

The NCTA will comply with the VAD ordinance (*Gaston County Voluntary Agricultural District Ordinance*, Gaston County Web site: www.co.gaston.nc.us/ordinances/VADOrdinance2004-07-22.pdf) and will work with Gaston County regarding public hearings related to land condemnation proceedings against the VAD parcels prior to right-of-way acquisition.

Farm Relocations. Estimated farm relocations have not changed since the Draft EIS was prepared (Section 4.3.4.3). The Preferred Alternative would require relocation of one farm, located on Victory Trail east of Rufus Ratchford Road. Because much of southern Gaston County is still rural, it is anticipated that there would be suitable replacement property available for relocation of this farm.

2.5.2.4 Utilities and Infrastructure

Impacts to utilities and infrastructure reported in Section 4.4 of the Draft EIS and Section 1.3.2.4 have not changed for the Preferred Alternative, except for the addition of a Norfolk Southern rail spur at the Charlotte-Douglas International Airport described below.

Utility Service

NCTA will coordinate with local utilities during final design and construction to avoid and minimize disruptions in service.

Utilities addressed include electric power, water and sewer facilities, natural gas, telecommunications, and railroads. The Preferred Alternative has the potential to impact utilities, as summarized below.

Electrical Power Generation and Transmission. The Preferred Alternative would not impact operations at the Duke Power Corporation's Allen Steam Station. The Preferred Alternative would cross 14 major electrical power transmission line easements. The preliminary design refinements made to the Preferred Alternative avoided two electric transmission towers (Section 2.3.1.9). However, other transmission towers may be affected. Additional opportunities to minimize conflicts with electric power facilities would be investigated during final design.

Any modifications to the high-voltage electric power transmissions lines necessary to accommodate the proposed project are not expected to adversely impact the transmission lines or consumer electrical service in the area. Any impacts and relocations of power transmission lines or towers would be coordinated with Duke Energy Corporation and the Rutherford Electric

Membership Cooperative (EMC) during final design. Impacts to distribution lines would be coordinated with Duke Energy Corporation, Rutherford EMC, and the City of Gastonia prior to construction.

Natural Gas. The Preferred Alternative crosses the natural gas transmission easements owned by Plantation Pipeline Company and Colonial Pipeline Company described in Draft EIS Section 4.4.1.2 and Section 1.3.2.4. Each easement contains two natural gas transmission pipelines. The refined preliminary design for the Preferred Alternative does not encroach on the easement owned by the Transcontinental Gas Pipeline Corporation. The Preferred Alternative also crosses numerous natural gas distribution lines.

Although both natural gas transmission and distribution lines would be crossed by the Preferred Alternative, the project is not expected to impact consumer gas service. To avoid disruptions in service and delivery, the NCTA would coordinate any required relocation or modification of transmission lines with Plantation Pipeline Company and Colonial Pipeline Company and any required relocation or modification of distribution lines with area providers, including PSNC Energy and Piedmont Natural Gas.

Telecommunications. Neither the communication tower nor the cell tower described in Section 1.3.2.4 is anticipated to be impacted by the Preferred Alternative. During final design of the Preferred Alternative, all telecommunication utility providers would be consulted to ensure that the proposed design and construction of the project would not substantially disrupt service.

Water Service. Most of the land in Gaston and Mecklenburg County crossed by the Preferred Alternative does not have public water service. Those areas that do have service are located between I-85 and Linwood Road and an area east of US 321. In addition, a small area in Belmont crossed by the Preferred Alternative is served by public water (Draft EIS Figure 4-4), and the Preferred Alternative would cross a public water line along Southpoint Road that extends to the end of the peninsula. The remaining areas crossed by the Preferred Alternative are served by private or community wells.

In the areas served by public water, the Preferred Alternative would cross water lines, but water service is not expected to be disrupted. Prior to project construction, the NCTA would coordinate any water line relocation or reconfiguration with the appropriate municipality or county.

Wells within the Preferred Alternative right of way would be surveyed prior to project construction. NCTA would purchase these wells and cap and abandon them in accordance with State standards (15A NCAC 2C). Any subsurface contamination would be reported to the regional office of NCDENR.

Sewer Service. Most of the areas crossed by the Preferred Alternative do not have public sewer service. Those areas that do are located in the western end of the project, around US 321, and in Mecklenburg County (Draft EIS Figure 4-4). The remainder of the Preferred Alternative area is served by private septic tanks or community treatment systems.

The Preferred Alternative would not impact sewage treatment facilities or public sewer service within the Project Study Area. Any sewer line relocation or reconfiguration required for construction of the Preferred Alternative would be coordinated with the affected municipalities or counties, and is not expected to disrupt service.

Railroads. The Preferred Alternative would cross two Norfolk Southern rail lines and two spur lines. All crossings would be grade separated.

The Norfolk Southern mainline that runs east-west through Gaston County would be impacted by the Preferred Alternative. As shown in **Figure 2-3b**, the track is close to, and parallels, the east side of NC 274 (Bessemer City Road). Because the proposed Gaston East-West Connector/I-85 interchange is close to the I-85/NC 274 interchange, the I-85/NC 274 interchange ramps and the mainline of I-85 need to be modified to accommodate the new interchange to the west. Modifications would require the replacement of the existing railroad bridge over I-85. It is expected that the replacement bridge could be built in the existing bridge location, with a temporary detour bridge constructed immediately to the east during the bridge construction. Substantial disruptions in rail service are not anticipated. Additional coordination would be conducted regarding the Norfolk Southern mainline near I-85.

The Preferred Alternative would cross the Norfolk Southern branch line that runs north-south parallel to the east side of US 321. The interchange design at US 321 has the ramps located on the west side of US 321 to avoid the rail line.

The Preferred Alternative would cross the rail spur that serves Duke Energy Corporation's Allen Steam Station.

The Preferred Alternative also would cross the new Norfolk Southern rail spur located east of I-485 that will serve the intermodal facility at the Charlotte-Douglas International Airport. As discussed in **Section 2.3.1.12**, the refined preliminary design would utilize a planned bridge over the spur.

Final design of the Preferred Alternative would be coordinated with the NCDOT Rail Division and the rail line owners to ensure that the grade-separated crossings of rail lines incorporate the appropriate horizontal and vertical clearances, in accordance with current standards.

2.5.2.5 Visual Resources

Visual resources and existing overlay districts are described in Draft EIS Section 4.5, and have not changed since publication of the Draft EIS.

Travelers Using the Gaston East-West Connector. The Preferred Alternative has the potential to offer users of the proposed project visually pleasing views of the project and its surroundings, such as valleys, hills, wooded areas, farmlands, streams, and cultural features.

