

1. Decision

This Record of Decision (ROD) is for the proposed Winston-Salem Northern Beltway in Forsyth County, North Carolina. The proposed action's Selected Alternative will construct a freeway facility on new location around the northern portion of Winston-Salem. The project passes through the municipalities of Winston-Salem, Kernersville, Walkertown, and Tobacoville. It is adjacent to or near the municipalities of Rural Hall, Bethania, Clemmons, and Lewisville.

The three North Carolina Department of Transportation (NCDOT) projects, R-2247, U-2579, and U-2579A, collectively are commonly known as the Winston-Salem Northern Beltway. The western portion of the Beltway (Project R-2247) extends from US 158 north to US 52. The eastern portion of the Beltway (Projects U-2579 and U-2579A) extends from US 52 north of Winston-Salem to US 311 southeast of Winston-Salem.

In accordance with the National Environmental Policy Act (NEPA) and the requirements set by the Council of Environmental Quality (CEQ) (40 CFR 1505.2), this ROD:

- 1) identifies the selected alternative for the Winston Salem Northern Beltway Projects R-2247, U-2579, and U-2579A;
- 2) summarizes all alternatives considered by the Federal Highway Administration and the factors that were considered in the evaluation of the alternatives;
- 3) describes measures adopted to avoid and minimize harm;
- 4) identifies monitoring and enforcement programs for the implementation of mitigation measures; and,
- 5) responds to comments on the January 11, 2007 Supplemental Final Environmental Impact Statement (SFEIS)/Final Environmental Impact Statement (FEIS).

The primary purposes and needs of the proposed action are listed below for the Northern Beltway. The Northern Beltway in its entirety serves several purposes, listed below. In addition, the eastern and western portions are independent from one another and have different purposes and needs, also listed below. Additional detail is provided in Section 1.4 (Needs) and Section 1.5 (Purposes) of the SFEIS/FEIS.

Summary of Needs for the Northern Beltway

The transportation needs in the project study area that would be met by constructing the entire Northern Beltway include the following:

- Poor roadway connectivity in eastern and western Forsyth County
- Capacity deficiencies
- Poor regional, intrastate, and interstate linkage

In addition, the Northern Beltway is consistent with state and local land use and transportation plans, and is consistent with the North Carolina Highway Trust Fund Act. The Highway Trust Fund Act, enacted in 1989 and amended in subsequent years, establishes a funding stream for urban loops. Included in the law as an urban loop is a multi-lane facility around Winston-Salem on new location from I-40 west of Winston-Salem around the northern portion of Winston-Salem to US 311 in eastern Forsyth County. This Act allocated highway funds to various portions of the state with an objective of providing equitable distribution. Urban loop freeways were included in the Act originally for seven major cities in North Carolina, including Winston-Salem, although additional loops have been added since.

The transportation needs in the project study area that the Western Section only (Project R-2247) is intended to address include the following:

- Poor north/south roadway connectivity within and through western Forsyth County
- Capacity deficiencies

The transportation needs in the project study area that the Eastern Section and Extension only (Projects U-2579 and U-2579A) are intended to address include the following:

- Poor intrastate and interstate linkage to the north and south
- Poor roadway connectivity within and through eastern Forsyth County
- Capacity deficiencies
- Above-average accident rates on area roadways
- Corridor for I-74 (a congressionally designated High Priority Corridor on the National Highway System)

Purpose of the Northern Beltway

The Winston-Salem Northern Beltway as a whole will provide benefits that will address the transportation needs identified above. The purposes for building the entire Northern Beltway include the following:

- Improve roadway connectivity in eastern and western Forsyth County

- Provide congestion relief for area roadways
- Expand options for regional/intrastate/interstate travel
- Help meet the state and local land use and transportation plans
- Help fulfill the Highway Trust Fund Act

The purposes for constructing Project R-2247 are listed below. These also will be served by construction of the entire Northern Beltway.

- Improve north/south connectivity in western Forsyth County
- Provide improved direct connections to US 52, US 421 and I-40
- Provide congestion relief for area roadways

The purposes for constructing Projects U-2579 and U-2579A are listed below. These also will be served by construction of the entire Northern Beltway.

- Improve intrastate and interstate mobility
- Improve roadway system linkage and continuity
- Reduce traffic congestion and carry future traffic at a desirable level of service
- Enhance safety
- Provide a corridor for I-74 (a congressionally designated High Priority Corridor on the National Highway System)

Selected Alternative

The SFEIS/FEIS identifies a Preferred Alternative for each of the three projects that comprise the Winston-Salem Northern Beltway: Alternative C3-WEST-B for Project R-2247, Alternative 7 for Project U-2579, and Alternative N2-S1 with a single-point urban interchange at Kernersville Road for Project U-2579A. The Preferred Alternative for the entire Northern Beltway identified in the SFEIS/FEIS is the combination of these three alternatives: Alternative C3-WEST-B/Alternative 7/Alternative N2-S1 with a single-point urban interchange at Kernersville Road.

FHWA chooses Alternative C3-WEST-B as its Selected Alternative for the Western Section of the Northern Beltway (Project R-2247). FHWA chooses Alternative 7 (Project U-2579) and Alternative N2-S1 with a single-point urban interchange at Kernersville Road Project U-2579A) as its Selected Alternative for the Eastern Section of the Northern Beltway (Projects U-2579 and U-2579A). For the entire Northern Beltway, FHWA chooses Alternative C3-WEST-B/Alternative 7/Alternative N2-S1 with a single-

point urban interchange at Kernersville Road as its Selected Alternative. The location of this Selected Alternative is shown in **Figure 1 (Appendix A)**.

2. Alternatives Considered

Preliminary alternatives considered for the proposed actions included:

- No-Build Alternative
- Transportation Management Alternatives
- Mass Transit/Multi-Modal Alternatives
- Preservation Easements Alternative
- Improve Existing Roadways Alternatives
- Build Alternatives and Partial Build Alternatives on New Location

As discussed in the SFEIS/FEIS, the No-Build Alternative, Transportation Management Alternatives, Mass Transit/Multi-Modal Alternatives, Preservation Easements Alternative (for Project R-2247), and Improve Existing Roadways Alternatives would not effectively meet the projects' purposes and needs. The Partial Build Alternatives (Build-East and Build-West) and the Build Alternatives on New Location (build the entire Northern Beltway) were determined to meet their respective purposes, as discussed in Section 1 above.

The Partial Build Alternatives include the following:

- Build-West scenario – Build Only Project R-2247 – means build Project R-2247, but no action under Projects U-2579 and U-2579A
- Build-East scenario – Build Only Projects U-2579 and U-2579A – means build Projects U-2579 and U-2579A, but no action under Project R-2247

The Partial Build Alternatives would incur only those impacts and result in only those benefits listed for the project that is built (Project R-2247 or Projects U-2579 and U-2579A). As described in Section 2.7.2 of the SFEIS/FEIS, both Project U-2579 and Project U-2579A would need to be constructed in order to fulfill the projects' purpose as the I-74 corridor since both projects connect to designated Interstate highways. Therefore, in developing the Partial Build Alternatives, Projects U-2579 and U-2579A were not separated.

The following sections summarize the process for determining alternatives for each project, including identifying preliminary alternatives, presenting alternatives to the public, and choosing a Selected Alternative.

Project R-2247 Alternatives

The preliminary study corridors for Project R-2247 were identified as Corridors R, S, and T, consisting of three main north-south routes with numerous crossovers linking portions of each. The preliminary corridors represented over 84 miles of new alignment, and were presented to the public during open-house workshops on July 24 and 25, 1990.

Following the workshops, eight Detailed Study Alternatives were selected for further study. The preliminary corridors and Detailed Study Alternatives were discussed in the August 1992 Project R-2247 Draft Environmental Impact Statement (DEIS). The DEIS and Detailed Study Alternatives were presented at two evenings of Pre-Public Hearing Open Houses (August 27 and 28, 1992) and at a Corridor Public Hearing (September 1, 1992).

A Preferred Alternative for Project R-2247, Alternative C3-WEST-B, was identified by NCDOT in April 1993. Project R-2247's 1992 DEIS and the 1993 identification of the Preferred Alternative pre-dated the 1997 Section 404/NEPA Merger process, although inter-agency coordination did occur.

An FEIS was approved March 14, 1996. A ROD identifying Alternative C3-WEST-B as the Selected Alternative was approved May 7, 1996. A Pre-Hearing Workshop was held on August 15, 1996 to provide citizens an opportunity to review the project designs. A Design Public Hearing was held on September 5, 1996 to present the Project R-2247 Preferred Alternative. The ROD was rescinded in 1999 as a result of the settlement of a lawsuit (US District Court for Middle District of North Carolina, Civil Action No. 1:99CV00134).

A Preferred Alternative for Project R-2247, Alternative C3-WEST-B, was identified in the combined SFEIS/SDEIS (approved on October 1, 2004) for the combined Winston-Salem Northern Beltway. Merger Team members agreed to insert the Western Section into the merger process post-Concurrence Point 3 (LEDPA).

A fresh look at the Project R-2247 alternatives also was conducted as part of the combined SFEIS/SDEIS (approved on October 2004) for Projects R-2247, U-2579, and U-2579A. This included an evaluation of two additional Improve Existing Roadway Alternatives and evaluation of three additional designs for the R-2247 Preferred

Alternative's interchange at Bethania-Tobaccoville Road. Sections 2.6 and 2.9 of the SFEIS/FEIS provide more details.

A Citizens Informational Workshop was held on November 27, 2001 to present the two Improve Existing Roadways Alternatives to the public. Two local officials meetings and one property owners meeting were held on February 25, 2003 to solicit comments on the preliminary engineering designs of the alternatives under consideration for the Project R-2247 interchange at Bethania-Tobaccoville Road.

Following two pre-hearing open houses for the combined Northern Beltway (November 8 and 9, 2004), an open house public hearing for Project R-2247 was held on November 16, 2004 to solicit public input. Public comments provided are summarized in Section 6.2.3.3 of the SFEIS/FEIS, and are provided in full in Appendix C.4 of the SFEIS/FEIS.

Project U-2579 Alternatives

Thirty-four preliminary alternative segments were developed within the study area. At the first local officials meeting and Citizens Informational Workshop on April 29, 1993, citizens were provided the opportunity to suggest additional study segments within the study area. Although no new preliminary alternative segments emerged from the workshop, citizens offered suggestions to the proposed project, including widening of existing roads and routing the Northern Beltway further north and east of Winston-Salem. The preliminary alternative segments were analyzed individually, and those segments determined to be infeasible were eliminated from further detailed study. The remaining segments were then combined into ten Detailed Study Alternatives. At the second local officials meeting and Citizens Informational Workshop on March 8, 1994, the Detailed Study Alternatives were presented to the public for additional comments.

A DEIS for Project U-2579 was approved in September 1995. The Detailed Study Alternatives were presented to citizens at the Corridor Public Hearing on December 7, 1995. Following the public hearing, Alternative 7 was identified as NCDOT's Project U-2579 Preferred Alternative in March 1996. NCDOT discussed the selection of Alternative 7 at an interagency coordination meeting held on August 15, 1996. Following an additional field review meeting on December 11, 1996, it was determined that Alternative 7 was the least environmentally damaging practicable alternative (LEDPA). Copies of the concurrence letters from the U.S. Corps of Engineers (USACE) dated September 19, 1997 and from the North Carolina Division of Water Quality (NCDWQ) dated December 1, 2003 are included in Appendix D.2 of the SFEIS/FEIS.

Project U-2579's 1995 DEIS and the 1996 identification of the Preferred Alternative predated the 1997 Section 404/NEPA Merger process, although inter-agency coordination did occur as described above. Since there was documented concurrence from the regulatory agencies on LEDPA, the Eastern Section was entered into the merger process post-Concurrence Point 3 (LEDPA).

A Preferred Alternative for Project U-2579 was identified in the SFEIS/SDEIS (approved on October 1, 2004) for the combined Winston-Salem Northern Beltway.

Following two pre-hearing open houses for the combined Northern Beltway (November 8 and 9, 2004), a formal public hearing for Project U-2579 was held on November 17, 2004 to solicit public input. Public comments provided are summarized in Section 6.2.3.3 of the SFEIS/FEIS, and are provided in full in Appendix C.4 of the SFEIS/FEIS. In addition to the meetings described above, NCDOT also held small group meetings with citizens to discuss Project U-2579.

Project U-2579A Alternatives

The original limits of Project U-2579 were US 52 and US 421/I-40 Business. A proposal was made in January 1994 at a Project U-2579 interagency meeting to extend those limits to US 311. A joint interagency and steering committee meeting was held on January 4, 1995 to discuss the history of the project, preliminary alternatives, and key environmental concerns. Following a feasibility study that identified three preliminary alternative corridors for Project U-2579A, a Citizens Informational Workshop was held on February 7, 1995 to present these corridors and solicit public input.

Project U-2579A is the extension of Project U-2579 from US 421/I-40 Business to US 311. The termini of the proposed Project U-2579A alternatives are US 311 on the south and US 421/I-40 Business on the north. Projects U-2579 and U-2579A together extend from US 52 to US 311. Since a Preferred Alternative had already been selected for Project U-2579 prior to the decision to extend the project to US 311, alternatives for Project U-2579A were developed to tie into the southern terminus of the Project U-2579 Preferred Alternative at US 421/I-40 Business. A review of other potential Project U-2579A northern termini included evaluation of impacts both north and south of US 421/I-40 Business and it was determined there would be more impact at other locations. The location of the Project U-2579A southern terminus at US 311 was flexible.

Preliminary alternative segments were developed after the first Section 404/NEPA Merger meeting in February 2000 to discuss the purpose and need for Project U-2579A.

To develop preliminary alternatives, the Project U-2579A study area was divided into two parts: one from US 421/I-40 Business to I-40 and one from I-40 to US 311. Four preliminary alternative segments were developed between US 421/I-40 Business and I-40 and three alternative segments were developed between I-40 and US 311. They were discussed with the Section 404/NEPA Merger Team on February 8, 2001 at a meeting on Concurrence Points 1 (Purpose and Need) and 2 (Alternatives). They were also discussed with the Winston-Salem/Forsyth County Metropolitan Planning Organization (MPO) on March 23, 2001.

At the Concurrence Point 2 (Alternatives) meeting on April 18, 2001, the Section 404/NEPA Merger Team agreed to eliminate two preliminary alternative segments from further consideration, and requested that all Detailed Study Alternatives be evaluated both with and without an interchange at Kernersville Road. The remaining five segments were developed into six Detailed Study Alternatives, each with and without an interchange at Kernersville Road.

A public officials meeting and Citizens Informational Workshop were held on November 1, 2001 to present the project study corridors and a typical section of the proposed project. A supplemental DEIS to add Project U-2579A to Project U-2579 was underway when the decision was made in November 2001 to combine the environmental document for the Eastern and Western Sections of the Beltway.

The Project U-2579A Detailed Study Alternatives were discussed in the SFEIS/SDEIS (approved on October 1, 2004) for the combined Winston-Salem Northern Beltway. Detailed Study Alternatives were presented to the public at two pre-hearing open houses for the combined Northern Beltway (November 8 and 9, 2004), and a formal public hearing for Project U-2579A on December 2, 2004. Public comments provided are summarized in Section 6.2.3.3 of the SFEIS/FEIS, and are provided in full in Appendix C.4 of the SFEIS/FEIS.

The Merger Team met to discuss the LEDPA for Project U-2579A on January 25, 2005 and February 10, 2005, and agreed on Alternative N2-S1 with a single point urban interchange at Kernersville Road. The Merger Team signed the concurrence form on March 14, 2005.

2.1. Basis for Selection

FHWA chooses Alternative C3-WEST-B as its Selected Alternative for the Western Section of the Northern Beltway (Project R-2247). FHWA chooses Alternative 7 (Project U-2579) and Alternative N2-S1 with a single-point urban interchange at Kernersville Road Project U-2579A) as its Selected Alternative for the Eastern Section of the Northern Beltway (Projects U-2579 and U-2579A). For the entire Northern Beltway, FHWA chooses Alternative C3-WEST-B/Alternative 7/Alternative N2-S1 with a single-point urban interchange at Kernersville Road as its Selected Alternative.

The Selected Alternative was chosen for the reasons listed below, by section and as a whole:

From US 158 to US 52 (Project R-2247 – Western Section), Alternative C3-WEST-B was selected because it:

- Avoids impacts to community facilities (two schools and parkland);
- Avoids direct impacts to historic sites (Pfafftown Historic District and John Henry Kapp Farm);
- Has a more desirable interchange design and location with US 52
- Avoids potential impacts to Rural Hall associated with extending the roadway east of US 52
- Avoids crossing the confluence of the Muddy Creek and Silas Creek floodplains (a notable wildlife habitat);
- Is one of the least expensive alternatives;
- Is one of two alternatives with the fewest residential relocations; and
- Is one of two alternatives with the least floodplain impact.

From US 52 to US 421/I-40 Business (Project U-2579 – Eastern Section), Alternative 7 was selected because it:

- Is one of the alternatives with the fewest residential relocations;
- Has the shortest length and requires the least amount of land;
- Impacts the fewest high quality wetlands;
- Is one of the alternatives with the least impact to the Salem Lake Watershed;
- Has the least impact on neighborhoods;
- Was agreed to as the Least Environmentally Damaging Practicable Alternative by regulatory agencies (DWQ and USACE); and

- The southern terminus minimizes impacts when Project U-2579A is taken into account.

From US 421/I-40 Business (Project U-2579A – Eastern Section Extension), Alternative N2-S1 with an interchange at Kernersville Road was selected because it:

- Has the fewest relocations and the least impact on neighborhoods;
- Would have less negative economic impact by keeping US 311/Union Cross Road interchange open;
- Is preferred by the Town of Kernersville and the City of Winston-Salem;
- Would allow for a single-point urban interchange (SPUI) to be constructed at the Kernersville Road interchange;
- Is one of the alternatives with the least impact to streams;
- Provides best connectivity in Kernersville by keeping Sedge Garden Road open; and
- Was selected as the least environmentally damaging practicable alternative (LEDPA) by the Section 404/NEPA Merger Team.

As part of the process to identify the Selected Alternatives for Projects R-2247, U-2579, and U-2579A, the junctions or termini where these sections meet were examined. It was determined that:

- The location where the Western and Eastern Section Selected Alternatives cross US 52 is preferred because it provides acceptable interchange spacing on US 52 and minimizes impacts on Rural Hall; and
- The location where the Eastern Section and Eastern Section Extension Selected Alternatives cross US 421/I-40 Business is preferred because it provides acceptable interchange spacing on US 421/I-40 Business and minimizes impact to streams and to neighborhoods on both sides of US 421/I-40 Business.

Alternative C3-WEST-B/Alternative 7/Alternative N2-S1 with a single-point urban interchange at Kernersville Road is the environmentally preferable alternative because it:

- Best balances impacts to various resources with the need for transportation infrastructure;
- Has been chosen by the Merger Team as the Least Environmentally Damaging Practicable Alternative (LEDPA), which is Concurrence Point 3 in the Section 404/NEPA Merger process; and

- Takes into account all practicable measures to minimize harm, as discussed in Section 4 of this ROD.

2.2. Description of the Selected Alternative

The location of the Selected Alternative is shown in **Figure 1 (Appendix A)**. The total length of the Selected Alternative is 34.2 miles.

Project R-2247

The Project R-2247 Selected Alternative is Detailed Study Alternative C3-WEST-B. It is 17.4 miles long. The Project R-2247 Selected Alternative begins at US 158 (Stratford Road) near the southwestern limits of Winston-Salem. It extends north on new location to the west of Winston-Salem, crossing Ploughboy Lane and McGregor Road before reaching an interchange with I-40.

The Selected Alternative continues north, crosses Peace Haven Road, and has an interchange with US 421. Because of the close spacing between the interchanges along US 421, modifications are proposed to the existing US 421/Peace Haven Road interchange and the US 421/Styers Ferry Road-Lewisville-Clemmons Road interchange.

The Selected Alternative then continues north to cross Styers Ferry Road and has interchanges at Shallowford Road, Robinhood Road, and Yadkinville Road. After the interchange at Yadkinville Road, the Selected Alternative continues to the north crossing Skylark Road and Balsom Road before reaching an interchange with NC 67 (Reynolda Road).

