APPENDIX B

ADDITIONAL INFORMATION ON ALTERNATIVES ANALYSIS

- Table B-1: Record and History of US 74 Alternatives Page B-1
- Alternatives Analysis Figures from Draft EIS and Final EIS Page B-3

Table B-1 presents a summary of the analysis of US 74 alternatives throughout the project development process.

The maps included in this appendix are reproduced from the Draft EIS and Final EIS. They show the progression of alternatives development from Preliminary Corridor Segments (including alternatives located to the north and south of existing US 74 as well as along existing US 74) to Preliminary Study Alternatives to Detailed Study Alternatives and finally to the Preferred Alternative.
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Table B-1. Record and History of US 74 Alternatives in the Monroe Connector/Bypass EIS

<table>
<thead>
<tr>
<th>IMPROVE EXISTING ALTERNATIVE</th>
<th>DOCUMENTED IN/DATE</th>
<th>ALTERNATIVE DESCRIPTION in DRAFT EIS</th>
<th>1ST SCREENING (Qualitative)</th>
<th>2ND SCREENING (Qualitative)</th>
<th>3RD SCREENING (Quantitative)</th>
<th>ADDITIONAL EXAMINATION OF ALTERNATIVE</th>
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<tr>
<td>Transportation System Management (TSM) Alternatives</td>
<td>Alternatives Development and Analysis Report (April 2008, Section 1.2.3, pp. 1-7 – 1-9)</td>
<td>TSM are activities that maximize efficiency of the present transportation system, including traffic signal timing and intersection improvements. No new location component to this alternative concept.</td>
<td>Screened alternative against elements of the P&amp;N. Conclusion: - Meets only two of three elements of P&amp;N (enhance mobility and capacity and still maintains access to properties along US 74) - Does not provide for high-speed regional travel - Does not provide long-term solutions - Much lower level of improvement in mobility and capacity</td>
<td>This alternative was not carried forward to the 2nd or 3rd screening in the Draft EIS.</td>
<td>TSM Concept 2 was developed and evaluated by NCDOT in the Final EIS to incorporate the recommendations in the US 74 Corridor Study (Stantec, July 2007). Includes the original TSM Alternative and improvements labeled “long-term improvements” (to be implemented by 2035) in the US 74 Corridor Study. Conclusion: - Does not provide for high speed (&gt;50 mph) regional travel - Does not provide long-term solutions for the design year of 2035</td>
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<tr>
<td>Improve Existing US 74 as a Standard Arterial Widening</td>
<td>Alternatives Development and Analysis Report (April 2008, Section 1.2.5, p. 1-11)</td>
<td>Adding 2- to 4-lanes to create an 8-lane arterial facility. Signalized intersections and driveways would remain. No new location component to this alternative concept.</td>
<td>Screened alternative against elements of the P&amp;N. Conclusion: - Meets only one of three elements of P&amp;N (maintains access to properties along US 74)</td>
<td>This alternative was not carried forward to the 2nd or 3rd screening in the Draft EIS.</td>
<td>After the Final EIS and at the request of the USACE, NCDOT prepared a year 2035 comparative planning level analysis of four Upgrade Existing US 74 corridor scenarios to determine if acceptable corridor levels of service would be provided in the design year 2035 (US 74 Corridor Analysis Scenarios, HNTB, December 2010). One of the scenarios included a Widens to 6-lane (No Superstreet) scenario that assumed widening the entire corridor to a 6-lane section while maintaining other roadway characteristics. Conclusion: - Analysis concluded that this scenario would not provide acceptable levels of service in the US 74 corridor in 2035.</td>
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<tr>
<td>Improve Existing US 74 as a Superstreet</td>
<td>Alternatives Development and Analysis Report (April 2008, Section 1.2.6, p. 1-12 – 1-13)</td>
<td>Involves conversion of existing facility to a superstreet. Configuration adds capacity at intersections by restricting left turns and through movements from cross-streets. In the December 2010 analysis two Superstreet concepts were evaluated: 1) Superstreet Existing, which assumed maintaining existing 4-lane and 6-lane sections and upgrading to high speed principal arterials at 45 and 55 mph posted speeds and 2) Superstreet to 6-Lanes, which assumed widening the entire US 74 corridor to a 6-lane section and upgrading to high-speed principal arterials at 45 and 55 mph. No new location component to this alternative concept.</td>