Gaston County has demonstrated its intention to maintain aesthetic and visually pleasing development immediately surrounding the proposed project through the establishment of the Garden Parkway Interchange (GPX) District and the Garden Parkway (GP) Overlay District in the Unified Development Ordinance (UDO).

Landscaping and Aesthetics
The NCTA will develop a landscaping plan and aesthetic design plan as part of final design to enhance views of the project.

During the final design of the Preferred Alternative, NCTA would incorporate a landscaping and aesthetic plan into the project that would enhance views within the right of way.

Users of Surrounding Roadways and Residential Areas. For people in the residential areas and on roadways surrounding the Preferred Alternative, the project's fill slopes and structures have the potential to detract from existing views. However, due to natural changes in elevation, the project's cut slopes in areas outside of floodplains, and tall trees within the area, much of the roadway would not be visible from areas outside the project's immediate vicinity.

Overall, visual changes would be intermittent, with some residents subjected to a view of the roadway, and other views shielded by the cut/fill areas, forested areas, and project landscaping.

The project's landscaping plan and the zoning requirements of the GPX District and GP Overlay District also will enhance and maintain aesthetics for these viewer groups, as well as those using the Gaston East-West Connector.

Boaters and Residents along the South Fork Catawba River and Catawba River.

The Preferred Alternative would construct bridges over the South Fork Catawba River and Catawba River. Boaters on these rivers, as well as some riverfront and nearby residents, would experience a substantial change in those views found within the vicinity of the bridges.

During final design for the Preferred Alternative, NCTA would investigate the feasibility and reasonableness of incorporating cost-effective treatments for the bridge sides, piers, and railings in order to enhance aesthetics as part of an aesthetic plan for the project. This is included as a special project commitment in **Chapter PC**.

Visitors to the Daniel Stowe Botanical Garden. The Preferred Alternative is not anticipated to adversely impact the Botanical Garden, or be close enough to be visible from the areas of the DSBG open to the public.

Visitors in Crowders Mountain State Park. The Preferred Alternative is one of the DSAs farthest from Crowders Mountain State Park.

The park's appeal includes views of the surrounding region, and there are areas of the park that would experience a change in existing viewsheds. The northeast overlook, Summit Tower, Rock Top Trail, and Tower Trail each have the potential to offer full or limited views of the proposed project from locations along the trails and/or summit where views to the east are possible. Although viewers may notice an immediate change with construction of any of the DSAs, it is anticipated that over time, the proposed project would blend with the suburbanizing landscape that is expected to develop with the project or without (No-Build Alternative).

2.5.2.6 Hazardous Materials

An updated hazardous materials evaluation was prepared by the NCDOT Geotechnical Engineering Unit to identify potentially contaminated sites within the project corridor for the Preferred Alternative. The results are presented in a *Hazardous Materials Report* (NCDOT, October 29, 2009, incorporated by reference).

Hazardous Materials Sites

Twenty-eight sites were identified within the Preferred Alternative corridor. Two sites received a moderate-high potential impact rating.

Hazardous material impacts may include active and abandoned underground storage tank (UST) sites, hazardous waste sites, regulated landfills and unregulated dump sites. The State's GIS database was used to identify known sites of concern within the project corridor. Geotechnical Engineering Unit personnel conducted field investigations along the Preferred Alternative corridor between September 30 and October 1, 2009. A search of appropriate environmental agencies' databases was performed to assist in evaluating identified sites.

Twenty-eight sites were identified within the Preferred Alternative corridor. The sites include six UST sites, three hazardous waste sites, seven manufacturing facilities, five junkyards, six automotive repair facilities, and one automobile race track (Carolina Speedway). **Figure 2-5** shows the approximate locations of the sites.

Table 2-10 summarizes the impacts of the potentially contaminated sites on the Preferred Alternative, including the anticipated level of potential impact and the type of contamination

expected to be encountered at each site. There were two sites within the corridor that received a “moderate to high” impact rating. Low, moderate, and high ratings are defined as follows:

- Low – Little to no impacts to cost or schedule anticipated.
- Moderate – Additional costs and time may be incurred due to the handling of contaminated materials, and a need for special construction techniques or products.
- High - Costs and scheduling could overwhelm smaller projects and cause serious delays in larger projects. Liability may fall upon the NCTA to clean up contamination, which could require decades. These sites should be avoided to the extent possible.

TABLE 2-10: Hazardous Materials Sites in the Preferred Alternative Corridor

Site Number	DEIS Site Number ¹	Site Type and Facility ID Number	Location	UST Owner	Other Information ²	Anticipated Type of Impact	Anticipated Impact Severity
1	1	UST 0-016633	1210 Edgewood Rd, Bessemer City	Acme Petroleum and Fuel Co	Former Shell gas station GWI 27458	Petroleum contaminated soils	Low
2	2	UST 0-016693	1205 Edgewood Rd, Bessemer City	United Oil Co	Edgewood Mini Mart – current gas station GWI 23944	Petroleum contaminated soils	Low
3	16	Haz Waste Facility/Manuf 000-615-872	1260 Shannon Bradley Rd, Gastonia	N/A	Manuf facility – hazardous waste facility Former AMP, Inc.	Chemicals	Low to Moderate
4	6	UST 0-015530	1520 Shannon Bradley Rd, Gastonia	BellSouth Telecomm	One UST in use	Petroleum contaminated soils	Low
5	7	UST 0-016617	1721 Bessemer City Rd, Gastonia	S&S USA, Inc	Grab-N-Go – current Citgo gas station GWI 27159	Petroleum contaminated soils	Low
6	10	UST 0-016709 0-216709	1651 Bessemer City Rd, Gastonia	United Oil of the Carolinas	Stuarts BP – current gas station GWI 10328	Petroleum contaminated soils	Low
7	9	UST 0-016178	1900 Jenkins Dairy Rd, Gastonia	Western Auto Supply Co	Currently Advance Auto Store GWI #16116/27615	Petroleum contaminated soils	Low
8	14	UST 0-016839/ Manuf	2900 Northwest Blvd, Gastonia	Dana Wix Corp Allen Plant	Current filter manufac. Facility; Tank removed 1987	Petroleum contaminated soils	Low
9	15	Haz Waste Facility/Manuf 000-003-194	3021 Northwest Blvd, Gastonia	N/A	Chrome plating facility; small-quantity generator	Chemicals	Low
10	12	UST	3112 Northwest Blvd, Gastonia	Sands and Co, Inc	Currently Park Elevators GWI #18990	Petroleum contaminated soils	Low
11	12	–	3124 Northwest Blvd, Gastonia	N/A	GWI #18990 from Site 10 extends to this parcel	Petroleum contaminated soils	Low
12	–	Junkyard	440 Shannon Bradley Rd, Gastonia	N/A	Auto repair business	None	Low
13	20	Junkyard	3301 W Franklin Blvd (US 29-74), Gastonia	N/A	Patterson Auto Parts – salvage yard	Petroleum contaminated soils	Low to Moderate
14	19	Auto salvage	3038 W. Franklin Blvd, Gastonia	N/A	Mac’s Auto Parts – possible former gas station	Petroleum contaminated soils	Low
15	19	Junkyard	3026 W. Franklin Blvd, Gastonia	N/A	Muffler Brake Shop and junkyard managed by Mac’s Auto (site 14)	Petroleum contaminated soils	Low to Moderate