The Selected Alternative then turns to the east and comes to an interchange with Bethania-Tobaccoville Road. It then crosses Bethania-Rural Hall Road and ends at a freeway-to-freeway interchange with US 52, which includes a nested minor interchange with Bethania-Rural Hall Road.

Project U-2579

The Project U-2579 Selected Alternative is Detailed Study Alternative 7, which is a combination of the Western and Eastern Alternatives using Crossover 4. It is 12.4 miles long.

The Selected Alternative begins at the NC 66 Connector just east of US 52. It extends east on a new location crossing University Parkway with an interchange, generally paralleling Old Hollow Road (NC 66) about one-half mile to the north of NC 66. It then crosses Stanleyville Drive and interchanges with NC 8 (Germanton Road) about 0.3 miles north of the intersection of NC 66 and NC 8. The Selected Alternative crosses NC 66 just east of Old Rural Hall Road and proceeds in a southeast direction, generally paralleling NC 66 on its south side. It then interchanges with Baux Mountain Road and crosses Davis Road before crossing Dippen Road south of the intersection of Dippen Road and Day Road. It crosses Old Walkertown Road near Northampton Drive and interchanges with New Walkertown Road (US 311) south of Williston Road.

The Selected Alternative transitions from the Western Alternative near US 311 to the Eastern Alternative near US 158 (Reidsville Road) using Crossover 4. The Selected Alternative follows the Eastern Alternative in a southeast direction and interchanges with US 158 about 0.9 miles south of the intersection of Darrow Road and US 158. Continuing in the same direction, it crosses Old Belews Creek Road, Walkertown-Guthrie Road, and West Mountain Street about one mile west of its intersection with NC 66. The Selected Alternative extends to a proposed interchange with US 421/I-40 Business located 0.8 mile east of the Hastings Hill Road bridge.

Project U-2579A

The Project U-2579A Selected Alternative is Detailed Study Alternative N2-S1 with an interchange at Kernersville Road. It is 4.4 miles long.

The Selected Alternative begins at the southern terminus of Project U-2579 at US 421/I-40 Business. From this point, it curves to the southwest, crossing both Hastings Hill Road and Sedge Garden Road. It then curves slightly to the east to an interchange at Kernersville Road. South of Kernersville Road, the Selected Alternative continues southeast along Oak Grove Road, and then continues southward to an interchange at I-40 about 1,000 feet west of Oak Grove Road. South of I-40, the Selected Alternative curves to the southwest, crosses Glenn Hi Road and High Point Road, and terminates in an interchange at US 311.

2.3. Cost Estimates

During the preparation of the SFEIS/FEIS, right of way and construction cost estimates were updated for each of the Selected Alternatives. These estimates are presented in **Table 1**.

Project R-2247

The construction and right-of-way cost estimates for the Project R-2247 Selected Alternative were updated in March 2006. The total estimated cost to complete right of way acquisition and construct the project is \$414.6 million dollars. Of this amount, \$340.4 million is for construction, \$15.0 million is for utility relocations, and \$59.2 million is for right of way. The NCDOT 2007-2013 TIP lists a total cost of \$447,225,000 for Project R-2247, including \$57,325,000 in previous expenditures.

Project U-2579

Costs estimates for the Project U-2579 Selected Alternative were updated in October 2005 through January 2006. The total estimated cost to complete right of way acquisition and construct the project is \$445.2 million dollars. Of this amount, \$291.1 million is for construction, \$4.0 million is for utility relocations, and \$150.1 million is for right of way. The NCDOT 2007-2013 TIP lists a total cost of \$485,197,000 for Project U-2579.

Project U-2579A

Costs estimates for the Project U-2579A Selected Alternative were updated in September through December 2005. The total estimated cost to complete right of way acquisition and construct the project is \$215.8 million dollars. Of this amount, \$154.2 million is for construction, \$1.5 million is for utility relocations, and \$60.1 million is for right of way. The NCDOT 2007-2013 TIP lists a total cost of \$214,300,000 for Project U-2579A.

The NCDOT 2007-2013 TIP lists a total cost of \$699,497,000 for Projects U-2579 and U-2579A, including \$39,937,000 in previous expenditures.

Table 1: Summary of Estimated Costs (2005-2006 dollars)

Northern Beltway Project	Estimated Costs (in millions of dollars)			Total
	Right of Way Completion	Utilities	Construction	
Project R-2247	\$ 59.2	\$ 15.0	\$ 340.4	\$ 414.6
Project U-2579	\$ 150.1	\$ 4.0	\$ 291.1	\$ 445.2
Project U-2579A	\$ 60.1	\$ 1.5	\$ 154.2	\$ 215.8
Total	\$ 269.4	\$ 20.5	\$ 785.7	\$ 1,075.6

2.4. Summary of Impacts

Evaluation criteria in the SFEIS/FEIS included community cohesion, home and business relocations, impacts to community facilities, environmental justice, economic impacts, land use and transportation plan impacts, traffic noise impacts, air quality, farmland impacts, utility and railroad impacts, visual impacts, hazardous materials sites, floodplain and floodway impacts, historic architectural and archaeological resources, biotic community and wildlife impacts, water quality impacts, wetland and stream impacts (including Section 404 jurisdictional issues), Section 4(f) resources, construction impacts, and indirect and cumulative effects. Each of these topics is discussed in Section 4 of the SFEIS/FEIS. The basis for selection of the Northern Beltway Selected Alternative is discussed in Section 2.1, above. A summary of impacts associated with the Selected Alternative is presented in **Table 2**.

Table 2: Direct Environmental Consequences – Northern Beltway Selected Alternative

Environmental Issue	Impact
Length (miles)	34.2
Estimated Costs¹	
Construction Costs (millions \$)	785.7
Right-of-Way Costs to Complete (millions \$)	269.4
Utility Costs (millions \$)	20.5
Total Costs (millions \$)	1,075.6
Relocation Impact Summary²	
Residences (total)	1,013
Owner-occupied	888
Tenant-occupied	125
Minority-occupied (owners or tenants)	155
Businesses	60
Community Services and Facilities Impact Summary	
Schools	1 ^{3,4}
Parks & Recreational Facilities	0
Churches & Cemeteries	7 ^{4,5}
Other Community Facilities	0
Utilities⁶	
Electrical Easement Crossings	9
Electrical Substations	0
Major Gas Mains	2
Directional Radio Antenna Arrays	0
Railroad Crossings	3
Historic Architectural and Archaeological Resources Impact Summary	
# of Archaeological sites requiring preservation in place ⁷	0
# of Historic Resources with No Adverse Effect	4
# of Historic Resources with Adverse Effect	1
Section 4(f)/6(f) Resources Impact Summary	
Section 4(f) Resources	0
Section 6(f) Resources	0
Air Quality Impact Summary	
Intersections Exceeding Carbon Monoxide NAAQS	0
Noise Impact Summary	
# of Impacted Receptors – with mitigation in place	271
Hazardous Materials Impact Summary	
Number of Potentially Impacted Hazardous Materials Sites	19
Major Drainage Structure Summary	
Number of Bridges over Streams	18
Number of Crossings with Major Culverts (> 72 inches in diameter)	37

Environmental Issue	Impact
Floodways and Floodplains Impact Summary	
Floodplains/Floodways (# of crossings)	22
Number of Crossings Requiring Floodway Modification	13
Biotic Communities Impact Summary (acres)	
Piedmont/Low Mountain Alluvial Forest	106
Piedmont Bottomland Forest	12
Dry Oak-Hickory Forest	63
Dry Mesic Oak-Hickory Forest	581
Mesic Mixed Hardwood Forest	174
Maintained/Disturbed	1,160
Agriculture	369
Cut-Over	59
Successional Pine Forest	1
Pine Plantation	77
Farmland Impact Summary	
Acres of Land Zoned as Agricultural	206
Acres of Land Designated as Rural Area	424
Acres of Prime, Statewide, and Local Important Farmland Soils Impacted	1,380
Prime, Statewide, and Local Important Farmland Impacts ⁸	0
Jurisdictional Issues Summary	
Acres of Wetlands Impacted	7.48
Number of Wetland Crossings	45
Acres of Ponds Impacted	24.71
Number of Pond Crossings	23
Total Linear Feet of Impacted USACE Mitigable Streams	35,665
Total Linear Feet of Relocated Streams	6,189
Number of Stream Crossings	120
Protected Species Impact Summary	
Bog Turtle (<i>Clemmys muhlenbergii</i>) ⁹	N/A
Red-Cockaded Woodpecker (<i>Picoides borealis</i>)	No Effect
Small-Anthered Bittercress (<i>Cardamine micrantha</i>)	No Effect

Impacts were based on revised preliminary engineering designs for the Project R-2247, U-2579, and U-2579A Selected Alternatives.

¹ Based on 2005-2006 cost estimates for Projects R-2247, U-2579, and U-2579A Selected Alternatives.

² Based on 2005 relocation reports for U-2579 and U-2579A Selected Alternatives, and 2003 relocation reports for R-2247 Selected Alternative.

³ Sedge Garden Elementary School; temporary impact from Sedge Garden Road detour.

⁴ Impact to property does not impact school or church facilities.

⁵ Mount Pleasant Christian Church.

⁶ Interchange ramp design may cause multiple crossings of the utility corridor at locations of planned interchanges.

Only one crossing is noted in the table for each of these locations.

⁷ Site 31FY1053(**) in the Project U-2579 study area requires further study.

⁸ Impacts based on NRCS Assessment with all scores from Form AD-1006 (Farmland Conversion Impact Rating) less than 160 points.

⁹ This species is not biologically endangered or threatened and is not subject to Section 7 consultation.

Issues that are not quantified in the table are summarized below.

Land Use and Transportation Planning. The Northern Beltway is consistent with state and local transportation plans in the area.

Public Safety. The Northern Beltway will have an overall beneficial impact on the level of public safety in the study area. Project U-2579 crosses the southern corner of Gospel Light Baptist Church and Christian School, but is not expected to have any impact on pedestrians or drivers accessing the church and school site. Project U-2579A would temporarily detour Sedge Garden Road, which would have a minor, temporary impact on Sedge Garden Elementary School. This detour would impact approximately 0.35 acres of school property, but is not anticipated to negatively affect school operations. The southern end of the realigned road is located between the existing access points of the circular driveway in front of the school, crossing the north exit, which would temporarily impact drivers utilizing that driveway during construction of the new road.

Environmental Justice. The Northern Beltway will not have an adverse or disproportionate impact on minority and/or low-income populations.

Visual Impacts. The Northern Beltway will have visual impacts to the area. Although the roadway will diminish the rural, pastoral atmosphere of much of the affected area, the growth plan described in *The Legacy Plan* indicates that much of the study area will be changing from the existing rural atmosphere to one of a more developed, suburban character due to anticipated residential development. The roadway probably will not be visible from areas other than the immediate vicinity due to the natural change in elevation, the extensive areas of cut in areas out of the floodplain, and tall trees in the area.

Mineral Resources. No known mines or quarries are located in the immediate vicinity of the project study area. Therefore, the project will not adversely impact such resources through conversion of their existing land uses.

There are two Forsyth County rock quarries and numerous concrete plants located throughout the county. With a ready source for these materials, construction of the Northern Beltway is not expected to cause a local shortage of construction materials. No other known mineral resources will be impacted as a result of the proposed projects.

Soils. The soils within the project study area are composed of four main associations: Pacolet-Cecil, Madison-Pacolet, Chewacla-Wehadkee-Congaree, and Wedowee-Louisburg. 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 will be determined during final design.

Water Quality. Stormwater runoff rates likely will increase slightly due to the increase in impervious surface area. This is an unavoidable, long-term impact resulting from construction of the Northern Beltway in whole or in part. The proposed action also has the potential to temporarily degrade the quality of water in the surrounding streams as a result of soil erosion and sedimentation during construction. Implementation of NCDOT's *Best Management Practices for the Protection of Surface Waters* will minimize these impacts. Quantitative water quality modeling will be conducted for the selected alternatives as part of the Section 401 Water Quality Certification process.

Indirect and Cumulative Impacts. The methods described in the *NCDOT Indirect and Cumulative Impact Guidance Manuals (Volumes I and II)* were followed to assess the indirect and cumulative impacts of the Winston-Salem Northern Beltway. Four analysis scenarios were chosen for the indirect and cumulative assessment of the Winston-Salem Northern Beltway. These are listed below:

- No-Build
- Partial Build Alternative: Build-West – Build Project R-2247 (Western Section) only
- Partial Build Alternative: Build-East – Build Projects U-2579 and U-2579A (Eastern Section and Eastern Section Extension) only
- Full-Build Northern Beltway (Projects R-2247, U-2579, and U-2579A)

The time frame for the analysis is the year 2025. The overall study area for the indirect and cumulative impact evaluation is Forsyth County. Potential changes to general land use, accessibility, and development potential/attractiveness were evaluated in this study area. Traffic Analysis Zones (TAZs) used in the Piedmont Triad Regional Traffic Model were used for most of the quantitative analysis.

Overall conclusions of the indirect and cumulative effects assessments are summarized below. These must be tempered by the inherent uncertainty associated with future economic and policy conditions.

- The underlying land use pattern in Forsyth County is, and has been for several decades, a low-density suburban growth pattern characteristic of many urban areas in the Southeast. Winston-Salem/Forsyth County has made notable strides in managing this growth, particularly with consideration of protecting open space in outlying areas of the county.
- The TAZs that are expected to face the greatest development pressures over the next 20 years (i.e. with the greatest projected increases in housing and employment) do not vary regardless of whether the Northern Beltway or any of its segments are constructed. However, pace of development may be slightly accelerated and the nature of the development may change partially as a result of the construction of the Northern Beltway at these high growth zones.
- Building the Northern Beltway, or any of its individual segments, does not appreciably increase the amount of suburban type development in Forsyth County, although a greater variety of land uses will be attracted to future interchange locations. The greatest increase in land use in any TAZ that is attributable to the implementation of any build scenario is between three and five percent over the No-Build scenario. In some cases, these growth areas are being actively planned for by the community and are considered desirable changes over the No-Build case.
- The Northern Beltway, in whole or in part, will have a small effect on the desirability of given tracts of land over other, similar tracts of land (tracts near the beltway tend to have slight gains in total employment or housing relative to the No-Build Scenario).
- Development, particularly commercial development, near the proposed interchanges is more likely in the Build cases than in the No-Build case. This is evident from the results of the gravity allocation model, research findings, and comparative case studies of other interchange areas across the State.
- The FHWA's SMITE model was used to provide an estimate of induced travel that may occur related to the Winston-Salem Northern Beltway (Section 4.20.2.2 of the SFEIS/FEIS defines terminology used in the indirect and cumulative impacts analysis). In 2025, induced travel for all reasonably foreseeable projects is estimated to be approximately 1.80 percent of total travel. Induced travel with only the Northern Beltway is approximately 1.05 percent. Based on this analysis, it can generally be concluded that the amount of induced travel resulting from construction of the Northern Beltway is not appreciable when examined as a portion of vehicle miles traveled throughout the region.

In summary, the indirect effects attributable solely to the Northern Beltway projects (Projects R-2247, U-2579, and U-2579A) are relatively small, but should be placed in an

appropriate context with public policy, available land for conversion to higher-intensity uses, other public infrastructure projects, and market conditions.

Cumulatively, the Northern Beltway, in conjunction with other public and private projects, places some additional pressures from induced development, induced travel, and encroachment-alteration effects on communities, natural habitat, and water quality.

While the magnitude of these changes is difficult to quantify with certainty, the nature of the land use changes, the features that may be sensitive to change, and the locations most susceptible to indirect/cumulative effects have been identified. Local governments and stakeholder groups should be prepared for these changes, and be proactive in mitigating for their negative effects while maximizing positive benefits from the proposed Beltway Projects.

3. Section 4(f)

Section 4(f) of the United States Department of Transportation Act of 1966, as amended, states that the Secretary may approve a transportation program or project (other than any project for a park road or parkway under section 204 of title 23) requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by the Federal, State, or local officials having jurisdiction over the park, area, refuge, or site) only if:

- 1) there is no prudent and feasible alternative to using that land; and
- 2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from that use.

Several historic sites and districts in the project area were determined to be eligible for listing in the National Register of Historic Places (NRHP) (see Section 4.7.2, below). The proposed action will not use land eligible for protection under this act, and therefore there is no involvement under Section 4(f).

4. Measures to Minimize Harm

Measures to minimize harm through coordination, avoidance, minimization, mitigation and environmental commitments are discussed in detail in the SFEIS/FEIS in Section 4

(Environmental Consequences), and in the Special Project Commitments (Green Sheets) included in Appendix B of this document.

4.1. Relocations

The Northern Beltway Selected Alternative will impact a total of 1,013 residences, 60 businesses, one farm, and one church. Of the residential relocations, 888 are owners (88%), 125 are tenants (12%), and 155 are minorities (15%). As discussed in Section 2.1, the Selected Alternative was chosen in part because it had fewer residential relocations than all but one of the other alternatives.

During the Section 404/NEPA Merger process, residential relocations were reduced by six following a modification to the interchange of the Northern Beltway Selected Alternative at Bethania-Tobaccoville Road, which was made to avoid an adverse effect on the Samuel Stauber House and Barn, a property listed on the National Register of Historic Places. Copies of the NCDOT Relocation Reports for all projects are in Appendix G of the SFEIS/FEIS.

All relocations will be done in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), the North Carolina Relocation Assistance Act (GS-133-5 through 133-18), and the NCDOT Relocation Assistance Program. The NCDOT Relocation Reports indicated that suitable replacement business sites and residences were available based upon discussions with area realtors, newspaper listings, and visual survey. Adequate housing will be available if the project is split into phases, although rental housing may present a problem for low income tenants. Where displacement would force an owner or tenant to purchase or rent property at higher cost or to lose a favorable financing arrangement (in case of ownership), the Relocation Replacement Housing Payments or Rent Supplement Program would compensate up to \$22,500 to owners who are eligible and qualify, and up to \$5,250 to tenants who are eligible and qualify.

4.2. Community Services and Facilities

The Northern Beltway Selected Alternative was chosen in part to minimize impacts to community facilities. The Selected Alternative will require the relocation of one church (Mount Pleasant Christian Church). Outreach to discuss opportunities for mitigation were made to members of the Mount Pleasant Christian Church, a minority church. NCDOT staff met with the pastor and board members of Mount Pleasant Christian Church during one of the public meetings in November 2004.

The Selected Alternative also will take some land and outbuildings from six other churches, but will not relocate any church buildings. It will impact the property of one school (Sedge Garden Elementary School), but will not take school buildings or playground facilities. One of the reasons the Project R-2247 Selected Alternative was chosen was because it avoids impacts to two schools and a park.

4.3. Public Safety

Fog is potentially an issue in the study area. No fog-related safety devices are currently proposed under this project. In accordance with NCDOT normal operating procedures, fog-related safety issues are evaluated on projects on a case-by-case basis after the projects are constructed.

The Northern Beltway Selected Alternative was designed to minimize impacts on the safety of pedestrians and drivers accessing nearby schools. The temporary detour of Sedge Garden Road for Project U-2579A may result in a minor temporary impact to drivers utilizing the circular driveway, and pedestrians crossing Sedge Garden Road in front of Sedge Garden Elementary School. The Green Sheets include a commitment by NCDOT to ensure the safety of students bicycling and/or walking to Sedge Garden Elementary School during construction.

4.4. Community Cohesion

The Northern Beltway Selected Alternative was chosen in part to minimize disruption to communities in the study area. One of the reasons for selecting the Project U-2579 and U-2579A Selected Alternatives was that they had the least community cohesion impact. Mitigation has been incorporated into the Selected Alternative, including providing road connections across the Northern Beltway based on comments received on the SFEIS/SDEIS and at the 2004 public hearings, and from meetings with the Town of Kernersville. The Project U-2579A Selected Alternative preliminary design plans were revised so that Hastings Hill Road, High Point Road, and Pisgah Church Road would retain their connections across the Northern Beltway. The purpose of the additional crossings is to maintain continuity of major surface streets and to mitigate for the divisions created to the transportation network of the Beltway.