<td>Screened alternative against elements of the P&amp;N. Conclusion: - Meets two of three elements of P&amp;N (enhance mobility and capacity and still maintains access to properties along US 74) - Does not provide long-term solutions - Much lower level of improvement in mobility and capacity</td>
<td>This alternative was not carried forward to the 2nd or 3rd screening in the Draft EIS.</td>
<td>TSM Concept 2 incorporated Superstreet design elements. See entry above for TSM Alternatives. After the Final EIS and at the request of the USACE, NCDOT prepared a year 2035 comparative planning level analysis of four Upgrade Existing US 74 corridor scenarios to determine if acceptable corridor levels of service would be provided in the design year 2035 (US 74 Corridor Analysis Scenarios, HNTB, December 2010). Two of the scenarios included the superstreet concept: Superstreet Existing and Superstreet to 6-lanes. Conclusion: - Analysis concluded that these scenarios would not provide acceptable levels of service in the US 74 corridor in 2035. - The Superstreet 6-lane concept provided the highest corridor capacity compared to the other scenarios, but most of the corridor would operate with greatly reduced average travel speeds (i.e., would not provide for high speed regional travel).</td>
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| Improve Existing US 74 as a Controlled-Access Highway | • Alternatives Development and Analysis Report (April 2008, Section 1.2.7, p. 1-13)   
• Upgrade Existing US 74 Alternatives Study (NHB, March 2009)  
• Draft EIS (March 2009, Section 2.2.2.5, Section 2.4.4.3)  
• Final EIS (May 2010, Section 1.2.2.1, 1.4 – 1.10)  
• Final EIS (May 2010, Section 3.3.2, pp. 3.7 - 3.8) | Upgrading existing US 74 from I-485 to between the towns of Wingate and Marshville to controlled-access freeway with a free alternate route, as required, in form of frontage roads. Concept assumed a 6-lane freeway section with 2-lane, one-way frontage roads on either side to provide access to adjacent properties. No new location component to this concept. | Screened alternative against elements of the P&N. Conclusion:  
- Meets all three elements of P&N  
- Reasonableness of alternative not clearly determined | Preliminary Corridor Segments (PCS) were developed and evaluated individually to determine if impacts would make the segment impractical or unreasonable to implement. Conclusion:  
Reasonableness of alternative not clearly determined  
Remainder PCS used to form end-to-end Preliminary Study Alternatives (PSAs). PSA G included as a preliminary alternative that would improve existing US 74 | 3rd screening used to identify alternatives that should be carried forward as Detailed Study Alternatives (DSAs) in the Draft EIS.  
Quantitative comparison/evaluation of 25 PSAs based on 20 impact categories/factors. Factors coordinated with local, regional, state, and federal regulatory and resource agencies. Conclusion regarding PSA G (Improve Existing US 74):  
- PSA G would have significant human environment impacts, substantial disruption during construction, and more impacts to streams compared to new location PSAs  
- PSA G would result in impacts to 499 businesses along existing US 74 or about 11 percent of the total businesses in Union County. | In response to agency comments requesting further study of PSA G, NCDOT completed additional quantitative updates to studies of PSA G in the Draft EIS for traffic operations, costs, and impacts for comparison to the DSAs. Updated PSA G would have frontage roads operating at I-485 F, would have higher costs and construction time than DSAs, and still have significant impacts to businesses (481). Penennial stream impacts would be less than for the DSAs, but intermittent stream impacts would be greater.  
Also in response to agency comments, NCDOT developed Revised PSA G* and quantitatively evaluated it in the Draft EIS. Revised PSA G modified PSA G to reduce impacts and costs, and improve operations. The revised alternative still resulted in significant (23%) business relocations (5.5 percent of Union County businesses) and, compared to the DSAs, 20-23 percent higher costs and much greater construction time. Penennial stream impacts would be less than the DSAs, but intermittent stream impacts would be greater.  
Conclusion:  
- Additional evaluation confirmed PSA G and Revised PSA G would not be reasonable or practicable and should not be considered as DSAs. |

