RECORD OF DECISION

United States Department of Transportation
Federal Highway Administration

Winston-Salem Northern Beltway
Forsyth County

Winston Salem Northern Beltway
US 158 north to US 52

Federal Aid Project No. (none)
State Project No. 6.628001T
TIP Project No. R-2247

Winston Salem Northern Beltway
US 52 south to I-40 Business and
I-40 Business south to US 311

Federal Aid Project No. NHF-0918 (14)
State Project No. 8.2625101
TIP Project Nos. U-2579 and U-2579A

February 2008

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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 Tobaccoville. 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 pre-dated 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 Costs[1]	
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 Summary[2]	
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
Utilities[6]	
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 (*Clemmys muhlenbergii)*[9]	N/A
Red-Cockaded Woodpecker (*Picoides borealis*)	No Effect
Small-Anthered Bittercress (*Cardamine micrantha)*	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 if 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 Samual 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
EPA-2 EPA-14 DWQ-3 DWQ-5	**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.	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." 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." 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. 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.
DWQ-4	NCDOT should demonstrate the	NCDOT has coordinated with NCDWQ and USACE to avoid and minimize

	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	**SECTION 401 WATER QUALITY CERTIFICATION:** A quantitative indirect and cumulative impacts analysis will be required for approval of the 401 Water Quality Certification. 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.	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	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 *Stormwater Best Management Practices*, the *NC Sediment and Erosion Control Planning and Design Manual*, and NCS000250 should be followed.	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." 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. 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]." 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." NCDOT's erosion control plans will be implemented and maintained in accordance with the Sediment Pollution Control Act and applicable Land

	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.	As stated in *NCDOT's Compliance with Executive Order 13112*: "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. 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 (*Albizia*

	Summarized Comment	Response
		julibrissin), Thorny, Russian & Autumn Olive (*Elaeagnus pungens, angustifolia*, & *umbellata*), Japanese Silvergrass (*Miscanthus sinensis*), Multiflora Rose (*Rosa multiflora*), Chinese & Japanese Privet (*Ligustrum sinese* & *japonicum*), Crown Vetch (*Coronilla varia*), Chinese & Japanese Wisteria (*Wisteria sinense & floribunda*), and English Ivy (*Hedera helix*). 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 (*Ailanthus altissima*) and Princess tree (*Paulownia tomentosa*). In addition a new biological control agent (*Chondrostereum purpureum*) (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 (*Polygonum cuspidatum; Fallopia japonica;* Reynoutria japonica), and Alligator weed (*Alternanthera philoxeroides*). In addition, the germination and growth habits of several native grasses and milkweed *(Asclepias tuberosa*) will be evaluated. The ultimate goal would be to develop a successful seeding methodology to allow incorporation of more native species along the roadsides."
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.	*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. More information on the SIP is in Section 4.7.4 of the SFEIS/FEIS. Details on air quality mitigation measures during construction are in Section 4.21 of the SFEIS/FEIS.
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.	HOV lanes are not precluded by this project, but are not included as part of the current design. As stated in the response to Comment A24-6 in the SFEIS/FEIS, page 6-56. "The Congestion Management System (CMS) of the *2030 LRTP* 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."
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.	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. 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."
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.	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. 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

	Summarized Comment	Response
		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. See Section 3.16 in the SFEIS/FEIS for more information on natural resource survey methodology.
Hart-1	**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.	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. 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): 2001 – 30.35 inches 2002 – 39.67 inches 2003 – 56.3 inches 2004 – 43.4 inches 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

	Summarized Comment	Response
		precipitation in December is 3.38 inches, the December before the western surveys was 4.93 inches). 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)." A letter dated June 20, 2007 from the US Army Corps of Engineers verifies the validity of the jurisdictional delineation (Appendix D).
EPA-17	**FARMLANDS:** The SFEIS/FEIS did not provide impacts to either the agriculturally zoned area or the Rural Area designation for Project R-2247. 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.	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. 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.
Jones-16	**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	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.

	Summarized Comment	Response
	Beltway would have a major impact on remaining farms in Forsyth County and their water supplies.	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. 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. In the *Growth Management Plan*, which is part of the *Legacy Development Guide*, 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 *Growth Management Plan*. The Northern Beltway Selected Alternative will impact 206 acres of land zoned agricultural, and 424 acres of land designated as Rural Area.
WRC-5	**LAND USE PLANS:** More could be done to ensure the Legacy Comprehensive Plan and the Growth Management Plan are fully implemented.	Comment noted. 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."
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.	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 *Legacy Plan*. In fact, a reason cited in not approving several rezonings was that there was a conflict with the *Legacy Plan*. The local government is responsible for all decisions regarding land use. In an update to the *Legacy Plan*, the Legacy Oversight Committee evaluated rezonings and compliance with the *Legacy Plan* in 2003-2004. Their brochure states "Statistics on rezonings for the period 2003-2004 reveal that, in cases where *Legacy* 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.'"
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 dis-equilibrium 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.	concurrence.
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 *2030 Long Range Transportation Plan (LRTP)*, 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 *2030 Long Range Transportation Plan*. Therefore, it is not a reasonably foreseeable project and is not included in this study."

	Summarized Comment	Response
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 *2005 Thoroughfare Plan* is not in the NCDOT's 2006-2012 Transportation Improvement Program, nor is it on the *Winston-Salem Urban Area 2030 Long Range Transportation Plan (LRTP)*. 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.	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. 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."
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.	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. 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.
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.	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. 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.
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.	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, *Technical Report No. 1: Model Development and Calibration* (NCDOT, 1999) and *Technical Report No. 2: Development and Evaluation of Alternative Land Use Scenarios* (NCDOT, 2000)." 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, *Calibration and Adjustment of System Planning Models,* 1990.

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Smith-1	**TRANSPORTATION MODELING:** Additional vehicle miles traveled (VMT) induced by the Northern Beltway will result in an incremental detriment to global warming.	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. 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. 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.

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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 *Legacy Plan* goals include the desire to curtail sprawl (noted on page S-4 and Section 3.3.1 in the *Indirect and Cumulative Impacts Analysis*). Page 12 of the *Indirect and Cumulative Impacts Analysis* (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 *Guidance for Assessing Indirect and Cumulative Impacts of Transportation Projects in North Carolina, Volume II: Practitioner's Handbook*. 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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		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. 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). The N.C. Division of Environment and Natural Resources (NCDENR) has agreed with the methodologies spelled out in the *Guidance for Assessing Indirect and Cumulative Impacts of Transportation Projects in North Carolina, Volume II: Practitioner's Handbook*. 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.
Marshall-11	**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.	The gravity model is an accepted method for assessing indirect effects of highway projects (as noted in the NCDOT *Guidance for Assessing Indirect and Cumulative Impacts of Transportation Projects in North Carolina*, 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

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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	**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.	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, "*Road Expansion, Urban Growth, and Induced Travel: A Path Analysis*," 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. 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). The conclusion reached regarding the short-term effects of new freeways agrees with the results found in the *Indirect and Cumulative Impacts Analysis*, 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

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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 *Indirect and Cumulative Impacts Analysis*.
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 *Indirect and Cumulative Impacts Analysis* 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 Summary[8]							
Residences (total)	***1,013***	985 (963)	1,021 (999)	939	1,009 (1,006)	948 (938)	1,105 (1,005)
Owner-occupied	***888***	888 (867)	922 (901)	844	911 (909)	849 (839)	914 (904)
Tenant-occupied	**125**	97 (96)	99 (98)	95	98 (97)	99 (99)	101 (101)
Minority	**155**	171 (171)	173 (168)	169	182 (172)	170 (169)	191 (170)
Businesses	**60**	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 Summary[7]	
Residences (total)	***1,013***
Owner-occupied	***888***
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)	**1[2]**	**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	***271***	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	***271***

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 north***east*** 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 *Farmland Soils* (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							
Acres of Land Zoned as Agricultural	***206***	***206***	***197***	***206***	***197***	***206***	***197***
Acres of Land Designated as Rural Area	***424***	***424***	***424***	***424***	***424***	***424***	***424***
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	
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[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.
[1]USACE 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 Alternatives**[1]	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.
[1]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.
[2]USACE mitigatable streams are considered as such based on guidance from the USACE. Mitigatable streams must be mitigated for.
[3] Stream 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 2***2*** 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

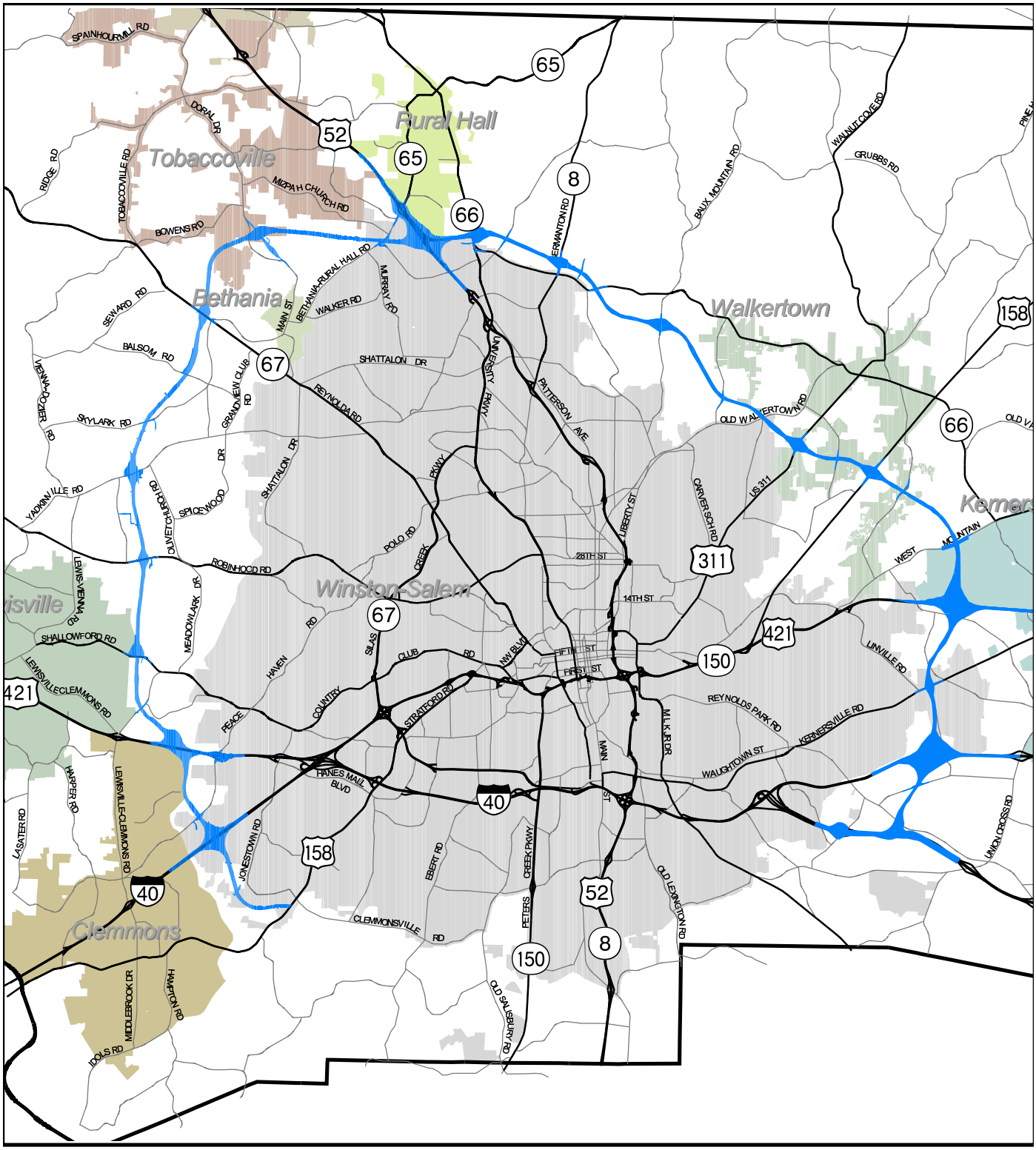
February 15, 2008
Date

APPENDIX CONTENT

A Figures	Figure 1 – Winston-Salem Northern Beltway Selected Alternative
B Project Commitments	Project Commitments ("Green Sheet")
C Agency and Citizen Comments	Agency and Citizen Comment Letters on the 2007 SFEIS/FEIS • Agency comments • Citizen comments
D Agency Coordination	June 20, 2007 Letter from USACE re: Jurisdictional delineation verification

APPENDIX A

Figures



LEGEND Winston-Salem Northern Beltway Preferred Alternative (approximate right-of-way limits)

(TIP Projects R-2247, U-2579, and U-2579A)

N

North Carolina Department of Transportation

1 0 1 2
Miles

Winston-Salem Northern Beltway
Selected Alternative

Figure 1

APPENDIX B

Project Commitments
("Green Sheets")

Green Sheet — PROJECT COMMITMENTS

Winston-Salem Northern Beltway
Forsyth County
Federal-Aid Project No. NHF-0918 (14)
State Project Nos. 6.628001T, 8.2625101
TIP Project Nos. R-2247, U-2579, and U-2579A

In addition to the Section 404 Conditions, Regional Conditions, State Consistency Conditions, the North Carolina Department of Transportation (NCDOT) Guidelines for Best Management Practices for the Protection of Surface Waters, General Certification Conditions, and Section 401 Conditions of Certification, the following special commitments have been agreed to by NCDOT:

Project Development and Environmental Analysis:

1. Archaeological site 31FY570**, a historic cemetery, will require avoidance or compliance with North Carolina General Statute, Chapter 70.

2. Temporary construction easements may be needed on the historic Clayton Family Farm property. It has been determined that these temporary easements do not constitute a use under Section 4(f). No permanent right of way will be acquired from the Clayton Family Farm property. All work will be contained in temporary easements, and the encroachment on the property will be minimal. The duration of the temporary encroachment on the Clayton Family Farm property will be shorter than the timeframe for the construction of the project. The land temporarily occupied from the Clayton Family Farm will be fully restored, that is, the Clayton Family Farm property will be returned to a condition that is at least as good as that which existed prior to the project.

3. Eligibility of Site 31FY64 is unknown because archaeologists were denied access to the property. If the site falls within the Preferred Alternative after final design, an assessment would be conducted prior to construction after it is acquired by NCDOT. Currently, the site is adjacent to non-preferred Detailed Study Alternative segment E3.

4. A design noise study will be prepared for the selected alternative. The date of public knowledge for noise abatement purposes is the date the Record of Decision (ROD) is signed.

5. The design noise study for the Project R-2247 portion of the Beltway will include an evaluation of Ronald Reagan High School.

*6. The NCDOT will develop Data Recovery Plans (DRP) for Sites 31FY888, 31FY893**, 31FY901, 31FY902**, 31FY903, 31FY910**, 31FY911**, 31FY912**, 31FY921, 31FY925**, 31FY944, 31FY1053/1053**, all of which will be affected by the subject project, in consultation with the North Carolina SHPO.

* Commitments marked by an asterisk (*) are taken from the Memorandum of Agreement between SHPO, NCDOT, and FHWA regarding addressing the Adverse Effects to historic resources (**Appendix D.1 of the SFEIS/FEIS).**

*7. The NCDOT will ensure that each DRP is implemented after Right-of-Way is acquired or once Right-of-Entry is secured from the property owners and prior to construction activities within the site location as shown in the DRP.

*8. As they are developed, each individual DRP will be forwarded for review by the SHPO.

*9. Upon completion of each Data Recovery effort, the NCDOT will prepare and forward a Management Summary to the SHPO detailing the results of the Data Recovery field investigations. The Management Summary will contain sufficient information to demonstrate that the field investigation portion of the DRP has been implemented.

*10. Upon receipt of the Management Summary, the SHPO will respond within ten (10) days to the recommendations contained within the document.

*11. Upon acceptance of the recommendations contained in the Management Summary, the SHPO will issue the NCDOT documentation that the Data Recovery field investigations have been completed.

*12. The analysis and report preparation, detailing Sites 31FY888, 31FY893**, 31FY901, 31FY902**, 31FY903, 31FY910**, 31FY911**, 31FY912**, 31FY921, 31FY925**, 31FY944, 31FY1053/1053** will be completed by the NCDOT, or their consultants, within twenty-four (24) months after completion of each site's fieldwork schedule.

*13. In consultation with SHPO, NCDOT will determine the extent of control-of-access fencing, as well as its type, material, and finish. NCDOT will purchase and then install the control-of-access fencing within the NCDOT right-of-way. NCDOT will maintain the control-of-access fencing.

Roadway Design:

1. NCDOT will continue to work with residents of affected communities to develop mitigation strategies for community impacts. The following options will be considered during final design to minimize impacts to communities/subdivisions: construction of noise abatement barriers landscaping or vegetative screens based on NCDOT policies and guidelines. These types of options already have been incorporated into the Project R-2247, Project U-2579, and Project U-2579A preliminary engineering designs where practicable, but will be further considered during final design.

2. During final design for Projects R-2247, U-2579, and U-2579A, all utility providers and railroad operators would be coordinated with to ensure that the proposed design and construction of the project would not substantially disrupt service.

* Commitments marked by an asterisk (*) are taken from the Memorandum of Agreement between SHPO, NCDOT, and FHWA regarding addressing the Adverse Effects to historic resources (**Appendix D.1 of the SFEIS/FEIS).**

3. The development of this project will be further coordinated with the City of Winston-Salem and Forsyth County Parks and Recreation Departments to minimize any conflicts with future parks and greenways planning. Provisions will be considered to maintain the future viability of any impacted proposed greenways.

4. NCDOT will coordinate with the Forsyth County Division of Environmental Health and Laboratory regarding the Reynolds Auto Junkyard and other solid waste sites along the selected alternatives for Projects R-2247, U-2579, and U-2579A. Impacted sites will be remediated as required.

5. NCDOT will consider wildlife crossings where appropriate in the vicinity of stream crossings, which will allow animals to cross under the Beltway.

6. NCDOT will coordinate with the Town of Kernersville regarding the compatibility of the Beltway design with the proposed Big Mill Farm Road interchange at US 421. This coordination will take place once all relevant design information has been obtained regarding the design of the Big Mill Farm Road interchange.

7. NCDOT intends to maintain a connection from Northampton Road to Old Walkertown Road. The final design will be developed based on design constraints and cost considerations.

*8. NCDOT will align the Alexander Hege House driveway opposite the new intersection ramp, so property access will be under full traffic control. This will allow NCDOT and the property owner full movement for equipment and trucks.

NCDOT Hydraulics Unit:

1. All bridges and culverts located in designated FEMA flood zones will be designed such that an increase in flood elevation would not exceed the lesser of 0.5 foot for the 100-year flood event or the elevation needed to protect structures.