4.5. Environmental Justice

The US Department of Transportation and FHWA require the evaluation of effects of transportation actions on minority and low-income groups. In particular, Executive

Order 12898, Federal Actions to Address Environmental Justice in Minority and Low Income Populations (February 11, 1994) directs all federal agencies to determine whether a proposed action would have an adverse or disproportionate impact on minority and/or low-income populations. Based on review of 2000 Census data, it was determined that this project will not have a disproportionate adverse effect on minority or low-income communities.

The Northern Beltway Selected Alternative avoids passing through the centers of all neighborhoods and subdivisions wherever possible. The design includes mitigation for lessening the impacts on all neighborhoods, including bridging for access across the Northern Beltway where feasible and practical, providing new access routes if bridging is not practical, constructing noise abatement barriers, and providing visual barriers or vegetative screens.

Additional outreach to discuss opportunities for mitigation were made to members of the Mount Pleasant Christian Church, a minority church, and residents of North Oaks, a minority community, both impacted by the Project U-2579 Selected Alternative. Outreach to affected minorities included a meeting with residents of the North Oaks community and continuing communication with community representatives. Following the meeting, the preliminary design was modified to reduce impacts and address community concerns. The original design created a cul-de-sac on Northampton Road. NCDOT intends to maintain this connection, and has modified the plans to include a grade separation on Dippen Road. The final design will be developed based on design constraints and cost considerations. NCDOT staff also met with the pastor and board members of Mount Pleasant Christian Church during one of the public meetings in November 2004.

4.6. Utilities and Infrastructure

The Northern Beltway Selected Alternative will require some adjustment, relocation, or modification to existing public utilities in the study area. These impacts will be short-term and restricted to the construction period. Coordination with utility providers will be maintained during design and construction to ensure that any service disruptions are minimized.

4.7. Cultural Resources

4.7.1. Archaeological Resources

The Northern Beltway Selected Alternative will have an effect on 12 archaeological sites determined eligible for listing in the NRHP (31FY888, 31FY893**, 31FY901, 31FY902**, 31FY903, 31FY910**, 31FY911**, 31FY912**, 31FY921, 31FY925**, 31FY944, and 31FY1053/1053**). A Memorandum of Agreement (MOA) regarding minimizing impacts to these sites has been executed by FHWA and the State Historic Preservation Officer (SHPO), and concurred with by NCDOT (a copy of the MOA is in Appendix D.1 of the SFEIS/FEIS). As outlined in the MOA, NCDOT will develop Data Recovery Plans (DRP) for each site, and will ensure that each DRP is implemented. Upon completion of each data recovery effort, NCDOT will prepare a Management Summary detailing the results of the data recovery field investigations. Data recovery is the appropriate mitigation, and preservation in place is not anticipated for any of these archaeological sites.

A portion of the Selected Alternative, as it presently exists, remains to be surveyed due to access problems. Intensive survey will be conducted for these areas after acquisition of right of way, but prior to construction. SHPO concurrence of this course of action is contained in letters in Appendix D.1 of the SFEIS/FEIS. Sites worthy of preservation-in-place are not likely. The Project Commitments (“Green Sheets”) in the SFEIS/FEIS (also included in this ROD) lists NCDOT’s commitments to minimizing impacts to archaeological sites.

4.7.2. Historic Architectural Resources

Historic architectural studies were conducted pursuant to Section 106 of the National Historic Preservation Act of 1966 and the *Advisory Council on Historic Preservation Regulations for Compliance with Section 106*, codified as 36 CFR Part 800. All concurrence forms from the SHPO are in Appendix D.1 of the SFEIS/FEIS.

The Northern Beltway Selected Alternative will have an Adverse Effect on one property eligible for the NRHP (Project R-2247), No Effect on two properties eligible for the NRHP (Project U-2579), and No Adverse Effect on four properties listed on or eligible for the NRHP (two on Project R-2247 and two on Project U-25279). More detail on each impact is below.

Project R-2247

The Project R-2247 Selected Alternative will have an Adverse Effect on one property eligible for the NRHP, the Alexander Hege House. Although the Selected Alternative will take no land from the site, it will introduce an interchange immediately adjacent to the northern boundary of the site altering the character of the property's setting and diminishing its integrity. However, this indirect effect will not constitute a constructive use of this historic property under Section 4(f). Because of the determination of Adverse Effect, the Hege House was included in an MOA executed by FHWA and SHPO, and concurred with by NCDOT and in consultation with the owner of the Hege House (see copy of MOA in Appendix D.1 of the SFEIS/FEIS). The MOA specifies that NCDOT will photographically record the existing conditions of the Hege House and its surroundings prior to construction, that the driveway will be aligned opposite the proposed ramp and will be under signal control, that access control fencing be designed in consultation with SHPO prior to its installation by NCDOT, and that NCDOT will provide tree protection and limit disturbance of plantings along the National Register boundary. The owner may pursue a preservation easement for the house.

Originally, based on the 1992 functional designs, the effect on the Samuel Stauber House and Barn was Adverse effect. In the 1996 Project R-2247 FEIS, the Preferred Alternative was considered to have No Adverse Effect on two properties, the John Henry Kapp Farm and the Samuel Stauber House and Barn, based on the 1995 preliminary engineering design. The revised determination of No Adverse Effect to the Samuel Stauber House and Barn resulted from the relocation of the alignment in the preliminary design approximately 300 feet farther away from the property.

During the service road studies for the Bethania-Tobaccoville Road area conducted during final design activities after the 1996 Project R-2247 FEIS, the determination of effect to the Samuel Stauber House and Barn was changed again to Adverse Effect based on concern that a service road's fill would adversely effect the historic site's setting. In response, Bethania-Tobaccoville Road and the interchange were relocated about 860 feet east. Based on this new design, which was incorporated into the 2002 preliminary engineering design, the Selected Alternative will have No Adverse Effect on the Samuel Stauber House and Barn.

In the 1996 Project R-2247 FEIS, the Preferred Alternative was considered to have No Adverse Effect on the John Henry Kapp Farm. The SHPO agreed with the previous determination of No Adverse Effect on the John Henry Kapp Farm with the condition

that NCDOT shall not approve any more driveway permits along the property of the John Henry Kapp Farm within the right of way of the Preferred [Selected] Alternative.

Project U-2579

The SHPO concurred that the Project U-2579 Selected Alternative has No Adverse Effect With Commitment (no net effect) on the Clayton Family Farm, No Effect on Seaver's Gulf Station, No Adverse Effect on the Hammock Family Farm, and No Effect on the John and Charles Fries Day Farm.

The historic property boundary of the Clayton Family Farm was expanded when the site was listed on the NRHP in 2001. Due to the revised boundary, the original alignment of the Selected Alternative in that location would have directly impacted the Clayton Family Farm. As a result, the Selected Alternative alignment was shifted to avoid impact to the site. Stanleyville Drive will be closed during construction of the grade separation to avoid impact to the Clayton Family Farm. Minor temporary construction easements will be needed during construction, but there will be no permanent encroachment, and the impacted portion of the property will be restored to its original condition. The SHPO determined that the Project U-2579 Selected Alternative would have No Adverse Effect on the Clayton Family Farm with the condition that any trees that would be removed during construction will be replaced with a similar species.

After consultation between FHWA, SHPO, and NCDOT, it was determined that there would be No Adverse Effect to the Hammock Family Farm provided that no construction occurs within the historic boundary; that there would be No Effect to Seaver's Gulf Station; and that since there were no design changes in the Selected Alternative near the John and Charles Fries Day Farm, the previous determination of No Effect is still applicable.

Project U-2579A

There are no properties within the Project U-2579A Selected Alternative that are listed on or identified as eligible for the NRHP.

4.8. Section 4(f) and 6(f) Resources

The Northern Beltway Selected Alternative was chosen in part to avoid all direct impacts to Section 4(f) and Section 6(f) resources.

4.9. Air Quality

Based on microscale modeling, the Northern Beltway Selected Alternative is not predicted to cause exceedance of the National Ambient Air Quality Standard for carbon monoxide. The Winston-Salem Northern Beltway is currently included in the approved *Winston-Salem Urban Area 2030 Multi-Modal Long Range Transportation Plan (LRTP)*, which conforms to the intent of the State Implementation Plan (SIP). The USDOT made a conformity determination on the 2030 LRTP on October 1, 2005. The current conformity determination is consistent with the final conformity rule found in 40 CFR Parts 51 and 93.

4.10. Noise

A total of 498 noise receptors will be benefited by mitigation (noise walls) as part of the Northern Beltway Selected Alternative. The construction of noise walls was found to be reasonable and feasible in 19 locations – eleven under Project R-2247, four under Project U-2579, and four under Project U-2579A. Noise walls will be provided at the recommended locations pending property owner consensus per NCDOT policy. In addition, NCDOT will prepare a design noise study and will provide additional walls if warranted under NCDOT policy.

Project R-2247

Eleven noise barriers are recommended for the Project R-2247 Selected Alternative. These are shown on Figures 4-3(a-d) of the SFEIS/FEIS. The recommended noise barrier locations are: Lake Forest subdivision; Dorchester subdivision; Creekview subdivision on Vestal Road; Forest Village subdivision along Village Oak Drive; Moravian Heights subdivision; Nottingham subdivision; the southeast quadrant of the Shallowford Road interchange; west of I-40 and west of the Selected Alternative; near Peace Haven Road east of the Selected Alternative and south of US 421; north of the Selected Alternative and north of Rockingham Drive between US 158 and Ploughboy Lane; and north of the Yadkinville Road interchange, west of the Selected Alternative and south of Skylark Road.

A total of 242 noise receptors will be benefited by ten of the eleven noise barriers. The noise barrier at the Shallowford Road interchange was shown to the public at the 1996 Design Public Hearing, but this barrier was not included in the 1996 Project R-2247 FEIS. No additional information is available about this barrier, including the number of benefited receptors. The public has been presented the noise barrier recommendations included in the 1996 Project R-2247 FEIS, as well as those included on the Design Public

Hearing Map. As a result, the NCDOT will provide noise barriers at the locations shown in the 1996 Project R-2247 FEIS and on the Design Public Hearing Map.

Project U-2579

The Project U-2579 Selected Alternative will impact a total of 242 noise receptors. Six noise barriers are recommended, shown on Figure 4-5(a-b) of the SFEIS/FEIS. The recommended noise barrier locations are: one on either side of Davis Road on the north side of the Selected Alternative; Old Walkertown Road to northwest of US 311 on the south side of the Selected Alternative; west of Williston Road on the north side of the Selected Alternative; north of West Mountain Road on the north side of the Selected Alternative; and in the southeast quadrant of the interchange with US 421/I-40 Business. A total of 105 noise receptors will be benefited by the six noise walls.

Project U-2579A

The Project U-2579A Selected Alternative will impact a total of 218 noise receptors. Four noise barriers are recommended, shown on Figure 4-7 of the SFEIS/FEIS. The recommended noise barrier locations are: between I-40 and Kernersville Road; the northwest quadrant of the I-40 interchange; the southeast quadrant of the I-40 interchange; and east of the US 311 interchange. A total of 151 noise receptors will be benefited by the four noise walls.

4.11. Farmland

According to the FPPA, lands that receive a combined score of less than 160 points from the land evaluation and site assessment criteria are not covered by the Act. Since the soils impacted by the Northern Beltway Selected Alternative did not meet the threshold of protection based on the evaluation under the FPPA, the impact to prime and state/locally important farmland is not considered under the Act.

4.12. Water Resources

The Northern Beltway Selected Alternative's preliminary design avoids and minimizes impacts to streams and wetlands where possible. The Section 404/NEPA Merger Team discussed and agreed upon bridge lengths over streams and wetlands (Concurrence Point 2A) and avoidance and minimization measures associated with stream and wetland impacts (Concurrence Point 4A). The Concurrence Point 2A and 4A meetings are discussed in Section 6.1.1.2 (Project R-2247) and Section 6.1.2.3 (Projects U-2579 and U-2579A) of the SFEIS/FEIS. Section 404/NEPA Merger Team meeting minutes are in Appendix D.4 of the SFEIS/FEIS.

Bridges are included at 18 locations to reduce impacts. During the Concurrence Points 2A and 4A meetings, impacts to streams and wetlands were further reduced by:

- adjusting the preliminary design where possible;
- providing additional openings to provide wildlife crossings where appropriate;
- shortening culvert lengths where possible, including the use of 2:1 slopes and daylighting systems between culverts in interchange areas where possible; and
- changing proposed culverts to bridges at Mill Creek No. 3 and Grassy Creek (Project R-2247); Mill Creek, Martin Mill Creek, and Lowery Mill Creek (Project U-2579); and Smith Creek (Project U-2579A).

During final design and the Section 404 permitting process, additional measures will be taken to minimize and mitigate for wetland impacts. Some stream impacts will be mitigated on-site; that is, within the project's right of way. To date, the Merger Team has discussed possible on-site mitigation opportunities, and will continue to do so during Concurrence Points 4B and 4C of the Section 404/NEPA Merger process. Once on-site opportunities are exhausted, compensatory mitigation will be provided by the Ecosystem Enhancement Program (EEP) in accordance with the 2003 Memorandum of Agreement signed by the US Army Corps of Engineers, the NC Department of Environment and Natural Resources, and NCDOT.

NCDOT has already ordered mitigation from EEP for Projects U-2579 and U-2579A based on impacts presented in the SFEIS/FEIS. This is a conservative estimate for required mitigation since on-site mitigation will first be used where available. Wetland mitigation for Project R-2247 is already in place. Stream mitigation for Project R-2247 will be discussed during Concurrence Points 4B and 4C. Section 4.17 in the SFEIS/FEIS provides further discussion of jurisdictional issues and mitigation, including completed mitigation for Project R-2247.

4.12.1. Water Quality

The Northern Beltway Selected Alternative has the potential to temporarily degrade the quality of water in the surrounding streams as a result of soil erosion and sedimentation during construction. Cumulative direct impacts to water quality from the Northern Beltway Selected Alternative will be minimized through adherence to NCDOT's *Best Management Practices for the Protection of Surface Waters* (June 1991). In addition, a detailed sediment and erosion control plan will be developed and implemented, including mitigation measures listed in Section 4.13 of the SFEIS/FEIS.

4.12.2. Stream Impacts

The Northern Beltway Selected Alternative will impact a total of 52,572 linear feet of streams, 35,665 linear feet of which are mitigable. It will relocate 6,189 linear feet of streams, 5,744 linear feet of which are mitigable. The Selected Alternative will not impact any streams on the 303(d) list (defined under Section 303(d) of the Clean Water Act) or any High Quality Waters. The Project U-2579A Selected Alternative was chosen in part because it is one of the alternatives with the fewest impacts to streams.

The Selected Alternative was chosen in part to minimize impacts to existing stream channels. Mitigation will be provided for important stream channel impacts. Complete bridging of the stream channel will not require mitigation, but construction of standard concrete or metallic culverts will require mitigation for the disturbed stream channel. If channel relocations are required in the right of way, they will be designed using natural channel design techniques and will be self mitigating. Relocated streams are considered mitigated impacts.

NCDOT has committed to implement sedimentation and erosion control measures that adhere to the Design Standards in Sensitive Watersheds (15A NCAC 04B.0124) for streams that are on the 303(d) list of impaired waters for sedimentation impairment, and for streams that are in High Quality Water (HQW) zones. The Northern Beltway Selected Alternative would not impact any streams listed on the 303(d) list of impaired waters for sedimentation impairment, would not impact any streams classified as High Quality Waters, and would not impact any Critical Water Supply Watersheds. The Design Standards in Sensitive Watersheds would not be applicable for this project.

4.12.3. Wetlands

The Selected Alternative will impact a total of 7.48 acres of wetlands, including 1.65 acres of low quality wetlands (22%), 2.92 acres of medium-quality wetlands (39%), and 2.91 acres of high-quality wetlands (39%). The Project U-2579 Selected Alternative was chosen in part because it impacts the fewest high quality wetlands.

4.12.4. Floodways and Floodplains

The Northern Beltway Selected Alternative's preliminary design avoids and minimizes impacts to floodways and floodplains where possible. The Selected Alternative will cross 22 floodplains or floodways, including eleven by Project R-2247 (eight minor and three major crossings), nine by Project U-2579 (seven minor and one major crossings),

and two by Project U-2579A (one major and one minor crossing). (Three of the five crossings by Project U-2579A are shared with Project U-2579). It is anticipated that 13 of these crossings will require floodway modifications. The Project R-2247 Selected Alternative was chosen in part because it is one of two alternatives with the least floodplain impact.

For all major encroachments, a Conditional Letter of Map Revision will be required to be submitted to the County's floodzone administrator and coordinated with the Federal Emergency Management Agency (FEMA) in compliance with the Forsyth County Flood Damage Prevention Ordinance and the National Flood Insurance Program Rules and Regulations.

Regulatory floodplains within the study area were identified in accordance with Executive Order 11988: Floodplain Management, which prohibits floodplain infringements when uneconomical, hazardous, or incompatible land use of floodplain results. Any action within the limits of the floodplains that would involve critical interruption of a necessary transportation facility, a substantial flood risk, or a sizeable impact on the natural values of the floodplain would be considered as such an encroachment. The proposed project will be developed to comply with this order.

Hydraulic design techniques described in 23 CFR 650, Subpart A, A Location and Hydraulic Design of Encroachment on Floodplains, will be utilized to determine the impact of roadway drainage structures on the 100-year floodplain. Structures will be sized to ensure that no increase to the extent and level of flood hazard risk would result from such encroachments. Concurrence Point 4B (30 Percent Hydraulic Design) and Concurrence Point 4C (100 Percent Hydraulic Design) of the Section 404/NEPA Merger Process focuses on this aspect of the project design. The hydraulic analysis will examine drainage patterns near flood overflow pipes to ensure that the passageway does not become inundated with roadway drainage.

The long-term, indirect impacts on flood hazard zones from future development were considered during project development. As a freeway, the proposed action will not support probable incompatible floodplain development. Where floodplain impacts are unavoidable, methods to minimize harm and restore and preserve the floodplains could include minimizing fill and grading requirements, preserving the free natural drainage whenever possible, maintaining vegetation buffers, controlling urban run-off using best management practices, and minimizing erosion and sedimentation during construction.

4.13. Biotic Resource Impacts

4.13.1. Wildlife

The Northern Beltway Selected Alternative will impact wildlife resources. The Project R-2247 Selected Alternative was chosen in part because it avoids crossing the confluence of the Muddy Creek and Silas Creek floodplains, a notable wildlife habitat.

The Northern Beltway Selected Alternative will have slightly less habitat fragmentation than other alternatives. As part of the Concurrence Point 4A (Avoidance and Minimization) discussions, the Merger Team agreed to include wildlife crossings where appropriate and possible. (See Appendix D.1 in the SFEIS/FEIS.)

Best management practices for standard road and bridge construction will be used to minimize impacts to the aquatic organisms and their habitats in the study area.

4.13.2. Biotic Communities

The Northern Beltway Selected Alternative will impact terrestrial biotic communities in the study area. However, much of the area impacted will not actually be paved, but will return as ruderal-type vegetation, grasses, and weeds that will provide limited habitat value for some wildlife species. The amount of vegetation removed will be minimized, and native vegetation will be reestablished to the extent feasible within the project limits. The limits of construction will be posted and enforced to minimize impacts. Bare soil will be promptly seeded with grass species to minimize erosion. Long-term impacts to vegetation from highway runoff will be minimized by using retention/detention basins and grassed swales in the construction design.

The Northern Beltway Selected Alternative will impact aquatic communities, which are sensitive to even small changes in their environment. Sediment and erosion control measures during construction as discussed in Section 4.13 of the SFEIS/FEIS will minimize impacts and protect water quality for aquatic communities.

4.13.3. Protected Species

Surveys for plants and animals with federal protection status of Threatened or Endangered, established by the Endangered Species Act of 1973, as amended, resulted in biological conclusions of no effect for all protected species. The Northern Beltway Selected Alternative will not impact the red-cockaded woodpecker or the small-anthered bittercress. A biological conclusion was not made for the bog turtle since the species,

which is threatened by similarity of appearance, is not biologically endangered or threatened and therefore is not subject to Section 7 consultation. However, no impacts to bog turtle are anticipated from the Selected Alternative.