| New Location/Improve Existing Roadways Hybrid | • Alternatives Development and Analysis Report (April 2008, Section 1.2.9, p. 1-14)  
• Draft EIS (March 2009, Section 2.2.2.7, pp. 2.11 – 2.26) | Building a portion of the project on new location and improving some combination of existing roadways (US 74 or other roadways) for the remainder of the project.  
The facility type for both portions would be a controlled-access highway. | Screened alternative against elements of the P&N. Conclusion:  
- Meets all three elements of P&N  
- Reasonableness of alternative not clearly determined | Preliminary Corridor Segments (PCS) developed for additional analyses in response to agency comments. PSAs developed for comparison and evaluation to determine whether a PCS was viable and reasonable to carry forward into 3rd quantitative screening. Conclusion:  
Various hybrid PCSs warrant further comparison and evaluation | Quantitative comparison/evaluation based on 20 impact categories/factors. Factors coordinated with local, regional, state, and federal regulatory and resource agencies. 8 of the 25 PSAs were New Location/Improve Existing Roadways Hybrids. Conclusion:  
- PSA E-7, F-3, F-12, F-13, and G (all hybrids) eliminated due to significant business relocation impacts (207-337)  
- Comparatively greater impacts to streams, minor road crossings, hazardous material sites, construction costs Not reasonable based on impacts, and not carried forward as DSAs | No additional evaluation of this alternative. |

*Revised PSA G: Revised PSA G option included US 74 as a tolled, controlled access 6-lane freeway facility with one-way two-lane frontage roads on either side to allow access to adjacent facilities. Difference was combination of two typical sections, which included 1) narrower curb-end gutter sections in areas with higher concentrations of businesses as well as retaining walls to maintain the narrow section at interchanges or cross-streets.  
2) wider typical section used in less developed sections, including wider areas at interchanges or crossovers to accommodate ramps. Approximately 7.6 MiVs of Revised PSA G (or 18 percent of the 19.7 MiV long alternative) would be on retaining walls (substantial adverse visual impact).
Figure 2-1
PRELIMINARY CORRIDOR SEGMENTS
STIP PROJECT NO. R-3329/R-2559
Mecklenburg County and Union County
Monroe Connector/Bypass
Mecklenburg County and Union County
North Carolina Counties
Legend
Preliminary Corridor Segments
Minor Roads
Major Roads
Subdivisions
Streams
Lakes
Project Study Area
County Boundary
Multicolor

B-3
BEGIN PROJECT

Monroe

Unionville

Wingate

Marshville

Indian Trail

Wesley Chapel

Mint Hill

Matthews

Weddington

Lake Park

Hemby Bridge

END PROJECT

Legend

- Preliminary Corridor Segments
- Major Roads
- Minor Roads
- Streams
- Lakes
- Subdivisions
- Project Study Area
- County Boundary

Note: Dashed Segment Lines depict those segments that were modified as a result of early public involvement activities.

Source: Mecklenburg County and Union County GIS.
Map Period March 2009.

STIP PROJECT
NO. R-3329/R-2559
Mecklenburg County and Union County

MONROE CONNECTOR/
BYPASS
PRELIMINARY
CORRIDOR SEGMENTS
REVISED

Figure 2-3

from Draft EIS
Figure 2-5
PRELIMINARY CORRIDOR SEGMENTS FOR QUANTITATIVE THIRD SCREENING
Monroe Connector/Bypass
Mecklenburg and Union Counties
North Carolina Counties

Legend
- Preliminary Corridor Segments
- Major Roads
- Minor Roads
- Streams
- Lakes
- Subdivisions
- Project Study Area
- County Boundary

STIP PROJECT NO. R-3329/R-2559
Mecklenburg County and Union County

Source: Mecklenburg County and Union County GIS. Map Printed March 2009.
Alternative A
(Segments 0, 18A, 21, 22A, 31, 36, 40, 42 and 43)

Alternative B
(Segments 0, 18A, 21, 30, 31, 36, 40, 42 and 43)

Alternative C
(Segments 0, 1, 2, 21, 22A, 31, 36, 40, 42 and 43)

Alternative D
(Segments 0, 1, 2, 21, 30, 31, 36, 40, 42 and 43)

Alternative E
(Segments 0, 1, 1A, 9, 24, 29, 31, 36, 40, 42 and 43)

Alternative F
(Segments 0, 1, 1A, 9, 9A, 8, 8A, 7, 36, 40, 42 and 43)

Alternative G
(Segments 0, 1, 1A, 9, 9A, 8, 8A, 44, 42 and 43)
Alternative A1
( Segments 0, 18A, 21, 22A, 31, 34, 40, 42 and 43 )

Alternative B1
( Segments 0, 18A, 21, 30, 31, 34, 40, 42 and 43 )

Alternative C1
( Segments 0, 1, 2, 21A, 31, 34, 40, 42 and 43 )