TABLE 2-10: Hazardous Materials Sites In the Preferred Alternative Corridor

Site Number	DEIS Site Number ¹	Site Type and Facility ID Number	Location	UST Owner	Other Information ²	Anticipated Type of Impact	Anticipated Impact Severity
16	--	Equipment repair	3031 W. Franklin Blvd, Gastonia	N/A	Sparks Grading & Excavating	Petroleum contaminated soils	Low
17	18	Junkyard	3001 W Franklin Blvd (US 29-74), Gastonia	N/A	Putnam's Auto Parts	Petroleum contaminated soils; hazardous waste	Moderate to High
18	--	Junkyard	2920 W Franklin Blvd (US 29-74), Gastonia	N/A	Junkyard	Petroleum contaminated soils	Moderate
19	--	Auto Repair	2845 W Franklin Blvd (US 29-74), Gastonia	N/A	Russell's Paint & Body Shop	Petroleum contaminated soils	Low
20	28	UST 0-003235/ Manuf	207 Telegraph Rd, Gastonia	BF Goodrich	Lubrizol Corp. 12 USTs removed between 1991-1999 GWI #15733	Petroleum contaminated soils & chemicals	Low
21	32	Manuf	4604 York Hwy, Gastonia	N/A	Former metal foundry and casting shop; owned by Bruce's Iron & Metal	Metals	Moderate to High
22	--	Auto Repair	4550 York Hwy, Gastonia	N/A	Auto repair/used car sales	Petroleum contaminated soils	Low
23	--	Manuf	4619 York Hwy, Gastonia	N/A	Former metal fabrication facility	None	Low
24	--	Junkyard	407 Davis Heights Dr, Gastonia	N/A	Junkyard; Former auto repair (Johnny Parker's Garage)	Petroleum contaminated soils	Low
25	32	UST 0-001629	4604 S. York Hwy, Gastonia	Bruce's Iron & Metal Inc	Metal recycling/scrap yard; 4 tanks removed GWI 16955/20049	Petroleum contaminated soils	Moderate
26	34	Haz Waste Facility NCD 3154010	4801 York Hwy, Gastonia	N/A	AB Carter, Inc Inactive hazardous waste site	Soil and ground water contamination	Low
27	--	Other	6355 Union Rd, Gastonia	N/A	Carolina Speedway - 0.4 mile dirt track	Petroleum contaminated soils	Moderate
28	41	UST 0-015988	1901 South Point Rd, Belmont	Petroleum World, Inc	Jim's Grocery & South Point Grill GWI #05140/20049	Petroleum contaminated soils	Low

Source: *Hazardous Materials Report*, NCDOT Geotechnical Engineering Unit, October 2009.

Notes: ¹As presented in Draft EIS Table 4-13 and Appendix J, Table J-1. ²GWI – groundwater incident.

Eight of the sites in Table 2-10 are additional sites discovered during field investigations for the updated *Hazardous Materials Report* that were not reported in the Draft EIS. Ten of the potentially contaminated sites shown in Table 4-13 of the Draft EIS as impacting DSA 9 are not included in Table 2-10. According to the NCDOT Geotechnical Engineering Unit (Email from Mr. Terry Fox, NCDOT Geotechnical Unit, February 2, 2010), these sites were not included in the 2009 *Hazardous Materials Report* for one of the following reasons: 1) field inspections revealed that the actual former UST location was well outside of the proposed corridor for the Preferred Alternative, 2) the site is included as part of another site, or 3) the site was remediated.

The Geotechnical Engineering Unit would provide soil and groundwater assessments on each of the properties listed in **Table 2-10** before right-of-way acquisition. The discovery of additional sites not recorded by regulatory agencies and not reasonably discernable during the field investigations may occur.

2.5.2.7 Floodplains and Floodways

Floodplains and floodways in the Project Study Area are described in **Section 1.3.2.7**.

Impacts to Floodplains and Floodways. As discussed in Section 4.7.3 of the Draft EIS, a preliminary hydraulics analysis (*Final Preliminary Hydraulic Technical Memorandum for the Gaston County East-West Connector*, PBS&J, December 2007) was performed to identify the preliminary sizes and locations of major drainage structures along the DSAs that would be needed to adequately carry floodwaters. Major drainage structures are bridges, box culverts, or pipe culverts greater than 72 inches in diameter.

The locations of major drainage structures for the Preferred Alternative are shown on Figure 4-7 of the Draft EIS. Appendix H of the Draft EIS includes details about the crossing locations such as preliminary drainage structure size and length, floodplain width, and floodway width.

The major drainage structures and crossings were reviewed by the environmental regulatory and resource agencies at TEAC Meetings on February 5, March 4, and April 8, 2008. As a result of these meetings, the NCTA agreed to include several bridges in the preliminary design beyond those required to convey floodwaters. For the Preferred Alternative, these included bridging Blackwood Creek (Stream S135) and lengthening the mainline bridge over Catawba Creek (Stream S259) to span the main body of Wetland W248. This extension would also avoid impacting the Catawba River buffer areas on the east side of the creek.

Floodplains and Floodways
The Preferred Alternative crosses 10 floodways and 13 floodplains. There also would be an unavoidable longitudinal encroachment along the Crowders Creek floodplain. The Preferred Alternative will be designed to comply with all applicable State and local floodplain protection standards.

The Preferred Alternative includes six bridge crossings over water and 45 major culverts or pipes. There would be ten crossings of floodways and thirteen crossings of floodplains. The preliminary design for the Preferred Alternative in Corridor Segment J4a would involve a longitudinal encroachment on the edge of the Crowders Creek floodplain just north of New Haven Drive. This longitudinal encroachment would be approximately 1,400 feet in length and include an area of approximately five acres.