2. A conditional Letter of Map Revision will be prepared for any floodway modification, in coordination with Federal Emergency Management Agency.

3. NCDOT will avoid installing bridge bents in creeks to the maximum extent practicable.

NCDOT Roadside Environmental:

1. 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.

* Commitments marked by an asterisk (*) are taken from the Memorandum of Agreement between SHPO, NCDOT, and FHWA regarding addressing the Adverse Effects to historic resources (**Appendix D.1 of the SFEIS/FEIS).**

2. NCDOT will incorporate sediment and erosion control measures according to the Design Standards in Sensitive Watersheds for all construction in high quality water (HQW) zones in compliance with 15a NCAC 04B.0124.

*3. NCDOT will provide tree protection measures along the National Register boundary lines adjoining project construction areas. NCDOT will exercise best management practices to minimize, as practicable, tree trimming and disturbance of existing plantings along the National Register boundary.

NCDOT Roadside Environmental and Hydraulics:

1. Generally, 2:1 slopes will be used where possible to minimize culvert length, and NCDOT will shorten culvert lengths where possible and daylight systems between culverts where possible in interchange areas.

NCDOT Right of Way Branch:

1. NCDOT will work with the property owner of Walker Mobile Home Park off of Bethania-Tobaccoville Road to determine the feasibility of relocating the homes to another area of the parcel.

2. NCDOT will contact the pastor of Mount Pleasant Holiness Church prior to the public hearing and will, if desired, meet with the pastor and members of the church to discuss the impact of Project U-2579 on the church, NCDOT relocation policies, and potential mitigation. *Action since the 2004 SFEIS/SDEIS: NCDOT and consultant staff met with the pastor and members of Mount Pleasant Holiness Church during the 2005 public hearings. The church representatives declined to attend an additional meeting regarding this project or impacts of the Northern Beltway on the church. Additional information is in* ***Section 6.2.2.3***.

3. NCDOT will contact minority residents of North Oaks subdivision prior to the public hearing and will, if desired, meet with them to discuss the impacts of Project U-2579 on the community, NCDOT relocation policies, and potential mitigation. *Action since the 2004 SFEIS/SDEIS: NCDOT and consultant staff met the with North Oaks community on November 15, 2004. Additional information is in* ***Section 6.2.2.3***.

NCDOT Division 9 and Construction:

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

NCDOT Division 9:

1. During construction for Project U-2579A, NCDOT will coordinate with the Forsyth County School Board to ensure the safety of those students bicycling and/or walking to Sedge Garden Elementary School. If a portion of school property is needed for a temporary construction easement, that area will be fenced to keep school children out of the construction site. The school property will be restored following construction.

* Commitments marked by an asterisk (*) are taken from the Memorandum of Agreement between SHPO, NCDOT, and FHWA regarding addressing the Adverse Effects to historic resources (**Appendix D.1 of the SFEIS/FEIS).**

2. NCDOT will coordinate with local media during the construction of the project to alert the public of traffic restrictions and construction related activities.

3. NCDOT shall not approve any new driveway permits along the property of the historic John Henry Kapp Farm within the right of way for the Preferred Alternative. This condition shall be filed in the NCDOT Division office responsible for driveway permits.

APPENDIX C

Agency and Citizen Comments on the SFEIS/FEIS

North Carolina
Department of Administration

Michael F. Easley, Governor

Britt Cobb, Secretary

February 12, 2007

Mr. George Thorpe
NCDOT
Transportation Building
1548 Mail Service Center
Interoffice

Dear Mr. Thorpe:

Subject: Final Environmental Impact Statement - SUPPLEMENTAL TO EIS This document includes 3 projects known as Winston-Salem Northern Pkwy: (1) western half is Tip#R-2247; (2 &3) eastern half and extension are Tip# U2579 and U2579A.

The N. C. State Clearinghouse has received the above project for intergovernmental review. This project has been assigned State Application Number 07-E-4220-0269. Please use this number with all inquiries or correspondence with this office.

Review of this project should be completed on or before 03/12/2007. Should you have any questions, please call (919)807-2425.

Sincerely,

Chrys Baggett

Ms. Chrys Baggett
Environmental Policy Act Coordinator

cc: Missy Dickens, Project Engineer

Mailing Address:
1301 Mail Service Center
Raleigh, NC 27699-1301

Telephone: (919)807-2425
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State Courier #51-01-00
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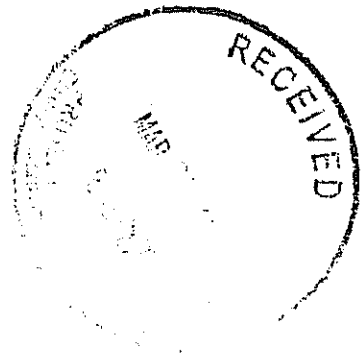
116 West Jones Street
Raleigh, North Carolina

"EPA" 1/6



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

March 22, 2007

Gregory J. Thorpe, Ph.D.
Environmental Management Director
Project Development and Environmental Analysis Branch
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, North Carolina 27699-1548

SUBJECT: Winston-Salem Northern Beltway (FHW-E40325-NC): Supplemental Final EIS Western Section TIP No. R-2247 (CEQ No. 20040058), and Final EIS Eastern Section TIP Nos. U-2579 and U-2579A (CEQ No. 20040057)

Dear Dr. Thorpe:

In accordance with Section 102(2)(C) of the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, EPA is providing comments on the subject document which serves as a Supplemental Final Environmental Impact Statement for the Western Section (R-2247), and a Final Environmental Impact Statement for the Eastern Section (U-2579 and U-2579A) of the Northern Beltway, collectively referred to herein as the FEIS. EPA appreciates the cumulative assessment of the entire Northern Beltway by the North Carolina Department of Transportation (NCDOT) and the Federal Highway Administration (FHWA). The total length of the project would be approximately 34 miles on new alignment. EPA commented on the previous Supplemental EIS issued for review in October 2004, and is responding to those stated concerns. Additionally, EPA is commenting further about impacts to migratory birds and impacts of invasive exotic plant species. We are also commenting on the classification of 'Prime Farmland' and the discussion of impacts which should be clarified.

1 The benefits of having the FEIS cover the entire Northern Beltway are overshadowed by confusing data quantification and presentation which have not been corrected from the 2004 DEIS; and incomplete documentation of the proposed mitigation
2 for identified unavoidable impacts. The FEIS lacks specific information regarding mitigation for impacts to 7-8 linear miles of surface streams. It is important for a FEIS to disclose fully the proposed mitigation so that interested citizens and local officials can be provided with a comprehensive plan for addressing this large amount of compensatory action.

Erosion and sedimentation will also be a major, ongoing adverse impact. The
3 project would benefit from close oversight by state and local environmental officials regarding the avoidance and minimization of impacts to surface streams. NCDOT should strive to avoid concurrent project clearing and grading with that for private development

4 in order to lessen excessive storm water runoff to small streams. EPA is hopeful that Forsyth County's widened streamside buffer ordinance recently enacted for Abbotts Creek, a 303(d) listed stream, will be followed and that this ordinance would be applied to other watersheds to lessen the direct and indirect impacts of this project.

5 Clearing operations, which will remove 936 acres of terrestrial forest, will have significant adverse impacts to wildlife. NCDOT should follow the federal requirements for minimizing adverse impacts to migratory birds by minimizing/avoiding clearing activities during nesting season. Conversely, the large amount of clearing and earth

6 moving unfortunately will benefit opportunistic invasive exotic plants. EPA recommends that NCDOT follow Federal Executive Order 13112 and take proactive measures for the detection, and prevention of spreading invasive species. Of particular note, is the documentation of the highly invasive Japanese knotweed within the project area.

7 EPA is recommending that all of the environmental commitments listed in the "Green Sheets," and each of the concerns noted in our comments be addressed in the Record of Decision. There should be substantive commitments for follow-through to achieve maximum avoidance, minimization, and where necessary resource compensation. Please see the enclosed detailed comments. Overall, although some of our DEIS comments have been addressed, we continue to have concerns about the points described above.

Thank you for the opportunity to comment on the FEIS. Please direct inquiries to Mr. Ted Bisterfeld (tel. 404/562-9621) who is the Region's primary contact for this project review.

Sincerely,

Heinz J. Mueller
Chief, NEPA Program Office

Enclosures: Detailed EPA Comments

cc: Federal Highway Administration, NC Division
US Fish and Wildlife Service, Raleigh Field Office
US Army Corps of Engineers, Wilmington District

ENCLOSURE
Detailed EPA comments on the Winston–Salem Northern Beltway FEIS

Air Quality: The area is in a designated Early Action Compact per the Conformity Rule. This EAC will expire in December 2007. EPA recommends that the ROD include a
8 final verification of the project's inclusion in a conforming Long Range Transportation Plan (LRTP) and identify mitigation for project construction and operation..

Air Quality: The NCDOT response to EPA's comment recommending further consideration of HOV lanes indicates that the LRTP does not recommend HOV lanes for this project. That plan states that HOV lanes may be applicable if air quality problems
9 worsen. The area continues to have poor air quality so it is unclear why HOV would not be implemented in order to reduce vehicle usage but maintain future mobility. Also, it is noted that planning is continuing for improvements to US 52 (U-2826B) through the city including addition of two lanes. The air quality benefits and the adverse impacts to the
10 community should be fully considered in decisions for that project. Widening US 52 to 8 lanes was rejected by NCDOT as alternative to the Northern Beltway.

Air Quality: Page 1-35. Traffic modeling was done with US 52 at 8-lanes as it is defined in the LRTP. This is inconsistent with the response to EPA's comment where
11 NCDOT indicated that such widening through the center of the city would result in substantial environmental justice impacts. Assuming the Northern Beltway is built, EPA recommends careful review of subsequent traffic analyses and modeling to ensure that US 52 requires widening.

Aquatic Habitat: EPA notes the NCDOT efforts to re-survey (via aerial photography and mapping) to document conditions, relative to residential development, stream encroachment, etc., within the area have not changed since earlier EIS documentation. NCDOT indicates that it was unimportant for decision-making to document the condition
12 of natural resources. EPA differs with this view because it is necessary to define the status of resources, particularly aquatic habitat, in order to determine the necessary/appropriate mitigation for the project.

Water Quality: EPA notes the response to comment A24-12. Although the NCDOT and FHWA lack unilateral authority to address degraded water quality, EPA notes that transportation planning involves local agencies not just NCDOT. It is therefore
13 incumbent on all parties to cooperate to address degraded surface waters, since the NCDOT project contributes to the indirect adverse effects to streams.

Compensatory Mitigation: EPA notes the response to comments at page 4-218 and Page 6-68. NCDOT and FHWA identify the Friedberg Site as the location where the wetland

Enclosure

impacts from the R-2247 project are to be mitigated. The FEIS does not describe what compensatory mitigation is available for the wetland impacts from the U-2579/U-2579A project segments. Page 4-218 also describes approximately 9,000 total linear feet of stream mitigation provided at the WRP Stone Mountain Park Site in Wilkes County. The total stream impacts after avoidance and minimization efforts by the Merger team for the project are 36,445 linear feet. NCDOT and FHWA have not proposed any specific on-site stream restoration or mitigation efforts. There are still 27,445 linear feet of stream impact that will require compensatory mitigation. FHWA and NCDOT should have provided additional detail on the status of obtaining compensatory mitigation for stream and wetland impacts. The statement in the FEIS regarding a "full analysis of the impacts and the existing mitigation will be included in the 404/401 permitting process" is not potentially consistent with the Section 404/NEPA Merger 01 Memorandum of Understanding (MOU). Additional details regarding potential on-site mitigation opportunities as well as off-site compensatory mitigation through the Ecosystem Enhancement Program (EEP) should be available at this stage of the Section 404/NEPA process. The fact that the EEP is not referenced or mentioned in Sections 4.17.2, 4.17.3 and 4.17.4 of the FEIS and the need for potentially 27,445 linear feet of stream mitigation is a significant omission. EPA is not confident that compensation is near to being resolved. FHWA and NCDOT should provide this information during concurrence point 4B meetings and prior to the issuance of the ROD.

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Federal Species of Concern/State Listed Species, Pages 3-104 & 105: EPA acknowledges the North Carolina legal protection afforded to Federal and State endangered, threatened and species of concern. It may be important to note that while the Loggerhead Shrike (Lanius ludovicianus ludovicians) is a State-listed species of Special Concern, it is also afforded potential protection under the Migratory Bird Treaty Act of 1918, as amended by the Migratory Bird Treaty Reform Act of 2004.

15

Invasive Exotic Plant Species, Pages 3-83 to 3-92 and Pages 4-198 to 4-204: The FEIS lists a number of invasive exotic plant species present within the project study corridor under the descriptions of certain terrestrial biotic communities, including Chinese privet (*Ligustrum sinense*), Japanese honeysuckle (*Lonicera japonica*) and others. However, the FEIS fails to include other significant, highly invasive exotic plant species, including Japanese knotweed (*Reynoutria japonica* {Weakley, 2006}; *Fallopia japonica* or *Polygonum cuspidatum*), Tree of Heaven (*Ailanthus altissima*), Mimosa or Silktree (*Albizia julibrissin*) and Kudzu (*Pueraria montana*). While all of these highly invasive species are present in the project study corridor and can impact terrestrial communities, EPA has environmental concerns particularly for Japanese knotweed as it can thrive in both terrestrial and riparian habitats. Colonies of Japanese knotweed can

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already be found along the I-40 and I-40 Business highway corridors, including one colony in the preferred alternative project area west of Kernersville and east of Salem Lake (a water supply). The proposed project is 34.2 miles in length, has approximately 936 acres of terrestrial forest impacts (1.46 square miles) and 53,352 linear feet of stream impact (non-mitigatable and mitigatable). The potential to substantially spread Japanese knotweed into riparian areas is a significant direct impact that was not addressed in the FEIS and could have long-term and indirect impacts to water quality within the project study area. Although invasive exotic plant species are referenced in the FEIS, FHWA and NCDOT did not address the requirements of E.O. 13112. The E.O. requires the Lead Federal Agency to prevent the introduction of invasive species, detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner, monitor invasive species populations accurately and reliably and provide restoration of native species and habitat conditions in ecosystems that have been invaded. Japanese knotweed in many areas of the U.S., including North Carolina, is spreading exponentially through human activities such as mowing near riparian areas, placement of fill dirt or quarry stone with rhizomes, etc. EPA and other resource agencies believe that there is credible scientific evidence that Japanese knotweed can adversely impact native wildlife habitat (Blossey, Nuzzo and Maerz, 2006). There is also empirical evidence that colonies of Japanese knotweed can increase winter time bank erosion rates and cause long-term degradation to water quality. The potential costs to completely eradicate Japanese knotweed once it has become established can be very substantial ($1,200 to $10,000 per acre). Considering the location of at least one existing colony of Japanese knotweed near designated water supply and critical water supply areas, the problem of managing and controlling knotweed in these areas is extremely difficult. EPA believes that FHWA and NCDOT should fully examine the issue and compliance with the E.O. in the Record of Decision (ROD) and develop an avoidance, minimization and mitigation strategy with input from the resource agencies for invasive exotic plant species with an emphasis on preventing the uncontrolled spread of Japanese knotweed.

Prime Farmland, Pages 3-71 to 3-72 and Pages 4-146 to 4-152: On page 4-149 of the SFEIS/FEIS, it is stated that a small amount of land crossed by the Preferred Western Alternative (R-2247) is currently zoned agriculture. It is also stated that the Preferred Alternative skirts the Rural Area designation north of Yadkinville Road based upon the Growth Management Plan (Figure 3-2). The SFEIS/FEIS did not provide the actual impact to either the agriculturally zoned area or the Rural Area designation based upon the footprint of the Preferred Alternative. This information should be quantified in the ROD. EPA also notes on page 4-149 that the statement "no mitigation for farmland loss is required for the project" (in accordance with the Farmland Protection Policy Act - FPPA). The FPPA and regulations contained at Title 7 of the Code of Federal Regulations, Part 658, require that "Federal agencies consider alternative actions, as appropriate, that could lessen adverse effects". In NEPA nomenclature, this is essentially

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avoidance and minimization and not 'formal' mitigation in the context of 'creating' or 'restoring' prime farmland. The issue of "mitigation" for farmland loss is repeated on page 4-151 for U-2579 and on page 4-152 for U-2579A. There appears to be substantial confusion by certain parties on the requirements of the FPPA. EPA highlights this issue because the information in the SFEIS/FEIS is quite confusing. EPA notes that Tables 4-47, 4-48, and 4-49 in the SFEIS/FEIS impacts are for Prime and State/Locally Important Farmland soils, and that none of the preferred alternatives impact Prime or State/Locally Important Farmlands under the NRCS Land Assessment and Site Assessment (LESA) criteria (Reference: 7 CFR Section 658.4(c)(2). Sites receiving a total score of less than 160 need not be given further consideration for protection and no additional sites need to be evaluated). EPA notes that page 3-72 identifies that there are 62,005 acres of prime farmland soils and 72,285 acres of state and locally important farmland soils in all of Forsyth County. Based upon Figure 3-6, it appears that approximately 17 farms are identified as participating in the Farmland Preservation Program in Forsyth County and that they represent only a few thousand acres. None of these designated farms are impacted from the proposed project. This issue could have been more clearly highlighted in Section 4.12.8 along with the statement that none of the preferred alternatives for R-2247, U-2579 or U-2579A impact parcels participating in the Farmland Preservation Program and that a majority of actual agricultural areas where the soils are identified as being prime or state/locally important farmland otherwise meet the specific NRCS criteria for protection under FPPA. The Table 4-47 impact figures do not match up to the text description of impacts on pages 4-148 and 4-149. What is even more confusing to EPA is the information contained in Table 4-88 for Combined Direct Environmental Consequences on pages 4-258 and 4-259 that lists 1,380 acres of Prime, Statewide and Local Important Farmland (not soils) for the preferred alternatives for R-2247, U-2579 and U-2579A. If one adds the 'text' information on pages 4-148 and 4-151 the Table 4-49 information, the 'prime farmland impact' is 1,379.6 acres, but the actual impact is to prime farmland soils, and not the regulatory definition of a prime farmland. This is further complicated by the format of Table 4-88 that lists 369 acres of agriculture and 1,160 acres of maintained/disturbed land just above the environmental issue of Acres of Prime, Statewide and Local Important Farmland. The entire sections on 'prime farmland' need to be clarified and simplified in the ROD. The actual impact to prime, unique and statewide and locally important farmland appears to be 0 acres based upon coordination and consultation with NRCS.