Alternative D1
( Segments 0, 1, 2, 21, 30, 31, 34, 40, 42 and 43 )

Alternative E1
( Segments 0, 1, 1A, 9, 24, 29, 31, 34, 40, 42 and 43 )

Alternative F1
( Segments 0, 1, 1A, 9, 9A, 8, 8A, 7, 34, 40, 42 and 43 )
Alternative A2  
( Segments 0, 18A, 21, 22A, 31, 36, 41, and 43 )

Alternative B2  
( Segments 0, 18A, 21, 30, 31, 36, 41 and 43 )

Alternative C2  
( Segments 0, 1, 2, 21, 22A, 31, 36, 41 and 43 )

Alternative D2  
( Segments 0, 1, 2, 21, 30, 31, 36, 41 and 43 )

Alternative E2  
( Segments 0, 1, 1A, 9, 24, 29, 31, 36, 41 and 43 )

Alternative F2  
( Segments 0, 1, 1A, 9, 9A, 8, 8A, 7, 36, 41 and 43 )

Figure 2-6c
Alternative A3
( Segments 0, 18A, 21, 22A, 31, 34, 40, 42, and 43 )

Alternative B3
( Segments 0, 18A, 21, 30, 31, 34, 41 and 43 )

Alternative C3
( Segments 0, 1, 2, 21, 22A, 31, 34, 41 and 43 )

Alternative D3
( Segments 0, 1, 2, 21, 30, 31, 34, 41 and 43 )

Alternative E3
( Segments 0, 1, 1A, 9, 24, 29, 31, 34, 41 and 43 )

Alternative F3
( Segments 0, 1, 1A, 9, 9A, 8, 8A, 7, 34, 41 and 43 )
Figure 2-8a

Legend:
- Potential Interchange
- Potential Partial Interchange
- Interstate Highway
- US Highway
- NC State Highway
- State Road
- Railroad
- Parcels
- Corridor Study Area
- River / Stream
- Lake
- County Boundary

Detailed Study Alternative:
- Segment 18A
- Segment 2
- Segment 21
- Segment 22A
- Segment 30
- Segment 31
- Segment 34
- Segment 34A
- Segment 34B
- Segment 36
- Segment 36A
- Segment 36B
- Segment 40
- Segment 41

Source: Mecklenburg County and Union County GIS. Map Printed March 2009.

from Draft EIS
Alternative A
( Segments 18A, 21, 22A, 31, 36, 36A, and 40 )

Alternative A1
( Segments 18A, 21, 22A, 31, 34, 34B, and 40 )

Alternative C
( Segments 2, 21, 22A, 31, 36, 36A, and 40 )

Alternative C1
( Segments 2, 21, 22A, 31, 34, 34B, and 40 )

Alternative B
( Segments 18A, 21, 30, 31, 36, 36A, and 40 )

Alternative B1
( Segments 18A, 21, 30, 31, 34, 34B, and 40 )

Alternative D
( Segments 2, 21, 30, 31, 36, 36A, and 40 )

Alternative D1
( Segments 2, 21, 30, 31, 34, 34B, and 40 )
Alternative A2  
( Segments 18A, 21, 22A, 31, 36, 36B and 41 )

Alternative B2  
( Segments 18A, 21, 30, 31, 36, 36B and 41 )

Alternative C2  
( Segments 2, 21, 22A, 31, 36, 36B, and 41 )

Alternative D2  
( Segments 2, 21, 30, 31, 36, 36B, and 41 )

Alternative A3  
( Segments 18A, 21, 22A, 31, 34, 34A, and 41 )

Alternative B3  
( Segments 18A, 21, 30, 31, 34, 34A, and 41 )

Alternative C3  
( Segments 2, 21, 22A, 31, 34, 34A, and 41 )

Alternative D3  
( Segments 2, 21, 30, 31, 34, 34A, and 41 )
Figure 2-1

STIP PROJECT
NO. R-3329/R-2559
Mecklenburg County and Union County

MONROE CONNECTOR / BYPASS

PREFERRED ALTERNATIVE DSA D

Legend
- Preferred Alternative Right of Way
- Preferred Alternative Study Corridor
- County line
- Lakes
- Streams
- Interstates & Highways
- Local Roads
- Railroad

Based on functional designs. Subject to change.

Source: Mecklenburg County and Union County GIS
Map printed: February 2010

from Final EIS