4.14. Indirect and Cumulative Impacts

The Northern Beltway Selected Alternative is expected to have a small effect on:

- the land use pattern in Forsyth County
- the amount of suburban type development in the County
- the desirability of given tracts of land over other, similar tracts of land; and
- the amount of induced travel resulting from construction of the Northern Beltway.

Development near the proposed interchanges is more likely for the Selected Alternative than for the No-Build alternative, but would be similar to that with other Build alternatives. Some induced travel is expected to occur as a result of the Beltway and other reasonably foreseeable projects, but the amount of this travel resulting from construction of the Northern Beltway is not appreciable when examined as a portion of vehicle miles traveled throughout the region.

Cumulatively, the Northern Beltway in conjunction with other public and private projects places some additional pressures from induced development, induced travel, and encroachment-alteration effects on communities, natural habitat, and water quality. While the magnitude of these changes is difficult to quantify with certainty, the nature of the land use changes, the features that may be sensitive to change, and the locations most susceptible to indirect/cumulative effects have been identified. Local governments and stakeholder groups should be prepared for these changes, and be proactive in mitigating for their negative effects while maximizing positive benefits from the proposed Beltway projects.

The responsibility for mitigating the effects of the Northern Beltway will fall primarily on local and state governments, with the participation of private sector developers. Ideally, there will be a concerted effort of local and state governments to partner with one another and with non-governmental stakeholders to minimize the negative aspects of growth. Mitigation measures recommended for the stakeholders in this area include developing plans for interchange areas that anticipate growth and development; revising site design standards to minimize stormwater runoff impacts; and continuing to monitor air and water quality.

5. Monitoring and Enforcement Program

Coordination will be maintained with all regulatory and resource agencies during final design, permitting, right-of-way acquisition, and construction to ensure that avoidance, minimization, and compensatory mitigation measures are implemented. The NCDOT and FHWA will enforce all pertinent specifications and contract provisions in accordance with the intent of the SFEIS/FEIS and the welfare of the public. Many of the avoidance, minimization, and compensatory mitigation measures included in this document are likely to be conditions of federal or state permits that are enforceable by regulatory agencies.

6. Environmental Commitments

Environmental commitments are shown in Appendix B, Special Project Commitments (Green Sheets).

7. Comments on the SFEIS/FEIS

The SFEIS/FEIS for the project was approved on January 11, 2007 and circulated to environmental regulatory and resources agencies for comments. Section 6 of the SFEIS/FEIS, incorporated by reference, includes a full list of agencies and organizations that received copies of the document. Comments on the SFEIS/FEIS were received from the following federal and state resource agencies:

Federal Agencies

U.S. Environmental Protection Agency – March 22, 2007

State Agencies

North Carolina Department of Environment and Natural Resources – March 28, 2007

North Carolina Department of Environment and Natural Resources –

Division of Water Quality – March 28, 2007

North Carolina Wildlife Resources Commission – March 28, 2007

In addition, comments were received from the following citizens or citizen groups:

Robin Dean – March 29, 2007

Sarah Jones – March 27, 2007

Jerry and Sandra Hart – March 27, 2007

Marsh Smith, P.A. and Norman Marshall (Smart Mobility) – April 17, 2007

Copies of these letters are included in Appendix C. Summaries of the substantive comments from these agencies and citizens, and responses to those comments from the North Carolina Department of Transportation, are included below.

Table 3: Comments on the SFEIS/FEIS

	Summarized Comment	Response
<p>EPA-2 EPA-14 DWQ-3 DWQ-5</p>	<p>MITIGATION AND EEP: The FEIS should have included additional detail on providing mitigation for stream and wetland impacts. Information about potential on-site mitigation as well as off-site compensatory mitigation through the Ecosystem Enhancement Program (EEP) should have been included in Chapter 4.</p>	<p>As stated in the response to Comment A24-22 in the SFEIS/FEIS, page 6-68: “NCDOT will obtain all required permits and implement all required mitigation measures that are conditions of those permits.”</p> <p>As stated in the response to Comment A23-17 in the SFEIS/FEIS, page 6-52: “During the permitting phase of the project, the NCDOT will be investigating on-site mitigation opportunities throughout the area. Off-site mitigation for the project is being implemented by the Ecosystem Enhancement Program.”</p> <p>The phrase “during the permitting phase” should more accurately say “during Concurrence Points 4B and 4C of the Section 404/NEPA Merger process.” NCDOT has coordinated with the DENR-EEP program for off-site stream and wetland mitigation where on-site mitigation is not practicable. This program was discussed in Chapter 6 of the SFEIS/FEIS and should have been discussed in Section 4.17.2 as well.</p> <p>On-site mitigation would be the first option, with off-site mitigation used if sufficient suitable on-site mitigation sites are not available. The DENR-EEP program will be used to satisfy all NCDOT’s required off-site compensatory mitigation requirements for the federal and state permits, pursuant to the terms of the NCDENR/NCDOT 2004 Memorandum of Agreement Governing EEP Operations NCDOT has already ordered mitigation from EEP for Projects U-2579 and U-2579A based on impacts presented in the SFEIS/FEIS. This is a conservative estimate for required mitigation since on-site mitigation will first be used where available. Mitigation for Project R-2247 is discussed in Section 4.17.2 in the SFEIS/FEIS.</p>
<p>DWQ-4</p>	<p>NCDOT should demonstrate the</p>	<p>NCDOT has coordinated with NCDWQ and USACE to avoid and minimize</p>

	Summarized Comment	Response
	avoidance and minimization of impacts to wetlands and streams to the maximum extent practical. In the event that mitigation is required, the mitigation plan should be designed to replace appropriate lost functions and values.	impacts to wetlands and streams through Concurrence Points 2A (bridging decisions and alignment review) and 4A (avoidance and minimization). NCDOT will continue work with these agencies for Concurrence Points 4B (review of conceptual drainage design with 30 percent hydraulic design) and 4C (review surface drainage design and permit drawings with 100 percent hydraulic design) and to obtain a Section 401 Water Quality Certification and a Section 404 Permit prior to project construction.
DWQ-1 DWQ-6 DWQ-7 DWQ-8 DWQ-12	<p>SECTION 401 WATER QUALITY CERTIFICATION: A quantitative indirect and cumulative impacts analysis will be required for approval of the 401 Water Quality Certification.</p> <p>All impacts, including but not limited to, bridging, fill, excavation and clearing, to jurisdictional wetlands, streams, and riparian buffers need to be included in the final impact calculations. These impacts, in addition to a demonstration of avoidance and minimization actions and a mitigation plan, also need to be included as part of the 401 Water Quality Certification Application.</p>	In preparation for the 401 Water Quality Certification, NCDOT is preparing a quantitative indirect and cumulative impact analysis.
DWQ-10	SECTION 401 WATER QUALITY CERTIFICATION: Impacts to wetlands	As stated in the response to Comment A22-12 in the SFEIS/FEIS, page 6-46: “Contract standard specifications prohibit a contractor from selecting

	Summarized Comment	Response
	in borrow/waste areas should be avoided to the extent practical, and should be quantified in the 401 Water Quality Certification.	borrow/waste sites that are in wetland areas.”
DWQ-11 Jones-15	STORMWATER: Stormwater should not be permitted to discharge directly into streams or surface waters, and the 401 Water Quality Certification should address proposed methods for stormwater management, and should address existing stormwater problems.	Stormwater runoff is discussed in Section 4.13 in the SFEIS/FEIS. As stated in the response to Comment A22-8 in the SFEIS/FEIS, page 6-45: “The Section 401 Water Quality Certification application will specify storm water management methods. NCDOT will develop a storm water management plan and use appropriate storm water Best Management Practices to control and/or treat storm water runoff.”
EPA-13	WATER QUALITY: NCDOT and FHWA should cooperate with local agencies to address degraded surface waters.	Comment noted.
WRC-7 EPA-4	WATER QUALITY: It is suggested that Forsyth County’s widened streamside buffer ordinance recently enacted for Abbotts Creek be followed and expanded for other watersheds.	This project will comply with all current applicable water quality regulations. As stated in the response to Comment A23-10 in the SFEIS/FEIS, page 50: “Regulations and ordinances related to water quality and preservation of habitat/open space are outside the scope of this project and outside the authority of NCDOT and FHWA. Local governments or other state agencies may address these issues.”
EPA-3 DWQ-2	EROSION AND SEDIMENTATION: Sedimentation and erosion impacts should	As stated in the response to Comment A23-1 in the SFEIS/FEIS, page 6-46: “NCDOT will incorporate sediment and erosion control measures according to the

	Summarized Comment	Response
DWQ-9 DWQ-21 WRC-1	<p>be minimized, especially to small streams, impaired streams, and 303(d) waters. Sediment and erosion control measures should not be placed in wetlands or streams, and should follow design standards for sensitive watersheds in areas that drain to Water Supply waters. Most current versions of <i>Stormwater Best Management Practices</i>, the <i>NC Sediment and Erosion Control Planning and Design Manual</i>, and NCS000250 should be followed.</p>	<p>Design Standards in Sensitive Watersheds for all construction in high quality water (HQW) zones. See the table at http://h2o.enr.state.nc.us/csu/freshwater.pdf for more information.”</p> <p>NCDOT has committed to implement sedimentation and erosion control measures that adhere to the Design Standards in Sensitive Watersheds for streams that are on the 303(d) list of impaired waters for sedimentation impairment, and for streams that are in HQW zones. The Northern Beltway Selected Alternative would not impact any streams listed on the 303(d) list of impaired waters for sedimentation impairment, would not impact any streams classified as High Quality Waters, and would not impact any Critical Water Supply Watersheds. The Design Standards in Sensitive Watersheds would not be applicable for this project.</p> <p>As stated in the response to Comment A24-12 in the SFEIS/FEIS, page 6-61: “The Preferred [Selected] Alternative avoids the watershed critical zone for Salem Lake, the nearest water supply resource. Best Management Practices (BMPs) will be used to minimize construction impact in the Salem Lake watershed. Please see response to Comment A23-1 [above].”</p> <p>As stated in the response to Comment A22-11 in the SFEIS/FEIS, page 6-45: “Sediment and erosion control measures should not be placed in wetlands or waters to the maximum extent practicable. If placement of sediment and erosion control devices in wetlands or waters is unavoidable, they shall be removed and the natural grade restored once the project is complete and fill slopes have been stabilized.”</p> <p>NCDOT’s erosion control plans will be implemented and maintained in accordance with the Sediment Pollution Control Act and applicable Land</p>

	Summarized Comment	Response
		Quality/Division of Land Resources regulations, including the planning and design manual.
EPA-5 EPA-15	MIGRATORY BIRDS: NCDOT should follow federal requirements for minimizing adverse impacts to migratory birds, including the Loggerhead Shrike.	As stated in the response to Comment A24-18, A24-33, A24-34, and A24-35 in the SFEIS/FEIS, page 6-65. “NCDOT is coordinating with the USFWS to ensure this project’s compliance with all applicable laws.”
EPA-6 EPA-16	EXOTIC SPECIES: NCDOT should follow Executive Order 13112 and take proactive measures for the detection and prevention of spreading invasive species, especially Japanese knotweed. The FEIS did not include information on all invasive exotic plant species present within the project study corridor, particularly Japanese knotweed. The ROD should address this issue, and should include an avoidance, minimization, and mitigation strategy.	<p>As stated in <i>NCDOT’s Compliance with Executive Order 13112</i>: “Complying with the executive order means that federal-aid and Federal Lands Highway Program funds cannot be used for construction, revegetation, or landscaping that purposely includes the use of known invasive plant species. The executive order established a National Invasive Species Council, and until an approved national list of invasive plants is defined by the council, “known invasive plants” are defined as those listed on the official noxious weed list of the state in which the activity occurs. FHWA recommends use of federal-aid funds for new and expanded invasive species control under each state’s roadside vegetation management program. In NC, The Department of Agriculture and Consumer Services (NCDA&CS) produces / maintains the State’s official noxious weed list (http://www.ncagr.com/plantind/plant/weed/noxweed.htm). In addition to the June 30, 2006 federal list of approximately 64 genre of noxious weeds (http://www.aphis.usda.gov/plant_health/plant_pest_info/weeds/downloads/weedlist2006.pdf), there are 15 additional species specific to North Carolina’s list.</p> <p>The Design and Development Section within the Roadside Environmental Unit maintains a listing of invasive ‘ornamental’ plants. It contains plants that may have been propagated or volunteered along the roadside in the distant past, but they are no longer being actively integrated within landscape plantings due to their invasive nature. Some examples from the list include: Mimosa (<i>Albizia</i></p>

	Summarized Comment	Response
		<p><i>julibrissin</i>), Thorny, Russian & Autumn Olive (<i>Elaeagnus pungens, angustifolia, & umbellata</i>), Japanese Silvergrass (<i>Miscanthus sinensis</i>), Multiflora Rose (<i>Rosa multiflora</i>), Chinese & Japanese Privet (<i>Ligustrum sinense & japonicum</i>), Crown Vetch (<i>Coronilla varia</i>), Chinese & Japanese Wisteria (<i>Wisteria sinense & floribunda</i>), and English Ivy (<i>Hedera helix</i>).</p> <p>NC Department of Transportation is currently funding two multi-year research projects totaling over \$600,000. These projects are investigating control methods for invasive terrestrial or aquatic weed species. Dr. Joe Neal and Dr. Rob Richardson are the principle investigators at North Carolina State University. Dr. Neal's project (2006-05) is titled "Innovative and Environmentally Responsible Methods for Controlling Invasive Woody Plant Species in NC Rights-of-Way" and was initiated in 2005. The project goals include: investigating wet-blade technologies to determine their feasibility to control tree species including Tree-of-heaven (<i>Ailanthus altissima</i>) and Princess tree (<i>Paulownia tomentosa</i>). In addition a new biological control agent (<i>Chondrostereum purpureum</i>) (tentative trade name: Chontrol) is being evaluated which is intended to prevent resprouting of woody weeds following cutting. Dr. Richardson's project (2008-06) is titled "Establishing Native Vegetation and Improved Invasive Species Control on North Carolina Roadsides." This project is in the initial phase of conducting an extensive literature search. The project goals include: developing control methodologies for two aquatic invasive plants: Japanese knotweed (<i>Polygonum cuspidatum; Fallopia japonica; Reynoutria japonica</i>), and Alligator weed (<i>Alternanthera philoxeroides</i>). In addition, the germination and growth habits of several native grasses and milkweed (<i>Asclepias tuberosa</i>) will be evaluated. The ultimate goal would be to develop a successful seeding methodology to allow incorporation of more native species along the roadsides."</p>
EPA-8	AIR QUALITY: The ROD should verify	The Winston-Salem Northern Beltway is currently included in the approved

	Summarized Comment	Response
	the project's inclusion in a conforming LRTP and identify mitigation for project construction and operation.	<p><i>Winston-Salem Urban Area 2030 Multi-Modal Long Range Transportation Plan (LRTP)</i>, which conforms to the intent of the State Implementation Plan (SIP). The USDOT made a conformity determination on the 2030 LRTP on October 1, 2005. The current conformity determination is consistent with the final conformity rule found in 40 CFR Parts 51 and 93. More information on the SIP is in Section 4.7.4 of the SFEIS/FEIS.</p> <p>Details on air quality mitigation measures during construction are in Section 4.21 of the SFEIS/FEIS.</p>
EPA-9	AIR QUALITY: It is unclear why HOV lanes would not be implemented at this time in order to reduce vehicle usage and thus improve air quality.	<p>HOV lanes are not precluded by this project, but are not included as part of the current design.</p> <p>As stated in the response to Comment A24-6 in the SFEIS/FEIS, page 6-56. "The Congestion Management System (CMS) of the <i>2030 LRTP</i> includes HOV lanes as one of a list of TDM strategies. The plan states that HOV lanes and congestion pricing may have applicability if congestion and air pollution problems grow worse. However, no HOV lane improvements are proposed as specific projects in the LRTP. HOV lanes were discussed in Chapter 2 of the SFEIS/SDEIS and determined not to meet the purpose and need of this project."</p>
EPA-10	AIR QUALITY: Air quality benefits from Project U-2826B (US 52 in Winston-Salem) as well as adverse community impacts should be considered in decisions for that project.	Comment noted.
EPA-11	AIR QUALITY: A careful review of traffic analyses is recommended after the	Comment noted.

	Summarized Comment	Response
	Northern Beltway is built before widening US 52.	
WRC-3	AIR QUALITY: Air quality should be monitored and burning of land clearing debris should be minimized.	<p>Air quality is currently being monitored by the Department of Environment and Natural Resources. This project will comply with all air quality ordinances, as described in Section 4.21 of the SFEIS/FEIS, page 4-250. Please see the response to Comment A23-5 in the SFEIS/FEIS, page 6-48 for more detail on the location of Forsyth County’s eight air quality monitoring stations.</p> <p>As stated in Section 4.21 of the SFEIS/FEIS, “Any burning of cleared materials would be conducted in accordance with applicable state and local laws, regulations and ordinances and the regulations of the North Carolina SIP for air quality, in compliance with 15 NCAC 2D.0520. Care would be taken to ensure burning occurs under constant supervision, at the greatest practical distance from homes, and not when weather conditions could create hazards.”</p>
Jones-17	AIR QUALITY: If the EPA raises the standards for Conformity for Air Evaluation in 2008, the entire Piedmont Triad Area may be out of conformity.	Comment noted.
EPA-12	NATURAL RESOURCE SURVEYS: EPA disagrees with NCDOT’s view that it was unimportant to document the condition of natural resources, especially aquatic habitat.	<p>It is not NCDOT’s view that it is unimportant to document the condition of natural resources. NCDOT procedures include documenting the condition of natural resources. For example, surveys of natural resources were updated for the Project R-2247 and U-2579 Selected Alternatives, and the Project U-2579A Detailed Study Alternatives.</p> <p>As stated in the response to Comment A24-2 in the SFEIS/FEIS, page 6-53: “Surveys of the streams, wetlands, and natural areas for the Project R-2247 and</p>

	Summarized Comment	Response
		<p>Project U-2579 Preferred [Selected] Alternatives all were updated for the SFEIS/SDEIS. The surveys within the Project R-2247 Preferred [Selected] Alternative were updated in 2002-2003.” The surveys within the Project U-2579 Preferred [Selected] Alternative and U-2579A Detailed Study Alternatives were updated in 2003.</p> <p>See Section 3.16 in the SFEIS/FEIS for more information on natural resource survey methodology.</p>
Hart-1	<p>NATURAL RESOURCE SURVEYS: The wetland surveys performed in 2002 were under extreme drought conditions, and need to be redone according to the U.S. Army Corps of Engineers’ comprehensive approach. Verify that hydrophytic vegetation, hydric soils, and wetland hydrology all were considered sufficiently during the field survey.</p>	<p>Jurisdictional delineations are based on wetland field indicators for vegetation, soil, and evidence of current or past hydrology. These indicators develop during “normal circumstances” and would be present regardless of the current weather conditions (i.e. periods of drought or periods of flood). The US Army Corps of Engineers, who field verified the Jurisdictional Delineations, has indicated in correspondence that the delineation is valid.</p> <p>As stated in the response to Comment 153-4 in the SFEIS/FEIS, page 6-84: “Wetlands surveys for the Project R-2247 Preferred [Selected] Alternative were performed in January and February 2003. For the eastern side (Projects U-2579 and U-2579A), surveys were performed in March and April 2002. Average annual precipitation in the Winston-Salem area is 42.5 inches. Total precipitation for Forsyth County by year is listed below (source: www.wunderground.com):</p> <ul style="list-style-type: none"> 2001 – 30.35 inches 2002 – 39.67 inches 2003 – 56.3 inches 2004 – 43.4 inches <p>Dry years occurred in 2001 and 2002. Surveys on the eastern side were done during a dry cycle. Surveys on the western side were done in a wet cycle (normal</p>