North Carolina
Department of Administration

Michael F. Easley, Governor

Britt Cobb, Secretary

March 23, 2007

Mr. George Thorpe
NCDOT
Transportation Building
1548 Mail Service Center
Raleigh, NC 27699-1548

Dear Mr. Thorpe:

Re: SCH File # 07-E-4220-0269; FEIS; SUPPLEMENTAL TO EIS This document includes 3 projects known as Winston-Salem Northern Pkwy: (1) western half is Tip#R-2247; (2 &3) eastern half and extension are Tip# U2579 and U2579A.

The above referenced environmental impact information has been submitted to the State Clearinghouse under the provisions of the National Environmental Policy Act. According to G.S. 113A-10, when a state agency is required to prepare an environmental document under the provisions of federal law, the environmental document meets the provisions of the State Environmental Policy Act. Attached to this letter for your consideration are the comments made by agencies in the course of this review.

If any further environmental review documents are prepared for this project, they should be forwarded to this office for intergovernmental review.

Should you have any questions, please do not hesitate to call.

Sincerely,

Chrys Baggett/SC

Ms. Chrys Baggett
Environmental Policy Act Coordinator

Attachments

cc: Region I

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1301 Mail Service Center
Raleigh, NC 27699-1301

Telephone: (919)807-2425
Fax (919)733-9571
State Courier #51-01-00
e-mail Chrys.Baggett@ncmail.net

Location Address:
116 West Jones Street
Raleigh, North Carolina

NCDENR
North Carolina Department of Environment and Natural Resources

Michael F. Easley, Governor

William G. Ross Jr., Secretary

MEMORANDUM

TO: Chrys Baggett
State Clearinghouse

FROM: Melba McGee
Project Review Coordinator

RE: 07-0269 SFEIS Winston-Salem Northern Beltway, Forsyth County

DATE: March 23, 2007

The Department of Environment and Natural Resources has reviewed the proposed project.

Several areas need further clarification as noted in the attached comments from the N.C. Wildlife Resources Commission and the Division of Water Quality. We ask that the Department of Transportation work with our commenting agencies to assure that their concerns are adequately addressed prior to finalizing project plans. Addressing these comments during the review process and/or during the merger process will avoid delays at the permit phase.

Thank you for the opportunity to comment on this project.

Attachments

1601 Mail Service Center, Raleigh, North Carolina 27699-1601
Phone: 919-733-4984 \ FAX: 919-715-3060 \ Internet: www.enr.state.nc.us/ENR/

"WRC" 1/5

Revised
Attach b
file

North Carolina Wildlife Resources Commission

Richard B. Hamilton, Executive Director

TO: Melba McGee, Environmental Coordinator
Office of Legislative and Intergovernmental Affairs, DENR

FROM: Marla Chambers, Western NCDOT Permit Coordinator Marla Chambers
Habitat Conservation Program, NCWRC

DATE: March 12, 2007

SUBJECT: Supplemental Final Environmental Impact Statement for the proposed Western Section and Final Environmental Impact Statement for proposed Eastern Section and Eastern Section Extension of the Winston-Salem Northern Beltway, Forsyth County, North Carolina. TIP No.R-2247, U-2579 and U-2579A. OLIA Project No. 07-0269, original due date: 03/07/2007. revised due date: 03/12/2007.

North Carolina Department of Transportation (NCDOT) has submitted a Supplemental Final Environmental Impact Statement (SFEIS) for the proposed Western Section and Final Environmental Impact Statement (FEIS) for proposed Eastern Section and Eastern Section Extension of the Winston-Salem Northern Beltway. Staff biologists with the North Carolina Wildlife Resources Commission (NCWRC) have reviewed the information provided and have participated in the Section 404/NEPA merger process, including field and concurrence meetings, for the subject project. These comments are provided in accordance with the provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

NCDOT proposes to construct three projects, commonly known as the Winston-Salem Northern Beltway, as a multi-lane, median divided facility with full access control on new location for a total project length of approximately 34.2 miles. The western portion of the Beltway (Project R-2247) extends from US 158 west of the City northward 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. Preferred Alternatives have been chosen for all three segments. Current estimates of direct project impacts include 53,352 linear feet (lf) of stream (35,665 lf of which is USACE mitigatable streams), 6,189 lf of stream relocations, 7.48 acres (ac) of

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Telephone: (919) 707-0220 • **Fax:** (919) 707-0028

wetlands, 24.71 ac of ponds, 936 ac of forested lands, and 1,380 ac of prime, statewide, and local important farmland.

The western section (R-2247) study area is in the Yadkin River basin and is drained by Muddy Creek and its named and unnamed tributaries, except for Bashavia Creek, which flows directly to the Yadkin River. All streams in this section are designated Class C waters by the NC Division of Water Quality (NCDWQ), with the possible exception of Bashavia Creek. Drainages in the western section study area have scoured deep channels from two to ten feet deep and some streams are experiencing noticeable increases in peak flows, likely due to localized subdivision development. The majority of the waters in the Muddy Creek subbasin exhibit some level of impacts to water quality due to both point and non-point sources and the subbasin has one of the highest number of impaired streams within the Yadkin-Pee Dee River basin. Muddy Creek, and therefore all of its unnamed tributaries, is on the Section 303(d) list of impaired waters, primarily attributed to stormwater runoff from construction sites and developed areas. Reynolds Creek is also on the 303(d) list. NCDWQ's Use Support rating system also designates Muddy Creek as Impaired. Silas Creek is mentioned as having "notable impacts" in NCDWQ's 2003 Yadkin-Pee Dee Water Quality Basin Management Plan. Most of this section of the project lies just east of the designated Yadkin River water supply watershed; the Yadkin River supplies the majority of the county's drinking water.

The study areas for the eastern sections (U-2579 and U-2579A) are primarily in the Yadkin River basin, with a small part in the north draining into the Dan River in the Roanoke River basin. A number of federal and state listed species inhabit the Dan River. Salem Lake, a water supply reservoir for the City of Winston-Salem located in the eastern section study area, flows to Muddy Creek via Salem Creek, which is also on the Section 303(d) list and designated as Impaired in NCDWQ's Use Support rating system. The lake received nutrient status indicating high nutrient levels and was listed as Support Threatened. Mill creek was another stream mentioned as having "notable impacts". Salem Lake, Martin Mill Creek, Lowery Mill Creek, Smith Creek, Fishers Branch, and their associated tributaries are classified as Water Supply Watershed III (WS-III) streams. Kerners Mill Creek, another tributary to Salem Lake, is classified WS-II and is a critical area within the watershed. The remaining streams in the study area are Class C waters. The eastern extension study area is on the border of a WS-III area associated with Abbotts Creek, significant portions of which are still undeveloped agriculture and forest lands. Sediment and erosion control measures should adhere to the design standards for sensitive watersheds in all portions of the project that drain to Water Supply waters. Special efforts should also be employed to minimize further degradation of impaired streams.

Considerable direct impacts will also occur to terrestrial wildlife habitat, not only through forest destruction but also loss of agricultural land. Patches of agricultural land interspersed with escape and shelter habitats can provide exceptional value for wildlife, such as deer and turkey. The right-of-way for the preferred alternative for the western segment, R-2247, is comprised of about 41% forested area and 22% agricultural and pine plantation. The right-of-way for the preferred alternative for the eastern segment, U-2579, consists of approximately 46% forested and 11% agricultural and successional pine. Habitat fragmentation, by introducing a large barrier to animal migration, further degrades the high quality habitat that remains. This barrier is most evident in the west where the Beltway will divide the habitat along the Yadkin River from

Muddy Creek and in the northeast where it separates the Yadkin River Basin from the Dan River Basin.

Wildlife losses will occur from direct losses of non-mobile species, displacement and subsequent competition for remaining resources by mobile species, and road kills. The latter also has serious human safety concerns, which underscores the need for wildlife crossings throughout the project. We appreciate NCDOT working cooperatively with the Merger Team and agreeing to provide bridges at key stream crossings that will accommodate wildlife passage and for their commitment to continue to consider additional wildlife crossings where appropriate. Measures, such as longer bridges and use of floodplain drains (pipes or culverts), will provide some additional habitat connectivity, as well as spread out flood flows, which reduces flood damage.
2 We request that the clearing of trees and vegetation for this project be avoid the breeding season as much as possible in order to reduce direct loss of wildlife. We also appreciate NCDOT's commitment to accommodating proposed greenways though the project corridor.

Air quality is another important concern. Forsyth County currently is a maintenance area for the one-hour ozone standard and for the carbon monoxide standard, and has been declared nonattainment for the eight-hour ozone standard. Both Guilford and Davidson County have been listed as nonattainment areas for the fine particulate matter standard. The Union Cross community that sits between these two counties in southeast Forsyth County may already have air quality issues due to prevailing southwest and westward winds without additional traffic and development. However, this area is the location of the new Dell computer manufacturing facility and a project to widen Union Cross Road to a multi-lane divided roadway is proposed. This area
3 is experiencing rapid growth and it is expected to continue. Air quality should be monitored and other measures should be employed to manage the growth in this area, which was originally
4 expected to have a low potential for induced development. Burning of land clearing debris should be minimized.

The Winston-Salem/Forsyth County City-County Planning Board initiated a community-wide planning process that resulted in the development of the Legacy Comprehensive Plan, which includes a Growth Management Plan. The document indicated that the City-County Planning Board realized the need to manage growth through curbing urban sprawl by creating more compact and efficient development patterns that still accommodate growth, while maintaining environmental quality, making more efficient use of the land that has already been developed, encouraging reuse, and preserving open space and rural character. The County plans to institute provisions for the protection of farmlands, natural areas, and rural character. We applaud these efforts to manage growth and protect natural areas, which will benefit wildlife, water quality, and
5 the quality of life for residents; however, we feel more could be done to ensure these plans are fully implemented.

Secondary and cumulative impacts will likely have more serious effects than direct impacts and are a major concern for the project. A study commissioned by Smart Growth America, Measuring Sprawl and Its Impact (Ewing, et. al., 2002) identified the Piedmont Triad as ranking second in the nation for urban sprawl. In the secondary and cumulative impacts analysis we found few details about existing regulations and to what extent growth will be limited and water
6 quality will be protected. No estimation of impervious surface coverage currently existing or

expected at build-out was noted, nor when build-out is likely to occur. Numerous studies have shown that when 10–15% of a watershed is converted to impervious surfaces, there is a serious decline in the health of receiving waters (Schueler 1994) and the quality of fish habitat and wetlands are negatively impacted (Booth 1991, Taylor 1993). One ordinance change was mentioned in the document; in November 2005 the Forsyth County Board of Commissioners increased the riparian buffer width from 30' to 50' in the Abbotts Creek watershed, a water supply watershed with Abbotts Creek being on the 303(d) list. We appreciate this improvement; however our standard recommendation is 100' buffers on perennial streams and 50' buffers on intermittent streams. Additional regulations or ordinances will be necessary to adequately protect water quality and preserve wildlife habitat and open space, which is very important to the health of the area and is a main focus of local plans. 7

The project study area, which lies just outside the highly urbanized City of Winston-Salem, consists primarily of rural residential and agriculture uses with undeveloped wooded tracts and numerous streams. We believe the land surrounding the project corridor will become much more attractive to industrial, commercial and residential development and that secondary and cumulative impacts will be substantial. Development, especially commercial, is likely near proposed interchanges and is anticipated in local plans. The NCDOT 2006-2012 Transportation Improvement Program lists over 40 road projects for Forsyth County not including bridge replacements, rail, transit, bike and pedestrian, or other miscellaneous projects. Some local groups are proposing additional road projects in the area, such as a four-lane parkway from High Point to the Piedmont Triad International Airport proposed by consultants working on the Heart of the Triad plan. Planned private development projects in the area are numerous. The Northern Beltway, combined with other public and private projects, places additional pressures from induced development, induced travel, and impacts on communities, natural habitat, and water quality.

NCDOT should ensure the Winston-Salem Northern Beltway is consistent with local plans to protect environmental quality, forested lands, open space, and the rural nature of the area. Our concurrence with the permits to construct this project will be strongly influenced by the mitigation measures adopted and put into practice to offset the direct, secondary, and cumulative impacts related to this project and the degree to which they will protect the natural resources of the county. As the SFEIS/FEIS indicated, the responsibility of mitigating the secondary and cumulative effects will fall primarily on local and state governments, with participation of private sector developers. Measures to mitigate secondary and cumulative impacts can be found in the Guidance Memorandum to Address and Mitigate Secondary and Cumulative Impacts to Aquatic and Terrestrial Wildlife Resources and Water Quality (NCWRC 2002). Substantial stormwater management controls and impervious surface limits should be required for all new development. Recommended riparian buffers would provide important water quality and wildlife protection. Improvements, retrofits, and stream restoration efforts should be implemented in previously developed areas to improve already degraded streams and water quality. Alternatives to traditional curb and gutter should be developed to provide better treatment of stormwater and we encourage the use of non-impervious materials to construct sidewalks, parking lots, and other facilities. Low impact development techniques to manage stormwater quantity and quality should be incorporated into both new and existing development (see www.lowimpactdevelopment.org for information)

Loss of trees through both direct and secondary impacts, added to the cumulative impacts of the numerous projects in the study area substantially reduces their benefits to the community and the environment. Some of the benefits provided by trees include: wildlife habitat, stabilization of stream banks, soil stabilization, air quality improvements, aesthetics, and shade, which not only moderates stream and habitat temperature changes, but can reduce the residential cooling costs in warmer months. These losses should be mitigated by preserving forested areas and planting native trees and vegetation in previously disturbed areas. Water supply watersheds, riparian areas and floodplains, large tracts of natural and rural areas, and sites containing listed species should be focused on for enhancement and preservation measures. 8

We strongly recommend NCDOT work with local authorities to ensure these mitigative measures are in place prior to submitting a permit application and these measures are clearly identified in the application to avoid any delays. Thank you for the opportunity to review and comment on this project. If you have any questions regarding these comments, please contact me at (704) 545-3841.

Literature Cited:

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Taylor, B.L. 1993. The influences of wetland and watershed morphological characteristics and relationships to wetland vegetation communities. Masters thesis. Dept. of Civil Engineering. University of Washington. Seattle, WA.

cc: Marella Buncick, USFWS
Sue Homewood, NCDWQ
Chris Militscher, USEPA

'DWQ' 14

Michael F. Easley, Governor
William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources
Alan W. Klimek, P.E. Director
Division of Water Quality

March 23, 2007

MEMORANDUM

To: Melba McGee

Through: John Hennessy

From: Sue Homewood, Division of Water Quality, Winston-Salem Regional Office

Subject: Comments on the Final Environmental Impact Statement related to proposed Winston-Salem Northern Beltway from existing US 52 south to Existing I-40 Business and I-40 Business south to US 311 and Supplemental Final Impact Statement related to proposed Winston-Salem Northern Beltway from existing US 158 north to US 52, Forsyth County, Federal Aid Project No. NHF-0918(14) and not applicable, State Project No. 8.2625101 and 6.628001T, TIP U-2579/U-2579A and R-2247.
DENR Project Number 07-0269

This office has reviewed the referenced document dated January 2007. The Division of Water Quality (DWQ) is responsible for the issuance of the Section 401 Water Quality Certification for activities that impact Waters of the U.S., including wetlands. It is our understanding that the project as presented will result in impacts to jurisdictional wetlands, streams, and other surface waters. The DWQ offers the following comments based on review of the aforementioned document:

Project Specific Comments:

1 The remainder of these projects is being planned as part of the 404/NEPA Merger Process. As a participating team member, the NCDWQ will continue to work with the team.

1 2. As previous communications have indicated, DOT is reminded that a quantitative Indirect and Cumulative Impacts analysis is required for approval of the 401 Water Quality Certification.

2 3. Some streams within this project study area are identified as 303(d) waters of the State for impaired use for aquatic life due to urban runoff and agriculture. DWQ is very concerned with sediment and erosion impacts that could result from this project. DWQ recommends that the most protective sediment and erosion control BMPs be implemented to reduce the risk of nutrient runoff to these streams. DWQ requests that road design plans provide treatment of the storm water runoff through best management practices as detailed in the most recent version of NC DWQ *Stormwater Best Management Practices*.

Transportation Permitting Unit
1650 Mail Service Center, Raleigh, North Carolina 27699-1650
2321 Crabtree Boulevard, Suite 250, Raleigh, North Carolina 27604
Phone: 919 733 1786 / FAX 919 733-6893 / Internet: http://h2o.enr.state.nc.us/ncwetlands

General Comments:

3 4. The environmental permitting documents should provide a detailed and itemized presentation of the proposed impacts to wetlands and streams with corresponding mapping. If mitigation is necessary as required by 15A NCAC 2H.0506(h), it is preferable to present a conceptual (if not finalized) mitigation plan with the environmental documentation. Appropriate mitigation plans will be required prior to issuance of a 401 Water Quality Certification.

4 5. After the selection of the preferred alternative and prior to an issuance of the 401 Water Quality Certification, the NCDOT is respectfully reminded that they will need to demonstrate the avoidance and minimization of impacts to wetlands (and streams) to the maximum extent practical. In accordance with the Environmental Management Commission's Rules {15A NCAC 2H.0506(h)}, mitigation will be required for impacts of greater than 1 acre to wetlands. In the event that mitigation is required, the mitigation plan should be designed to replace appropriate lost functions and values. The NC Ecosystem Enhancement Program may be available for use as wetland mitigation.

5 6. In accordance with the Environmental Management Commission's Rules {15A NCAC 2H.0506(h)}, mitigation will be required for impacts of greater than 150 linear feet to any single perennial stream. In the event that mitigation is required, the mitigation plan should be designed to replace appropriate lost functions and values. The NC Ecosystem Enhancement Program may be available for use as stream mitigation.

6 7. Future documentation, including the 401 Water Quality Certification Application, should continue to include an itemized listing of the proposed wetland and stream impacts with corresponding mapping.

7 8. A quantitative analysis of cumulative and secondary impacts anticipated as a result of this project is required.

8 9. NC DOT is respectfully reminded that 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 any construction impacts, temporary or otherwise, also need to be included as part of the 401 Water Quality Certification Application.

9 10. Sediment and erosion control measures should not be placed in wetlands or streams.

10 11. Borrow/waste areas should avoid wetlands to the maximum extent practical. Impacts to wetlands in borrow/waste areas will need to be presented in the 401 Water Quality Certification and could precipitate compensatory mitigation.

11 12. The 401 Water Quality Certification application will need to specifically address the proposed methods for stormwater management. More specifically, stormwater should not be permitted to discharge directly into streams or surface waters.

12 13. Based on the information presented in the document, the magnitude of impacts to wetlands and streams may require an Individual Permit (IP) application to the Corps of Engineers and corresponding 401 Water Quality Certification. Please be advised that a 401 Water Quality

Certification requires satisfactory protection of water quality to ensure that water quality standards are met and no wetland or stream uses are lost. Final permit authorization will require the submittal of a formal application by the NCDOT and written concurrence from the NCDWQ. Please be aware that any approval will be contingent on appropriate avoidance and minimization of wetland and stream impacts to the maximum extent practical, the development of an acceptable stormwater management plan, and the inclusion of appropriate mitigation plans where appropriate.