During final design of the Preferred Alternative, a detailed hydrologic and hydraulic analysis would be performed for each crossing location to determine the actual size and configuration of each structure. Also, for all new location crossings on Federal Emergency Management Agency (FEMA)-regulated streams (streams where a floodway and/or floodplain has been identified), a Conditional Letter of Map Revision (CLOMR) and Letter of Map Revision (LOMR) would be prepared and submitted to the NC Floodplain Mapping Program or Mecklenburg County, as applicable, for approval.

In National Flood Insurance Program flood hazard areas, the final hydraulic designs for the Preferred Alternative would be such that the floodway would carry the 100-year flood without a substantial increase in flood elevation. The effect of the project on floodwaters could be mitigated effectively through proper sizing and design of hydraulic structures.

A LOMR is FEMA's modification to an effective Flood Insurance Rate Map (FIRM), or Flood Boundary and Floodway Map (FBFM), or both. LOMRs generally are based upon the implementation of physical measures affecting the hydrologic or hydraulic characteristics of a flooding source, and thus result in the modification of the existing regulatory floodway, the effective Base Flood Elevations, or the Special Flood Hazard Area. The LOMR officially revises the FIRM or Flood Boundary and FBFM, and sometimes the Flood Insurance Study report, and when appropriate, includes a description of the modifications (FEMA Web site: www.fema.gov/plan/prevent/floodplain/nfipkeywords/lomr.shtm).

Floodplain Finding. Executive Order 11988 directs federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The FHWA requirements for compliance with this Executive Order are included in 23 CFR 650 Subpart A.

In accordance with 23 CFR 650.113, "A proposed action which includes a significant encroachment shall not be approved unless the FHWA finds that the proposed significant encroachment is the only practicable alternative. This finding shall be included in the final environmental document (final environmental impact statement or finding of no significant impact) and shall be supported by the following information:

- (1) The reasons why the proposed action must be located in the flood plain,
- (2) The alternatives considered and why they were not practicable, and
- (3) A statement indicating whether the action conforms to applicable State or local flood-plain protection standards.

A "Significant encroachment" shall mean a highway encroachment and any direct support of likely base flood-plain development that would involve one or more of the following construction- or flood-related impacts (23 CFR 650.105):

- A significant potential for interruption or termination of a transportation facility which is needed for emergency vehicles or provides a community's only evacuation route.
- A significant risk, or
- A significant adverse impact on natural and beneficial flood-plain values.

The Preferred Alternative would cross floodplains associated with Oates Branch, Bessemer Branch, Crowders Creek, Blackwood Creek, Stream S146 (unnamed tributary to Crowders Creek), Catawba Creek, South Fork Catawba River, Catawba River, Beaverdam Creek, and Legion Lake Stream.

With the exception of the longitudinal floodplain encroachment of Crowders Creek, the proposed crossings are as perpendicular as possible, considering other surrounding constraints such as neighborhood, community resources, natural resources, etc. Crossings of Oates Branch and Bessemer Branch would occur at I-85 and would involve extensions of existing culverts under I-85. Blackwood Creek, Stream S146, Catawba Creek, South Fork Catawba River, and Catawba River would be bridged. Beaverdam Creek would be crossed by the mainline with a double eight-foot by eight-foot reinforced concrete box culvert, and by an access road with a double nine-foot by eight-foot reinforced box culvert. Legion Lake Stream would be crossed via extensions of existing culverts under I-485.

The Preferred Alternative would involve a longitudinal encroachment on the fringe of the Crowders Creek floodplain just north of New Haven Drive, as shown in **Figure 2-3f**. This

longitudinal encroachment would be approximately 1,400 feet in length and include an area of approximately five acres within the right of way.

This longitudinal encroachment is minimized to the extent practicable based on the refined preliminary design for the Preferred Alternative and information available to date. Just south of this encroachment, the Preferred Alternative turns eastward to an interchange with US 321. The curve of the mainline in this area is constrained by the interchange design. Also, moving the mainline eastward, out of the floodplain area, would encroach on a NC Natural Heritage Program Important Natural Area (Stagecoach Road Granitic Outcrop) and would result in a crossing of the Blackwood Creek floodplain in a wider area.

In NFIP flood hazard areas, the final hydraulic designs for the Preferred Alternative will ensure that the floodway will carry the 100-year flood without adversely affecting floodplain elevations. The effect of the Preferred Alternative can be mitigated effectively through proper sizing and design of hydraulic structures (culverts, bridges, and channel stabilization).

All the alternatives considered for the project are described in Chapter 2 of the Draft EIS and briefly in Section 1.2 of this Final EIS. The Preferred Alternative was selected based on a consideration of impacts to natural resources and the human and physical environments, and on the ability to minimize impacts (Section 2.2). As such, there is no other practicable alternative for the proposed project.

The proposed action would comply with all applicable State and local floodplain protection standards. The NCTA would coordinate with the NC Flood Mapping Program for floodplains in Gaston County and with Charlotte-Mecklenburg Storm Water Services for floodplains in Mecklenburg County.

2.5.3 CULTURAL RESOURCES AND SECTION 4(F) AND SECTION 6(F) RESOURCES

2.5.3.1 Historic Architectural Resources

Section 5.2 of the Draft EIS includes descriptions of the historic architectural resources in the project's Area of Potential Effects (APE). There have been no updates to this information since the Draft EIS was published.

As discussed in Section 5.2.1.1 and shown on Figure 5-1 of the Draft EIS, the APE extends beyond the DSA corridor boundaries and is about 22 miles long and one to three miles wide, with an area of approximately 31,600 acres. It encompasses areas of both direct and indirect effects that may result from the proposed project, including possible takings, alterations to historic view sheds, and the introduction of noise elements.

Historic Architectural Resources

The Preferred Alternative would not have adverse effects on historic resources on or eligible for listing on the National Register of Historic Places.

Meetings were held with the State Historic Preservation Office (HPO) on April 21, 2008 and July 21, 2008 to reach concurrence on NRHP-eligible properties and to reach concurrence on the assessment of effects to listed and eligible properties from the DSAs. Concurrence forms are included in Appendix A-2 of the Draft EIS.

Effects were determined based on the preliminary designs for each DSA. Table 2-11, based on Draft EIS Table 5-1, presents the effects determination for each listed and eligible property in

relation to the Preferred Alternative, as well as any conditions placed on the Preferred Alternative to achieve a No Adverse Effect determination.

