

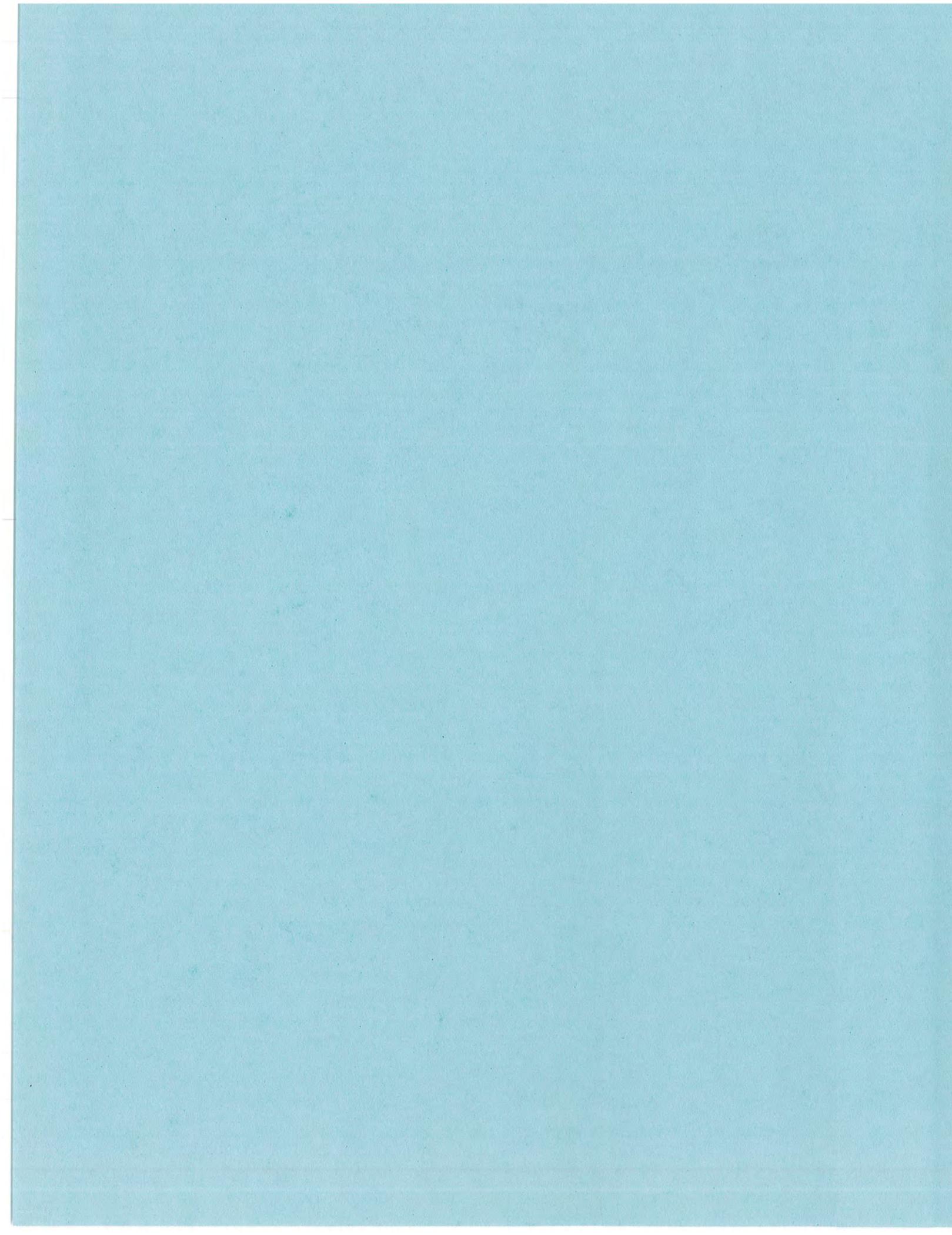
SUMMARY



BUILDING THE FUTURE

Winston-Salem

BUSINESS 40



SUMMARY

US 421 PAVEMENT REHABILITATION, REPLACEMENT OF BRIDGE NUMBERS 178, 278, 286, 288, 291, 293, 305, 312, 313, 336 AND VARIOUS SAFETY IMPROVEMENTS

From West of Fourth Street to East of Church Street
Forsyth County, North Carolina

FEDERAL AID PROJECT NO. NHF-0421(5)
WBS ELEMENT NO. 34872.1.1
TIP PROJECT NO. U-2827B

1. TYPE OF ACTION

This is a Federal Highway Administration (FHWA) action, Environmental Assessment (EA).