13 14. Bridge supports (bents) should not be placed in the stream when possible.

14 15. Whenever possible, the DWQ prefers spanning structures. Spanning structures usually do not require work within the stream or grubbing of the streambanks and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges allow for human and wildlife passage beneath the structure, do not block fish passage and do not block navigation by canoeists and boaters.

15 16. Bridge deck drains should not discharge directly into the stream. Stormwater should be directed across the bridge and pre-treated through site-appropriate means (grassed swales, pre-formed scour holes, vegetated buffers, etc.) before entering the stream. Please refer to the most current version of NC DWQ *Stormwater Best Management Practices*.

16 17. If concrete is used during construction, a dry work area should be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete should not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills.

17 18. 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 to stabilize the soil and appropriate native woody species should be planted. When using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact allows the area to re-vegetate naturally and minimizes soil disturbance.

18 19. Placement of culverts and other structures in waters, streams, and wetlands shall be placed below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20 percent of the culvert diameter for culverts having a diameter less than 48 inches, to allow low flow passage of water and aquatic life. Design and placement of culverts and other structures including temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to or upstream and down stream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by DWQ. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact the NC DWQ for guidance on how to proceed and to determine whether or not a permit modification will be required.

19 20. If multiple pipes or barrels are required, they should be designed to mimic natural stream cross section as closely as possible including pipes or barrels at flood plain elevation and/or sills where appropriate. Widening the stream channel should be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage

20 21. If foundation test borings are necessary; it should be noted in the document. Geotechnical work is approved under General 401 Certification Number 3494/Nationwide Permit No. 6 for Survey Activities

21 22. Sediment and erosion control measures sufficient to protect water resources must be implemented and maintained in accordance with the most recent version of North Carolina Sediment and Erosion Control Planning and Design Manual and the most recent version of NCS000250.

22 23. 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.

23 24. Heavy equipment should be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams. This equipment should be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.

24 25. Riprap should not be placed in the active 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.

25 26. 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.

The NCDWQ appreciates the opportunity to provide comments on your project. Should you have any questions or require any additional information please contact Sue Homewood at 336-771-4964.

cc: John Thomas, US Army Corps of Engineers, Raleigh Field Office
Felix Davila, Federal Highway Administration
Chris Militscher, Environmental Protection Agency
Marla Chambers, NC Wildlife Resources Commission
Marella Buncick, US Fish and Wildlife Service
DWQ Winston-Salem Regional Office
DWQ 401 Transportation Permitting Unit

North Carolina
Department of Administration

Michael F. Easley, Governor

Britt Cobb, Secretary

March 27, 2007

Ms. Missy Dickens
NCDOT
Transportation Building
1548 Mail Service Center
Interoffice

Dear Ms. Dickens:

Subject: Final Environmental Impact Statement - SUPP. TO FEIS: Winston-Salem Northern Pkwy: Tip#R-2247 (note: review period re-opened/extended to the official DOT close date)

The N. C. State Clearinghouse has received the above project for intergovernmental review. This project has been assigned State Application Number 07-E-4220-0269. Please use this number with all inquiries or correspondence with this office.

Review of this project should be completed on or before 03/12/2007. Should you have any questions, please call (919)807-2425.

Sincerely,

Chrys Baggett

Ms. Chrys Baggett
Environmental Policy Act Coordinator

Mailing Address:
1301 Mail Service Center
Raleigh, NC 27699-1301

Telephone: (919)807-2425
Fax (919)733-9571
State Courier #51-01-00
e-mail: Chrys.Baggett@ncmail.net

Location Address:
116 West Jones Street
Raleigh, North Carolina

North Carolina
Department of Administration

Michael F. Easley, Governor

Britt Cobb, Secretary

April 18, 2007

Mr. Gregory Thorpe
NCDOT
Transportation Building
1548 Mail Service Center
Raleigh, NC 27699-1548

RECEIVED

APR 23 2007

Dear Mr. Thorpe:

Re: SCH File # 07-E-4220-0269; FEIS; SUPP. TO FEIS: Winston-Salem Northern Pkwy: Tip#R-2247 (note: review period re-opened/extended to the official DOT close date)

The above referenced environmental impact information has been submitted to the State Clearinghouse under the provisions of the National Environmental Policy Act. According to G.S. 113A-10, when a state agency is required to prepare an environmental document under the provisions of federal law, the environmental document meets the provisions of the State Environmental Policy Act. Attached to this letter for your consideration are **additional** comments made by agencies in the course of this review.

If any further environmental review documents are prepared for this project, they should be forwarded to this office for intergovernmental review.

Should you have any questions, please do not hesitate to call.

Sincerely,

Chrys Baggett/SJL

Ms. Chrys Baggett
Environmental Policy Act Coordinator

Attachments

cc: Region I

Mailing Address:
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Location Address:
116 West Jones Street
Raleigh, North Carolina

"Smith" 1/6

Law Office of Marsh Smith, P.A.

Street Address: 255 West New York Avenue, Southern Pines, NC 28387
Mailing Address: PO Box 1075, Southern Pines, NC 28388
Phone: (910) 695-0800 / Fax: (910) 695-0903
E-mail: marsh@marshsmithlaw.com

17 April 2007
VIA E-MAIL(chrys.baggett@ncmail.net) and FIRST CLASS MAIL

Chrys Baggett, State Environmental Policy Act Coordinator
N.C. Dep't of Administration
116 W. Jones St.
Room 5106 of the Administration Building
Raleigh, NC 27603-8003

Re: State Clearing House # 07E42200269
SFEIS/FEIS for TIP Nos. R-2247, U-2579 & U-2579A
a.k.a. State Project Nos. 6.628001T & 8.2625101 and Fed. Aid Proj. No. NHF-0918(14)

Dear Ms. Baggett:

Regarding the SFEIS/FEIS for the projects identified above (collectively "northern beltway"), I submit the following comments and the attached comments of Norman Marshall, the principal of Smart Mobility, Inc., on behalf of the North Carolina Alliance for Transportation Reform, Inc. ("NCATR"), Sarah Norman Jones, the Friends of Forsyth ("FOF"), and any other citizen, resident or organization aggrieved by the northern beltway.

In the face of the looming crisis of global warming and the strong evidence that additional lane miles of highway in urban areas increase the number of vehicle miles traveled each day by the average driver in these urban areas (*see, e.g.*, Cervero, Robert. "Road Expansion, Urban Growth, and Induced Travel: A Path Analysis", *APA Journal*, Vol. 69, No. 2, p. 145-163, Spring 2003 – a paper cited by the SFEIS/FEIS), the Federal Highway Administration ("FHWA") and the North Carolina Department of Transportation ("NCDOT") continue to

advocate[1] for these additional highways as though vehicle miles traveled ("VMT") had no relation to the emission of carbon dioxide and other greenhouse gases – methane, nitrous oxide, and hydrofluorocarbons.

Additionally, errors concerning the scope of the analysis of the northern beltway persist in the SFEIS/FEIS.

VMTs and GLOBAL WARMING

Massachusetts v. EPA

On 2 April 2007 – just under three months after the SFEIS/FEIS issued – the United States Supreme Court issued its opinion in the case of Massachusetts, et al v. E.P.A., et al, 127 S.Ct. 1438 (2007). In holding that the petitioners in Massachusetts v. EPA were aggrieved parties and that the U.S. E.P.A. must ground its reasons for action or inaction (on the petitioners' request for rulemaking) in the Clean Air Act (42 U.S.C.A. § 7401 et seq.), the Supreme Court found that the harms associated with global warming are serious, well recognized and associated with greenhouse gases – carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons – emitted in large quantities by automobiles in the United States. The Supreme Court reasoned that the federal government's own objective assessment of the relevant science and a strong consensus among qualified experts indicated that global warming threatens, *inter alia,* a precipitate rise in sea levels, severe and irreversible changes to natural ecosystems, a significant reduction in winter snowpack with direct and important economic consequences, increases in the spread of disease and the ferocity of weather events.

The Massachusetts v. EPA opinion concerned the E.P.A.'s ability to regulate emissions of greenhouse gases – principally carbon dioxide – from new automobiles. Noting that the

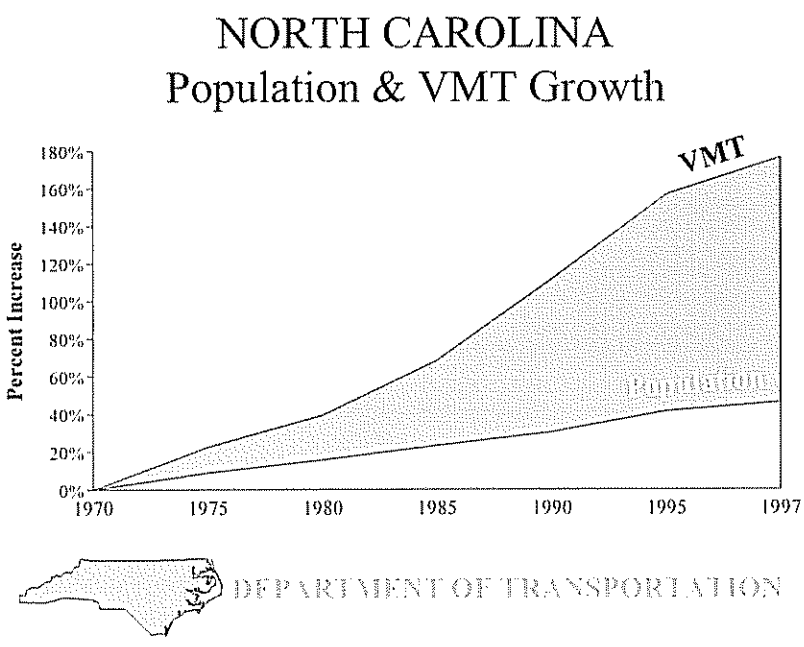
[1] Marshall, Norman L. Review of Winston-Salem Northern Beltway SFEIS/SDEIS, Smart Mobility, Inc., 17 April 2007, p. 4. ("The SFEIS/FEIS is focused on justifying the Northern Beltway.")

United States' transportation sector emitted 1.7 billion metric tons of carbon dioxide in 1999 alone, the Supreme Court observed that this accounted for more than 6% of worldwide carbon dioxide emissions in 1999 and made the U.S. transportation sector the third largest emitter of carbon dioxide in the world. The Supreme Court found that – given the enormity of the environmental consequences arising out of global warming – even the incremental improvement to the situation resulting from lower emissions from new automobiles becomes very important, thus making even the substantial time it takes for a new motor vehicle fleet to supplant the existing one irrelevant when considered against the backdrop of this looming crisis. *See* Id., 127 S.Ct. at 1457-8.

Similarly, the northern beltway's incremental detriment to the global warming situation, stemming from additional VMTs arising out of traffic induced by the northern beltway (*see* below), becomes a very important impact that cannot be ignored by the SFEIS/FEIS.

Increases in the Number of Vehicle Miles Traveled Offset Emission Improvements

The Southern Environmental Law Center's 2005 report, "Clean Air for the Triad Area: An Action Agenda", found that increases in vehicle miles traveled offset improvements to new vehicle emissions. Farren, David and Thompson, Gudrun, Clean Air for the Triad Area: An Action Agenda, pp. 11-13 (2005). The Southern Environmental Law Center (SELC) report observed that "at nearly 32 miles every day per person, vehicle miles traveled (VMT) in the Greensboro urbanized area is the 11th highest in the nation, with Winston-Salem following closely behind at nearly 29 miles per person, per day." Id., p. 13. The SELC report further noted that "the Triad was one of the ten worst areas in the nation in percentage increase in commuting time between 1990 and 2000." Id. The graph shown below, generated by the North Carolina Department of Transportation, shows that this disturbing trend of increasing VMT pervades the entire State. In fact, as this graph demonstrates, the rate of change for VMTs exceeds the State population's rate of change by nearly a factor of four.



Norman Marshall's report shows that the construction of the northern beltway will exacerbate the increases in VMTs and, hence, the emission of greenhouse gases, and other air pollutants, due to induced travel. Marshall, pp. 8-11. As noted above, the northern beltway's incremental detriment to the global warming situation, stemming from additional VMTs arising out of traffic induced by the northern beltway, cannot be ignored, or grossly underestimated[2], by the SFEIS/FEIS and comply with NEPA.

SCOPE

2 The SFEIS/FEIS fails to analyze either the southern loop ("a potential future southern loop connecting the northern beltway from US 158 to US 311" and resulting in a complete loop around Winston-Salem as shown by the 2002 Thoroughfare Plan. *See* SFEIS/SDEIS, p. 1-24) or the airport connector and the interchange(s) associated with it ("After the Record of Decision on the Northern Beltway, there may be ways to address the new interchange [with Airport Connector] as a supplemental document. NCDOT could do a supplement if the Airport Connector was funded"). The test for whether the SFEIS/FEIS should evaluate the impacts of southern loop and the airport connector (with associated interchanges) is whether "a person of ordinary prudence would take it into account in reaching a decision" (Western N.C. Alliance v. NCDOT, 312 F.Supp.2nd 765 (E.D.N.C. 2003)), not whether it's funded.

Considering the geographic proximity of the southern loop to the northern beltway, "a person of ordinary prudence would [have] taken it into account in reaching a decision." Therefore, the SFEIS/FEIS should have analyzed the environmental impacts of constructing the southern loop together with its analysis of the three projects that constitute the northern beltway.

[2] "This [Cervero] study cited by the SFEIS/FEIS to support the low estimate [of traffic induced by the northern beltway], actually provides further evidence against [the lower estimate]." Marshall, p. 11.

Considering that the airport connector is likely to get built once the northern beltway gets constructed, since it connects the northern beltway to the urban loop around Greensboro via the Piedmont Triad Airport (*See* Meeting Minutes Winston-Salem Beltway, TIP Project U-2579A, Meeting of NCDOT and Town of Kernersville, December 3, 2004), "a person of ordinary prudence would [have] taken it into account in reaching a decision." Therefore, the SFEIS/FEIS should have analyzed the environmental impacts of constructing the airport connector together with its analysis of the southern loop and the three projects that constitute the northern beltway.

CONCLUSION

For the reasons offered in this letter, the accompanying comments of Norman Marshall and previous comments offered by NCATR, FOF and Ms. Sarah Norman Jones, the SFEIS/FEIS contains substantial flaws which will seriously mislead any decision-maker relying upon it. Consequently, the Record of Decision should not issue until FHWA and NCDOT correct these flaws.

Sincerely,

Marsh Smith

Attachment: Report of Norman L. Marshall

cc:
Don Voelker, FHWA (don.voelker@fhwa.dot.gov)
Greg Thorpe, Ph.D., NCDOT (gthorpe@dot.state.nc.us)
Sarah N. Jones
Norman Marshall

"Marshall" 1/17

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Review of Winston-Salem Northern Beltway SFEIS/FEIS

Norman L. Marshall

April 17, 2007

Overview

In January 2005, we reviewed the Supplemental Final Environmental Impact Statement/ Supplemental Draft Environmental Impact Statement for the Winston Salem Northern Beltway and identified several deficiencies.[1] In the 2007 Supplemental Final Environmental Impact Statement/Final Environmental Impact Statement (SFEIS/FEIS), some of our concerns have been addressed, some have been partially addressed but new errors have been introduced, and others have not been addressed substantively.

Specific deficiencies include:

- A new critical crash rate analysis in the FEIS is riddled with errors and fails to support a safety need for the project.
- The continued reliance on "all-or-nothing" traffic assignment in the FEIS makes the traffic forecasts worthless in evaluating congested roadways.
- The indirect and cumulative impacts analyses are too narrowly focused only on Forsyth County, and rely on one invalid mathematical model (LBGI) and a second misapplied model (SMITE).

There is a general theme running through these deficiencies – the generation of large quantities of numbers which appear precise but are based on errors and invalid or inappropriate analytic techniques. Because of these deficiencies, the FEIS fails to support the safety and capacity needs identified in the Project Purpose and Need. As was discussed in our January 2005 comments, the other project purposes listed in the FEIS all are based on vague notions of "connectivity" – that the lack of a road connecting certain places is a need for such a road. Such notions could justify any proposed road anywhere and are not based on data or analysis.

New Deficiencies in SFEIS/FEIS Resulting from Efforts to Correct Past Deficiencies

Safety

Safety is given in the SFEIS/FEIS as a Purpose and Need for the eastern section (p. 1-11). Safety is not part of the Purpose and Need for the western section, and no safety problems in the western section are documented in the SFEIS/FEIS. In our January 2005 comments, we noted that the accident analysis in the SFEIS/DEIS used accident statistics as support, but provided no evidence that accident rates are statistically significantly greater than statewide averages. In response to this comment, the FEIS now includes a "new critical crash rate analysis." (p. 6 – 122, p. 1-43 - 1-47).

Each accident has its own set of causes. These can include deficiencies in the roadway system but also driver impairment or distraction, weather, obstacles including animals, and other factors.

[1] Marshall, Norman L. and Brian R. Grady. *Review of Winston-Salem Northern Beltway SFEIS/SDEIS*. Smart Mobility, Inc., January 14, 2005

The rationale for critical crash analysis is that each location has an underlying accident rate that would become clear over a long period of time, but that the true rate may be obscured by random effects. This is similar to flipping a coin over and over. After 10 flips, we might have a total of 5 heads and 5 tails, but we also might get 8 heads and 2 tails. With 10 coin flips, we could not conclude that it was an unbalanced or "bad" coin even if we got 10 heads or 10 tails. With 100 flips, we would have much more confidence in our estimate. There are standard statistical methods for estimating the confidence range for the coin flips, and the critical cash analysis applies the same methods to accident rates. The critical crash rate analysis tells us whether the observed rate is higher than the average rate at a statistically significant level.

2 Use of the critical crash rate analysis methodology is correct. However, the SFEIS/FEIS, calculates the critical rates incorrectly. Table 11 in the SFEIS/FEIS summarizes crashes for 13 roadway segments relevant to the eastern part of the study area. With the incorrect calculations, the SFEIS/FEIS shows 7 of the 13 segments as having crash rates greater than the critical rate. Correcting these calculations shows that only 5 of the 13 segments have crash rates greater than the critical rate, and the ratios of observed rate to the critical rate are much lower than the SFEIS/FEIS reports. However, as discussed below, even these 5 segments do not support a need
3 for the Northern Beltway.