TABLE 2-11: Effects to Historic Architectural Resources from Preferred Alternative

Property Name	Site No.	Size (Acres)	Effects Determination*	Additional Notes
Wolfe Family Dairy Farm	GS 1327	~257	No Effect	--
Pisgah ARP Church	GS 00547	~2	No Effect	--
Jake Long Dairy Barn	GS 1320	< 1	No Effect	--
William Wilson House	GS 00198	~ 1	No Effect	--
William Alexander Falls House	GS 00169	~6	No Effect	--
Mendenhall-Grissom House	GS 00173	~13	No Effect	--
Stowe-Caldwell-Lowery House	GS 00179	~2	No Effect	--
William Clarence Wilson House	GS 00341	~1	No Effect	--
JBF Riddle House	GS 00337	~2	No Adverse Effect	No Adverse Effect provided the shoulder width and ditch slope do not result in taking of property either by fee simple or permanent easement.
Harrison Family Dairy Farm	GS 1322	~80	No Adverse Effect	No Adverse Effect if full access to the property is maintained.
William N. Craig Farmstead	GS 00320	~19	No Effect	--
Thomas Allison House	GS 00316	~4	No Effect	--
Dillard-Falls House	GS 1323	~3	No Effect	--
Bridge No. 350022	Pending	Bridge footprint	No Effect	--
Byrum-Croft House	MK 2841	~5	No Effect	--
Steele Creek Presbyterian Church and Cemetery	MK 01377	~20	No Effect	--
Steele Creek Presbyterian Church Manse	MK 1378	~7	No Effect	--
Shopton Rural Historic District	--	~16	No Effect	--

Source: April 21, 2008 Effects Meeting – HPO, FHWA, NCTA, and NCDOT.

* Effects determination based upon refined preliminary design.

As shown in Table 2-11, the Preferred Alternative has a No Adverse Effect determination to JBF Riddle House and Harrison Family Dairy Farm. The No Adverse Effect determination is based on the preliminary design shown in the Draft EIS. In the area near JBF Riddle House (Figure 2-3i), the refined preliminary design is the same as the preliminary design shown in the Draft EIS and the conditions are maintained for the No Adverse Effect determination. The shoulder width and ditch slope would not result in taking of property from the JBD Riddle House.

In the area near the Harrison Family Dairy Farm (Figure 2-3k), the refined preliminary design of the NC 274 (Union Road) interchange changed compared to the Draft EIS preliminary design.

However, near the Harrison Family Dairy Farm, the proposed improvements to NC 274 (Union Road) are the same and full access to the property is maintained, which means the conditions are met to maintain the No Adverse Effect determination. As with the Draft EIS preliminary design, the refined preliminary design of the Preferred Alternative would not require land from the Harrison Family Dairy Farm.

2.5.3.2 Archaeological Resources

An intensive archaeological survey was conducted for the Preferred Alternative. The survey is documented in the *Archaeological Survey and Evaluation of Detailed Study Alternative 9 (Recommended Route) for the Proposed Gaston East-West Connector* (Coastal Carolina Research, February 2010), incorporated by reference into this Final EIS. This study is referred to in this section as the *Intensive Archaeological Survey*.

Area of Potential Effects. The APE for the *Intensive Archaeological Survey* included the DSA 9 preliminary design right of way, ranging in width from 300 feet on the mainline corridor to more than 1,400 feet in some of the proposed interchange areas. The corridor right of way encompassed approximately 1,865 acres. Three non-contiguous areas of right of way for access roads also were included in the survey. These areas encompassed slightly less than 20 acres. Previously surveyed areas that required no further archaeological survey comprised approximately 164 acres.

Survey Methods. The North Carolina Office of State Archaeology (OSA) was consulted at a meeting on July 30, 2009, prior to commencement of the surveys, to review the approach and scope of the study. A letter from OSA summarizing the meeting is included in **Appendix K**.

The *Intensive Archaeological Survey* covered all previously unsurveyed portions of the APE. Areas that were disturbed, extremely sloped, or low and wet were examined on foot but not intensely surveyed. In remaining areas, shovel tests were conducted at appropriate intervals. Recovered artifacts were processed and analyzed, as described in the *Intensive Archaeological Survey*.

Archaeological sites within the APE that appeared to retain significant deposits were investigated to gather data on the sites' dimension and artifact distribution, presence or absence of subsurface features, site integrity, and composition. The testing was limited to the amount necessary to determine a site's significance in terms of NRHP criteria.

Previously Identified Sites. Background research was conducted as part of the *Archaeological Assessment of Detailed Study Alternatives for the Proposed Gaston East-West Connector* (Coastal Carolina Research, Inc., April 2007), as reported in the Draft EIS. There were 33 previously recorded sites within or immediately adjacent to the DSAs (Section 5.3.1.1 of the Draft EIS).

Of these 33 sites, ten previously recorded sites were identified as lying within or adjacent to the intensive survey APE. Of these ten, one site, 31GS0337** - Stovesville Cotton Mill, was recommended for additional evaluation to determine whether the site is eligible for listing on the NRHP. The other nine sites were recommended as not eligible for listing on the NRHP or not requiring further work. These sites are listed in **Table K-1** in **Appendix K**.

In addition, two cemeteries (Fall Farm and Mt. Pleasant Baptist Church) and two possible gold mine locations within or near the intensive survey APE were presented in the previous archaeological assessment summarized in the Draft EIS.

The Fall Farm Cemetery (Site 01-06) is noted in local records (Gaston County Historical Society, 1998) as a small, unmarked cemetery. Its general vicinity was recorded as near the *Intensive Archaeological Survey* APE, but evidence of the cemetery was not encountered during the assessment's cemetery reconnaissance, despite surface inspection and inquiries with area residents.

The Mt. Pleasant Baptist Church Cemetery (Site 03-35) is a small cemetery recorded as an archaeological site during the *Intensive Archaeological Survey*. It is described below.

The two possible gold mine locations were based on notations for mines or quarries in the Gaston County Soil Survey (Woody, 1989). These locations were investigated during the intensive survey, as described below.

Intensive Archaeological Survey Results. The *Intensive Archaeology Survey* identified 32 sites and eleven isolated finds newly recorded within the intensive survey APE. Four sites are potential gold mines. One of the newly recorded sites is the Mt. Pleasant Baptist Church Cemetery, previously identified in local records as Site 03-35, and is now recorded as Site 31GS0368**.

Archaeological Resources

No archaeological resources identified in the Intensive Archaeological Survey for the Preferred Alternative were determined eligible for the National Register of Historic Places.