	Summarized Comment	Response
		<p>precipitation in December is 3.38 inches, the December before the western surveys was 4.93 inches).</p> <p>Drought conditions will not affect the jurisdictional status of wetlands unless they occur over a period of many years. In addition, wetlands were verified in October 2004 (a normal precipitation year).”</p> <p>A letter dated June 20, 2007 from the US Army Corps of Engineers verifies the validity of the jurisdictional delineation (Appendix D).</p>
EPA-17	<p>FARMLANDS: The SFEIS/FEIS did not provide impacts to either the agriculturally zoned area or the Rural Area designation for Project R-2247.</p> <p>The tables in Section 4.12 are for Prime and State/Locally Important Farmland soils, but the summary table (Table 4-88) lists Prime, State, and Local Important Farmland (not soils). The entire sections on “prime farmland” need to be clarified and simplified in the ROD.</p>	<p>Based on coordination with NRCS (Alan Walters, June 11, 2007), Sections 3.14 and 4.12 from the SFEIS/FEIS have been revised and included in this ROD. Impacts to agriculturally zoned areas and Rural Area designated areas have been quantified, references to mitigation have been modified, and references to “farmlands” and “farmland soils” have been clarified. The revised Farmlands sections are included in Section 8.1 of this ROD.</p> <p>Table 4-88 in the SFEIS/FEIS now includes four rows for impacts to Farmlands: the existing row has been revised to “Acres of Prime, Statewide, and Local Important Farmland Soils Impacted,” with the impacts as given. A second row was added called “Impacts to Prime, Statewide, and Local Important Farmland Protected Under the FPPA.” Two additional rows have been added to quantify impacts to land zoned as agricultural or designated as Rural Area.</p>
Jones-16	<p>FARMLANDS: The FEIS does not address past farm and farmland losses since 2002. It is not correct that “no significant impacts to farmland would occur under” this project. The Northern</p>	<p>According to the Relocation Reports in Appendix G of the SFEIS/FEIS, no farms would be entirely relocated by the Project R-2247 Selected Alternative or the Project U-2579A Selected Alternative. Two farms would be relocated by the Project U-2579 Selected Alternative.</p>

	Summarized Comment	Response
	Beltway would have a major impact on remaining farms in Forsyth County and their water supplies.	<p>As described in Section 4.12 of the SFEIS/FEIS (as revised in this ROD), none of the soil impacts by the Selected Alternatives meet the threshold for protection under the Farmland Protection Policy Act.</p> <p>Final impacts will be determined during final design, and compensation determined during right of way negotiations, but it is anticipated that some farms and their water supplies will be impacted by partial takes.</p> <p>In the <i>Growth Management Plan</i>, which is part of the <i>Legacy Development Guide</i>, one of the goals is to preserve farmland, open space, and the rural character within the Rural Area. The Northern Beltway is consistent with the <i>Growth Management Plan</i>.</p> <p>The Northern Beltway Selected Alternative will impact 206 acres of land zoned agricultural, and 424 acres of land designated as Rural Area.</p>
WRC-5	LAND USE PLANS: More could be done to ensure the Legacy Comprehensive Plan and the Growth Management Plan are fully implemented.	<p>Comment noted.</p> <p>As stated in the response to Comment A23-10 in the SFEIS/FEIS, page 6-50: “Regulations and ordinances related to water quality and preservation of habitat/open space are outside the scope of this project and outside the authority of NCDOT and FHWA. Local governments or other state agencies may address these issues.”</p>
Jones-12	LAND USE PLANS: The FEIS says there is a Metro Activity Center planned at the Robinhood Road interchange, but Figure 3-2 shows the Metro Center on Shallowford Road.	The original Metro Activity Center list included one on Shallowford Road, which has since been replaced with a center at Robinhood Road. Figure 3-2 shows the activity center at the old location.

	Summarized Comment	Response
Jones-9	LAND USE PLANS: The FEIS should point out that the Legacy Plan is not working.	<p>As stated in the response to Comment 100-14 in the SFEIS/FEIS, page 6-87: “Section 3.3.2 of the Final Winston-Salem Northern Beltway Indirect and Cumulative Effects Analysis states, ‘As part of the review of Forsyth County zoning, an examination of rezoning requests for 2001, 2002, and 2003 was conducted. Over the period examined, it was determined that approximately 68 percent of rezoning requests presented to Forsyth County were approved. The vast majority of these involved “upzoning,” designating the land use to a more valuable or dense type of development. Regardless, the review generally indicates that the approved rezonings were in accordance with the <i>Legacy Plan</i>. In fact, a reason cited in not approving several rezonings was that there was a conflict with the <i>Legacy Plan</i>.</p> <p>The local government is responsible for all decisions regarding land use. In an update to the <i>Legacy Plan</i>, the Legacy Oversight Committee evaluated rezonings and compliance with the <i>Legacy Plan</i> in 2003-2004. Their brochure states “Statistics on rezonings for the period 2003-2004 reveal that, in cases where <i>Legacy</i> principles were relevant, decisions made by planning boards and elected officials showed a high rate of compliance with those principles. Elected bodies, planning boards and staff were in agreement on decisions in 54 of 64 cases or 84.4% of cases.”</p>
WRC-4	Measures should be employed to manage the growth in this area, which was originally expected to have a low potential for induced development.	Growth is regulated by local governments.
WRC-2	CONSTRUCTION PROCEDURES: WRC requests that the clearing of trees	Beyond commitments listed in the Green Sheets, the contractor will be allowed flexibility to stage work as he or she deems appropriate.

	Summarized Comment	Response
	and vegetation for this project be avoided during the breeding season as much as possible.	
WRC-7	CONSTRUCTION PROCEDURES: WRC requests that loss of trees be mitigated, and that these mitigation measures are in place prior to submitting a permit application.	As stated on page 3 of the Green Sheets: “During design and construction, efforts will be made to minimize the impact to existing vegetative buffers and natural areas. NCDOT will prepare a post construction landscape design/corridor plan to mitigate construction impacts and integrate enhancements, while remaining sensitive to the environment and to the safety of the traveling public.”
DWQ-13	CONSTRUCTION PROCEDURES: Bridge supports (bents) should not be placed in the stream when possible.	As stated in the response to Comment A22-9 in the SFEIS/FEIS, page 6-45: “NCDOT will avoid installing bridge bents in creeks to the maximum extent practicable.”
DWQ-14	CONSTRUCTION PROCEDURES: Whenever possible, the DWQ prefers spanning structures.	As stated in the response to Comments A24-19, A24-36, and A24-37 in the SFEIS/FEIS, page 6-66: “During the Concurrence Point 2A (bridging decisions and alignment review)/4A (avoidance and minimization) meetings, NCDOT agreed to bridge several streams that had been proposed to be crossed by culverts (see Section 4.14.1). NCDOT agreed to shorten culvert lengths where possible and daylight systems between culverts where possible in interchange areas. In addition, NCDOT will include wildlife crossings where appropriate in the vicinity of stream crossings, which will allow animals to cross under the Beltway (see concurrence form in Appendix D.4).”
DWQ-15	CONSTRUCTION PROCEDURES: Bridge deck drains should not discharge directly into the stream. Stormwater should be directed across the bridge and pre-treated through site-appropriate means before entering the stream.	At the Section 404/NEPA Merger Concurrence Point 4B meeting, NCDOT will review with the Merger Team the proposed drainage for purposes of team concurrence.

	Summarized Comment	Response
DWQ-16	CONSTRUCTION PROCEDURES: Stream water should not contact curing concrete during construction.	These recommendations follow NCDOT's typical design practices.
DWQ-17	CONSTRUCTION PROCEDURES: If temporary access roads or detours are constructed, the site shall be graded to its preconstruction contours and elevations. Disturbed areas should be seeded or mulched and appropriate trees should be planted. When using temporary structures, the area should be cleared but not grubbed.	Where temporary access roads and detours are required, NCDOT will consider regrading to preconstruction contours and elevations on a case by case basis and will do so where reasonable. Disturbed areas will be reseeded following construction. Where temporary bridge structures are required, the area will be cleared but not grubbed.
DWQ-18	CONSTRUCTION PROCEDURES: Culverts and other structures in waters, streams, and wetlands shall be placed one foot below the elevation of the streambed for culverts with a diameter greater than 48 inches, and 20 percent of the culvert diameter for culverts having a diameter less than 48 inches. Culverts and other structures shall not be placed where disequilibrium of wetlands, streambeds, or banks would result.	These recommendations follow NCDOT's typical design practices.
DWQ-19	CONSTRUCTION PROCEDURES: Multiple pipes or barrels should be	At the Section 404/NEPA Merger Concurrence Point 4B meeting, NCDOT will review with the Merger Team the proposed drainage design for purposes of team

	Summarized Comment	Response
	designed to mimic natural stream cross section as closely as possible. Widening the stream channel should be avoided.	concurrency.
DWQ-21	CONSTRUCTION PROCEDURES: Any necessary foundation test borings should be noted in the document. Geotechnical work is approved under General 401 Certification Number 3494/Nationwide Permit No. 6 for Survey Activities.	As stated in the response to Comment A22-10 in the SFEIS/FEIS, page 6-45: "It is anticipated that foundation test borings will be necessary. NCDOT will obtain any required permits for this work."
DWQ-22	CONSTRUCTION PROCEDURES: All work in or adjacent to stream waters should be conducted in a dry work area. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock berms, cofferdams and other diversion structures should be used to prevent excavation in flowing water.	All current approved and appropriate BMPs will be followed.
DWQ-23	CONSTRUCTION PROCEDURES: Heavy equipment should be operated from the bank rather than in stream channels, and should be inspected daily.	These recommendations follow NCDOT's typical design practices.
DWQ-24	CONSTRUCTION PROCEDURES: Riprap should not be placed in the active	These recommendations follow NCDOT's typical design practices.

	Summarized Comment	Response
	thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be properly designed, sized and installed.	
DWQ-25	CONSTRUCTION PROCEDURES: Riparian vegetation (native trees and shrubs) should be preserved to the maximum extent possible. Riparian vegetation must be reestablished within the construction limits of the project by the end of the growing season following completion of construction.	NCDOT will include language in the construction contract to address minimizing the amount of vegetation that is removed, and reestablishing the riparian vegetation to the amount practical within the project limits.
Dean-3 Marshall-10 Jones-2 Jones-3	I-73/I-74 CONNECTOR: The I-73/I-74 Connector and associated interchange(s) should have been included in the Northern Beltway SFEIS/FEIS.	The portion of the I-73/I-74 Connector (also known as the Airport Connector) from the Winston-Salem Northern Beltway to the Forsyth County/Guilford County line is estimated at \$76 million in the Winston-Salem Urban Area <i>2030 Long Range Transportation Plan (LRTP)</i> , and is designated as a Turnpike Authority project. The \$76 million would have to be provided by toll revenues since no state, Federal, or local funds have been identified for the project. The Turnpike Authority is not currently studying the I-73/I-74 Connector. It is not funded in the 2007-2013 TIP. It is not a reasonably foreseeable project.
Dean-4 Jones-1 Smith-2	SOUTHERN LOOP: The Southern Loop should have been included in the Northern Beltway SFEIS/FEIS.	As stated in the response to Comment 100-2 in the SFEIS/FEIS, page 6-85: "The Southern Loop is not a funded project, is not in the TIP, and is not included in the <i>2030 Long Range Transportation Plan</i> . Therefore, it is not a reasonably foreseeable project and is not included in this study."

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Dean-5 Jones-13	STYER’S FERRY CONNECTOR: The Styer’s Ferry Connector referenced in Tables 2-8 and 2-9 and discussed in a May 31, 1996 memo should not have been shown in the SFEIS/FEIS if it is no longer considered a feasible project.	The future Peace Haven-Styer’s Ferry Connector shown on the <i>2005 Thoroughfare Plan</i> is not in the NCDOT’s 2006-2012 Transportation Improvement Program, nor is it on the <i>Winston-Salem Urban Area 2030 Long Range Transportation Plan (LRTP)</i> . Therefore, it is not a reasonably foreseeable project and is not included in this study. The May 31, 1996 memo referred to in the comment was written after the Project R-2247 FEIS was completed (March 11, 1996). The data used in that FEIS and memo is historic data, and was not used in the current analyses. Tables 2-8 and 2-9 were taken from the 1996 Project R-2247 FEIS and are included as historic references for the Detailed Study Alternatives.
Jones-4	ALTERNATIVES: The FEIS should have considered advantages of using such alternatives as existing roads and providing light rail transit.	The SFEIS/FEIS considered and evaluated both the Improve Existing Roadways Alternatives (Section 2.6) and Mass Transit/Multi-Modal Alternatives (Section 2.4).
Jones-7	ALTERNATIVES: Upgrading US 52 is a viable alternative to constructing the Northern Beltway on new location.	As stated in Section 2.6.3.2 of the SFEIS/FEIS: “Based on the above impacts and the fact that the widening would not meet elements of the purpose for U-2579 and U-2579A, widening of US 52 to eight lanes is not considered to be a viable alternative and was eliminated from further study.”
Jones-14	PURPOSE AND NEED: “Improve north/south connectivity in Western Forsyth County” is not a valid purpose of Project R-2247 because there is nothing important to connect.	Sections 1.4.1 and 1.5.1 of the SFEIS/FEIS discuss the need for better connectivity within and through western Forsyth County: “All of the major arterials converge on the downtown Winston-Salem area, so circumferential traffic (traffic wanting to travel across the county) must first drive towards the city to move north or south, or must weave through a series of north/south roadways to reach destinations inside or outside western Forsyth County.” “In western Forsyth County, there are no adequate cross-network routes between current and future residential areas and the employment/service centers outside of the central urban

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		area.” Examples of employment/service centers include the Northridge Industrial Park (US 52 north of Winston-Salem), business/industrial parks along US 158, I-40, and US 421 (e.g., Stratford Industrial Park on US 158), and Hanes Mall.
Marshall-1 Marshall-3	PURPOSE AND NEED: The FEIS does not support the safety and capacity needs identified in the Purpose and Need. The segments on US 52 and NC 66 with a crash rate greater than the critical crash rate do not support a need for the Northern Beltway.	<p>Sections 1.4.3 and 1.5.3 of the SFEIS/FEIS summarize the purpose and need. Sections 1.12 and 2.10.5 discuss safety and capacity issues for Projects U-2579 and U-2579A.</p> <p>The Northern Beltway will improve safety by providing a safer option for drivers, as explained in Section 2.10.5 of the SFEIS/FEIS. As stated in the response to Comment 225-7 in the SFEIS/FEIS, page 6-123: “As described in Section 1.5.3 of the SFEIS/FEIS, enhancing safety is only one purpose of Projects U-2579 and U-2579A. Other purposes include improving intrastate and interstate mobility, improving roadway system linkage and continuity, reducing traffic congestion, and providing a corridor for I-74. The range of alternatives for Projects U-2579 and U-2579A described in the SFEIS/FEIS were developed to fulfill as many of these purposes as possible. Alternatives for Projects U-2579 and U-2579A that were evaluated and eliminated from detailed study are described in Chapter 2. They include transportation management alternatives, mass transit/multi-modal alternatives, and improving existing US 52.”</p>
Jones-18	PUBLIC INVOLVEMENT: The FEIS does not include details of citizen protests to the Northern Beltway prior to 1999.	The Project R-2247 Final EIS, which was signed in March 1996 and is included in the SFEIS/FEIS by reference, reports all public involvement and citizen comment summaries prior to 1996. These comments are provided in detail in Part II of Appendix A in the 1996 Project R-2247 FEIS, and have been summarized in Section 6.2.1.1 of the SFEIS/FEIS. Public involvement activities between 1996 and 1999 are summarized in Section 6.2.1.2 of the SFEIS/FEIS.
Jones-6	PUBLIC INVOLVEMENT: The type	As stated in Section 2.7.1.1 in the SFEIS/FEIS, page 2-29: “The citizens of

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	of access for Project R-2247 was decided without public input.	Winston-Salem and Forsyth County had several opportunities to provide input into the type of access management implemented for this project. During the update of the county-wide Thoroughfare Plan in 1986 and 1987, and in the early stages of the 1996 Project R-2247 FEIS, citizens voiced their concern over the type of roadway that would be constructed (expressway versus freeway). Their input led the City-County Planning Board and the North Carolina Department of Transportation to change the concept of the highway from a limited-access facility with driveways and at-grade intersections (expressway) to a full control of access facility (freeway) (1996 Project R-2247 FEIS, Section 2.4.4.3).”
Dean-1	CONSTRUCTION PROCEDURES: The comment period for the 1996 Project R-2247 FEIS was shortened from 30 days to 11 days. The 1996 Project R-2247 ROD was signed one day before Forsyth County went into non-attainment for air quality.	According to NCDOT records, appropriate comment procedures were followed for the 1996 R-2247 FEIS. The 1996 Project R-2247 ROD was signed one day before Forsyth County went into non-attainment for air quality.
Marshall-2	SAFETY: SFEIS/FEIS calculates the critical crash rates incorrectly.	An error was made in calculating the “M” value in the equation given in Section 1.12 of the SFEIS/FEIS. The corrected table is in Section 8.3 of this ROD. After correcting this error, 5 of the 13 segments were determined to have a crash rate greater than the critical crash rate, including segments on US 52 and NC 66.
Marshall-4	SAFETY: US 52 accident history is irrelevant to a safety purpose and need because Project U-2826B should significantly reduce accident rates on US 52.	The U-2826B improvements address short-term safety and operations issues only (see Section 2.3.1.1 in the SFEIS/FEIS). The Northern Beltway is relevant regarding safety improvements because it will provide a safer option for travelers.