The SFEIS/FEIS values and corrected values are shown in Table 1. The formula used in the SFEIS/FEIS and its source – *Guidelines for Utilizing NC Statewide Crash Rates* – produced these corrected calculations shown in Table 1. The spreadsheet used to calculate the corrected rates was validated with the example from *Guidelines for Utilizing NC Statewide Crash Rates*. As I am experienced in critical crash rate calculations and with statistics in general, I immediately noted when reading the SFEIS/FEIS that the numbers were wrong. The SFEIS/FEIS critical crash rates average 1.4% above the average rates – this is certainly too narrow a confidence interval. This should have been apparent to other knowledgeable reviewers. The corrected rates average 19.5% above the average rates.

The two highest volume segments are on US 52 between I-40 and Akron Drive (SR #2264). This freeway has very closely spaced interchanges, and close interchange spacing causes higher crash rates.[2] The SFEIS/FEIS reports that NCDOT is planning to address these design deficiencies in the near term.

> The NCDOT proposes to improve safety and capacity on existing US 52 by adding auxiliary lanes in some locations and modifying or closing ramps (TIP Project U-2826B)... According to the *NCDOT 2006-2012 Transportation Improvement Program*, construction for TIP Project U-2826B is scheduled to begin in 2008... (FEIS, p. 2-5 - 2-6)

These improvements should significantly reduce the accident rates on US 52 before the Northern Beltway would be completed. Therefore, US 52 accident history is irrelevant to a safety Purpose
4 and Need because much more targeted safety improvements are already planned.

---

[2] Bared, Joe G., Praveen K. Edara and Tachyeong Kim, *Safety Impact of Interchange Spacing on Urban Freeways* Presented at the Annual Meeting of the Transportation Research Board, Washington DC, January 2006

The other three segments that appear to have significantly high crash rates all are on NC 66. The analysis of these segments in the SFEIS/DEIS includes additional errors. Most obvious is that the
5 traffic volumes assumed are too low. This is important because the accident rate is calculated as crashes per 100 million vehicle miles. If the traffic volume assumed is too low, the calculated crash rate is too high. The first segment listed is from US 421/I-40 Business south to US 311. The length of the segment is 9.43 miles and a daily traffic volume of 9,900 is given, and the roadway is described as a rural 2-lane road. In fact, NCDOT 2002 traffic maps show daily traffic volumes ranging from 9,000 to 24,000, with an average of 15,900 for the values shown. Traffic volumes assumed in the SFEIS/FEIS for the other NC 66 segments also are too low. Table 2 shows what happens when the average traffic volumes are corrected. This moves the calculated crash rate below the critical rate for one of the segments.

There is another problem with the SFEIS/FEIS analysis of the other NC 66 segments. The
6 accident methodology assumes homogenous conditions for an analyzed section. That is why a single traffic volume is entered. The example given in *Guidelines for Utilizing NC Statewide Crash Rates* is a segment of 0.92 miles. The segments used in the SFEIS/FEIS of 9.43 miles and 11.48 include a wide range of land use patterns, traffic volumes, and roadway types. For example, Figure 1 below compares an aerial view of a section of NC 66 that the SFEIS/FEIS calls "2-Lane Undivided Rural" (actually 5 lanes) with the illustration of a 2-Lane Undivided Rural road in the *Guidelines for Utilizing NC Statewide Crash Rates*.

Figure 1: 5-Lane Section of NC 66 Analyzed as 2-Lane Undivided Road and 2-Lane Undivided Road Illustration in Guidelines for Utilizing NC Statewide Crash Rates

Exhibit 3 - 2 Lanes Undivided

I will return to the coin flip example to explain why using long segments introduces bias. The SFEIS/FEIS analysis is like flipping each of 10 coins 10 times and lumping the results into 100 coin flips. If the result suggests we have a bad coin, we don't know which coin or coins are bad, but it is likely to not be all of the coins. These long sections of NC 66 should have been divided into much shorter, homogenous sections for analysis, with the appropriate standards applied for each subsection. If this had been done, few of the subsections would be found to have

significantly high crash rates. If 1-mile segments were analyzed (as in the example in *Guidelines for Utilizing NC Statewide Crash Rates*), the bar for determining whether a crash rate is statistically significant is higher because of the smaller traffic history. Table 2 shows that if the crash rates were constant across the long segments, and the segments were split into 1-mile sections, no section on NC 66 would be found to have a statistically high accident rate. It is more likely that some subsections would have higher than average crash rates and other lower than average. If a few high accident locations were found, it would likely be possible to address these deficiencies with geometric improvements. The SFEIS/FEIS is not focused on addressing safety problems; rather, it is focused on justifying the Northern Beltway.

"Marshall" 6/17

Table 1: SFEIS/FEIS Table 1-12 with Corrected Calculations (new entries in bold)

Roadway	Segment	Road Type	Length (miles)	ADT	Total No. of Accidents	**Exposure (100 million vehicle miles)**	Total Accident Rate	Statewide Average Accident Rate	FEIS Critical Crash Rate	FEIS Safety Ratio	**Probability Constant k (Urban vs. Rural)**	**Corrected Critical Crash Rate**	**Corrected Safety Ratio**
US 421/I-40 Business	US 52 and NC 66	Urban Interstate	9.88	47,400	304	**5.13**	59.28	125.86	126.68	0.47	**3.291**	**142.26**	**0.42**
I-40	US 52 and NC 66	Rural Interstate	10.48	62,000	460	**7.11**	64.65	67.62	68.13	0.95	**1.645**	**72.76**	**0.89**
US 52	I-40 and US 421/I-40 Business	4-Lane Divided Full Access Control Urban US Route	2.66	57,300	428	**1.67**	256.44	155.81	157.4	1.63	**3.291**	**187.91**	**1.36**
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	**2.77**	265.24	155.81	157.05	1.69	**3.291**	**180.69**	**1.47**
US 52	Akron Drive (SR #2264) and NC 65	4-Lane Divided Full Access Control Urban US Route	6.03	45,200	253	**2.98**	84.77	155.81	157	0.54	**3.291**	**179.76**	**0.47**
US 311	Williston Road (SR #2381) and I-40	4-Lane Divided Full Access Control Urban US Route	11.82	59,800	1024	**7.74**	132.30	155.81	156.55	0.85	**3.291**	**170.64**	**0.78**
US 311	I-40 and NC 66	4-Lane Divided Full Access Control Urban US Route	7.87	7,700	112	**0.66**	168.79	155.81	158.34	1.07	**3.291**	**206.99**	**0.82**
US 158	US 421/I-40 Business and NC 66	2-Lane Undivided Rural US Route	5.46	49,600	216	**2.97**	72.84	170.47	171.72	0.42	**1.645**	**183.11**	**0.40**
US 311	NC 66 and Williston Road (SR #2381)	2-Lane Undivided Urban US Route	1.01	4,600	17	**0.05**	334.16	321.84	335.02	1.00	**1.645**	**462.51**	**0.72**
NC 66	US 421/I-409 Business and US 311	2-Lane Undivided Rural NC Route	9.43	9,900	364	**1.02**	356.07	182.95	185.16	1.92	**1.645**	**205.45**	**1.73**
NC 66	NC 676 Connector (SR #1840) to Hopkins Road (SR #2649)	2-Lane Undivided Rural NC Route	11.48	9,500	354	**1.19**	296.43	182.95	184.99	1.60	**1.645**	**203.73**	**1.46**
NC 66	Hopkins Road (SR #2649) and US 421/I-40 Business	2-Lane Undivided Urban NC Route	3.97	12,000	233	**0.52**	446.65	334.95	339.13	1.32	**3.291**	**419.30**	**1.07**
NC 66 Connector (SR #1840)	US 52 to NC 66	2-Lane Undivided Rural SR Route	1	5,400	6	**0.06**	101.47	347.58	360.28	0.28	**1.645**	**482.16**	**0.21**

Table 2: Selected Segments from SFEIS/FEIS Table 1-12 with Corrected Calculations and Additional Corrections (new entries in bold)

Roadway	Segment	Road Type	Length (miles)	ADT	Total No. of Accidents	**Exposure (100 million vehicle miles)**	Total Accident Rate	Statewide Average Accident Rate	FEIS Critical Crash Rate	FEIS Safety Ratio	**Probability Constant k (Urban vs. Rural)**	**Corrected Critical Crash Rate**	**Corrected Safety Ratio**
	Corrected Volumes												
NC 66	US 421/I-409 Business and US 311	2-Lane Undivided Rural NC Route	9.43	**15,900**	364	**1.64**	221.71	182.95	185.16	1.92	**1.645**	**200.62**	**1.11**
NC 66	NC 676 Connector (SR #1840) to Hopkins Road (SR #2649)	2-Lane Undivided Rural NC Route	11.48	**13,200**	354	**1.66**	213.34	182.95	184.99	1.60	**1.645**	**200.52**	**1.06**
NC 66	Hopkins Road (SR #2649) and US 421/I-40 Business	2-Lane Undivided Urban NC Route	3.97	**13,200**	233	**0.57**	406.05	334.95	339.13	1.32	**3.291**	**415.33**	**0.98**
	Corrected Volumes and 1-mile segments												
NC 66	US 421/I-409 Business and US 311	2-Lane Undivided Rural NC Route	**1**	**15,900**	39	**0.17**	221.71	182.95	185.16	1.92	**1.645**	**239.15**	**0.93**
NC 66 Connector (SR #1840)	NC 676 Connector (SR #1840) to Hopkins Road (SR #2649)	2-Lane Undivided Rural NC Route	**1**	**13,200**	31	**0.14**	213.34	182.95	184.99	1.60	**1.645**	**244.93**	**0.87**

"Marshall" 7/13

7

As has been demonstrated, the SFEIS/DEIS failed to properly analyze past accident rates, and the SFEIS/FEIS also fails to properly analyze future accident rates. The SFEIS/FEIS uses an overly simplistic argument for suggesting that construction of the Northern Beltway will reduce future crashes. It relies on the fact that limited access freeways have relatively low accident rates per 100 million vehicle miles, and assumes that travel on limited access freeways can substitute for travel on other roadways at a one mile to one mile basis. This is wrong. No trip begins or ends on a limited access freeway; accordingly, travel on a limited access freeway cannot substitute for much existing travel. Access to and from limited access freeways often involves circuitous routing to access on-ramps and off-ramps, so that the number of vehicle miles goes up when high-speed limited access roads are opened. Then, any reasonable safety analysis must also account for secondary impacts of land development that further increase vehicle miles of travel. The Indiana Department of Transportation's analysis of a proposed new Interstate I-69 included modeling that included all of these factors. It was concluded that crash rates would be slightly lower in the early years after opening I-69, but over time induced travel would offset much of the safety benefits of a new and safer roadway.[3] The Northern Beltway SFEIS/FEIS makes no attempt to provide a balanced analysis of these factors, and has not demonstrated a safety benefit.

Deficiencies not Addressed Substantively in SFEIS/FEIS

Invalid Transportation Modeling

In our January 2005 review, we stated that:

> The "all or nothing" assignment approach used is invalid for congested roadway networks, and therefore can not be used to reach conclusions about levels of future congestion. (p. 1)

We included an excerpt from a 1990 FHWA publication recommending that all-or-nothing assignment not be used except when there is "minimal congestion."[4] We cited such an old publication from a period where computing advances supported phasing out all-or nothing assignment to illustrate the obsolescence of such methods. Since 1990, I have developed, applied, and/or critiqued regional travel demand models in about 20 U.S. regions – including regions both smaller and larger than the Triad Region. I have not encountered any other region that continues to use an all-or-nothing assignment.

We presented a significant amount of evidence as to why all-or-nothing assignment lacks validity in our January 2005 comments, but I will supplement them here. The most-used textbook on travel demand modeling states:

> The simplest route choice and assignment method is "all-or-nothing" assignment. This method assumes that there are no congestion effects...[5]

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[3] I-69 Evansville to Indianapolis Tier 1 Draft Environmental Impact Statement, 2002.
[4] Federal Highway Administration, *Calibration and Adjustment of System Planning Models*, 1990
[5] Ortuzar, Juan de Dios, and Luis G. Willumsen. Modeling Transport, 3rd Edition, p. 331, John Wiley and Sons, 2001.

In practice, "no congestion effects" means that modeled traffic levels are independent of the number of travel lanes assumed. For example, the Northern Beltway modeling assumed that US 52 would be widened to eight lanes with or without the project[6], despite this concept being rejected in the EIS text. Normally, this would be a fatal flaw in the modeling because traffic would be over-assigned to US 52. However, with all-or-nothing assignment, the amount of traffic is the same if US 52 is modeled as 8 lanes as if it is modeled with 4 lanes – or, for that matter 2 lanes or 200 lanes. This is obviously wrong, and traffic volumes are similarly wrong on every other link in the model. Therefore, modeling the wrong number of lanes is not the fatal flaw in this case; using all-or-nothing assignment is the fatal flaw. None of the model outputs for traffic volumes, speeds, or delay are valid.

8

The SFEIS/FEIS response to our January 2005 comments is that it was decided to use this methodology in 1994 because it fit traffic data better for the base year (p. 6-121 - 6-122). This suggests only that the equilibrium assignment was not implemented well in 1994, or otherwise the all-or-nothing approach would not have been selected then. The "better fit the traffic data in 1994" rationale does not justify such an approach now; rather it only serves to identify the existence of errors made in 1994. All-or-nothing assignment is simply not valid for modeling congested conditions in the future, and the results of such modeling are useless.

Indirect and Cumulative Impacts

Indirect and cumulative impacts were considered only for Forsyth County even though the Triad Region is multi-centric and intercounty travel including community is growing rapidly. Between 1990 and 2000, 64% of the net new jobs in the county were filled with workers commuting in from outside the county. Similarly, 60% of net new workers residing in Forsyth County commuted to jobs outside the county. Construction of the Northern Beltway would affect not just Forsyth County but also travel between northern Forsyth County and neighboring counties.

9

The SFEIS/FEIS response to our January 2005 comments includes the statement: "... there are major transportation infrastructure projects in Guilford, Randolph, and Davidson Counties that would tend to maintain the existing equilibrium of jobs and housing." (p. 6-134). This misses the point. It is exactly this expansion of roadways away from county centers that is making the county lines irrelevant in forecasting growth. The growth pressure will be increasingly focused around these new roadways and beyond the limits of traditional centers.

Particularly strong growth pressure will result in the Kernersville area – in both Forsyth and Guilford Counties. If constructed, the Airport Connector, as shown in the Thoroughfare Plan, will only amplify this pressure.

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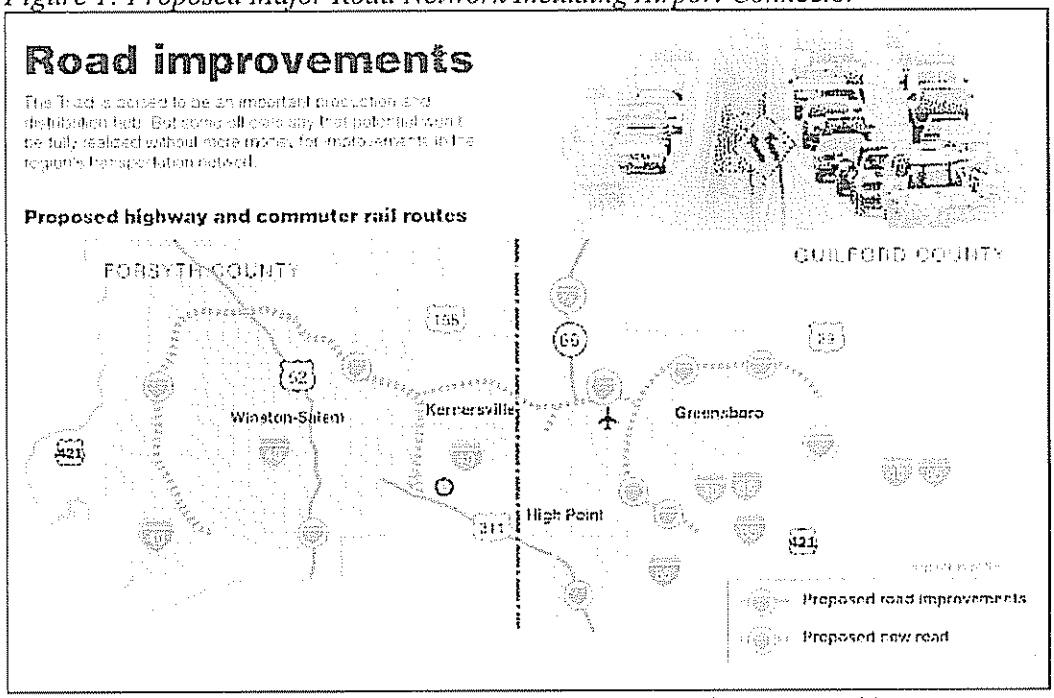
[6] "Readme-File Description doc" describing model files developed for the SFEIS/DEIS and not updated since, plus our examination of the model files. In both the No Build and Build alternative model files, US 52 is coded with significantly greater capacity than any other roadway in Forsyth County (including the Interstate Highways).

"Marshall" 10/17

Figure 1. Proposed Major Road Network Including Airport Connector



Source: http://media.gatewaync.com/media/wsj/2004/roadimprov_lg.gif

10 The eventual construction of the Airport Connector is anticipated in the SFEIS/FEIS and in other regional planning efforts.

> The distance between the proposed interchanges at Reidsville Road and US 421/I-40 Bypass is approximately 3.5 miles. This provides adequate interchange spacing for a future connector to the airport, as shown in the Thoroughfare Plan. (SFEIS/FEIS, p. 6-38)

The SFEIS/FEIS anticipates construction of the Airport Connector.

> After the Record of Decision (ROD) on the Northern Beltway, there may be ways to address the new interchange [with Airport Connector] as a supplemental document. NCDOT could do a supplement if the Airport Connector was funded, or even if a portion of it was funded. If a portion from West Mountain Street to the Beltway, or from NC 66 to the Beltway was funded, NCDOT may be able to study an interchange with the Beltway. (Meeting Minutes Winston-Salem Beltway, TIP Project U-2579A, Meeting of NCDOT and Town of Kernersville, December 3, 2004

Not including intercounty interactions is a significant deficiency in the Indirect and Cumulative Impacts analysis, but it is not the most important one. Since our January 2005 comments, we have reviewed *Winston-Salem Northern Beltway Indirect and Cumulative Impacts Analysis*, prepared by Louis Berger Group, Inc. ("LBGI") for NCDOT and dated June 2005. The 5-page Appendix A-1 documents the methodology used for estimating changes in residences and

employment that would result from construction of the Northern Beltway. A gravity model is used as the core of a crude land use allocation model. I will call this the "LBGI" model.