The Mt. Pleasant Baptist Church cemetery is located near the intersection of Tucker Road and NC 273 (Southpoint Road). This cemetery, which is determined not eligible for the NRHP, consists of 93 marked graves in an unfenced but well-maintained plot of land, with additional depressions noted that could represent unmarked graves. The earliest marked grave is dated 1914, while the most recent burial occurred in 2008. As discussed in Sections 2.3.1.10 and 2.5.1.5, the cemetery's historic boundaries were larger than present-day property boundaries. The Preferred Alternative refined preliminary design avoids the areas of marked and potential unmarked gravesites in both the existing and historic boundaries of the cemetery.

The survey also revisited one previously recorded site (31GS0337**- the Stowesville Cotton Mill). These sites and isolated finds are listed in **Table K-2 of Appendix K**.

The *Intensive Archaeology Survey* involved detailed evaluation of four sites in order to determine their eligibility for listing on the NRHP: 31GS0355/355**, 31GS0358**, 31GS0337/337**, and 31GS0365/365**. These sites are described below.

Site 31GS0355/355.** This site is an approximately 2.4-acre site located on a well-defined ridge landform between two unnamed drainages. It consists of brick/stone piles, the partial articulated remnants of a chimney, a depressed area, possible stone piers that may represent an original house location, surface and subsurface historic artifacts, modern debris, and low density Native American lithic scatter. Artifacts recovered during the survey for the April 2007 assessment are consistent with occupation beginning in the late nineteenth century or early twentieth century. Although no additional fieldwork was recommended by OSA as a result of the April 2007 assessment, additional archival research was conducted to provide information on the dating of the site. Results of the archival research are presented in the *Intensive Archaeological Survey*.

Site 31GS0358.** This site is a historic domestic scatter site located just south of Craig McKee School Road. The site is located on a broad ridge landform above an unnamed tributary of Catawba Creek. The site includes a historic domestic component appearing to date to the late eighteenth century through the early to mid-nineteenth century. A lack of disturbance noted in the soil profiles during the initial assessment suggested that the site has the potential for intact

cultural deposits. However, intensive evaluation of this site did not reveal the potential for intact cultural deposits.

Site 31GS0337/337.** This site is the location of the Stowe's Cotton Factory/Gaither's Mill complex, which dates to the mid-nineteenth century. The mill itself is under the water of Lake Wylie, but components associated with the mill complex are extant. Water-powered mills were an important part of the historic rise of industrialization. The development of the Piedmont of North Carolina as the industrial leader of the state was tied to the development of water-powered industries. Mills were frequently one of the first industries in an area, and the Stowe's Factory has been identified as the third mill in Gaston County.

The only surviving element with intact remains is a stone foundation. Given its distance from the water, this foundation is likely not the foundation of the mill itself, but appears to be a domestic structure.

Site 31GS365/365.** This site is a Native American and historic artifact scatter located off Gaither Road. This approximately 1.1-acre site is on a ridge landform and is thought to be part of the Stowe's Factory complex. The artifacts recovered from the site are similar to and date from the same time period as those for the house site at 31GS0337/337**. It appears likely that this site is a village or settlement associated with the mill complex at 31GS0337/337**.

Based on intensive survey of site 31GS0365/365**, the Native American component of this site consists of an indeterminate lithic scatter intermixed with historic materials. The intermixing of the historic and Native American materials, as well as the lack of intact Native American features or temporally diagnostic artifacts, suggests this site lacks the potential to contain information concerning Native American occupations in the Piedmont of North Carolina. The historic component consists of a relatively high density of historic materials dating to the mid-nineteenth century and an articulated brick feature that appears to represent the remains of a brick road or drive.

Section 106 Coordination. In a memorandum dated May 21, 2010 (included in Appendix K), the HPO concurred that no archaeological sites identified within the APE are eligible for the NRHP. The *Intensive Archaeological Survey* recommended that two sites (31GS337/337** and 31GS365/365**) were potentially eligible for listing on the NRHP. However, based on an evaluation of the survey results, HPO and FHWA concurred that these sites do not retain the level of integrity nor do they possess the potential to yield significant new information pertaining to the history of North Carolina. Therefore, these sites are not eligible for listing on the NRHP.

2.5.3.3 Section 4(f) and Section 6(f) Resources

Section 4(f) Resources. There are three publicly-owned parks and eighteen significant historic sites located in or near the DSAs that are protected by Section 4(f) (49 USC Section 303 and 23 CFR Part 774).

Parks. Publicly-owned parks include Crowders Mountain State Park, Gaston County's Park at Forestview High School, and Mecklenburg County's Berewick Regional Park.

As described in Section 5.4.3 of the Draft EIS, none of the DSAs (including the Preferred Alternative) would directly or indirectly impact Crowders Mountain State Park or Gaston

Section 4(f) Resources

The Preferred Alternative refined preliminary design would not directly impact any Section 4(f) resources.

County's Park at Forestview High School. However, all of the DSAs' preliminary designs included in the Draft EIS would encroach upon Berewick Regional Park.

Based upon the preliminary design in the Draft EIS, the Preferred Alternative would impact approximately 1.6 acres on the east end of the park, adjacent to I-485. This minor encroachment on the edge of the property owned by Mecklenburg County was not anticipated to impact access or any future planned uses. The Mecklenburg County Park and Recreation Department concurred that the estimated right of way needed under any of the DSAs would not adversely affect the activities, features, and attributes of Berewick Regional Park (Section 5.4.3.1 of the Draft EIS).

The Preferred Alternative refined preliminary design avoids taking right of way from Berewick Regional Park (Section 2.3.1.12 and Figure 2-3r), and no further action under Section 4(f) is required.

Historic Architectural Sites. There are eighteen historic architectural resources listed on or eligible for listing on the NRHP located in the APE (Section 5.2.1.2 and Figure 5-1 of the Draft EIS). Because they are listed on or eligible for listing on the NRHP, they are considered significant historic sites under Section 4(f). Of these eighteen historic architectural resources, there are two historic architectural resources receiving a determination of No Adverse Effect as noted in the Draft EIS: JBF Riddle House and Harrison Family Dairy Farm.

There would be no land required from the JBF Riddle House or the Harrison Family Dairy Farm based on the refined preliminary design for the Preferred Alternative. As long as the conditions are met to maintain the No Adverse Effects determinations, there would be no use of these resources and no Section 4(f) evaluation is required.

Section 6(f) Resources. There are no Section 6(f) resources in the project study area.

