Monroe Expressway
ICE and Regional Model Assessment

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April 26, 2017
Agenda

1. Overview of Monroe Expressway, ICE and EIS
2. ICE and Model Reassessment – What, Why, How
3. Traffic Forecast Summary Memo
4. US 74 Corridor Travel Times
5. Origin-Destination and Screenline Analysis
6. Summary
Monroe Expressway

Selected Alternative
Monroe Expressway
NCDOT STIP Project No. R-3323/R-2559

Legend
- Selected Alternative Right of Way
- Selected Alternative Service Roads
- Selected Alternative Study Corridor

POTENTIAL INTERCHANGE LOCATIONS
1. US 74 Business
2. Rocky River Road
3. Indian Trail-Fairview Road
4. Concord Highway (US 601)
5. Unionville-Indian Trail Road
6. Morgan Mill Road (NC 2001)

NOTE: The Preferred Alternative, the light yellow area on the map, is a minimum of 1,000 feet wide. The final land acquisition design for the road has a minimum right-of-way width of 360 to 500 feet and is located within the corridor. Go to www.nctDOT.com/projdetails/MonroeExpressway for detailed info at the Final Land Acquisition.
## What is an EIS?

**The National Environmental Policy Act (NEPA)** requires federal agencies to prepare an Environmental Impact Statement (EIS) for major federal actions that are expected to significantly impact the environment. *(For more information go to [http://environment.fhwa.dot.gov/index.asp.](http://environment.fhwa.dot.gov/index.asp.))*

An EIS is a detailed report that defines the transportation problem, discusses the range of possible solutions considered, discloses the impacts possible solutions would have on the human and natural environments, summarizes involvement with the public and other stakeholders, and aids in making decisions about the project.

### The EIS process includes the following four major milestones:

1. **Notice of Intent (NOI):** The NOI is published in the Federal Register, signaling the initiation of the EIS process (Nov. 2009 for this project).

2. **Draft EIS:** After publication of the Draft EIS, there are public hearings and a formal comment period.

3. **Final EIS:** The Final EIS addresses comments received on the Draft EIS and identifies the preferred route for the project.

4. **Record of Decision (ROD):** The ROD identifies the selected route for the project, explains why it was chosen, and provides information on ways to minimize and compensate for project impacts.
Indirect and Cumulative Effects (ICE)

- Indirect and Cumulative Effects (ICE) assessment in long range planning enables planners to identify potential challenges early, informs decision-making, provides information to project-level ICE analysis, and provides best management practices.

*What are Indirect and Cumulative Effects (ICE)?*

- Indirect and cumulative effects are defined as shown below in relation to direct impacts:

<table>
<thead>
<tr>
<th>Direct Impacts</th>
<th>Indirect (Secondary) Effects</th>
<th>Cumulative Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impacts caused by a project that occur at the same time and place, and typically result from project construction and the project itself.</td>
<td>Impacts caused by a plan or project which occur after the project is built or are outside of the project’s actual location, but which are still reasonably foreseeable.</td>
<td>The incremental impacts of the proposed plan or project added to other past, present and future actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.</td>
</tr>
</tbody>
</table>
ICE and Model Reassessment

What was done?
- ICE data, the Metrolina Regional Model (MRM), and traffic forecasts/analyses were reviewed and reassessed to answer project-specific questions.

Why was this done?
- Response to public comments
- Legal challenges

How was this done?
- By evaluating ICE SE data, adopted SE data, versions of the MRM, and existing travel times.
Traffic Forecast Summary

1. What traffic forecasts were developed during the Monroe Connector/Bypass project development process and what were they used for?
2. Are the current No-Build traffic forecasts still valid for the purpose they were used?
3. Are the current Build traffic forecasts still valid for the purpose they were used?
4. How would the Monroe Connector/Bypass affect traffic volumes on the US 74 corridor?
5. How could changes in socioeconomic data affect the traffic forecast for the Monroe Connector/Bypass project?
6. How could changes in socioeconomic data related to indirect and cumulative effects affect the traffic forecast for the Monroe Connector/Bypass project?
Traffic Forecast Summary

1. What traffic forecasts were developed during the Monroe Connector/Bypass project development process and what were they used for?