I have developed land use allocation models based on gravity models myself and such models can be appropriate tools.[7] However, the LBGI model lacks statistical estimation or validation. While LBGI's calculations indicate that the Northern Beltway would make some areas more attractive, LBGI's analysis has no valid way in which to translate attractiveness into land use effects. LBGI's analysis assumes that the land use will change in proportion to the change in the gravity model numbers, but experience shows that the relationship is not directly proportional. The relationship must be estimated from data and then validated – generally by comparing actual land use changes over a moderate length period, such as 10 years. Without any estimation or validation, the numbers produced lack empirical relationship to the real world. Without such empirical "grounding", the LGBI analysis amounts to nothing more than a circular argument. LGBI's analysis takes the sum of thousands of calculations – each of which, on a vastly smaller scale, merely restate the basic premise that the roadway will only have small effects – and "reconstitutes" them back into the basic premise. 11

The SFEIS/FEIS also relies on a second model, an application of SMITE in evaluating Indirect and Cumulative Impacts. Based on our January 2005 comments, some errors in the SMITE spreadsheets were corrected. (SFEIS/FEIS, p. 6-140 - 6-141) However, these corrections do not address the broader concerns raised in our comments. 12

> In the reformulation, the SMITE model is inappropriately shifted from a corridor to an entire region. Rather than analyzing parallel roadways, the analysis is shifted to classes of roadways. The Northern Beltway is not analyzed as itself. It is analyzed as part of a class of all freeways. Implicitly, it is assumed to shift traffic equally from all other freeways equally – whether the freeway is near or far away, and whether the freeway is parallel or runs perpendicularly. Similarly travel is assumed to be drawn to this class of freeways from all other roadways – even minor local streets on the opposite side of the county. This use of the model is unrealistic and invalid. (Marshall and Grady 2005, p. 12)

As documented in our January 2005 comments, the SMITE application resulted in less induced travel than would be expected from the large literature on induced travel. After correcting some errors, the SFEIS/FEIS estimate of induced travel has dropped even further (SFEIS/FEIS, p. 6-140). The SFEIS/FEIS supports this low number with one paper by Cevero (SFEIS/FEIS, p. 6-140). The Cervero paper[8] referenced presents a complex analysis that yields both short-term and

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[7] Marshall, N. and S. Lawe. *Land Use Allocation Modeling in Uni-Centric and Multi-Centric Regions, Transportation Research Board Annual Meeting*, Washington DC: January 1996.
Marshall, N. and S. Lawe. *Forecasting Land Use Changes for Transportation Alternatives* Fifth National Conference on the Application of Transportation Planning Methods, Seattle WA, April 1995.
Marshall, N. and S. Lawe. *Land Use Allocation Models for Multi-County Urban and Suburban Areas*, Fourth National Conference on the Application of Transportation Planning Methods (Transportation Research Board), Daytona Beach, FL, May 1993.

[8] Cervero, Robert. "Road Expansion, Urban Growth, and Induced Travel: A Path Analysis", *APA Journal*, Vol. 69, No. 2, p. 145-163, Spring 2003.

long-term induced travel estimates. The short-term model is focused on "behavioral shifts [such as] latent trips [and] route diversion" and the long-term model includes "structural adjustments [such as]. land use changes" (Cevero, p. 153). The number given in the SFEIS/FEIS, 0.238, is the short-term number. Our comments concerned long-term induced travel, and Cervero's long-term estimate is 0.64 (Cevero, Table 4, p. 155) which is quite close to 0.7 value used in our January 2005 comments. This single study cited by the SFEIS/FEIS to support the low estimate actually is further evidence against it.

Conclusion

A general theme runs through the travel demand modeling, the accident analysis, the LBGI modeling and the application of SMITE – namely, the generation of large quantities of numbers which appear precise but are based on errors and invalid or inappropriate analytic techniques. Such a constellation of errors will seriously mislead any decision makers relying on this SFEIS/FEIS.

Submitted April 17, 2007.

Norman L Marshall

Norman L. Marshall, Principal
Smart Mobility, Inc.

"Marshall" 13/17

NORMAN L. MARSHALL, PRINCIPAL
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EDUCATION:

Master of Science in Engineering Sciences, Dartmouth College, Hanover, NH, 1982
Bachelor of Science in Mathematics, Worcester Polytechnic Institute, Worcester, MA, 1977

PROFESSIONAL EXPERIENCE:

Norm Marshall helped found Smart Mobility, Inc. in 2001 and is its President. Prior to this, he was at Resource Systems Group, Inc. for 14 years. He specializes in analyzing the relationships between the built environment and travel behavior, and doing planning that coordinates transportation with land use and community needs.

Regional Land Use/Transportation Scenario Planning

Burlington, Vermont – Leading team that is developing a new transportation plan for the City based, in part, on an extensive public involvement process.

Chicago Metropolis Plan and Chicago Metropolis Freight Plan (6-county region)— developed alternative transportation scenarios, made enhancements in the regional travel demand model, and used the enhanced model to evaluate alternative scenarios. Developed multi-class assignment model and used it to analyze freight alternatives including congestion pricing and other peak shifting strategies. Chicago Metropolis 2020 was awarded the Daniel Burnham Award for regional planning in 2004 by the American Planning Association, based in part on this work.

Envision Central Texas Vision (5-countyregion)—implemented many enhancements in regional model including multiple time periods, feedback from congestion to trip distribution and mode choice, new life style trip production rates, auto availability model sensitive to urban design variables, non-motorized trip model sensitive to urban design variables, and mode choice model sensitive to urban design variables and with higher values of time (more accurate for "choice" riders).

Mid-Ohio Regional Planning Commission Regional Growth Strategy (7-county Columbus region)— developed alternative future land use scenarios and calculated performance measures for use in a large public regional visioning project.

Baltimore Vision 2030—working with the Baltimore Metropolitan Council and the Baltimore Regional Partnership, increased regional travel demand model's sensitivity to land use and transportation infrastructure. Enhanced model was used to test alternative land use and transportation scenarios.

Transit Planning

Capital Metropolitan Transportation Authority (Austin, TX) Transit Vision – analyzed the regional effects of implementing the transit vision in concert with an aggressive transit-oriented development plan developed by Calthorpe Associates. Transit vision includes commuter rail and BRT.

Bus Rapid Transit for Northern Virginia HOT Lanes (Breakthrough Technologies, Inc and Environmental Defense.) – analyzing alternative Bus Rapid Transit (BRT) strategies for proposed privately-developing High Occupancy Toll lanes on I-95 and I-495 (Capital Beltway).

Central Ohio Transportation Authority (Columbus) – analyzed the regional effects of implementing a rail vision plan on transit-oriented development potential and possible regional benefits that would result.

Essex (VT) Commuter Rail Environmental Assessment (Vermont Agency of Transportation and Chittenden County Metropolitan Planning Organization)—estimated transit ridership for commuter rail and enhanced bus scenarios, as well as traffic volumes.

Georgia Intercity Rail Plan (Georgia DOT)—developed statewide travel demand model for the Georgia Department of Transportation including auto, air, bus and rail modes. Work included estimating travel demand and mode split models, and building the Departments ARC/INFO database for a model running with a GIS user interface.

Roadway Corridor Planning and Air Quality Analysis

State Routes 5 & 92 Scoping Phase (NYSDOT) —evaluated TSM, TDM, transit and highway widening alternatives for the New York State Department of Transportation using local and national data, and a linkage between a regional network model and a detailed subarea CORSIM model.

Twin Cities Minnesota Area and Corridor Studies (MinnDOT)—improved regional demand model to better match observed traffic volumes, particularly in suburban growth areas. Applied enhanced model in a series of subarea and corridor studies.

Seacoast Metropolitan Planning Organization (New Hampshire) — led team that developed integrated transportation, land use, and applied models in corridor studies and in regional air quality conformity modeling.

Developing Regional Transportation Models

Pease Area Transportation and Air Quality Planning (New Hampshire DOT)—developed an integrated land use allocation, transportation, and air quality model for a three-county New Hampshire and Maine seacoast region that covers two New Hampshire MPOs, the Seacoast MPO and the Salem-Plaistow MPO.

Syracuse Intermodal Model (Syracuse Metropolitan Transportation Council)—developed custom trip generation, trip distribution, and mode split models for the Syracuse Metropolitan Transportation

Council. All of the new models were developed on a person-trip basis, with the trip distribution model and mode split models based on one estimated logit model formulation.

Portland Area Comprehensive Travel Study (Portland Area Comprehensive Transportation Study)—Travel Demand Model Upgrade—enhanced the Portland Maine regional model (TRIPS software). Estimated person-based trip generation and distribution, and a mode split model including drive alone, shared ride, bus, and walk/bike modes.

Chittenden County ISTEA Planning (Chittenden County Metropolitan Planning Organization)—developed a land use allocation model and a set of performance measures for Chittenden County (Burlington) Vermont for use in transportation planning studies required by the Intermodal Surface Transportation Efficiency Act (ISTEA).

Research

Obesity and the Built Environment (National Institutes of Health and Robert Wood Johnson Foundation) – Working with the Dartmouth Medical School to study the influence of local land use on middle school students in Vermont and New Hampshire, with a focus on physical activity and obesity.

The Future of Transportation Modeling (New Jersey DOT)—Member of Advisory Board on project for State of New Jersey researching trends and directions, and making recommendations for future practice.

Trip Generation Characteristics of Multi-Use Development (Florida DOT)—estimated internal vehicle trips, internal pedestrian trips, and trip-making characteristics of residents at large multi-use developments in Fort Lauderdale, Florida.

Improved Transportation Models for the Future—assisted Sandia National Laboratories in developing a prototype model of the future linking ARC/INFO to the EMME/2 Albuquerque model and adding a land use allocation model and auto ownership model including alternative vehicle types.

Critiques

C-470 (Denver region) – Reviewed express toll lane proposal for Douglas County, Colorado and prepared reports on operations, safety, finances, and alternatives.

Intercounty Connector (Maryland) – Reviewed proposed *toll road and modeled* alternatives with different combinations of roadway capacity, transit capacity and pricing.

Foothills South Toll Road (Orange County, CA) – Reviewed modeling of proposed toll road.

I-93 Widening (New Hampshire) – Reviewed Environment Impact Statement and modeling, with a particular focus on induced travel and secondary impacts.

Stillwater Bridge – Participated in 4-person expert panel assembled by Minnesota DOT to review modeling of proposed replacement bridge in Stillwater, with special attention to land use, induced travel, pricing, and transit use.

Ohio River Bridges Project (Louisville region) – Reviewed Environmental Impact Statement for proposed new freeway/Ohio River bridge.

Indiana I-69 – Reviewed model analyses from Indiana statewide travel demand model of proposed new Interstate highway and performed sensitivity analyses for its benefit cost analysis.

Atlanta, Georgia – Critiqued conformity analyses and regional long-term transportation plan.

Daniel Island (Charleston, South Carolina) – Reviewed Draft Environmental Impact Statement for large proposed Port expansion (the "Global Gateway") for an environmental coalition.

MEMBERSHIPS/AFFILIATIONS

Member, Institute of Transportation Engineers
Individual Affiliate, Transportation Research Board
Member, American Planning Association
Member, Congress for New Urbanism
Technical Advisory Committee Member and past Board Member, Vital Communities (VT/NH)

PUBLICATIONS AND PRESENTATIONS (partial list)

Sketch Transit Modeling Based on 2000 Census Data with Brian Grady. Presented at the Annual Meeting of the Transportation Research Board, Washington DC, January 2006 and accepted for publication in the *Transportation Research Record*.

Travel Demand Modeling for Regional Visioning and Scenario Analysis with Brian Grady, *Transportation Research Record. Transportation Research Board, Journal of the Transportation Research Board, No. 1921, Travel Demand 2005*, 2005.

Chicago Metropolis 2020: the Business Community Develops an Integrated Land Use/Transportation Plan with Brian Grady, Frank Beal and John Fregonese, presented at the Transportation Research Board's Conference on Planning Applications, Baton Rouge LA, April 2003.

Chicago Metropolis 2020: the Business Community Develops an Integrated Land Use/Transportation Plan with Lucinda Gibson, P.E., Frank Beal and John Fregonese, presented at the Institute of Transportation Engineers Technical Conference on Transportation's Role in Successful Communities, Fort Lauderdale FL, March 2003.

Evidence of Induced Travel with Bill Cowart, presented in association with the Ninth Session of the Commission on Sustainable Development, United Nations, New York City, April 2001.

Induced Demand at the Metropolitan Level – Regulatory Disputes in Conformity Determinations and Environmental Impact Statement Approvals, Transportation Research Forum, Annapolis MD, November 2000.

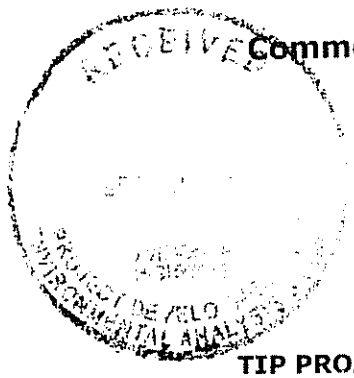
Evidence of Induced Demand in the Texas Transportation Institute's Urban Roadway Congestion Study Data Set, Transportation Research Board Annual Meeting, Washington DC: January 2000.

Subarea Modeling with a Regional Model and CORSIM" with K. Kaliski, presented at *Seventh National Transportation Research Board Conference on the Application of Transportation Planning Methods, Boston MA, May 1999.*

New Distribution and Mode Choice Models for Chicago with K. Ballard, *Transportation Research Board Annual Meeting*, Washington DC: January 1998.

"Land Use Allocation Modeling in Uni-Centric and Multi-Centric Regions" with S. Lawe, *Transportation Research Board Annual Meeting*, Washington DC: January 1996.

"Jones" 19



Comments on the Winston-Salem Northern Beltway

FEIS

March 27, 2007

TIP PROJECT NOS. R-2247 AND R-2247A, U-2579 AND U-2579A

To *Mr. Gregory Thorpe, Ph. D.*
North Carolina Department of Transportation
1548 Mail Service Center
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From *Sarah N. Jones*
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Winston-Salem, North Carolina 27104

Comments on the Winston-Salem Northern Beltway FEIS

March 27, 2007

1

1) The Southern Beltway is included in the Existing Thoroughfare Plan (figure 1-7) and the effects of the Environmental Impacts of the Southern part of the Loop should be included in the current FEIS. The Thoroughfare Plan is a serious Document that the Public pays for and is asked to Comment on, and that the Elected Officials Vote on. How can FHWA and NCDOT just dismiss it from the FEIS? If the Southern Beltway is not a serious project it should be removed from the Thoroughfare Plan and the Public should not have to consider it in their Future Plans.

The Southern Loop has been written about in the *Winston-Salem Journal* in 2001 and 1997. Many people living in the area have been concerned about its effects on Moravian History and Archives, and right-of-way and construction dates. The Southern Loop will have a major impact on the Communities and do considerable Environmental Damage to the County? Since Charlotte, Greensboro, and Raleigh have plans for complete loops, Winston-Salem will be pushing for the same thing. *See attached Thoroughfare Plan Map. Technical Report and Newspaper articles*

Winston-Salem/Forsyth County Urban Area Thoroughfare Plan Technical Report, February 28, 2002, Page 6:
"Northern and Southern Beltway
Serving as a circumferential bypass and commuting facility, the Northern Beltway western and eastern sections are in the Environmental Impact Phase of study. A design corridor has been selected for the western section and funding is in place for all but the segment from Interstate 40 to S. Stratford Road. The western section will be a four-lane divided facility from S. Stratford Road to US 52 North. The eastern section will be a six-lane divided facility from US 52 North to Business Interstate 40 with a four-lane divided facility for the portion from Business I-40 to US 311. A Southern Beltway loop is proposed to tie the facility from US 311 to S. Stratford Road and will be a four-lane divided facility."

October 10, 2001, *Winston-Salem Journal*, Carey Hamilton
"City to start planning a Southern Beltway
"Now the city wants to begin planning a 10-mile extension in southern Forsyth County and northern Davidson County that would complete the loop
The proposed Southern Beltway would meet up with the western leg of the Northern Beltway at U. S. 158 (South Stratford Road) and join the eastern leg at U.S. 311. To complete the loop, an extension of the Northern Beltway would be built from Business 40 to U.S. 311."

September 11, 1997, *Winston-Salem Journal*, Scott Maxwell
"Beltway could form ring around the city"
"Local transportation officials said yesterday that they are considering building a southern beltway around the southern half of the city and connecting to the Northern Beltway, creating a loop around the entire city
A committee of elected officials from around the county endorsed a plan, without discussion, yesterday that directs state engineers to start designing the southern beltway."