2.5.4 NATURAL RESOURCES

2.5.4.1 Soils and Mineral Resources

Soils. As discussed in Section 1.3.4.1, soils surveys for Gaston and Mecklenburg Counties were updated since the Draft EIS was published. A complete list of soils and soil properties can be found in Appendix E. The entire area underlain by the DSAs, including the Preferred Alternative, is rated "somewhat limited" or "very limited" for road construction. This means the soil properties indicate that special planning, design, or maintenance is needed to overcome soil limitations. The concern cited in the soil surveys is low strength (i.e., the soil is unable to support loads). Some soils also have shrink-swell potential, which is the potential for a soil volume to change with a loss or gain of moisture. Shrinking and swelling can cause damage to structures and roads, if either lack special design (USDA, January 1996).

Soils
The soils underlying the Preferred Alternative are rated by the US Department of Agriculture Natural Resource Conservation Service (NRCS) as "somewhat limited" or "very limited" for road construction. The expected soil limitations can be overcome through proper engineering design.

The expected soil limitations can be overcome through proper engineering design, including the incorporation of techniques such as soil modification, appropriate choice of fill material, use of non-corrosive subgrade materials, and design of drainage structures capable of conveying estimated peak flows. Decisions regarding soil limitations and methods to overcome them would be determined during the final design phase.

Mineral Resources. None of the active or inactive mines permitted by the NCDENR Division of Land Resources described in Section 6.1.4 of the Draft EIS would be impacted by the DSAs, including the Preferred Alternative. Geotechnical surveys conducted during the final design phase would identify abandoned mine shafts in the area that could affect construction activities. It is expected that abandoned mine shafts can be accommodated in the final design and construction of the Preferred Alternative.

2.5.4.2 Water Resources

Existing water resources and water quality are discussed in Section 1.3.4.2 and in Section 6.2.2 of the Draft EIS. The impacts discussion in Section 6.2.3 of the Draft EIS applies to the Preferred Alternative.

Water Quality Impacts and Mitigation. 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 could be possible due to particulates, heavy metals, organic matter, pesticides, herbicides, nutrients, and bacteria often found in highway runoff.

Water Quality Mitigation

Impacts from erosion and sedimentation will be minimized by implementing control measures in accordance with NC DENR and NCDOT guidance and best management practices.

Indirect impacts to water quality also were evaluated in the *Quantitative Indirect and Cumulative Effects Analysis* (Louis Berger Group, Inc., August 2010) prepared for the Preferred Alternative. The results are summarized in Section 2.5.5.

Prior to construction, an erosion and sedimentation plan would be developed for the Preferred Alternative in accordance with applicable rules, regulations and guidance, including the latest versions of the NCDENR publication *Erosion and Sediment Control Planning and Design Manual*, the NCDWQ's *Stormwater Best Management Practices Manual* (July 2007), and NCDOT's *Best Management Practices for Protection of Surface Waters*.

Due to construction activities and the increase of impervious surface associated with the construction of a major highway, managing stormwater runoff is an important activity to reduce pollutant loads to adjacent streams. The NCTA would work with regulatory agencies to identify the best management practices (BMP) that would help ensure water quality is protected.

The *Standard Specifications for Roads and Structures* requires proper handling and use of construction materials (NCDOT, January 2002) (NCDOT Web site: www.ncdot.org/doh/preconstruct/ps/specifications/dual/). The contractor would be responsible for taking every reasonable precaution throughout the construction of the project to prevent the pollution of any body of water. The contractor would also be responsible for preventing soil erosion and stream siltation.

Water-Based Recreational Activities. As discussed in Section 1.3.4.2, boating, fishing, and waterskiing occur on the Catawba River and South Fork Catawba River, particularly in the areas south of the Allen Steam Station on the Catawba River and south of the Allen Steam Station canal on the South Fork Catawba River. Boat traffic on the South Fork Catawba River is constrained by the existing NC 273 (Armstrong Road) bridge over the river. This bridge's vertical

clearance over the river allows passage of pontoon boats and ski boats, but no large houseboats or sailboats (Telephone interview, Catawba Riverkeeper Foundation, September 4, 2008).

The Preferred Alternative would cross the rivers north of the Allen Steam Station, which are areas that are less navigable due to siltation. However, recreational activities likely would be temporarily affected during construction of the bridges.

Based upon the refined preliminary design for the Preferred Alternative, the vertical clearances of the bridges over the South Fork Catawba River and Catawba River would exceed the 12-foot minimum clearance above full pond elevation (569.4 MSL) required by Duke Energy Corporation in accordance with their Shoreline Management Guidelines (Duke Energy Corporation Web site: www.duke-energy.com/pdfs/shoreline_mgt_guide.pdf). These clearances would allow passage of recreational boats.

Catawba-Wateree Hydro Project. The NCTA would continue to coordinate with Duke Energy Corporation to obtain the necessary Federal Energy Regulatory Commission (FERC) permit. The process is expected to result in a FERC license revision to allow the transfer of land within the FERC project boundary to NCTA to construct the Gaston East-West Connector Preferred Alternative’s bridges over Lake Wylie. This process must be complete prior to construction within the Lake Wylie boundaries and is included as a special project commitment (Chapter PC).

2.5.4.3 Natural Communities and Wildlife

Terrestrial Communities and Wildlife. Terrestrial communities would be impacted permanently by project construction from clearing and paving. **Table 2-12** provides the acreage of terrestrial communities by habitat type that would be impacted by the Preferred Alternative refined preliminary design, which includes proposed service roads. The acreages represent the area within the proposed right-of-way limits.

TABLE 2-12: Impacts to Terrestrial Communities

	Agricultural (acres*)	Clearcut (acres*)	Disturbed (acres*)	Hardwood Forest (acres*)	Pine Hardwood Forest (acres*)	Pine Forest (acres*)	Successional (acres*)	Open Water (acres*)	Total (acres*)
Preferred Alternative	152	20	537	195	445	152	111	19	1,631

Source: Natural Resources Technical Report for the Gaston East-West Connector (Earth Tech, Inc., February 2008)
 *Acreage is within the refined preliminary design right of way limits within the area surveyed for natural communities. This does not include some service roads or areas of the design that extend outside the original study corridor boundaries. The majority of these areas are along existing roads or other disturbed areas.

As discussed in **Section 1.3.4.3**, direct impacts from the Preferred Alternative would occur to the terrestrial communities and to the animals that inhabit them. Destruction of natural communities along the Preferred Alternative right of way would result in the loss of foraging and breeding habitats for the various animal species that utilize the area.

Indirect impacts would occur from forest fragmentation. Indirect impacts to habitats also are discussed in **Section 2.5.5**. Forest fragmentation occurs when large, contiguous forests are divided into smaller patches by urbanization, roads, and agriculture.