   - Three project-level traffic forecasts
   - Four traffic forecast interpolations, extrapolations, and redistributions
   - Two traffic and revenue studies

   - MRM05 or MRM06 were used as a tool
Traffic Forecast Summary

2. Are the current No-Build traffic forecasts still valid for the purpose they were used?

- Yes. Supported by:
  - 2012 NCDOT AADT volumes
  - MRM11v1.1 (2009 and 2030 SE data)
  - MRM14v1.0 (2013 and 2040 SE data)
  - Existing US 74 corridor travel time runs
  - Current 2008 and 2035 No-Build forecast information
Traffic Forecast Summary

3. Are the current Build traffic forecasts still valid for the purpose they were used?

• Yes. Supported by:
  – MRM06v1.1 raw model daily volume assignment
  – MRM11v1.1 raw model daily volume assignment
  – MRM14v1.0 raw model daily volume assignment
  – Build traffic forecasts
4. How would the Monroe Connector/Bypass affect traffic volumes on the US 74 corridor?

- MRM06v1.1, MRM11v1.1, and MRM14v1.0 all show less traffic along the US 74 Corridor with the Monroe Connector/Bypass in place.
5. How could changes in socioeconomic data affect the traffic forecast for the Monroe Connector/Bypass project?

<table>
<thead>
<tr>
<th>Year</th>
<th>2035</th>
<th>2035</th>
<th>2035</th>
<th>Percent Change from SE 2005 to SE 2008 Interim</th>
<th>Percent Change from SE 2005 to SE 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario</td>
<td>Build</td>
<td>Build</td>
<td>Build</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model Version</td>
<td>MRM11</td>
<td>MRM11</td>
<td>MRM11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Socioeconomic Data</td>
<td>2005</td>
<td>2008 Interim</td>
<td>2009</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classification</td>
<td>Raw Model</td>
<td>Raw Model</td>
<td>Raw Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source</td>
<td>Model</td>
<td>Model</td>
<td>Model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corridor VMT and % Change in VMT</td>
<td>743,793</td>
<td>778,388</td>
<td>782,051</td>
<td>5%</td>
<td>5%</td>
</tr>
</tbody>
</table>
6. How could changes in socioeconomic data related to indirect and cumulative effects affect the traffic forecast for the Monroe Connector/Bypass project?

<table>
<thead>
<tr>
<th>Year</th>
<th>2030</th>
<th>2030</th>
<th>2030</th>
<th>2030</th>
<th>2030</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario</td>
<td>No-Build</td>
<td>Build</td>
<td>Build</td>
<td>Build</td>
<td>Build</td>
<td>Build</td>
</tr>
<tr>
<td>Model Version</td>
<td>MRM11</td>
<td>MRM11</td>
<td>MRM11</td>
<td>MRM11</td>
<td>MRM11</td>
<td>MRM11</td>
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<td>Classification</td>
<td>Raw Model</td>
<td>Raw Model</td>
<td>Raw Model</td>
<td>Raw Model</td>
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<td>Raw Model</td>
</tr>
<tr>
<td>Source</td>
<td>Model</td>
<td>Model</td>
<td>Model</td>
<td>Model</td>
<td>Model</td>
<td>Model</td>
</tr>
<tr>
<td>Corridor VMT and % Change in VMT</td>
<td>918,517</td>
<td>729,912</td>
<td>-21%</td>
<td>760,974</td>
<td>-17%</td>
<td>4%</td>
</tr>
</tbody>
</table>
US 74 Corridor Travel Times

- Focused on travel time and average speed
- Used travel time runs and INRIX data
- Field runs to validate INRIX speeds on US 74

Table 1 – US 74 Corridor Travel Time and INRIX Data Summary

<table>
<thead>
<tr>
<th>Time</th>
<th>Field Runs</th>
<th>INRIX Data</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Travel Time (minutes)</td>
<td>Average Speed (mph)</td>
</tr>
<tr>
<td>AM</td>
<td>32.0</td>
<td>41.7</td>
</tr>
<tr>
<td>Westbound</td>
<td>33.1</td>
<td>40.5</td>
</tr>
<tr>
<td>Cumulative</td>
<td>32.5</td>
<td>41.1</td>
</tr>
<tr>
<td>Noon</td>
<td>30.4</td>
<td>43.9</td>
</tr>
<tr>
<td>Eastbound</td>
<td>34.9</td>
<td>39.1</td>
</tr>
<tr>
<td>Cumulative</td>
<td>32.9</td>
<td>41.3</td>
</tr>
<tr>
<td>PM</td>
<td>34.0</td>
<td>39.3</td>
</tr>
<tr>
<td>Eastbound</td>
<td>33.7</td>
<td>39.7</td>
</tr>
<tr>
<td>Cumulative</td>
<td>33.8</td>
<td>39.5</td>
</tr>
</tbody>
</table>

* US 74 corridor approximately 22.5 miles from I-485 (west of Stallings) to Elm Street (in Marshville)
* Travel time runs and INRIX data were collected and compared between 3/19/2013 to 3/21/2013 (Tuesday thru Thursday) for the AM (6:30-9:00 AM), noon (11:30-1:30 PM) and PM (4:00-6:00 PM).
Origin-Destination Analysis (2035 No-Build)
Origin-Destination Analysis (2035 Build)