2. DESCRIPTION OF ACTION

The proposed project involves pavement rehabilitation of travel lanes, reconstruction of shoulders and ramps, replacement of ten (10) bridges (Bridge Numbers 178, 278, 286, 288, 291, 293, 305, 312, 313, 336), and various safety improvement on US 421/I-40 Business (commonly referred to as Business 40 by residents of Winston-Salem) from west of Fourth Street to east of Church Street. Full control of access will be maintained. Minimal additional right-of-way with easements is proposed with the project. The project length is approximately 1.2 miles long. The vicinity map for the project is shown in Figure 2.

The project proposes to improve interchange spacing and geometrics by reducing the number of interchanges from six (6) existing interchanges (two full and four partial movement) to three (3) interchanges (two full and one partial movement).

3. SUMMARY OF PURPOSE AND NEED

The purpose of the project is to improve traffic flow, operations and safety on US 421/I-40 Business from west of Fourth Street to east of Church Street.

The six (6) interchanges within the 1.2 mile corridor do not meet current FHWA design standards, which calls for one-mile spacing between interchanges. The distance between interchanges in this segment ranges from 0.28 miles to 0.13 miles. This results in short weave sections between the current ramps with ranges from 150 feet to 300 feet. The recommended minimum spacing for weaving sections between ramps for similar interchanges is 2,000 feet.^{R2} This project will reduce the number of interchanges and eliminate and/or lengthen weaving sections between ramps, therefore improving traffic flow, operations and safety of the facility.

The potential problems with close interchange spacing can also be illustrated with “conflict points.” At an interchange, conflict points are located at the end of on-ramps, the beginning of off-ramps, and in weave sections. There are 20 existing conflict points in the 1.2 mile project corridor between West Fourth Street and Church Street. This project will reduce the number of conflict points, therefore improving traffic flow, operations and safety of the facility.

There are eleven (11) structures/bridges within the project study area. Ten (10) of the bridges are “Structurally Deficient” based on the most recent Bridge Inspection Reports. All of the bridges have insufficient vertical clearance, deficits range from eight (8) inches to three (3) foot, see Sections II. C. 2. g. [Structures] of this document. This project will improve vertical clearance of the bridges, therefore improving the operations and safety of the facility.

The existing concrete pavement with asphalt overlay has deteriorated and is in very poor condition, which is evident in a poor rideability and spalling, i.e. chipping, fragmenting, and/or flaking of pavement joints. This project will replace the pavement, therefore improving the safety of the facility.

4. ALTERNATIVES CONSIDERED

Preliminary alternatives considered for the proposed project included No Build Alternatives (short term minor activities, related to safety and operations, and a “no action” activity), alternative modes of transportation, travel demand management, mass transit, transportation systems management, and improve the existing facility. The project was divided into four (4) sections and Design Ideas to improve US 421/I-40 Business were developed for each section. Alternatives were initially developed by incorporating the Design Ideas in different combinations. After further evaluation and public review of the Design Ideas, the detailed study alternatives were developed. The detailed study alternatives that will improve the existing facility are summarized below:

Alternative 1 - Cherry/Marshall (main access to downtown Winston-Salem) Shallow Cut

This alternative provides for a full interchange at Peters Creek Parkway, a full interchange at Cherry/Marshall (via two partial interchanges acting as a full interchange) and partial interchange at Main Street. The shallow cut alternative lowers US 421/I-40 Business 6-7 feet to improve bridge clearances.