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Marshall-5	SAFETY: Assumed traffic volumes on NC 66 are too low, which results in an overstated crash rate.	The AADTs reported in Table 1-12 are a weighted average (based on length) of AADTs for the smaller segments of each roadway segment analyzed. This methodology is NCDOT's standard practice when calculating AADTs for a roadway with multiple measured AADTs.
Marshall-6	SAFETY: NC 66 should have been divided into much shorter, homogenous sections for safety analyses.	<p>The division of roadway segments for a crash analysis is performed based on the Engineer's judgment. The intention of this analysis is not to identify particular locations with safety issues, but to look at the system-level safety performance of roads whose volumes are most likely to be affected by the new project.</p> <p>Since this is a planning-level study, the analysis did not require homogenous roadway segments. This factor is taken into account in the critical crash analysis by the use of a confidence level of 95 percent for all rural and urban roads as opposed to a confidence level of 99 percent.</p>
Marshall-7	SAFETY: The SFEIS/FEIS fails to properly analyze future accident rates. The SFEIS/FEIS incorrectly assumes that travel on limited access freeways can substitute for travel on other roadways at a one mile to one mile basis. Vehicle miles traveled should take into account the circuitous routing to access on-ramps and off-ramps, as well as secondary impacts of land development.	<p>The crash analysis in Section 1.12 uses existing VMTs to calculate the existing crash rate. The SFEIS/FEIS does not attempt to make a prediction of future crash rates or identify specific areas of improvement. As an interstate facility, the Northern Beltway will provide drivers with a safer option, as discussed in Section 2.10.5 of the SFEIS/FEIS.</p> <p>The SFEIS/FEIS recognizes that VMTs for local traffic include routing to access on-ramps and off-ramps, although regional traffic using the Northern Beltway would not have this additional mileage. The 2025 traffic volume forecasts take into account future land development, including secondary impacts.</p>
Marshall-8	TRANSPORTATION MODELING: The All-or-Nothing modeling assignment is not valid for modeling congested	As stated in the response to Comments 225-4, 225-48, 225-59, and 225-60 in the SFEIS/FEIS, page 6-121: "The original model was tested for calibration in 1994 for both All-or-Nothing and Equilibrium loading methods. It was determined that

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	conditions in the future.	<p>All-or-Nothing yielded slightly better calibration results overall for major facilities than the equilibrium loading method. A series of applied “manual” capacity constraint adjustments were performed using relative speed sensitivity in an effort to simulate the observed travel patterns on radials and parallel routes in the modeled All-or-Nothing network. After the All-or-Nothing calibration with applied manual capacity constraints yielded the best results, it was determined that the use of the combined All-or-Nothing with capacity adjustment method was the best choice to clearly analyze and define travel pattern tendencies when performing traffic forecasts for local and regional projects. These analyses and results are documented in the Piedmont Triad Regional Travel Demand Model, <i>Technical Report No. 1: Model Development and Calibration</i> (NCDOT, 1999) and <i>Technical Report No. 2: Development and Evaluation of Alternative Land Use Scenarios</i> (NCDOT, 2000).”</p> <p>As described in these documents, it was determined that the All-or-Nothing assignment method would be used for the daily model, and that the Equilibrium assignment method would be used for the PM peak period sub-model to adequately simulate congested conditions. The Equilibrium loading used for the peak period has a built-in capacity restrained algorithm for the iterative recalculation of travel times so that assigned volumes reflect congested conditions. Prior to running All-or-Nothing assignment iterations for the daily model, individual facility link speeds were manually adjusted by facility to ensure assigned volumes appropriately converged to improve simulated daily travel patterns and to achieve calibration. As documented in the technical reports, the Piedmont Triad Regional Travel Demand Model adequately represented daily travel patterns as evidenced by meeting typical ranges for performance measures suggested in FHWA, <i>Calibration and Adjustment of System Planning Models</i>, 1990.</p>

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Smith-1	<p>TRANSPORTATION MODELING: Additional vehicle miles traveled (VMT) induced by the Northern Beltway will result in an incremental detriment to global warming.</p>	<p>From a policy standpoint, FHWA’s current approach on the issue of global warming is as follows. To date, no national standards have been established regarding greenhouse gases, nor has EPA established criteria or thresholds for greenhouse gas emissions. On April 2, 2007, the Supreme Court issued a decision in Massachusetts et al. v. Environmental Protection Agency et al. that the USEPA does have authority under the Clean Air Act to establish motor vehicle emissions standards for CO2 emissions. The USEPA is currently determining the implications to national policies and programs as a result of the Supreme Court decision. However, the Court’s decision did not have any direct implications on requirements for developing transportation projects.</p> <p>FHWA does not believe it is informative at this point to consider greenhouse gas emissions in an Environmental Impact Statement (EIS). The climate impacts of CO2 emissions are global in nature. Analyzing how alternatives evaluated in an EIS might vary in their relatively small contribution to a global problems will not better inform decisions. Further, due to the interactions between elements of the transportation system as a whole, emissions analyses would be less informative than ones conducted at regional, state, or national levels. Because of these concerns, FHWA concludes that we cannot usefully evaluate CO2 emissions in this SFEIS/FEIS in the same way that we address other vehicle emissions.</p> <p>FHWA is actively engaged in many other activities with the DOT Center for Climate Change to develop strategies to reduce transportation’s contribution to greenhouse gases – particularly Co2 emissions – and to assess the risks to transportation systems and services from climate change. FHWA will continue to pursue these efforts as productive steps to address this important issue. FHWA will review and update its approach to climate change at both the project and policy level as more information emerges and as policies and legal requirements evolve.</p>

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Jones-10	INDIRECT AND CUMULATIVE IMPACTS: The FEIS does not point out that Winston-Salem currently has a high degree of sprawl.	The <i>Legacy Plan</i> goals include the desire to curtail sprawl (noted on page S-4 and Section 3.3.1 in the <i>Indirect and Cumulative Impacts Analysis</i>). Page 12 of the <i>Indirect and Cumulative Impacts Analysis</i> (Section 3.2 Existing Land Use and Trends) also discusses sprawling growth patterns, and the potentially negative effects on quality of life issues in Forsyth County.
Jones-11	INDIRECT AND CUMULATIVE IMPACTS: The FEIS should have included a true no-build land use scenario.	As stated in Section 1.11.1.3 of the SFEIS/FEIS, page 1-34: “Since the presence or absence of the Northern Beltway, in whole or in part, is expected to have only a minor influence on spatial allocations of growth across the County, it was determined to be reasonable to use the same land use scenario to estimate future traffic volumes resulting from either of the four scenarios listed above [Build, Build-West, Build-East, and No-Build]. The local governments also have not created a land use projection that assumes the Northern Beltway, which has been on local transportation plans since 1965, is not in place; therefore, there is no true no-build land use scenario to incorporate into the model and use to estimate future traffic volumes.”
Marshall-9	INDIRECT AND CUMULATIVE IMPACTS: Indirect and cumulative impacts should have been considered for areas outside of Forsyth County, especially Kernersville, since the Triad Region is multi-centric and travel within the region is growing.	Limiting the analysis to Forsyth County (which includes Kernersville) is an appropriate methodology based on ICI guidance and engineering judgment. As stated in the response to Comments 225-24 and 225-50 in the SFEIS/FEIS, page 6-134: “The study area boundaries were defined according to NCDOT’s <i>Guidance for Assessing Indirect and Cumulative Impacts of Transportation Projects in North Carolina, Volume II: Practitioner’s Handbook</i> . The shifts in population and employment in Forsyth County were so small that any shifts outside Forsyth County were considered too small to include. In addition major transportation infrastructure projects in Guilford, Randolph, and Davidson Counties would tend to maintain the existing equilibrium of jobs and housing.”

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		<p>It may be assumed that the shorter, non-commute trips (e.g. shopping) that make up the majority of all trips will also be conducted within Forsyth County. The data cited in the comment is Journey-To-Work to/from the county, not the overall amount. The comment cited the change to commuting patterns, which is actually very small in percentage terms: only 3% more commuters entered Forsyth County from another county in 2000 compared to 1990.</p> <p>Further, the commuteshed based on CTPP (Census Transportation Planning Package) Journey-To-Work is limited to Forsyth County because in 2000, 70% of commuters that work in Forsyth County began their trip in Forsyth County (source: US Bureau of Census, 1990/2000 Journey-to-Work).</p> <p>The N.C. Division of Environment and Natural Resources (NCDENR) has agreed with the methodologies spelled out in the <i>Guidance for Assessing Indirect and Cumulative Impacts of Transportation Projects in North Carolina, Volume II: Practitioner's Handbook</i>. This agreement is documented by the February 2003 Memorandum of Understanding between NCDOT and NCDENR, in which both agencies agreed that the Guidance is an acceptable approach for performing an indirect and cumulative impact analysis when complying with NEPA. Also, NCDENR served on an inter-agency task force that was involved in the development of the Guidance.</p>
Marshall-11	<p>INDIRECT AND CUMULATIVE IMPACTS: The gravity model used by the Louis Berger Group in the indirect and cumulative analysis lacks statistical estimation or validation, resulting in a process using circular logic to prove the basic premise.</p>	<p>The gravity model is an accepted method for assessing indirect effects of highway projects (as noted in the NCDOT <i>Guidance for Assessing Indirect and Cumulative Impacts of Transportation Projects in North Carolina</i>, as well as that from other states and in studies referenced in FHWA ICI guidance). The gravity model generally confirmed what local planners indicated about where effects could occur in combination with other factors (water/sewer, etc.). In addition, external surveys that used the level of knowledge of the respondents' familiarity with a</p>

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		particular subarea to weigh the importance of the response, as well as internal analyses of growth pressures around the interchanges, were conducted and reported to help validate and cross-check the results of the gravity model.
Marshall-12	<p>INDIRECT AND CUMULATIVE IMPACTS: The SMITE model does not accurately estimate induced travel. The Cervero paper cited in the SFEIS/FEIS does not support NCDOT’s analysis.</p>	<p>SMITE was developed by FHWA for estimations of induced travel in a corridor; the model was used here for a large area that includes all of Forsyth County since the corridor under study would include almost all of Forsyth County. The Path model work cited (Robert Cervero, “<i>Road Expansion, Urban Growth, and Induced Travel: A Path Analysis</i>,” University of California, Berkeley, July, 2001) includes travel and mode shifts in the estimates of induced demand (Cervero, p. 17), translating into an overestimate of the true induced demand effect of adding new roadway capacity. Adding roadway capacity (or increasing operating speeds) was less important in Cervero’s judgment than personal income of residents of the surrounding area, a completely unrelated factor to roadway development.</p> <p>Cervero also notes that past studies (Hansen, et al., 1993; Hansen and Huang, 1997; Noland and Cowert, 2000; Cervero and Hansen, 2001) frequently cited as highlighting the induced effects of roadways on private development have over-inflated estimates, and concludes with the statement, “The problems people associate with roads – congestion, air pollution, and the like – are not the fault of road investments per se. These problems stem mainly from the unborne externalities from the use of roads, new and old alike. They also stem from the absence of thoughtful and integrated land use planning and growth management around new interchanges and along new corridors.” (Cervero, p. 25).</p> <p>The conclusion reached regarding the short-term effects of new freeways agrees with the results found in the <i>Indirect and Cumulative Impacts Analysis</i>, as well as other controlled studies that cite that roadways have an influence on private development, but it is a lesser influence on development patterns than other</p>

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		factors, such as public water/sewer provisions and proximity to existing concentrations of residents. In several works, the authors cite the need for better land management practices, which are also discussed in the <i>Indirect and Cumulative Impacts Analysis</i> .
WRC-6	The ICI analysis did not provide details on existing regulations, limitations on growth, water quality protection, existing or expected impervious surface coverage, or timing of build-out.	An estimation of anticipated changes to impervious surface cover has been completed, and includes a water quality model using ANNAGNPS and stream cross-sections. This information was not summarized in the SFEIS/FEIS or the <i>Indirect and Cumulative Impacts Analysis</i> since it was completed following publication of those reports, but will be included as part of the Section 401 Water Quality Certification and a Section 404 Permit.
EPA-1	REPORT FORMAT: The SFEIS/FEIS contains confusing data quantification and presentation, which have not been corrected from the 2004 SFEIS/DEIS.	The 2004 SFEIS/DEIS and the 2007 SFEIS/FEIS present information from previous reports as well as new information. This combination of information sources may contribute to confusion for the reader. It is necessary to include both previous and current data in order to provide full documentation of the evolution of the Northern Beltway over time.
EPA-7	REPORT FORMAT: All commitments listed in the Green Sheet and in these comments should be addressed in the ROD.	All of EPA's concerns are addressed in this section of the ROD. The Green Sheets have been included as part of the ROD.
Dean-2	PROJECT HISTORY: Changing the sequence of projects has made commenting on the SFEIS/FEIS difficult.	Comment noted.
Jones-5	PROJECT HISTORY: The SFEIS/FEIS should discuss the history of	The relevant history of the Highway Trust Fund Act was discussed in Section 1.4.1., including the limits of the Beltway as currently defined in the Act.

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	the Highway Trust Fund Act, including the 2003 addition of Project U-2579A, and the fact that Project R-2247A is not part of the Highway Trust Fund Act.	
Jones-8	PROJECT HISTORY: The Board of Transportation could choose to designate US 52 as I-74.	Comment noted.

8. Revisions to the SFEIS/FEIS

The following are revisions to the 2007 SFEIS/FEIS.

8.1. Accident Analysis

Table 1-12 contained an error in calculating the critical crash rate for the Eastern Section study area. In the equation below, an incorrect value was used for “M,” the vehicle exposure rate.

$$F_c = F_a + k(F_a / M)^{1/2} + 1/2M$$

In addition, there was an error in the ADT calculation for two segments: US 311 from I-40 to NC 66, and US 158 from US 421/I-40 Business to NC 66.

8.1.1. Section 1.4.3 Revisions

The “above-average accident rates on area roadways” need for Projects U-2579 and U-2579A should be revised to reflect the correct crash rate values. The second paragraph under this section should be modified as shown below, with revisions noted in ***bold italics***.

Six of the thirteen roadway segments analyzed in the Project U-2579 and Project U-2579A study areas had above-average accident rates. These segments were along ***US 158***, US 52, and NC 66 (see Table 1-12 in Section 1.12).

8.1.2. Section 1.5.3 Revisions

The “Enhance Safety” purpose for Projects U-2579 and U-2579A incorrectly referred to a projected accident rate decrease. Although a 2025 projected accident analysis was included in the SFEIS/SDEIS, it was determined by NCDOT not to be a valid analysis, and was removed from the SFEIS/FEIS (as discussed further in Section 2.10.5).

Therefore, the “Enhance Safety” bullet under Section 1.5.3 of the SFEIS/FEIS should be revised as shown below, as noted in ***bold italics***.

The Northern Beltway would provide a higher level of safety to traffic that would be diverted from US 52 and NC 66 to the Beltway because of its design as a modern Interstate facility. ***Modern interstate-standard facilities are the safest facility NCDOT can provide to the public. These facilities***

have the highest design-standards to minimize the potential for crashes, and built-in protections to lessen the severity of crashes that do occur. The Eastern Section of the Beltway (a modern interstate-standard facility) would provide the motoring public a safer choice than many of the existing routes available today.

8.1.3. Section 1.12 Revisions

The conclusions based on the critical crash rate analysis should be modified to reflect the correct crash rate values. The fifth paragraph in Section 1.12 should be modified as shown below, with revisions noted in *bold italics*.

In the Project U-2579 and Project U-2579A study areas, those roadways with safety ratios of 1.25 or higher include US 52, ***US 158***, and NC 66; *all* high-volume roadways that are primary routes in eastern Forsyth County. Safety ratios are as high as ***1.58*** and ***1.49*** on segments of US 52, ***1.30 on a segment of US 158***, and ***1.73*** on a segment of NC 66. For these reasons, safety is a component of the purpose and need for Projects U-2579 and U-2579A.

The revised Table 1-12, which reflects the corrected ADTs, critical crash rates, and safety ratios, is shown below.

Table 1-12: Accident Data for Roadway Segments in Project U-2579 and Project U-2579A Study Areas for the Years 1999-2002

Roadway	Segment	Road Type	Length (miles)	ADT	Total No. of Accidents	Total Accident Rate*	Statewide Average Accident Rate*	Critical Crash Rate**	Safety Ratio***	No. of Fatality Accidents	No. of Injury Accidents	No. of Property – Only Accidents
US 421/I-40 Business	US 52 and NC 66	Urban Interstate	9.88	47,400	304	59.28	125.86	134.11	0.44	3	99	202
I-40	US 52 and NC 66	Rural Interstate	10.48	62,000	460	64.65	67.62	72.76	0.89	8	162	290
US 52	I-40 and US 421/I-40 Business	4-Lane Divided Full Access Control Urban US Route	2.66	57,300	428	256.44	155.81	172	1.49	2	129	297
US 52	US-421/I-40 Business and Akron Drive (SR #2264)	4-Lane Divided Full Access Control Urban US Route	3.51	72,000	734	265.24	155.81	168.33	1.58	0	245	489
US 52	Akron Drive (SR #2264) and NC 65	4-Lane Divided Full Access Control Urban US Route	6.03	45,200	253	84.77	155.81	167.87	0.50	1	90	162
US 311	Williston Road (SR #2381) and I-40	4-Lane Divided Full Access Control Urban US Route	11.82	59,800	1024	132.3	155.81	163.26	0.81	3	358	663
US 311	I-40 and NC 66	4-Lane Divided Full Access Control Urban US Route	7.87	18,600	112	69.87	155.81	172.36	0.41	2	39	71
US 158	US 421/I-40 Business and NC 66	2-Lane Undivided Rural US Route	5.46	14,300	216	252.63	170.47	194.35	1.30	1	89	126
US 311	NC 66 and Williston Road (SR #2381)	2-Lane Undivided Urban US Route	1.01	4,600	17	333.99	321.84	463.82	0.72	0	6	11
NC 66	US 421/I-40 Business and US 311	2-Lane Undivided Rural NC Route	9.43	9,900	364	356.06	182.95	205.47	1.73	2	135	228
NC 66	NC 66 Connector (SR #1840) to Hopkins Road (SR #2649)	2-Lane Undivided Rural NC Route	11.48	9,500	354	296.43	182.95	203.77	1.45	2	152	200
NC 66	Hopkins Road (SR #2649) and US 421/I-40 Business	2-Lane Undivided Urban NC Route	3.97	12,000	233	446.62	334.95	377.66	1.18	1	76	156
NC 66 Connector (SR #1840)	US 52 to NC 66	2-Lane Undivided Rural SR Route	1.00	5,400	6	101.52	347.58	481.12	0.21	0	2	4

* Accident Rate = Number of Accidents / Million Vehicle Miles Traveled

** Critical Crash Rate is used to screen for high accident locations and accounts for exposure on each segment (from *Guidelines for Utilizing NC Statewide Crash Rates*)

*** Safety Ratio = Crash rate versus critical crash rate

Statewide Averages from NCDOT Traffic Engineering Branch for 2000-2002

8.1.4. Section 2.10.5 Revisions

The crash rate summary in Section 2.10.5 should be revised as shown below, noted in *bold italics*.

US 52 between US 421/I-40 Business and Akron Drive has a crash rate above the critical crash rate (**265.24** and 168.33 crashes per million vehicle-miles, respectively) which points to a safety problem along that route. Because the Eastern Section of the Beltway is projected to reduce volumes along this stretch of US 52 by diverting them to a safer facility, it is expected that the number of crashes on this stretch of US 52 would decrease as a result of the project. NCDOT is also addressing the safety issue along this stretch of US 52 by constructing some safety improvements as part of TIP Project U-2826B.

8.2. Relocation Impacts

The summary of relocation impacts in Tables 4-1, 4-88, and S-1 in the SFEIS/FEIS did not take into account the reduction of residential relocation impacts due to the revised Bethania-Tobaccoville Road interchange design. The revised interchange design will reduce the owner-occupied residential relocations by six, as shown below.

8.2.1. Section 4.2.1.2 Revisions

The summary of residential relocations for the Preferred Alternative in Table 4-1 is incorrect, as described above. Revisions to Table 4-1 are shown below. Revisions are shown in *bold italics*.

Table 4-1: Combined Direct Relocation Impacts – Projects R-2247, U-2579, and U-2579A

Project	Alternative	Residences				Businesses
		Total	Owner-Occupied	Tenant-Occupied ¹	Minority	
R-2247 and U-2579 Preferred Alternatives plus U-2579A Detailed Study Alternatives With (Without) Kernersville Road Interchange	N1-S1	988 (965)	891 (870)	97 (96)	171 (171)	50 (36)
	N1-S2	1,024 (1,002)	925 (904)	99 (98)	173 (168)	47 (34)
	N2-S1 (Preferred Alternative)	1,013 (942)	888 (847)	125 (95)	155 (169)	60 (42)
	N2-S2	1,012 (1,009)	914 (912)	98 (97)	182 (172)	49 (40)
	N3-S1	951 (941)	852 (842)	99 (99)	170 (169)	46 (35)
	N3-S2	1,018 (1,008)	917 (907)	101 (101)	191 (170)	44 (33)

Based on 2005 Relocation Reports for Projects U-2579, and U-2579A Preferred Alternatives and 2003 Relocation Reports for Project R-2247 Preferred Alternative and Project U-2579A non-preferred Detailed Study Alternatives.

() Alternative without Kernersville Road Interchange. The Project U-2579A Preferred Alternative includes an interchange at Kernersville Road.

'**Bold**' indicates Preferred Alternative.

¹ A number of tenant-occupied residences are privately-owned mobile homes. The owners rent space in a mobile-home park, and are thereby considered to be tenants.

8.2.2. Section 4.24 Relocation Impacts Revisions

The summary of residential relocations for the Preferred Alternative in Table 4-88 is incorrect, as described above. Revisions to Table 4-88 are shown below. Revisions are shown in *bold italics*.

Table 4-88: Combined Direct Environmental Consequences – Projects R-2247, U-2579, and U-2579A

Environmental Issue	Project R-2247 and Project U-2579 Preferred Alternatives PLUS Project U-2579A Detailed Study Alternatives						
	N2-S1 (Preferred Alternative)	N1-S1	N1-S2	N2-S1 (Without Interchange)	N2-S2	N3-S1	N3-S2
		With (Without) Kernersville Road Interchange			With (Without) Kernersville Road Interchange		
Relocation Impact Summary⁸							
Residences (total)	<i>1,013</i>	985 (963)	1,021 (999)	939	1,009 (1,006)	948 (938)	1,105 (1,005)
Owner-occupied	<i>888</i>	888 (867)	922 (901)	844	911 (909)	849 (839)	914 (904)
Tenant-occupied	<i>125</i>	97 (96)	99 (98)	95	98 (97)	99 (99)	101 (101)
Minority	<i>155</i>	171 (171)	173 (168)	169	182 (172)	170 (169)	191 (170)
Businesses	<i>60</i>	50 (36)	47 (34)	42	49 (40)	46 (35)	44 (33)

⁸ Based on 2005 relocation reports for U-2579 and U-2579A Preferred Alternative, and 2003 relocation reports for R-2247 Preferred Alternative and U-2579A non-preferred Detailed Study Alternatives.