2

2) The Environmental Impacts of the Interchange with the I-73/74 Connector, Project I-4924, should have been included in the FEIS. This is a major Interchange with Major Impacts. The Interchange is shown on the Thoroughfare Plan Map (figure 1-7) and the Long Range Plan Map (figure 1-6). It is listed in the TIP. $400,000 was approved to study the Connector Project by the MPOs of Winston-Salem and Greensboro in July 2005. It will have a major Impact on the Cash Elementary School, Kerwin Baptist Church & Church School, Pisgah United Methodist Church, and Martin Mill Creek Area. How can FHWA and NCDOT just dismiss it from the FEIS? If it is not going to be constructed in the future, it should be removed from all the plans. *See attached Resolutions*

3

3) The Environmental Impacts of the I-73/74 Connector Project I-4924 should have been included in the FEIS, as this is a major new Highway connecting two major Loop Projects, two major Highways and the Airport. The Connector is shown on the Thoroughfare Plan Map (figure 1-7) and the Long Range Plan Map (figure 1-6). It is listed in the TIP. $400,000 was approved to study the Connector Project by the MPOs of Winston-Salem and Greensboro in July 2005. It was approved by the Turnpike Authority Board to be studied as a Toll Road Facility in June 2005 at the request of the PART Board, because it was considered to be an important link between the Beltway and the Airport. How can FHWA and NCDOT

just dismiss it from the FEIS? If it is not going to be constructed in the future, it should be removed from all the plans. *See attached Resolutions*

4

4) The Cost of this project has reached over $1Billion and is displacing 1,019 Residences and 60 Businesses, Pages S 13-14. The Project is not worth the Cost. The Project is not worth the disruption to the Homes, Communities, the Historic Sites, and the Environment. $39,830 million per mile is a total waste of tax dollars. The money would be much better spent on Light Rail between Winston-Salem and Greensboro, repairing and upgrading Business 40 through Winston-Salem (TIP U-2827B), and repairing and upgrading US 52 through Winston-Salem (TIP U-2826). The FEIS should have pointed out that the advantages of Upgrading and Maintaining our Existing Roads, and providing Light Rail, instead of simply trying to justify New Construction. The Local MPO sets roadway improvement priorities only with consultation with NCDOT and needs to be given straight forward advice and an education in options other than spending huge sums of money on New Roads. *See attached TIP Pages*

	FEIS	2007-2013 TIP
COST	$1,075.6 billion	$1,167,022 billion
LENGTH	34.2 miles	29.3 miles

Northern Beltway Costs from 2007-2013 TIP

(IN THOUSANDS)

Project Number	1989 Miles	1989 TIP	2007-13 TIP	2007 Miles	Increase 1989-2007	% Increase	89 Cost /Mile	2007 /Mile
R-2247	15	$132,500	$447,225	14 8	$314,725			
R-2247A			$20,300	1 9	$20,300			
U-2579	12 6	$77,356	$699,497	12 6	$622,144			
U-2579A								
Totals	**27.6**	**$209,856**	**$1,167,022**	**29.3**	**$957,166**	**456%**	**$7,603**	**$39,830**

Winston-Salem Loop. Route R2247A and U-2579A added since 1989 TIP

U-2579 and U-2579A Combined in 2007-2013 TIP

5

5) Since the FEIS points out in the Need Summary that the Northern Beltway is "Consistent with the Highway Trust Fund Act", page 1-5, and in the Purpose Summary "Help fulfill the Highway Trust Fund Act...Building the loop would be consistent with the intent of the General Assembly when the Highway Trust fund Act was passed", page 1-10; then the FEIS should devote some time to the history and considerable changes in the Highway Trust Fund Act. Rather than painting a pretty picture of fulfilling the Highway Trust Fund Act, the FEIS should point out that in 1989 the Citizens were promised the HTF projects would be finished in 13 years, that the Construction time table for the HTF projects may now extend 30 to 35 years, and that Citizens and Communities will be held in Limbo for that period of time. The FEIS should point out that the Costs for the projects in the HTF have increased so much that the State is looking for other ways to fund the Projects, such as Bonds, Tolls, Added Local Taxes, and in the case of I-74 special Earmarks from our Representatives in Congress. The FEIS should also point out that R2247A is not part of the Highway Trust Fund and that U-2579A was added in 2003. The Local MPO sets roadway improvement priorities only with advice and consultation with NCDOT, and needs to be given straight forward information and an education in options other than Spending huge sums of Money on New Roads. *See the attached articles from the News & Observer and Winston-Salem Journal*

6

6) The type road was decided without Public Input, contrary to the statements on page 2-29. The *Winston-Salem Journal*, July 19, 1992 says "But local officials say they have quietly settled the equally important question of access: They have informally decided to build the road to freeway standards with overpasses and entrance ramps at key interchanges instead of intersections with traffic signals and turning lanes scattered along the road's 17-mile length." *See attached article*

7

7) Upgrading US 52 (page 2-27 & 2-28) is a viable alternative to constructing the Northern Beltway. The TIP Project U-2826 (US 52, I-40 Bypass to Proposed Western Loop Interchange. Widen and Upgrade Roadway and Interchanges. 12 Miles, $425,053), and TIP Project U-2925 (Salem Creek Connector, Salem Avenue to Martin Luther King Drive. Widen to Multi-Lanes with Part on New Location. 1 Mile, $27,298) would solve the traffic Safety Problems on US 52 and the money would be spent on an Existing Road that needs the Maintenance work. These projects should have been in place and completed years ago, many accidents could have been prevented. NCDOT should have informed and recommended to the Local MPO these Options. The Northern Beltway should never have been a priority, for 12 years the Western Section took Priority over the Safety Issues on U. S. 52.

The *Winston-Salem Journal*, October 29, 2005, "Project Safety... Improvements on U. S. 52 through downtown move closer to becoming reality," an article about an Alternatives Workshop on U. S. 52 Improvements:
"Though the long-term repairs have been needed for years, the DOT didn't allocate the money because finding money for the Northern Beltway loop around Winston-Salem took priority."

The *Winston-Salem Journal*, June 19. 2006, "Officials set goal of a safer U. S. 52"
"The number of wrecks on U. S. 52 inside the city limits has increased in recent years, from 509 wrecks in 2002 to 590 last year.
Wrecks with injuries have increased, from 124 in 2003 to 157 last year. Since 2003 there have been nine fatal wrecks on the section of the highway within the city limits...
About two-thirds of all wrecks on U. S. 52 can be attributed to aggressive or dangerous driving, such as speeding, following too close, and alcohol-related wrecks, Stutts said."
See attached TIP pages and articles from Winston-Salem Journal.

8

8) The FEIS points out that the Board of Transportation decided that the Eastern Section of the Beltway would be I-74, that it would "follow a new location corridor rather than using the congested sections of US 52 and US 311" (page1-11). The Board of Transportation could change their priority to Maintenance and Safety and designate US 52 as I-74, which was the original plan in the 1990s when Congress voted to create I-73 through Winston-Salem, then changed it to I-74. This should have been pointed out in the FEIS and should be pointed out to the Board.

The *Winston-Salem Journal*, January 13, 1996, "I-74 and beltway"
"Gov. Jim Hunt gave the local supporters of Interstate 74 something to cheer about this week when he went on record to give priority to building the parts of I-74 through Surry, Stokes and Forsyth counties. Politics and money being what they are these days, there's no telling exactly what this support will mean, but it now appears that there is a possibility that an interstate-quality road will run from Interstate 77, down U. S. 52 and 311 to U. S. 220, no matter what happens to the other sections of what is supposed to be a road (now two roads, including Interstate 73 through Roanoke and Greensboro) from Detroit to Charleston, S. C."

The *Winston-Salem Journal*, March 7, 1996, "Beltway proposal angers Forsyth. Road's eastern leg doesn't belong with I-74, officials insist"
"Several members of the city-county Transportation Advisory Committee said yesterday that the N.C. Department of Transportation shouldn't have included the beltway in the I-74 plans without their knowledge.
Gov. Jim Hunt announced the I-74 plan at a press conference in January, and the beltway's role in it came as news to most of the county's transportation policymakers."

The *Winston-Salem Journal*, May 2, 1995, "Faircloth agrees to plan for I-73. Route would go through Greensboro; section of 52 would be I-74"
"U. S. Sens. Lauch Faircloth and John Warner have sealed a deal that would route the proposed Interstate 73 through Greensboro rather than Winston-Salem, but the deal also would rename U. S. 52 through Winston-Salem as Interstate 74." *See articles from Winston-Salem Journal.*

Whether the Northern Beltway is built or not, US 52 & Business 40 will be used as the fastest access to Baptist Hospital, The Piedmont Triad Research Park, and the New Proposed Downtown Baseball Stadium

9

9) The FEIS discusses the Land Use Plans (page 1-29): "The *Legacy Development Guide* is a general guide to manage and promote 'smarter growth' for Forsyth County by building at higher densities and in activity centers, by promoting transit-oriented development that reduces auto-dependency and air pollution, and by protecting and enhancing community values. The plan also stresses the importance of protecting open space, farmland, and historic resources, and of revitalizing downtown and older neighborhoods...Although adopted as an official public document, Legacy is not a development ordinance and does not carry the force of law." While it is not the job of NCDOT to enforce local plans, the FEIS should point out that Legacy is not working. The *Winston-Salem Journal* pointed out in several March 2007 articles that only "four of the 23 benchmarks have been met since the governments...adopted the Legacy guide in 2001." And, "In several areas, progress toward benchmarks either had not changed or had gone in the wrong direction."

The *Winston-Salem Journal*, March 9, 2007, "Results are mixed on Legacy effort. City hears report on quality – of-life issues"
"Few quality-of-life benchmarks established in the Legacy guide have been met in Winston-Salem and Forsyth County, an oversight committee of city and county volunteers said in a report released this week.
According to the panel's annual review, four of the 23 benchmarks have been met since the governments of Winston-Salem, Forsyth County and the county's seven other municipalities adopted the Legacy guide in 2001."

The *Winston-Salem Journal*, March 19, 2007, "Legacy Letdown"
"And it's past time for city and county governments to start pushing the needle. It's understandable that the various governing bodies in the county represent varied constituents with varied views on taking the measures needed to carry out the plan. But the plan can clearly benefit the entire county, if only more elected officials would start pushing it."

The *Winston-Salem Journal*, March 19, 2007, "Legacy Compliance"
"Local Leaders talk a lot about Forsyth County's Legacy Plan, but the sad truth is that it isn't being applied nearly enough." *See Winston-Salem Journal Articles*

10

10) The FEIS does not point out that Winston-Salem already has a high degree of Sprawl:

- The Winston-Salem Triad Area was ranked 2nd in the Country in Sprawl in the study "Suburban sprawl and physical and mental health" released September 27, 2004, conducted by R. Sturm and D. A. Cohen for the Rand Corporation. "Researchers found that people who live in areas with a high degree of suburban sprawl are more likely to report chronic health problems."
- The Greensboro-Winston-Salem-High Point area ranked second out of 83 Metropolitan areas in Sprawl, in a study released October 17, 2002 conducted by professors at Rutgers and Cornell. "The scores for each factor indicate how badly regions have sprawled in terms of spreading out housing and population; segment homes from the activities of daily life; lacking the focus of strong economic activity centers; and building poorly connected street networks."
- The Brookings Institute Study, July 2000, "Adding It Up: Growth Trends and Policies in North Carolina" says "New beltways will likely worsen the sprawl problem." The study recommends looking for other ways to solve the Sprawl Problems.
- *Winston-Salem Journal*, March 12, 2006, "City wants to spruce up several business areas:"
  "Winston-Salem is home to some of the worst suburban sprawl in the United States, right up there with Atlanta and Riverside-San Bernardino in Southern California, according to a study released by Rand Corp. in 2004.
  Mayor Allen Joines referred to the study Friday when he talked about a $2 million plan to fix up 12 declining commercial areas in the heart of some of the city's older, blighted neighborhoods.
  'We, unfortunately, have experienced a lot of sprawl in Winston-Salem and the Triad area, so it makes sense to use and reuse some of these underutilized areas,' Joines said."
  See attached Winston-Salem Journal articles. Rand Study. Smart Growth America Study Brookings Study

11

11) "The Winston-Salem Northern Beltway Indirect and Cumulative Effects Analysis (2005), summarized in Section 4.20 concludes that except for localized impacts, each of the Beltway Build scenarios...would have minimal effect on the spatial allocation and amount of growth and development within the County compared to the No-Build Scenario...The local governments also have not created a land use projection that assumes the Northern beltway...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." (Page 1-34) The FEIS should have included a true no-build land use scenario. As pointed out in Comments 9& 10 above, Forsyth County has never been able to control Sprawl Lobby. The Banks, the Home Builders, the Chamber, the Developers, and the Automobile Dealerships have been the main supports of the Beltway.

The *Winston-Salem Journal*, December 13, 2004, "Price of Change"
"Paul Norby, the city-county planning director, said that many people see vacant land and don't realize that it might be zoned for residential and commercial development
Planners are expecting much of the vacant land to be developed in the coming years as the Northern Beltway is built...
Norby said he understands people's worries about new development. That's why there is a Legacy Comprehensive Plan and specific area guidelines to help better plan for growth, he said.
Norby said that there is little that can be done to prohibit development beyond the unrealistic idea of buying all the vacant land and preserving it." *See Winston-Salem Journal Article*

12

12) The FEIS says: "Development is concentrated near the planned Metro Activity Center at the Robinhood Road interchange." Table 4, Page 86-6 "Development Potential at Interchanges" Ranks Robin Hood Road Build-West as High, Full-Build as Medium. The Map in Figure 3-2 shows the Metro Center on Shallowford Road.

The *Winston-Salem Journal*, November 29, 2003, "Location of Brookberry's retail space undecided. .Legacy plan calls for it to be on northern end, but developers disagree"
"The problem is that the commercial development proposed for Brookberry in its current location on the southeast section of the property does not match the county's Legacy Comprehensive Plan...
One of those proposed metro activity centers, according to Legacy, should be along Robinhood Road near Meadowlark Drive, which happens to be on the northern end of Brookberry...
Brookberry's developers, however, have laid out a plan for commercial development in the southern part of the property, closer to Country Club Road, where some retail development already exists...
Planners said they will spend most of next year discussing whether to move the metro activity center suggested in their Legacy plan from Robinhood Road to Country Club Road...
McChesney, for one, said that moving the metro activity center in Legacy near Robinhood to Country Club Road makes the most sense...
'Certainly the intersection of Country Club Road and Meadowlark Drive has a certain level of commercial presence there already,' he said. 'Because of the proximity of (U.S.) 421 and (Interstate) 40, it seemed that end of the property was the logical place for services-type growth rather than in the middle of the property or the north end of the property'...
Paul Norby, the city-county planning director, said the issue of locating the metro activity center that is near Brookberry Farm is a bit more complex than the other centers...
'We're having to look between two interchanges,' he said, referring to Robinhood and Country Club roads."
See attached Winston-Salem Journal article

13

13) The FEIS shows the Peace Haven-Styers Ferry Road Connector in the Table 2-8, 2015 West-A and East B-Alternatives Traffic Volumes. Page 2-54 and in Table 2-9, 2015 Traffic Volumes and Lane Requirements, Page 2-55, but in a NCDOT Memo dated May 31, 1996 says: "The Winston-Salem thoroughfare plan shows a proposed Peace Haven-Styers Ferry Road Connector between the I-40 and US 421 Interchanges. There will not be enough length between these two interchanges to include an interchange for this connector."
The FEIS should have not shown the Peace Haven-Styers Ferry Road Connector and NCDOT should have recommended that the Local MPO take the Connector out of the Thoroughfare Plan.
See attached NCDOT Memo and Maps

14

14) One of the stated purposes of Project R2247 is to Improve North/South Connectivity in Western Forsyth County (page 1-10), but most of Western Forsyth County is a residential area, there is nothing important to Connect.
Connecting What to What? Rural Hall to Clemmons? Ronald Regan High School to West Forsyth High School? Shopping Center Exits to Shopping Center Exits? Housing Developments to Housing Developments?

The new Houses on the Brookberry Development to US 421? The latter is the main reason the Western Section was selected to begin the Winston-Salem Northern Beltway. That is a terrible misuse of Public Funds.

The major Commuting traffic patterns show that I-40 carries 16,515 to Guilford County and 7, 636 from Guilford to Forsyth everyday. US 52 carries 10,259 into Forsyth from Stokes County, and 11,062 from Davidson County into Forsyth everyday. I-40 carries 5,242 from Davie County into Forsyth, and US 421 carries 5,504 from Yadkin County into Forsyth everyday. The major commuting patterns are on the existing East/West, North/South Highways. The traffic counts show the heaviest travel is on I-40, which runs East/West. Most of the existing Industrial Parks are located close to US 52 or Business 40 or I-40. What is the NCDOT trying to Connect in Western Forsyth County?

The Hospitals are Major Employers in the County and they are located in the center of the wheel, not on the rim. The ambulances will take the shortest distance to the Hospitals and that will be along the existing spokes. There are no plans for any major employment opportunities, except schools and shopping centers, in the area surrounding the Western Section of the Beltway.
See attached Traffic flow map

15

15) The FEIS does not address the seriousness of the Existing storm-water runoff problem. The *Winston-Salem Journal* reported February 26, 2007, "Winston-Salem has long had serious storm-water problems that seem to be getting worse as the city and surrounding are keep growing. Damage from uncontrolled runoff that causes flooding, erosion and polluted creeks is threatening to strain public coffers and residents' pocketbooks while also lowering the quality of life that helped draw people here to live in the first place, city officials said. Heavy rains and swollen creeks regularly leave people's basements flooded while carving ravines out of what were once shallow ditches."
The *Winston-Salem Journal*, February 26, 2007, "Eroding Safety: Floods bring call for action, City seeks storm-water runoff plan"
"The meeting is being driven by significant increase in recent years in the number of storm-water complaints taken by city officials. Those complaints have come from all over town, not just a couple of spots ... Widespread flooding on New Year's Day has also helped focus people's attention on the problem."
See attached Winston-Salem Journal Article

16

16) The FEIS does not address the fact that the State has lost 6,000 farms and 300,000 acres of farmland since 2002, and 1,000 farms in 2005. The FEIS addresses the loss of 1,380 acres of Prime, Statewide, and Local Important Farmland, but with the accelerated loss of Farmland across North Carolina, the FEIS should address the lost of all Farmland. The N. C. Agriculture Commissioner released a statement in February 19, 2007 saying: "Farm loss has become a chronic problem here."
The FEIS says on page 4-147, Section 4.12.2 Combined Direct Farmland Impacts, "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." That is not true.
The Corridor of the Northern Beltway was chosen to go through Farmland, to avoid taking residences in Developments. The Planners obviously took aerial maps and routed the Highway through remaining Farmland wherever possible. Farmers are working hard to hold on, even with the acceleration of Real Estate Prices and Urban Development in their faces. The Northern Beltway will have a Major Impact on remaining Farms in Forsyth County and their Water Supplies.
Press Release, NCDA&CS, February 19, 2007, "North Carolina leads nation in loss of farms ... again"
"North Carolina lost 1,000 farms during 2005, tying Florida and Tennessee for first place in the nation, according to the U.S. Department of Agriculture ... 'Development pressure and economic uncertainty make a deadly duo for family farms,' Troxler said. 'And fewer farms mean fewer jobs.'"
Saving the Goodliest Land, Land for Tomorrow Report, June 2005:
"More than One Million acres of natural and rural land have been developed over the last decade. North Carolina lost more prime farmland between 1987 and 1997 than any other state except Ohio and Texas."
See attached Winston-Salem Journal Articles and Land for Tomorrow Report

17

17) The FEIS relies heavily on the current STIP and Conformity for Air Evaluation, but if the EPA raises the standards in 2008, and they very well could, the entire Piedmont Triad Area may be out of Conformity.
Clean Air for the Triad Area, published by the Southern Environmental Law Center, 2005:

"Although state and federal programs hold promise in cleaning up emissions from the four power plants in the area, **officials have failed to address with equal vigor the problem of motor vehicle emissions from escalating vehicle travel, the soon to be dominant contributor to ozone pollution in the Triad area.**"
The Roadmap for the Future recommends: "a combination of local, state, federal, and private-sector initiatives will be needed to clean up the Triad's air. . . In particular, though, local officials also must deal decisively with the problem of mobile emissions."
The Report recommends: "Reform Transportation Funding Priorities. **Meeting the nonattainment challenge will require a shift in funding priorities away from expanding road capacity in outlying areas, which encourages further sprawling development and even more driving. As other large metro areas have discovered, it is a myth that an area can devote enough money to highways to build itself out of congestion.** State and local elected officials should **maximize funding for alternatives** to single-occupant vehicle use, such as the **planned light rail system** and expansion of bus rapid transit, high-occupancy vehicle lanes, bikeways, and sidewalks. Other available transportation tools include adopting **a "fix it first" policy**, targeting transportation spending to existing areas, enhancing street connectivity and developing transit use incentive programs. . . Conclusion: The Triad area has a choice. Continuing down the same road unplanned growth, **failure to provide meaningful transportation choices, and lack of regional coordination leads to erosion of the area's quality of life, serious public health impacts due to air pollution** and even the risk of losing federal highway funds. The alternative route – a coordinated regional effort to improve air quality, land use and transportation planning – leads to healthy air and an improved quality of life for the area's citizens. While the Triad has taken some important positive steps, this is only the beginning of the road to clean air. Citizens and decision-makers in the Triad area should seize this critical opportunity to provide a legacy of healthy air quality for current and future generations." *See attached Clean Air for the Triad Report Summary*