Alternative 2 - Liberty/Main (main access to downtown Winston-Salem) Shallow Cut

This alternative provides for a full interchange at Peters Creek Parkway, a partial interchange at Broad Street and a full interchange at Liberty/Main (via two partial interchanges acting as a full interchange). The shallow cut alternative lowers US 421/I-40 Business 6-7 feet to improve bridge clearances.

Alternative 3 - Liberty/Main (main access to downtown Winston-Salem) Deep Cut

This alternative provides for a full interchange at Peters Creek Parkway, a partial interchange at Broad Street and a full interchange at Liberty/Main (via two partial interchanges acting as a full interchange). The deep cut alternative lowers US 421/I-40 Business up to 20 feet to improve bridge clearances.

And

Alternative 4 - Cherry/Marshall (main access to downtown Winston-Salem) Deep Cut

This alternative provides for a full interchange at Peters Creek Parkway, a full interchange at Cherry/Marshall (via two partial interchanges acting as a full interchange) and partial interchange at Main Street. The deep cut alternative lowers US 421/I-40 Business up to 20 feet to improve bridge clearances.

5. NCDOT ALTERNATIVES CARRIED FORWARD

Based on a review of project constructability, the ability to construct the project within existing right-of-way with minimal acquisitions, preliminary cost analysis and review of the alternatives by NCDOT and City of Winston-Salem, it was determined to carry forward Alternatives 3 and 4 for detail study.

6. SUMMARY OF ENVIRONMENTAL EFFECTS

The environmental effects of both alternatives, Alternative 3 and 4, are similar and are shown in the table below.

Table S1. Summary of Environmental Effects

Impact Category	Impacts	
	Alternative 3	Alternative 4
Natural Resources Impacts		
Federal Listed Species Habitat	Not Present	Not Present
100-Year Flood Plain or Floodway Impacts	None	None
Wetlands (number of crossings/acres)	0/0.00 AC	0/0.00 AC
Stream Crossings (number/linear feet)	1/90 LF	1/90 LF
Water Supply Critical Areas	None	None
Human Environment Impacts		
Residential Relocations (number) Total	30	32
Residential Relocations (number) Minority	10	10
Business Relocations (number)	1	1
Low Income/Minority Populations	Present	Present
Schools (number)	0	0
Cemeteries/Gravesites (number)	0	0
Historic Sites/Districts (number)	6	7
Section 4(f) Impacts	0	1 (de minimis)

Table S1. Summary of Environmental Effects (Cont.)

Impact Category	Impacts	
	Alternative 3	Alternative 4
Section 6(f) Impacts	0	0
Traffic Noise Impacts (total receptors)	307	307
Traffic Noise Impacts (receptors impacted)	82	82
Traffic Noise Impacts - Noise Sensitive Areas	7	7
Air Quality	Maintenance for carbon monoxide (CO)	
Physical Environmental Impacts		
Farmland (acres)	0	0
Underground Storage Tanks (number)	0	0
Preliminary Cost Estimates		
Construction	\$59,300,000.00	\$53,100,000.00
Utilities Relocation	\$ 2,144,000.00	\$ 1,929,000.00
Right-of-Way	\$12,600,000.00	\$11,850,000.00
Total Cost	\$74,044,000.00	\$66,879,000.00

7. PERMITS REQUIRED

A Nationwide Permit No. 14 will likely be applicable. The USACE holds the final discretion as to what permit will be required to authorize project construction. In addition to the 404 permit, the corresponding Section 401 Water Quality Certifications (WQC) from the NCDWR will be required.

8. COORDINATION

The following federal, state and local agencies were consulted regarding this project:

- U.S. Department of Transportation – Federal Highway Administration
- U.S. Army Corps of Engineers
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- NC Department of Cultural Resources
- NC Department of Environment and Natural Resources
 - Division of Environmental Health
 - Division of Water Quality
- NC Wildlife Resources Commission
- Winston-Salem Forsyth Urban Area Municipal Planning Organization
- Forsyth County
- City of Winston-Salem
- City-County Planning Board

9. CONTACT INFORMATION

Contact either of the following individuals for additional information concerning this project:

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