8.2.3. Section S.7 Relocation Impacts Revisions

The summary of residential relocations for the Preferred Alternative in Table S-1 is incorrect, as described above. Revisions to Table S-1 are shown below. Revisions are shown in *bold italics*.

Table S-1: Direct Environmental Consequences – Northern Beltway Preferred Alternative

Environmental Issue	Impact
Relocation Impact Summary⁷	
Residences (total)	<i>1,013</i>
Owner-occupied	<i>888</i>
Tenant-occupied	125
Minority	155
Businesses	60

⁷ Based on 2005 relocation reports for U-2579 and U-2579A Preferred Alternative, and 2003 relocation reports for R-2247 Preferred Alternative and U-2579A non-preferred Detailed Study Alternatives.

8.3. Community Service and Facilities Impact Summary

Section 4.2.2 describes the impacts to community services and facilities. The text is correct, but the summary of impacts to churches and cemeteries in Tables 4-5, 4-88, and S-1 are incorrect. The Northern Beltway Preferred Alternative would impact the following churches and cemeteries:

Project R-2247

- Pfafftown Baptist Church (property and an outbuilding only)

Project U-2579

- Mount Pleasant Christian Church
- Gospel Light Baptist Church and School (property and two houses owned by the church only)
- First Baptist Church of Stanleyville (property only)
- Bethany Baptist Church (property only)

Project U-2579A

- Pisgah United Methodist Church and Cemetery (property only)
- Christ Temple Church (property only)

8.3.1. Section 4.2.2.1 Revisions

The summary of impacts to churches and cemeteries in Table 4-5 is correct, but the footnotes are incorrect. There is no impact to the Oak Grove Moravian Church buildings or property, although the Oak Grove Moravian Church parsonage is within the right of way of the Project U-2579 Preferred Alternative. Revisions to Table 4-5 are shown below. Revisions are shown in *bold italics*, and omissions are shown in strikeout.

Table 4-5: Combined Direct Impacts to Community Services and Facilities – Projects R-2247, U-2579, and U-2579A

Project	Alternative	Schools	Parks & Recreational Facilities	Churches and Cemeteries	Other Community Facilities
R-2247 and U-2579 Preferred Alternatives plus U-2579A Detailed Study Alternatives ¹	N1-S1	1 ²	0	7 ^{4,5,6,7}	0
	N1-S2	1 ²	0	7 ^{3,4,5,7}	0
	N2-S1 (Preferred Alternative)	1²	0	7^{4,5,6,7}	0
	N2-S2	1 ²	0	7 ^{3,4,5,7}	0
	N3-S1	0	0	7 ^{4,5,6,7}	0
	N3-S2	0	0	7 ^{3,4,5,7}	0

Impacts are based on 2005 preliminary engineering designs for the Project R-2247, U-2579, and U-2579A Preferred Alternatives, and are based on the 2002 preliminary engineering designs for the Project U-259A non-preferred alternatives.

¹ Results are the same for Project U-2579A alternatives with or without the Kernersville Road interchange.

² Sedge Garden Elementary School; temporary impact from Sedge Garden Road detour.

³ Piedmont Memorial Gardens; impact to property, but not to existing graves.

⁴ ***Impact to the Gospel Light Christian School and Church, First Baptist Church of Stanleyville, Bethany Baptist Church, Pisgah United Methodist Church and Cemetery, and Pfafftown Baptist Church impacts property or outbuildings only, and does not impact church facilities.***

⁵ Mount Pleasant Christian Church.

⁶ Impact to Christ Temple Church does not impact church facilities.

⁷ ~~Impact to the Oak Grove Moravian Church includes relocation of the parsonage, but no impact to church facilities.~~

'Bold' indicates Preferred Alternative.

8.3.2. Section 4.24 Community Impact Revisions

The summary of impacts to churches and cemeteries in Table 4-88 is incorrect, and the footnotes are incomplete. The Community Services and Facilities Impact Summary in Table 4-88 has been revised to correctly reflect impacts to churches and cemeteries as described above. Revisions to Table 4-88 are shown below. Revisions are shown in ***bold italics***, and omissions are shown in ~~strikeout~~.

Table 4-88: Combined Direct Environmental Consequences – Projects R-2247, U-2579, and U-2579A

Environmental Issue	Project R-2247 and Project U-2579 Preferred Alternatives PLUS Project U-2579A Detailed Study Alternatives						
	N2-S1 (Preferred Alternative)	N1-S1	N1-S2	N2-S1 (Without Interchange)	N2-S2	N3-S1	N3-S2
		With (Without) Kernersville Road Interchange			With (Without) Kernersville Road Interchange		
Community Services and Facilities Impact Summary							
Schools	1^{4,5}	1 ^{4,5}	1 ^{4,5}	1 ^{4,5}	1 ^{4,5}	0	0
Parks & Recreational Facilities	0	0	0	0	0	0	0
Churches & Cemeteries	7^{5,9}	7^{5,9}	7^{5,6,9}	7^{5,9}	7^{5,6,9}	7^{5,9}	7^{5,6,9}
Other Community Facilities	0	0	0	0	0	0	0

⁴ Sedge Garden Elementary School; temporary impact from Sedge Garden Road detour.

⁵ Impact to property does not impact school or church facilities.

⁶ Piedmont Memorial Gardens; impact to property, but not to existing graves.

⁹ ***Mount Pleasant Christian Church.***

8.3.3. Section S.7 Community Impact Revisions

The summary of impacts to churches and cemeteries in Table S-1 is incorrect, and the footnotes are incomplete. The Community Services and Facilities Impact Summary in Table S-1 has been revised to correctly reflect impacts to churches and cemeteries as described above. Revisions to Table S-1 are shown below. Revisions are shown in ***bold italics***, and omissions are shown in strikeout.

Table S-1: Direct Environmental Consequences – Northern Beltway Preferred Alternative

Environmental Issue	Impact
Community Services and Facilities Impact Summary	
Schools	1 ^{4,5}
Parks & Recreational Facilities	0
Churches & Cemeteries	7 ^{5,8}
Other Community Facilities	0

⁴ Sedge Garden Elementary School; temporary impact from Sedge Garden Road detour.

⁵ Impact to property does not impact school or church facilities.

⁸ ***Mount Pleasant Christian Church.***

8.4. Historic Resource Impacts

The Memorandum of Agreement (MOA) prepared for the Hege House was executed by FHWA and SHPO, and was concurred in by NCDOT. The FHWA, SHPO, and NCDOT consulted with the owner of the Hege House when preparing the MOA. Although the owner was invited to concur in the MOA, they did not do so. The sentence in Section 4.4.3.3 of the SFEIS/FEIS that says the owner of the Hege House did concur on the MOA is incorrect. The second paragraph in Section 4.4.3.3 should be revised as shown below. Revisions are in ***bold italics***.

Because of the determination of Adverse Effect, the Hege House was included in a Memorandum of Agreement (MOA) executed by FHWA and SHPO, and concurred in by NCDOT (see copy of MOA in **Appendix D.1**). ***FHWA, SHPO, and NCDOT consulted with the owner of the Hege House when preparing the MOA.*** The MOA specifies that NCDOT would photographically record the existing conditions of the Hege House and its surroundings prior to construction, that the driveway would be aligned opposite the proposed ramp and would be under signal control, that access control fencing be designed in consultation with SHPO prior to its installation by NCDOT, and that NCDOT would provide tree

protection and limit disturbance of plantings along the National Register boundary. The owner may pursue a preservation easement for the house.

8.5. Noise

There was an error in the Noise Impact Summary for the Preferred Alternative in Tables 4-88 and S-1. The Northern Beltway Preferred Alternative will have the following impacts on noise receptors:

Project	R-2247*	U-2579	U-2579A	Total
Number of receptors impacted by Preferred Alternative	307	242	218	767
Number of receptors benefited by proposed noise walls	242	105	151	498
Number of receptors impacted with mitigation in place	67	137	67	271

* Does not include the noise barrier proposed at the Shallowford Road interchange, as discussed in Section 4.8.2.2 of the SFEIS/FEIS.

Revisions to Tables 4-88 and S-1 are shown below.

8.5.1. Section 4.24 Noise Revisions

The noise impact summary for the Northern Beltway Preferred Alternative in Table 4-88 is incorrect, and should be revised as described above. Noise impacts for the Preferred Alternative were updated based on updated noise analyses (2005 and 2006). Revisions to Table 4-88 are shown below. Revisions are shown in *bold italics*.

Table 4-88: Combined Direct Environmental Consequences – Projects R-2247, U-2579, and U-2579A

Environmental Issue	Project R-2247 and Project U-2579 Preferred Alternatives PLUS Project U-2579A Detailed Study Alternatives						
	N2-S1 (Preferred Alternative)	N1-S1	N1-S2	N2-S1 (Without Interchange)	N2-S2	N3-S1	N3-S2
		With (Without) Kernersville Road Interchange			With (Without) Kernersville Road Interchange		
Noise Impact Summary							
# of Impacted Receptors – with mitigation in place	<i>271</i>	755 (768)	721 (730)	809	742 (730)	792 (786)	713 (707)

8.5.2. Section S.7 Noise Revisions

The noise impact summary in Table S-1 is incorrect, and should be revised as described above. Revisions to Table S-1 are shown below. Revisions are shown in *bold italics*.

Table S-1: Direct Environmental Consequences – Northern Beltway Preferred Alternative

Environmental Issue	Impact
Noise Impact Summary	
# of Impacted Receptors – with mitigation in place	<i>271</i>

8.5.3. Section 4.8.3.4 Noise Revisions

There was an error in Section 4.8.3.4 of the SFEIS/FEIS in the description of one of the proposed Project U-2579A noise walls. The second paragraph on page 4-138 should be revised as shown below (noted in *bold italics*).

Barrier ESE-NB6 extends along the *northeast* quadrant of the I-40 interchange. The proposed barrier is projected to be 2,750 feet in length and ranges from 14 to 22 feet in height. The barrier is expected to benefit 49 receivers at a total cost of \$840,400, for a cost of \$17,150 per benefited receiver.

8.6. Farmlands

Sections 3.14 and 4.12 in the SFEIS/FEIS have been revised to clarify the following points:

- 1) Impacts by the Northern Beltway are to Prime and Important Farmland soils. However, since the soils impacted by Projects R-2247, U-2579, and U-2579A received scores of less than 160 points from the land evaluation and site assessment criteria, and thus did not meet the threshold of protection based on the evaluation under the Farmland Protection Policy Act (FPPA), the impact to prime and state/locally important farmland is not considered under the Act. This clarification has also been reflected in Sections 4.24 and S.7, as shown below.
- 2) According to the FPPA, the purpose of the Act is to minimize impacts to farmlands. The text has been revised to remove the reference to “mitigation” of farmland loss.
- 3) The impact of the Preferred Alternative to agriculturally zoned areas and Rural Area designated areas have been quantified and included in Section 4.12, Section 4.24, and Section S.7 of the SFEIS/FEIS.

8.6.1. Section 3.14 Revisions

Section 3.14 of the SFEIS/FEIS has been revised to clarify the issues as described above. The revised Section 3.14 has been included below, with revisions and additions noted in *bold italics* and deletions noted in strikeout.

3.14 PRIME AND IMPORTANT FARMLAND

The Farmland Protection Policy Act (*FPPA*) of 1981 (7 CFR Part 658) requires all federal agencies to consider the impact of their activities on prime, unique, statewide and locally important farmland ~~soils~~, as defined by the US Department of Agriculture (USDA), *Natural Resources Conservation Service* (NRCS) (Public Law 97-98, Subtitle 1, Section 1540). The NRCS (formerly the Soil Conservation Service [SCS]), in cooperation with state and local agencies, developed a listing of *Prime and Statewide Important Farmland of North Carolina* (USDA, 1998).

Prime Farmland is defined as soils best suited for producing food, feed, fiber, forage, and oil seed crops. These soils are favorable for all major crops common to the county, have a favorable growing season, and receive the available moisture needed to produce high yields on an average of eight out of every ten years. Land already in or committed to urban development or water storage is not included.

Unique Farmlands are used for production and specific high-value food or fiber crops. It has the special combinations of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops when treated and managed.

State and Locally Important *Farmland* is defined by the appropriate state or local government agency as soils important in the agriculture of an individual county. These definitions are based on measures of the soil's capacity to support productive farm activity, not of current cultivation.

There are 62,005 acres of prime farmland *soils*, 72,285 acres of state and locally important farmland *soils* and 137,070 acres of other land in Forsyth County (SCS, n.d.). **Table 3-23** identifies prime farmland, and state and

locally important farmland *soils*. Note that these are areas with proper soil conditions for farmlands, not areas that are currently or even recently cultivated. A considerable portion of the identified areas currently are forested.

Forsyth County has established a Farmland Preservation Program with a primary goal "to protect and conserve those soils in Forsyth County best suited to agricultural uses." The tracts participating in this program are shown on **Figure 3-6**.

8.6.2. Section 4.12 Revisions

Section 4.12 of the SFEIS/FEIS has been revised to clarify the issues as described above. The revised Section 4.12 has been included below, with revisions and additions noted in *bold italics* and deletions noted in ~~strikeout~~.

4.12 FARMLAND

4.12.1 Regulatory Background

In accordance with the Farmland Protection Policy Act (FPPA) of 1981 (7 CFR Part 658) and State Executive Order Number 96, an assessment was undertaken of the potential impacts of land acquisition and construction activities in prime, unique, and local or statewide important farmland~~soils~~, as defined by the ~~US~~ Natural Resource Conservation Service (NRCS).

The FPPA defines "farmland" as either "prime farmland," "*unique farmland*," "state and locally important farmland," or other farmland. All three types of "farmland" are defined by Section 1540(c)(1) of the Act, *as described in Section 3.14*. These definitions refer to areas where the soils are conducive to agricultural production, not just areas currently or historically used as farmland. According to the Act, prime farmland does not include land already in or committed to urban development or water storage.

Coordination with the NRCS for the proposed projects was conducted. Form AD-1006, *Farmland Conversion Impact Rating*, was submitted to the NRCS for the Project R-2247 Preferred Alternative, the Project U-

2579 Detailed Study Alternatives and Preferred Alternative, and the Project U-2579A Detailed Study Alternatives. The NRCS responded by completing their portions of this form and providing a relative value of farmland that may be affected (converted) by the proposed project.

The NRCS assigns ratings to potential farmland impacts in order to determine the level of significance of impacts. The ratings are comprised of two parts. The Land Evaluation Criterion Value represents the relative value of the farmland to be converted and is determined by the NRCS on a scale from 0 to 100 points. The Corridor Assessment, which is rated on a scale of 0 to 160 points, evaluates farmland soil based on 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 less than 160 should be given a minimal level of protection, and sites receiving a total score of 160 or more are given increasingly higher levels of consideration for protection (7 CFR Section 658.4).

As described in **Section 3.14**, some soils in the project area are considered as prime farmland and state important land as defined by the Natural Resources Conservation Service (formerly Soil Conservation Service (SCS)). *There are no soils considered to be unique or locally important in Forsyth County.*

4.12.2 Combined Direct Farmland Impacts

For the Project R-2247, U-2579, and U-2579A Preferred Alternatives, there are a total of 610.1 acres of prime farmland soils and 769.5 acres of state and locally important farmland soils, for a total of 1,379.6 acres. However, the majority of these soils do not meet the FPPA's definition of "prime farmland" because they are already in or committed to urban development as can be seen on the current zoning map (see Figure 3-1).

According to the FPPA, lands that receive a combined score of less than 160 points from the land evaluation and site assessment criteria are not covered by the Act. Since the soils impacted by Projects R-2247, U-2579, and U-2579A did not meet the threshold of protection based on the evaluation under the FPPA, the impact to prime, unique, and

state/locally important farmland is not considered under the Act. No significant impacts to farmland would occur under any of the Detailed Study Alternatives for Projects R-2247, U-2579, or U-2579A, whether constructed in whole or in part.

4.12.3 Farmland - Project R-2247 Detailed Study Alternatives

This section is based on Section 4.6.5 of the 1996 Project R-2247 FEIS.

As described in **Section 3.14**, some soils in the project area are considered as prime farmland or state/locally important farmland as defined by the Natural Resources Conservation Service (formerly Soil Conservation Service (SCS)).

Table 4-47 presents the estimates of prime and important farmland soils present in the Detailed Study Alternatives, based on the 1992 functional designs rights of way. These estimates of prime and state and locally important farmland *soils* were calculated by multiplying the linear length of the alignment traversing the farmland category by the ratio of right of way acreage to total segment length (farmland linear length * [right-of-way acreage/segment length]). The resulting number is an estimate based on the average ratio of right-of-way acreage to segment length and provides a relative measure for use in comparing segment impacts to farmland soils.

Table 4-47: Prime and Important Farmland Soils Impacts – Project R-2247 Detailed Study Alternatives

Detailed Study Alternative	Length (miles)	Right-of-way Area (acres)	Prime Farmland Soils (acres)	State/Locally Important Farmland Soils (acres)
WEST-A	17.22	1,273	202	335
EAST-A	16.31	1,163	155	295
WEST-B	17.59	1,259	182	325
EAST-B	16.68	1,149	135	286
C3-WEST-A	16.97	1,215	213	300
C2-EAST-A	17.05	1,222	183	312
C2-EAST-B	17.43	1,208	162	302
Preferred Alternative				
C3-WEST-B	17.35	1,201	193	291

Source: Table 4.5-3 of the 1996 Project R-2247 FEIS.
 Estimates of acreage based on 1992 functional designs right of way.
 ‘**Bold**’ indicates Preferred Alternative.

For the 1996 Project R-2247 FEIS, coordination with the SCS (phone conversation with Mr. P. Tant, SCS, July 23, 1991) confirmed that the lands within the study area did not meet the Farmland Protection Policy Act’s definition of prime farmland, as all land within the study area was zoned by the City-County Planning Board and Forsyth County for either residential, commercial, or industrial use. The preparation of Form AD-1006 (Farmland Conservation Impact Rating) was, therefore, not required for these lands.

As discussed in the next section, an AD-1006 form was submitted to the NRCS for the Preferred Alternative in August 2003. *Based on this assessment, soils within the Preferred Alternative did not meet the 160-point threshold of protection under the FPPA.* ~~The assessment for the Preferred Alternative did not result in a total site assessment score greater than 160 points and mitigation for farmland loss is not required under the FPPA.~~ Based on this result, it is not expected that any of the other Detailed Study Alternatives would result in significant impacts to farmland. The other seven Detailed Study Alternatives either include most of the segments used by the Project R-2247 Preferred Alternative, or use the segments to the east that are more urbanized.

4.12.4 Farmland - Project R-2247 Preferred Alternative

There are about 498 acres of prime farmland soils and 602 acres of statewide/locally important farmland soils within the 1,559 acres of right of way of the Preferred Alternative's 2002 preliminary engineering design. Estimates of prime and important farmland soils present in the right of way were calculated using the Arc/Info GIS program and overlaying the soils with the right of way. The soils data layer was provided by Forsyth County. The most recent list of Important Farmlands of North Carolina (dated May 1998) was downloaded from the NRCS website in August 2003 and used to identify prime and locally/state important farmland soils within the Preferred Alternative right of way.

Although there are about 498 acres of prime farmland soils within the Preferred Alternative right of way, the majority of these soils do not meet the Farmland Protection Policy Act's definition of "prime farmland" because they are already in or committed to urban development as can be seen on the current zoning map (see **Figure 3-1**).

The current zoning map shows that the majority of the land within the Project R-2247 Preferred Alternative right of way is zoned single-family residential with pockets of land zoned for business, industrial, multi-family residential, office, institutional and mixed use (see Figure 3-1). However, *approximately 197 acres* ~~a small amount of the land crossed~~ *taken* by the Preferred Alternative currently is zoned agriculture. Also, the Growth Management Plan shows that the Preferred Alternative skirts the Rural Area designation north of Yadkinville Road, *impacting approximately 242 acres of land designated as Rural Area* (see Figure 3-2).