When habitat is fragmented, the amount of edge habitat increases at the expense of interior habitat. Under these circumstances, species dependent upon interior habitat suffer (such as

many migratory or neo-tropical birds), while edge dependant species, including invasive species and predators, thrive. Highly fragmented forests do not provide the food, cover, or reproduction needs of interior forest species. The road itself could provide a physical barrier to the movement of mammals, reptiles, and amphibians along wildlife corridors and from one forest patch to another.

The impacts of habitat fragmentation could be reduced by providing connections between habitats on either side of the Gaston East-West Connector. In consultation with the NCWRC, USFWS, and USEPA, at a TEAC Meeting on April 8, 2008, the NCTA identified a location along all DSAs where wildlife passage structures could be provided to maintain habitat connectivity.

A wildlife passage structure would be studied at the crossing of Stream S156 during final design of the Preferred Alternative. Stream S156 (Figure 2-3h) is located between Forbes Road to the west and Robinson Road to the east. Wildlife passages often include additional culverts placed adjacent to the culverts needed for water passage. During final design, the NCTA would coordinate with the NCWRC, USFWS, and USEPA on the feasibility and design of the wildlife passage at Stream S156, and on designing bridge crossings to be wildlife friendly where feasible. This is included as a special project commitment in Chapter PC.

Wildlife Crossings

During final design, the NCTA would coordinate with the NCWRC, USFWS, and USEPA on the feasibility and design of the wildlife passage at Stream S156, and on designing bridge crossings to be wildlife friendly where feasible.

Aquatic Communities and Wildlife. Impacts to aquatic communities include fluctuations in water temperature as a result of the loss of riparian (forest) vegetation. Impacts to terrestrial communities, particularly in locations having steep to moderate slopes, could result in the aquatic community receiving heavy sediment loads as a consequence of erosion.

Construction impacts may not be restricted to the communities in which the construction activity occurs, but could affect downstream communities. The refined preliminary design for the Preferred Alternative reduced the number of streams crossed from 91 to 86, with six of these streams bridged (Crowders Creek, Blackwood Creek, Unnamed Stream 146, Catawba Creek, South Fork Catawba River, and Catawba River). Temporary and permanent impacts to aquatic organisms could result from increased sedimentation. Sediments have the potential to affect fish and other aquatic life in several ways including the clogging and abrading of gills and other respiratory surfaces, affecting the habitat by scouring and filling of pools and riffles, altering water chemistry, and smothering different life stages. Indirect impacts to water bodies are also discussed in Section 2.6.

As outlined in Section 6.2.3 (Mitigation of Impacts – Water Quality) of the Draft EIS, impacts to aquatic communities and wildlife from erosion and sedimentation would be minimized through implementation of a stringent erosion-control schedule and the use of BMPs.

Important Natural Areas. As described in Section 6.3.4 of the Draft EIS, there are three important natural areas within or near the DSAs: NCNHP Crowders Mountain State Park and Vicinity (Figure 2-3 Index), NCNHP Stagecoach Road Granitic Outcrop (Figure 2-3f), and Catawba Lands Conservancy conservation easement (Figure 2-3l). The Preferred Alternative refined preliminary design would not encroach on any of these natural areas.

Invasive Plant Species. Construction of the Preferred Alternative has the potential to provide opportunities for invasive plant species.

The NCTA would comply with Executive Order 13112. Known invasive plant species would not be used in construction, revegetation, or landscaping. During construction of the proposed project, BMPs would be implemented to reduce the potential for spreading invasive species.

2.5.4.4 Water Resources in Federal Jurisdiction

Impacts to Jurisdictional Resources.

Table 2-13 presents the impacts to water resources for the Preferred Alternative. The impacts were calculated using the refined preliminary design estimated slope stake limits plus a 25-foot buffer, in accordance with NCDOT procedures. The values below include the service roads described in Section 2.3.2. Streams and wetlands proposed to be bridged are not counted as impacts. Impacts to streams and wetlands were reduced compared to the Draft EIS preliminary design for DSA 9, as described in Section 2.3.3.

Reductions in Jurisdictional Resource Impacts

The Preferred Alternative preliminary design refinements resulted in an approximately 25 percent reduction (2.36 miles) in stream impacts and a 6 percent reduction (0.4 acre) in wetland impacts compared to the DSA 9 preliminary design presented in the Draft EIS.

TABLE 2-13: Impacts to Waters of the US

	Intermittent Stream Impacts (linear ft) ¹	Perennial Stream Impacts (linear ft) ¹	Total Stream Impacts (linear ft) ¹	Total Number of Stream Crossings	Wetland Impact Area (acres) ¹	Total Number of Wetlands Impacted	Pond Impact Area (acres) ¹
Preferred Alternative	7,383	29,033	36,416	87 (6 are bridges)	7.0	48	4.5

Source: Data in table was calculated using the refined preliminary design (January 2010) and GIS data for jurisdictional resources from the Natural Resources Technical Report for the Gaston East-West Connector (Earth Tech, Inc., February 2008) and surveys conducted for service roads and y-lines in November 2009.

¹ Impacts were calculated using the refined preliminary design construction limits, with an additional 25-foot buffer, in accordance with NCDOT procedures.

Appendix I includes tables listing each pond, wetland, and stream within the Preferred Alternative study corridor and the impacts by individual resource. Written verification of jurisdictional determinations for wetlands and streams from the NCDWQ is included in Appendix K. The USACE will provide written verification during the permitting process.

Impacts to Catawba River Buffers. Lake Wylie spans the Project Study Area and could not be avoided for any of the DSAs (including the Preferred Alternative). The refined preliminary design for the Preferred Alternative would impact Catawba River buffers for the crossings of Lake Wylie (Lake Wylie includes segments of Catawba River, South Fork Catawba River and Catawba Creek).

These crossings would be subject to the Catawba River Buffer Rules (15A NCAC 02B.0243). Road crossings that impact greater than 40 linear feet (lf), but equal to or less than 150 lf or one-third acre (14,505 square feet) of riparian buffer are allowable without mitigation. Road crossings that impact greater than 150 lf or one-third acre of riparian buffer are allowable with mitigation. These uses require prior written authorization from the NCDWQ.

Based on the refined preliminary design for the Preferred Alternative, the Preferred Alternative would impact 3,642 square feet of Zone 1 buffers and 8,859 square feet of Zone 2 buffers. The total impacts to buffers would be 12,501 square feet (0.28 acre). This is less than the threshold of one-third acre that requires mitigation.