![Map showing Origin-Destination Analysis results for 2035 Build]

### 2035 Build MRM Daily Trips

<table>
<thead>
<tr>
<th>US 74</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>130,400</td>
<td>23,000</td>
<td>11,700</td>
<td>400</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>23,000</td>
<td>38,200</td>
<td>11,900</td>
<td>600</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>11,700</td>
<td>11,900</td>
<td>54,100</td>
<td>9,000</td>
<td>1,100</td>
</tr>
<tr>
<td>4</td>
<td>400</td>
<td>600</td>
<td>9,000</td>
<td>32,600</td>
<td>4,100</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>0</td>
<td>1,100</td>
<td>4,100</td>
<td>33,200</td>
</tr>
</tbody>
</table>

### 2035 Build MRM Daily Trip Percentages

<table>
<thead>
<tr>
<th>US 74</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>100%</td>
<td>18%</td>
<td>9%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2</td>
<td>60%</td>
<td>100%</td>
<td>31%</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>3</td>
<td>22%</td>
<td>22%</td>
<td>100%</td>
<td>17%</td>
<td>2%</td>
</tr>
<tr>
<td>4</td>
<td>1%</td>
<td>2%</td>
<td>28%</td>
<td>100%</td>
<td>13%</td>
</tr>
<tr>
<td>5</td>
<td>0%</td>
<td>0%</td>
<td>3%</td>
<td>12%</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Monroe Bypass</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>130,400</td>
<td>37,400</td>
<td>26,300</td>
<td>21,800</td>
<td>15,800</td>
</tr>
<tr>
<td>2</td>
<td>37,400</td>
<td>51,100</td>
<td>33,700</td>
<td>26,600</td>
<td>17,800</td>
</tr>
<tr>
<td>3</td>
<td>26,300</td>
<td>33,700</td>
<td>43,200</td>
<td>32,800</td>
<td>20,200</td>
</tr>
<tr>
<td>4</td>
<td>21,800</td>
<td>26,600</td>
<td>32,800</td>
<td>36,100</td>
<td>21,100</td>
</tr>
<tr>
<td>5</td>
<td>15,800</td>
<td>17,800</td>
<td>20,200</td>
<td>21,100</td>
<td>33,200</td>
</tr>
</tbody>
</table>

### Monroe Bypass Percent of Select Link Trips

- 0.0 to 20.0%
- 20.0 to 40.0%
- 40.0 to 60.0%
- 60.0 to 80.0%
- 80.0 to 100.0%
- Other

Note: Results based on MRM 11 v1.1 raw model daily output volumes with the Monroe Connector/Bypass.

**DRAFT**

**Monroe Connector/Bypass**

**STIP Project R-3329, R-2259**

**2035 Build Origin-Destination Analysis**

(From Screening 1)

**NTS**

**DATE:** January 2014

**FIGURE 2**
Origin-Destination Analysis (2035 Build)
Screenline Analysis

2035 No-Build MRM11 v1.1 Corridor Screenline Trip Summary

Screenline Location

Screenline 1. US 74 east of I-485
Screenline 2. East of Unionville-Indian Trail Road
Screenline 3. East of US 601
Screenline 4. East of NC 200
Screenline 5. East of Forest Hills School Road

HNTB
Screenline Analysis

2035 Build MRM11 v1.1 Screenline Trip Summary
US 74 Corridor

Screenline 5 via US 74  Screenline 1 via US 74

MRM Daily Volume

0 23,000 11,700 4,100 33,200

Screenline 1. US 74 east of I-485
Screenline 2. East of Unionville-Indian Trail Road
Screenline 3. East of US 601
Screenline 4. East of NC 200
Screenline 5. East of Forest Hills School Road
Screenline Analysis

2035 Build MRM11 v1.1 Screenline Trip Summary
Monroe Bypass

Screenline 5 via Monroe Bypass
Screenline 1 via Monroe Bypass

Mid Daily Volume

Screenline 1. US 74 east of I-485
Screenline 2. East of Unionville-Indian Trail Road
Screenline 3. East of US 601
Screenline 4. East of NC 200
Screenline 5. East of Forest Hills School Road
Summary

• ICE, Traffic & Reassessments Provided Systematic, Reasonable and Defensible Findings for the:
  – FEIS (May 2010),
  – DSFEIS (November 2013),
  – FSFEIS / ROD (May 2014).

• Forth Circuit Court of Appeals ruled in favor of NCDOT (June 2016).
Questions?

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