As required by the FPPA, coordination with the NRCS was initiated by submittal of Form AD-1006, *Farmland Conversion Impact Rating*. The NRCS responded by completing their portions of this form and providing a relative value of farmland that may be affected (converted) by the proposed project.

The completed AD-1006 Farmland Conversion *Impact* Rating form is provided in **Appendix H**. The relative value of farmland included in the

Project R-2247 Preferred Alternative received a score of 29 points (out of a possible 100 points) and the total site assessment received a score of 66 points (out of a possible 160 points), for a total score of 95 points. ***Based on this assessment, soils within the Preferred Alternative did not meet the 160-point threshold of protection under the FPPA.*** ~~The Project R-2247 Preferred Alternative received less than the minimum level (160 points) at which the United States Department of Agriculture (USDA) recommends that a proposed alternative be considered for farmland protection. Therefore, in accordance with the Farmland Protection Policy Act, no mitigation for farmland loss is required for the project.~~

4.12.5 Farmland - Project U-2579 Detailed Study Alternatives

The following discussion is from Section 4.4.8 of the 1995 Project U-2579 DEIS. The impact to farmland was determined for areas that were designated as rural in the 1990 census.

All the proposed alternatives would involve the use of prime, statewide, and local important farmland within the proposed right of way. This project was coordinated with the Soil Conservation Service (SCS) as required by the Farmland Protection Policy Act (FPPA).

The Forsyth County Growth Management Plan included in *Vision 2005* indicates that the areas to the south of NC 66 and to the west of University Parkway are planned as "Growth Area." *Vision 2005* states that areas planned as "Rural Area" attempt to "retain farming activities." The Growth Management Plan also indicates that the only planned Rural Area in the study area is to the north of NC 66. Most of the study area is planned for future urbanization. Portions of the Eastern and Western Detailed Study Alternatives, as well as Crossovers 1 and 2, located north of NC 66 and east of University Parkway are located within the designated Rural Area. Since the 1995 Project U-2579 DEIS, the Growth Management Plan, the *Legacy Plan*, has been updated, and is discussed in **Section 1.10.3**.

The Farmland Conversion Impact Rating (Form AD-1006) was completed by the appropriate agencies and is included in **Appendix H, Table 4-48** summarizes the amount of prime, as well as statewide and local important

farmland *soils*, included in the Western and Eastern Detailed Study Alternatives and the five crossovers.

Table 4-48 indicates that the Western Detailed Study Alternative includes 532 acres of specially designated farmland *soils*, whereas the Eastern Detailed Study Alternative includes 500 acres. Crossover 2 includes the greatest amount of specially designated farmland of any of the crossovers (58 acres), whereas Crossover 3 has the least (41 acres).

Table 4-48: Prime and Important Farmland Soils Impacts – Project U-2579 Detailed Study Alternatives

Alternative/ Segment	Prime Farmland Soils (acres)	State/Locally Important Farmland Soils (acres)	Total Prime and Important <i>Farmland Soils</i> (acres)	Total Site Assessment Score
Western	303	229	532	140.4
Eastern	239	261	500	130.2
C1	10	39	49	129.2
C2	7	51	58	120.0
C3	21	20	41	150.4
C4	28	23	51	157.3
C5	10	40	50	134.2

Impacts are based upon right-of-way limits for the 1994 functional engineering designs. Source: Table 4-8 from the 1995 Project U-2579 DEIS

All of the proposed alternatives received less than the minimum level (160 points) at which the United States Department of Agriculture (USDA) recommends that a proposed alternative be considered for farmland protection. Based on this assessment, soils within the Detailed Study Alternatives are not eligible for protection under the FPPA. ~~Based on these relatively low scores, the proposed Detailed Study Alternatives for Project U-2579 require a minimal level of farmland protection, and no mitigation for farmland loss is required for the project.~~

4.12.6 Farmland - Project U-2579 Preferred Alternative

The current zoning map shows that the majority of the land within the Project U-2579 Preferred Alternative right of way is zoned single-family residential with pockets of land zoned for multi-family residential, institutional, business, and industrial (see Figure 3-1). The Preferred Alternative does not impact any land currently zoned as agricultural.

The Growth Management Plan shows that the Preferred Alternative impacts approximately 182 acres of land designated as Rural Area (see Figure 3-2).

The impact to farmland was determined for land that was designated as rural in the 2000 census. Acres of soils impacted were determined using ArcView to calculate the amount of each type of soil impacted by the construction limits of the Preferred Alternative. The Farmland Conversion Impact Rating (Form AD-1006) was completed by the Natural Resources Conservation Service, and is included in **Appendix H**. For the Preferred Alternative, there are 76.9 acres of prime and unique farmland *soils* and 116.0 acres of statewide and locally important farmland *soils*, for a total of 192.9 acres. *However, the majority of these soils do not meet the FPPA's definition of "prime farmland" because they are already in or committed to urban development as can be seen on the current zoning map (see Figure 3-1).* The total site assessment score was 114. *Based on this assessment, soils within the Preferred Alternative did not meet the 160-point threshold of protection under the FPPA. Since this is less than 160, according to the Farmland Protection Policy Act, no mitigation for farmland loss is required for this project.*

4.12.7 Farmland - Project U-2579A Detailed Study Alternatives and Preferred Alternative

The current zoning map shows that the majority of the land within the Project U-2579 Preferred Alternative right of way is zoned single-family residential with pockets of land zoned for multi-family residential, institutional, business, and industrial (see Figure 3-1). However, approximately 9 acres taken by the Preferred Alternative currently is zoned agriculture. The Growth Management Plan shows that the Preferred Alternative does not impact any land designated as Rural Area (see Figure 3-2).

The impact to farmland was determined for land that was designated as rural in the 2000 census. Acres of soils impacted were determined using ArcView to calculate the amount of each type of soil impacted by the construction limits of each Detailed Study Alternative. The completed Farmland Conversion Impact Rating (Form AD-1006) is provided in

Appendix H. Table 4-49 lists the acres of prime farmland soils, the acres of state and locally important farmland soils, and the total site assessment score *for each Detailed Study Alternative. For the Preferred Alternative, there are 35.2 acres of prime farmland soils and 51.5 acres of statewide and locally important farmland soils, for a total of 86.7 acres. The total site assessment score for the Preferred Alternative was 110. Based on this assessment, soils within the Detailed Study Alternatives, including the Preferred Alternative, did not meet the 160-point threshold of protection under the FPPA. Since none of the alternatives resulted in a total site assessment score greater than 160 points (including the Preferred Alternative), no mitigation for farmland loss is required for the project.*

Table 4-49: Prime and Important Farmland Soils Impacts – Project U-2579A Detailed Study Alternatives

Alternative ¹	Prime Farmland Soils (acres)	State/Locally Important Farmland Soils (acres)	Total Prime and Important Farmland Soils (acres)	Total Site Assessment Score
N1-S1	35.2	51.5	86.7	110
N1-S2	53.3	46.0	99.3	138
N2-S1 (Preferred Alternative)	35.2	51.5	86.7	110
N2-S2	53.3	46.0	99.3	138
N3-S1	36.2	51.9	88.1	119
N3-S2	54.9	44.5	99.4	141

¹ Results are the same for alternatives with and without the Kernersville Road interchange.

‘**Bold**’ indicates Preferred Alternative.

4.12.8 Local Farmland Policies

Seventeen farms in Forsyth County are participating in the Forsyth County Farmland Preservation Program (Figure 3-6). None of these farms would be impacted by any of the Detailed Study Alternatives (including Preferred Alternatives) for Projects R-2247, U-2579, or U-2579A. would impact parcels participating in the Forsyth County Farmland Preservation Program. The nearest participating farmland tract is located approximately 0.5 miles north of the Project U-2579 Detailed Study Alternatives.

8.6.3. Section 4.24 Farmland Revisions

Impacts to farmlands were summarized following Table 4-88 in Section 4.24 of the SFEIS/FEIS. The Farmlands summary in Table 4-88 has been revised to more clearly reflect impacts to Prime and Important Farmlands as described above, and the farmlands summary in Section 4.24 has been removed. Revisions to Table 4-88 are shown below, noted in *bold italics*.

Table 4-88: Combined Direct Environmental Consequences – Projects R-2247, U-2579, and U-2579A

Environmental Issue	Project R-2247 and Project U-2579 Preferred Alternatives PLUS Project U-2579A Detailed Study Alternatives						
	N2-S1 (Preferred Alternative)	N1-S1	N1-S2	N2-S1 (Without Interchange)	N2-S2	N3-S1	N3-S2
		With (Without) Kernersville Road Interchange			With (Without) Kernersville Road Interchange		
Farmland Impact Summary							
<i>Acres of Land Zoned as Agricultural</i>	<i>206</i>	<i>206</i>	<i>197</i>	<i>206</i>	<i>197</i>	<i>206</i>	<i>197</i>
<i>Acres of Land Designated as Rural Area</i>	<i>424</i>	<i>424</i>	<i>424</i>	<i>424</i>	<i>424</i>	<i>424</i>	<i>424</i>
Acres of Prime, Statewide, and Local Important Farmland Soils Impacted	1,380	1,380	1,392	1,380	1,392	1,381	1,392
Prime, Statewide, and Local Important Farmland Impacts ¹⁰	0	0	0	0	0	0	0

¹⁰ Impacts based on NRCS Assessment with all scores from Form AD-1006 (Farmland Conversion Impact Rating) less than 160 points.

8.6.4. Section S.7 Farmland Revisions

Impacts to farmlands were summarized following Table S-1 in Section S.7 of the SFEIS/FEIS. The Farmlands summary in Table S-1 has been revised to more clearly reflect impacts to Prime and Important Farmlands as described above, and the farmlands summary in Section S.7 has been removed. Revisions to Table S-1 are shown below, noted in *bold italics*.

Table S-1: Direct Environmental Consequences – Northern Beltway Preferred Alternative

Environmental Issue	Impact
Farmland Impact Summary	
<i>Acres of Land Zoned as Agricultural</i>	<i>206</i>
<i>Acres of Land Designated as Rural Area</i>	<i>424</i>
Acres of Prime, Statewide, and Local Important Farmland Soils Impacted	1,380
Prime, Statewide, and Local Important Farmland Impacts ⁹	0

⁹ Impacts based on NRCS Assessment with all scores from Form AD-1006 (Farmland Conversion Impact Rating) less than 160 points.

8.7. Stream Classification

There was an error in the classification of Kerners Mill Creek in Section 3.15.1.2. In the second paragraph, the third sentence should say “Kerners Mill Creek has a best usage classification of *WS-III* and is designated as a critical area within the watershed.”

8.8. Critical Area

There was an error in Section 4.14.2.7 of the SFEIS/FEIS regarding impacts to the critical area. The first paragraph on page 4-181 stated that Alternatives N1 and N2 impact a watershed critical area. The sentence was based on an error in the boundary of the critical area in the SFEIS/SDEIS, and should be deleted.

There was an error in summarizing stream impacts in Tables 4-63 and 4-57 of the SFEIS/FEIS.

8.9. Stream Impact Summary

8.9.1. Table 4-63 Revisions

In Table 4-63, the impacted length of USACE mitigable streams and the total impacted length for the Preferred Alternative (N2-S1) are incorrect. The revised values are noted

in ***bold italics*** below. The correct values match the totals given in Table 4-63-1 of the SFEIS/FEIS, which details impacts by the Project U-2579A Preferred Alternative.

Table 4-63: Stream Impacts by Alternative – Project U-2579A Detailed Study Alternatives

Detailed Study Alternative	Impacted Length - USACE Mitigable Streams ¹ (ft)	Impacted Length - Not Mitigable Streams (ft)	Total Impacted Length (ft)	Number of Stream Crossings
N1-S1	10,996	2,515	13,511	18
N1-S2	9,598	3,129	12,727	18
N2-S1 (Preferred Alternative)	7,357	2,899	10,256	22
N2-S2	10,133	3,129	13,262	20
N3-S1	13,975 (13,306)	2,515	16,490 (15,821)	21
N3-S2	12,577 (11,908)	3,129	15,706 (15,037)	21

Impacts are based on 2002 preliminary engineering designs, except for N2-S1 (Preferred Alternative), which are based on 2005 preliminary engineering designs.

Unless designated by () as without Kernersville Road interchange, Project U-2579A Detailed Study Alternatives are the same with or without the interchange. The Project U-2579A Preferred Alternative includes an interchange at Kernersville Road.

¹USACE mitigatable streams are considered as such based on field verification by the USACE.

8.9.2. Table 4-57 Revisions

In Table 4-57, the impacted length of USACE mitigable streams and the total impacted length for the combined project are incorrect. The revised values are noted in ***bold italics*** below.

Table 4-57: Combined Direct Stream Impacts – Projects R-2247, U-2579, and U-2579A

Project	Alternative	Impacted Length – USACE Mitigable ² (ft)	Impacted Length - Not Mitigable (ft)	Total Length of Impacted Stream ³ (ft)	Total Length of Relocated Stream ³ (ft)	Number of Stream Crossings
R-2247 and U-2579 Preferred Alternatives -plus U-2579A Detailed Study Alternatives¹	N1-S1	39,304	16,523	55,827	3,914	116
	N1-S2	37,906	17,137	55,043	3,914	116
	N2-S1 (Preferred Alternative)	35,665	16,907	52,572	6,189	120
	N2-S2	38,441	17,137	55,578	3,914	118
	N3-S1	42,283 (41,614)	16,523	58,806 (58,137)	3,914	119
	N3-S2	40,885 (40,216)	17,137	58,022 (57,353)	3,914	119

Impacts are based on 2005 preliminary engineering designs for the Project R-2247, U-2579, and U-2579A Preferred Alternatives, and are based on the 2002 preliminary engineering designs for the Project U-259A non-preferred alternatives.

¹Unless designated by () as without Kernersville Road interchange, Project U-2579A Detailed Study Alternatives are the same with or without the interchange. The Project U-2579A Preferred Alternative includes an interchange at Kernersville Road.

²USACE mitigatable streams are considered as such based on guidance from the USACE. Mitigatable streams must be mitigated for.

³Stream relocations are considered mitigated impacts.

8.10. Floodplains

There was an error in Section 4.14.3.6 and 4.14.3.8. Although the summaries in the tables are correct, the text summary for the Project U-2579 Preferred Alternative in Section 4.14.3.6 and Section 4.14.3.8 incorrectly stated that there are eight floodplain/floodway crossings. There are nine floodplain or floodway crossings by the Project U-2579 Preferred Alternative, as corrected in the following sections (noted in ***bold italics***).

8.10.1. Section 4.14.3.6 Revisions

The first paragraph in Section 4.14.3.6 of the SFEIS/FEIS should be revised as shown below.

The Project U-2579 Preferred Alternative crosses floodplains/floodways ***nine*** times, based on the 2005 preliminary engineering design. **Table 4-67** has been revised from the SFEIS/SDEIS, and describes the crossings for the Preferred Alternative, which impacts a total of 15.75 acres of 100-year floodplain. Floodplains, floodways, and streams are shown on **Figure 3-10b** and **Figure 2-22(a-i)**. The two major (longitudinal) encroachments are along

Mill Creek floodplain near Baux Mountain Road, and along Smith Creek (Harmon Mill Creek), also tabulated under Project U-2579A. Based on the 2005 preliminary design, it is anticipated that eight floodway modifications may be required for the Preferred Alternative (including three also listed under Project U-2579A). A flood study will be completed if necessary based on the final engineering designs.

8.10.2. Section 4.14.3.8 Revisions

The second paragraph in Section 4.14.3.8 of the SFEIS/FEIS should be revised as shown below.

The Preferred Alternatives for Projects R-2247, U-2579, and U-2579A cross the 100-year floodplain/floodway at 22 locations, including 11 by Project R-2247 (eight minor and three major crossings), *nine* by Project U-2579 (seven minor and *two* major crossings), and two by Project U-2579A (one major and one minor crossing). (Three of the five crossings by Project U-2579A are shared with Project U-2579). It is anticipated that 13 of these crossings will require floodway modification.

8.11. Mitigation

The NCDENR Ecosystem Enhancement Program (EEP) was discussed in Chapter 6 of the SFEIS/FEIS, and should have also been included in the mitigation discussion in Section 4.17.2.

8.11.1. Section 4.17.2 Revisions

The following changes (noted in *bold italics*) should be made to the first paragraph under “Compensatory Mitigation” in Section 4.17.2.

Compensatory Mitigation. Compensatory mitigation is not normally considered until anticipated impacts to Waters of the United States have been avoided and minimized to the maximum extent possible. Compensatory actions often include restoration, creation and enhancement of Waters of the United States. Such actions should be undertaken in areas adjacent to or contiguous to the discharge site where possible. *During Concurrence Points 4B and 4C of the Section 404/NEPA Merger process, NCDOT will investigate on-site mitigation opportunities throughout the area. Off-site mitigation for Projects U-2579 and U-2579A is being implemented by the*

NCDENR Ecosystem Enhancement Program (EEP). Off-site mitigation for Project R-2247 is already in place.

8.12. NCDOT Preferred Alternative Selection Letter

The NCDOT Preferred Alternative selection letter for Project U-2579A was signed on March 17, 2005. The SFEIS/FEIS incorrectly stated that this letter was signed March 16, 2005. The correct date should be used every place the selection letter is referenced.

8.13. Response to Comments

There was an error in the response to Comment A22-5 from NCDWQ, page 6-44. The following changes (noted in *bold italics*) should be made to the response.

NCDOT has coordinated with NCDWQ and USACE to avoid and minimize impacts to wetlands and streams through Concurrence Points 2A (*bridging decisions and alignment review*) and 4A (*avoidance and minimization*). NCDOT will continue work with these agencies for Concurrence Points 4B (review of conceptual drainage design with 30 percent hydraulic design) and 4C (review surface drainage design and permit drawings with 100 percent hydraulic design) and to obtain a Section 401 Water Quality Certification and a Section 404 Permit prior to project construction.

8.14. Project Special Commitments (“Green Sheets”)

The following changes (noted in *bold italics*) should be made to the NCDOT Division 9 and Construction special commitment, page 4 of the Green Sheets.

A pre-construction survey will be done in areas of ~~possible~~ concern regarding *possible blast-related* structural damage to assess a pre-construction condition.

8.15. Cost Estimates

The following sentences should be removed from Section 2.9.3.5 (updated cost estimates for Project R-2247).

The right of way costs include money already spent on right of way (see **Section 2.9.3.1**). These previous expenditures were not inflated to 2006 dollars because they have already occurred and are fixed.


9. Unresolved Controversies

A Petition for Judicial Review was filed on May 7, 2007 in Wake County North Carolina Superior Court challenging the Supplemental Final Environmental Impact Statement/Final Environmental Impact Statement (SFEIS/FEIS) which was approved in January 2007. The Petition alleges that the SFEIS/FEIS was prepared in violation of the North Carolina Environmental Policy Act (NCEPA), N.C.G.S. § 11 3A- 1, et seq. Several specific alleged failings of the document are listed in paragraph 35 of the Petition. Each of the claims raised in that paragraph is addressed in this Record of Decision (ROD). This document also addresses all the comments made by the Petitioners or their consultant (Smart Mobility, Inc.) on the SFEIS/FEIS.

On November 30, 2007, FHWA sent a letter to NCDOT to request information that further demonstrates that the State has complied with all applicable State laws and regulations on this project. On December 6, 2007, NCDOT provided the requested information to the North Carolina Division Office. After reviewing the information provided by NCDOT, FHWA has determined that State has complied with all applicable State laws and regulations for this project.

10. Conclusion of No Significant Changes from Supplemental Final Environmental Impact Statement/Final Environmental Impact Statement (SFEIS/FEIS)

FHWA has independently evaluated the comments received on the Supplemental Final Environmental Impact Statement (Project R-2247)/Final Environmental Impact Statement (Projects U-2579/U-2579A) (SFEIS/FEIS) approved on January 11, 2007, along with revisions to the document. Based on our thorough review of the project to date, FHWA has determined that there are no changes or new information that would result in significant environmental impacts that were not evaluated in the aforementioned SFEIS/FEIS. Therefore, no Supplemental EIS is required.



John F. Sullivan III, P.E., Division Administrator
Federal Highway Administration

February 15, 2008

Date