18

18) The FEIS does not show the Citizens Protests to the Northern Beltway before 1999, the Northern Beltway has historically been an Unpopular Project. Record of Opposition:

1.	Sept. 19, **1988**	Forsyth County Commissioners hold Hearing on Beltway, **350 ATTEND MEETING**, Public asked that EIS be done before choosing corridor, **OPPOSES BELTWAY.**
2.	Aug. 14, **1990**	Meeting at Forsyth Country Day School, the Journal Headlines- **"BELTWAY MEETING DRAWS 700", TO SHOW OPPOSTION** to the Northern Beltway.
3.	Sept. 1, **1992**	DEIS Hearing, Western Section, Journal Headlines - "Western Freeway Denounced by Many at Crowded Hearing". . **750 PEOPLE ATTENDED** hearing to **OPPOSE THE BELTWAY.**
4.	June 8, **1993**	TAC Meeting, Vote taken that The Preferred Corridor was in Conformance with the Thoroughfare Plan. **250 PEOPLE** attended the meeting, **represented by TWO LAWYERS, OPPOSING BELTWAY.**
5	Sept. 8, **1993**	"Residents Pack Advisory-Committee Meeting", the Journal Headlines read, **60 people** packed the TAC to present petitions with **3,500 SIGNATURES ON A PETITION OPPOSING THE BELTWAY.**
6	April 12, **1995**	**RALEIGH BUS TRIP, 200 PEOPLE** – go to Raleigh to support Senate Bill on Local Control. The Bill allowed the TAC to use funding for other needed projects on the TIP. Friends of Forsyth presented **500 LETTERS WRITTEN TO GOV. JIM HUNT OPPOSING THE BELTWAY.**
7	Nov. 1, **1995**	Friends of Forsyth Presentations to the **JOINT LEGISLATIVE TRANSPORTATION OVERSIGHT COMMITTEE** meeting in Winston-Salem, **OPPOSING THE NORTHERN BELTWAY.**
8	Dec. 7, **1995**	DEIS Hearing, Eastern Section, the Journal Headlines – **"OPPOSITION TO NORTHERN BELTWAY IS STRONG AT HEARING"...250 PEOPLE** packed the gymnasium.
9.	Sept. 5, **1996**	Final Hearing Western Section - the Journal Headlines - **"RESIDENTS EXPRESS ANGER OVER DOT BELTWAY PLANS". .300 PEOPLE ATTENDED HEARING, THE NIGHT HURRICANE FRAN CAME TO TOWN, OPPOSING THE BELTWAY.**

See attached articles

Submitted by:

Sarah N. Jones
4805 Styers Ferry Road
Winston-Salem, North Carolina 27104
336-766-6877

March 27, 2007

Ms. Missy Dickens, PE
Project Development and
Environmental Analysis Branch
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, NC 27699-1548

Re: Supplemental Final Environmental Impact Statement/
Final Environmental Impact Statement (SFEIS)(FEIS)
for the Winston-Salem Northern Beltway Project

Dear Ms. Dickens:

We have some concerns about the validity of the Environmental Impact Statement for the Winston-Salem Northern Beltway Project with respect to the wetlands delineation surveys performed by NCDOT.

We have a stream on our property that feeds into a lake on our property. This stream and the bog/marsh and lake are precious commodities, providing water for animals *(chipmunks, deer, foxes, groundhogs, 'possums, raccoons and squirrels)* and as a habitat for fish *(bass, bream, catfish and goldfish)*, frogs, turtles, Canadian geese and herons.

(1) According to the Environmental Impact Statement, the studies for U-2579 and U-2579A were performed in March and April 2002. This time period coincides with the same period that Forsyth County, NC (where we live) experienced record-setting droughts. It was the driest August – July period in the entire 108 years of recordkeeping. This occurred after about five consecutive years of drought seasons. This drought was so severe that even High Rock Lake ran dry in 2002. Governor Easley called upon the federal government to declare 54 counties, including Forsyth County, as disaster areas. Both surface and groundwater levels dropped significantly. Many streams that normally fed ponds and wetlands were completely dry.

We too saw the stream that fed our lake completely dry up (not a trickle!); something not seen by us since we first bought our land and then made our home here over forty years ago.

During the drought of 2002, our lake and stream was a part of a study done by NCDOT. All wetlands studies performed during the extreme drought conditions that existed during the drought period in 2002 needed to be done using the *comprehensive approach* in order to produce accurate conclusions.

Reference Source: U. S. Army Corps of Engineers – Wetlands Delineation Manual

Wetlands – Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted fro life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

The definition of wetlands contains the phrase "under normal circumstances," which was included because there are instances in which the vegetation in a wetland has been inadvertently or purposely removed or altered as a result of recent natural events or human activities.

When such activities occur, an area may fail to meet the diagnostic criteria for a wetland. In such cases, an alternative method must be employed in making wetland determinations.

One of the three key provisions of the Corps of Engineers/Environmental Protection Agency (CE/EPA) definition of wetlands includes "the presence of "normal circumstances". Normal circumstances ***WERE NOT present*** when the delineation study was performed. Forsyth County was under a then known multi-years drought.

Routine vs. Comprehensive Approaches - The approach used for wetland delineations will vary, based primarily on the complexity of the area in question. Two basic approaches described in the manual are (a) routine and b) comprehensive.

Routine approach – The routine approach will normally be used in the vast majority of determinations. The routine approach requires minimal level of effort, using primarily qualitative procedures.

Comprehensive approach – The comprehensive approach requires application of quantitative procedures for making wetland determinations. It should seldom be necessary, and its use should be restricted to situations in which the wetland is very complex ... Application of the comprehensive approach requires a greater level of expertise than application of the routine approach, and only experienced field personnel with sufficient training should use this approach.

Using a comprehensive approach, the field surveyor(s) should have described the type of alteration (the drought), the effects of alterations (lack of vegetation and water) and determined the types of vegetation, soils, and hydrology that previously existed using all methods available (aerial surveys, wetland records, etc.)

The key determinants for wetlands are *vegetation*, *soils* and *hydrology*. Comprehensive determinations require a basis understanding of sampling principles and the ability to identify all commonly occurring plant species in a project area, as well as a good understanding of indicators of hydric soils and wetland hydrology.

Vegetation - Surface and sub-surface water that would normally be present were long absent. The extreme drought caused significant wetland vegetation alteration and normally present wetland vegetation surely died due to lack of water – making such vegetation unobservable. This extreme drought was a natural event that definitely altered wetland vegetation. Was there a determination as to whether hydrophytic vegetation *(a prevalence of vegetation typically adapted for life in saturated soil conditions)* previously occurred by obtaining all possible evidence of the type of plant communities that occurred in the area prior to alteration?

Soils - The definition of wetlands (CE/EPA) includes inundated or saturated soil conditions resulting from permanent or periodic inundation by ground water or surface water. Was there a determination as to whether hydric soils previously occurred by examining the area and describing the type of alteration that occurred?

Hydrology – Was there a determination that wetland hydrology previously occurred by characterizing the hydrology that previously existed in the area by obtaining all possible evidence that may be used to characterize the hydrology that previously occurred?

Our Observations:

1. A drought, by definition, does not qualify as "normal circumstances." Normal circumstances WERE NOT present when the delineations study was performed. Forsyth County was under a then known multi-year drought.
2. The drought in 2002 was a "recent natural event" when the NCDOT study was done on our property.
3. A delineation of wetlands study performed using *routine* wetland delineation methods could not have been accurately performed.
4. "Normal circumstances" were not present during the drought of 2002, thus requiring the need to employ a *comprehensive* approach for atypical situations, that is, positive indicators of hydropytic vegetation, hydric soils, and/or wetland hydrology could not be found due to the effects of recent natural events.
5. The wetland delineation study done in 2002 needed to be performed at the more rigorous levels required by the U. S. Army Corp. of Engineers for the drought conditions that existed at that time.

Summary:

The wetland delineation studies performed in 2002 most likely understate the limits of the wetland areas due to the then-present drought conditions and should not be used.

Submitted By: Jerry and Sandra Hart
339 Sedge Garden Road
Kernersville, NC 27284
(336) 784-0301

"Dean" 114

48657

1584, Trinity Garden Circle,
Clemmons, N C 27012
March 28th, 2007

Dear Secretary Tippett,

Please find attached my attempts at commenting on the revised FEIS for the Northern Beltway.

The expression attempts is used because it is extremely difficult to comment on a document whose format and procedures can presumably be legally changed at the discretion of the NCDOT at any time, without the need for further public input.

As far as public input is concerned seemingly, because the elected and appointed officials have chosen to ignore the mismanagement of the Highway Trust Fund, the only avenue left open to the public to be heard, is by retaining a lawyer and taking the NCDOT to court.

Thousands of North Carolina residents have sacrificed their homes and land, State and Federal Tax payers have contributed billions of dollars and the beautiful North Carolina Environment has been desecrated , all in the name of the Highway Trust Fund.

It would appear by ignoring the mismanagement of the Highway Trust Fund, the NCDOT, the N.C. Legislature and the FHWA, have let down the residents of North Carolina and failed to treated them with the respect they deserve,

Yours Sincerely,

Mr. C Robin Dean

"Dean" 74

1584, Trinity Garden Circle,
Clemmons, N C. 27012
March 28th 2007,
Tel .- 336 766 9814

Dear Ms. Missy Dickens,

The difficulty confronting the public, when asked to comment on the revised Final Environmental Impact Statement for the Northern Beltway, the loop around Winston Salem, is how does the public take seriously the contents of any document that is a part of the North Carolina Highway Trust Fund.

When the North Carolina Legislature passed the Highway Trust Fund into law in 1989, the Legislature promised that 7 loops /beltways would be constructed around North Carolina's 7 major cities and other roadwork projects that would be completed by 2002

The funding for the projects would be created by an additional 5.2 cents on a gallon of gasoline and various other license taxes that would remain in place until 2002.

Since its creation, the Highway Trust Fund has become a classic example of how government can mismanage the taxpayers investment with just about every aspect of the project.

We are now in 2007, not a single loop has been completed, the additional taxes have been extended until 2025 and the funding shortage for not only the Highway Trust Fund projects, but maintenance of existing roads and bridges, as well as new road construction is now estimated for the next 25 years to be in excess of $64 billion, possibly more.

Construction of the Northern Beltway has not even started, as the result of a judgment in 1999 against the NCDOT, who knowingly ignored Federally mandated procedures and reduced
1 the public comment period for the original FEIS from 30 to 11 days, to enable the FEIS to be entered into the Record of Decision by May 7th 1996.

On May 8th 1996, Forsyth County went into non attainment for Air Quality which meant that if the full public comment period had been allowed, the original FEIS could not have been entered into the Record of Decision.

Since the judgment in 1999, the funding shortages in the Highway Trust Fund have had a dramatic impact on the Northern Beltway, including the changing of the sequence of construction

Unfortunately the original sequence of construction, the Western Section first, gave economic growth the priority over safety.

In 1995 Friends of Forsyth suggested at a NCDOT meeting in Raleigh that constructing the Eastern Section first would have dramatically improved safety on US 52, Forsyth Counties most dangerous road, but as stated, safety was not a priority

The sequence of construction has been changed as a result of the funding shortages, the fact that US 52 is still a safety hazard, a Fed Ex Hub is now being constructed near the Regional
2 Airport, Dell has opened a plant in Eastern Forsyth County and the Eastern Section of the Northern Beltway is planned to become a part of the I-74 interstate network

Changing the sequence of construction makes commenting on the revised FEIS difficult, as included in the Forsyth County Thoroughfare Plan on the Eastern Section of the Beltway is an interchange with the easterly exit from the interchange designated as the I-73 / I-74 connector.

On the Forsyth County Thoroughfare Plan the I-73 / I-74 Connector is only shown to the Forsyth County Line, but in reality it encircles the Regional Airport area and includes several major sized interchanges.

Bearing in mind the type and volume of traffic these major interchanges will carry and the fact that one of the principle interchanges of the I-73 / I-74 Connector, is with the Eastern
3 Section of the Northern Beltway, it would appear that Air and Water Quality as well as the overall Environment will undoubtedly be adversely impacted and therefore theoretically it should have been included in the Northern Beltway FEIS.

There has already been a Regional Airport Study conducted but there is no reference to the I-73 / I-74 Connector in the revised Northern Beltway FEIS.

What complicates the publics ability to comment is that the I-73 / I-74 Connector is now under the jurisdiction of the Turnpike Authority, who were not involved in the original Airport Regional Study.

The Turnpike Authority are at some point in time conducting their own Regional Airport Study but to date have nothing to offer the public with respect to their intentions, but this does not prevent the revised FEIS from being signed into the Record of Decision.

A decision, which apparently is legal, has already been made, presumably by the NCDOT, that whatever is decided by the Turnpike Authority after their Study is completed, will be entered into the revised FEIS for the Northern Beltway, with no opportunity of Public Input

4 References are made to the Southern Loop of the Northern Beltway on FEIS, page 28 and page 6-118-119.

Although there are no financial plans or planning studies programmed, the Southern Loop, which connects US 158 to US 311 still appears in the 2005 Thoroughfare Plan.

The Southern Loop is still considered a part of the Northern Beltway and because it will impact development, traffic volumes, Air Quality etc , the impact figures should have appeared in the FEIS. Again how can the public comment when no impact documentation is available

5 On FEIS page 2-54 and 2-55, Traffic Volumes and lane requirements are cited for The East-West Styer's Ferry Connector, which connects to the Western Section of the Northern Beltway and still appears in the 2005 Thoroughfare Plan

In a letter dated May 31st 1966 from NCDOT, it was stated that because there was insufficient space between the Beltway interchanges with US 421 and I-40 to construct a interchange with the Styers Ferry Connector, the project was no longer feasible.

It is confusing for the public, when trying to comment, when there is information in the FEIS concerning traffic volumes, for a project that has seemingly been abandoned

Because of the present funding shortages only 3 short sections of the Eastern Section of the Northern Beltway are funded

This means that because the entire Northern Beltway remains in the Transportation Improvement Plan (TIP), at least 80% of the construction remains unfunded, with no conceivable completion date.

"Dean" 4/4

The tragedy of the whole affair is that because of breaking the law and the mismanagement of the Highway Trust Fund and with all of the Northern Beltway remaining in the TIP, thousands of Forsyth County residents lives have been not only adversely affected but in some cases, devastated

With the approval of the FEIS and its entry into the R O D it means that it is perfectly legal for the North Carolina Legislature to keep those adversely impacted by the Highway Trust Fund projects to be held hostages in their own homes, indefinitely

As a member of the public and a taxpayer, rather than being asked to comment on the FEIS, it appears to me that it would be more appropriate for the North Carolina Legislature, the NCDOT, the NC Board of Transportation, the FWHA, who continue to pour billions of Federal dollars into the mismanaged Highway Trust Fund and the Forsyth County Transportation Advisory Committee, to explain to the tax payers who have received very little return on their investment why Highway Trust Fund problems have been ignored

The fact that there was a need for a $980 Highway Bond Referendum to be approved in 1996 and the need to extend the additional taxes, should have sent a clear message to the Legislature and the NCDOT, that there were major problems with the construction and funding schedules of the Highway Trust Fund projects 10 years ago

If a company in the non government sector, had treated its investors and customers, in the same manner as the State and Federal Taxpayers and those sacrificing their homes and land, have been treated, all as a result of the mismanagement of the Highway Trust Fund, the government would have either put the company out of business or made them accountable for their actions

Theoretically in America, the public elect representatives to form a Government that promise to represent the best interests of the taxpayers and the residents of the country and promise to be good custodians of the taxes invested

In return, the public promise to support the government by working hard, paying their taxes, obeying the law and accepting responsibility for their actions

In the case of the North Carolina Highway Trust Fund, government has not only failed to fulfill its promises, but continues to adversely impact and in some cases devastated the homeowners lives and continues to fail to give the taxpayers an acceptable return on their investment,

Yours Sincerely,

Mr C Robin Dean,

cc Governor Michael F Easley,
Mr. Lyndo Tippett, Secretary of Transportation
President Pro Tem Marc Basnight,
Speaker of the House Joe, Hackney
Senator Richard Burr
Senator Elizabeth Dole
Representative Virginia Foxx
Mr. John Sullivan FHWA
Senator Linda Garrou
Senator Peter S Brunstetter
Representative Bill McGee
Representative Dale R Folwell
Representative Earline W Parmon
Representative Larry R Brown
Representative Larry Womble
Ms Nancy Dunn N C B O T
Mayor Larry Williams, WSTAC
Mr Jim Sparks, W S Journal

APPENDIX D

Agency Coordination

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890

June 20, 2007

IN REPLY REFER TO

Regulatory Division

Action ID No. 200021474

RECEIVED

JUN 26 2007

Missy Dickens, PE
Staff Engineer
NCDOT / PDEA
1548 Mail Service Center
Raleigh, N.C. 27699-1548

Dear Ms. ~~Dickens~~ Missy:

Reference your letter of June 11, 2007, requesting our comments on correspondence you received from Jerry and Sandra Hart concerning the Jurisdictional Delineation (Waters of the United States) of the proposed corridor for the Winston-Salem Northern Beltway (TIP Projects R-2247, U-2579, and U-2579A) located north of Winston-Salem, in Forsyth County, North Carolina. The Harts expressed concern that the field work for the referenced Jurisdictional Delineation (JD) occurred during the drought of 2002. It is their contention that the JD is not accurate due to the work being done during a drought (i.e. not during "normal circumstances" of rain fall).

I have had the opportunity to review the Hart's correspondence and I have talked to Eric Alsmeyer of our Raleigh Regulatory Field Office staff who conducted site inspections of the referenced corridor and confirmed your JD work. Eric remembers doing the site inspections and confirming your JD work. Therefore for the purpose of your environmental assessment of the proposed project, the JD is valid. In regard to the concerns expressed by the Harts, their contention is based on the misunderstanding of the term "normal circumstances" found in our 1987 Wetlands Delineation Manual. As you are aware, documentation for JD's 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). In short, JD's are based on wetland field indicators developed over a period of time and not on current weather conditions.

Should you have any further questions please call me at the Raleigh Field Office at 919-876-8441.

Sincerely,

John Thomas
Project Manager, Raleigh
Regulatory Field Office